ALB ALBANY
INTERNATIONAL AIRPORT

ALBANY COUNTY AIRPORT AUTHORITY
REGULAR MEETING
AGENDA
October 13, 2026

General:

1. **Chairman's Remarks**

2. **Approval of Minutes**

   Regular Meeting – September 23, 2026

3. **Communications and Report of Chief Executive Officer**

3A. **Reports of Committees**

- **CIC**
- **Finance Committee**

Reports:

4. **Chief Operating Officer**

   - **Main Terminal Expansion Update**

5. **Chief Financial Officer**

6. **Project Development**

6 B. **Planning**

7. **Counsel**

8. **Concessions/Ambassador Program**

9. **Public Affairs**

9 A. **Art & Culture Program**

Action Items:

10. Authorization of Contracts, Leases, Contract Negotiations, Contract Amendments and Action Items

10.1 Purchase Order for purchase of Type I and Type IV Glycol from Ascent Aviation at a Fixed Cost Option

10.2 Purchase Order: Contract No. 1286: Filtered Sand Holliston Sand Company

10.3 Solid Deicer Product in 40 lb. Bags & 1000 lb. Mini Sacks from New Deal Deicing Sourcewell Contract # 031423-NDD

10.4 Authorization to make purchases using State of New York Contract for Road Salt. (Award #23449 / Contract # PC71087) Contract Period September 9, 2026 – August 31, 2027

10.5 Purchase of One (1) Structural Pumper - Sourcewell Contract #082025-PMI Vendor: Firematic Supply Company, Inc.

10.6 Purchase Orders: Issue Annual Purchase Orders for Deicer Products for runways, taxiways and ramps. Authorize four (4) one (1) year option year extensions subject to approval of the Chief Executive Officer. Contract # 1284 Vendor: Nachurs Alpine Solutions Industrial. (NASI)

11. Authorization of Change Orders

11.1 Change Order 16: Authorization to Award Contract Change Order No. 15 to Construction Contract 21-1082-INT STR for the Pre-TSA Terminal Expansion to MLB Construction Services, LLC.

11.2 Change Order 24: Authorization to Award Contract Change Order No. 23 to Construction Contract 21-1082-GC for the Pre-TSA Terminal Expansion to MLB Construction Services, LLC.

12. Authorization of Federal and State Grants

13. Informational - None

Old Business:

New Business:

Executive Session - Attorney-Client Privilege Matters

ES-1 Matter Involving a Particular Corporation

ES-2 Matter Involving a Particular Individual

NOTICE

AGENDA ITEM NO. 1

Chairman's Remarks

AGENDA ITEM NO. 2

Approval of Minutes

ALB ALBANY
INTERNATIONAL AIRPORT

Minutes of the Regular Meeting of the Albany County Airport Authority
September 23, 2026

Pursuant to notice duly given and posted, the regular meeting of the Albany County Airport Authority was called to order on September 23, 2026 at 9:00 a.m. in the Third Floor Conference Room located in the Terminal at the Albany International Airport, Albany, New York by Chair Samuel A. Fresina, with the following present:

MEMBERS PRESENT

Samuel A. Fresina, Chair
Kevin R. Hicks, Sr.
Steven Heider
Harold Iselin
Sari O'Connor
Janet M. Thayer

MEMBERS ABSENT

John-Raphael Pichardo

STAFF

Stephen Clark, Chief Executive Officer
Christine Quinn, Authority Counsel
John O'Donnell, Chief Operating Officer
Margaret Herrmann, Acting Chief Finance Officer
Kathy Greenwood, Director of Art & Culture
Helen Chadderdon, Marketing Manager
Matt Hunter, Communications Director
Dave Montiverdi, Airport Planner
Liz Charland, Administrative Services
Bobbi Matthews, Purchasing Agent
Jenn Munger, Paralegal

ATTENDEES

Carmiena Brooks, Assistant Airport Manager
Ray Camilli, Airfield Maintenance Manager, Avports
Chief Steve Dorsey, ARFF Avports
Kevin Hehir, AvPorts Building Maintenance Manager
Chris Pasquini, Assistant Maintenance Manager, Avports
Perry Blanchard, IT AvPorts
Don Brundage, AvPorts Safety, Health & Environmental Manager
Jim O'Brien, Operations Manager
Austin Sicko, Million Air Albany
Jim Dawsey, MLB Cnstruction
Jeff Lino, MLB Construction
Susan Quine-Laurilliard, Char Multi-Modal Transit Committee

Chair Fresina noted that there was a quorum.

General:

1. **Chairman's Remarks**

    - Chair Fresina welcomed incoming CEO Stephen Clark.

2. **Approval of Minutes**

    Mr. Iselin moved to approve the minutes of:

    Regular Meeting – August 17, 2026

    The motion was adopted unanimously.

3. **Communications and Report of Chief Executive Officer**

    Mr. Clark presented a Communications and Chief Executive Officer's Report for the month of September 2026.

3A. Reports of Committees

Reports:

4. **Chief Operating Officer**

    Mr. O'Donnell presented an update to the Main Terminal Expansion for the month of September 2026. (Power Point attached.)

5. **Chief Financial Officer**

    Ms. Herrmann presented the Financial Report for the month of September 2026. (Power

Point attached.)

6. Project Development

Mr. Mokey presented the Project Development Report for the month of September 2026. (Power Point attached.)

6B. Planning

Mr. Montiverdi presented the Planning Report for the month of September 2026 (Power Point attached.

7. Counsel

8. Concessions/Ambassador Program

Ms. Chadderdon presented the Concessions/Ambassador Report for the month of September 2026.

9. Public Affairs

Mr. Hunter presented the Public Affairs Report for the month of September 2026. (Power Point attached.)

9A. Art & Culture Program

Ms. Greenwood presented the Art & Culture Program Report for September 2026. (Power Point attached.)

Action Items:

10. Authorization of Contracts, Leases, Contract Negotiations, Contract Amendments and Action Items

10.1 Amendment No. 1 Design Services to Contract No. S-1267 for Design Services for a Guest Amenity Strategy to Architecture+

Mr. Mokey and Ms. Greenwood requested authorization to approve Amendment No. 1 to Contract No. S-1267 for Design Services for a Guest Amenity Strategy to Architecture+ in the amount of $35,000.00.

They advised this Phase 2 scope of services entails the provision of construction documents and specifications; furniture planning and specifications; and construction administration services. It supplements the completed Phase 1 services, that included conceptual planning, space programming, budget proposal and provision of detailed design renderings.

Ms. O'Connor moved to approve Amendment No. 1 to Contract No. S-1267 for Design Services for a Guest Amenity Strategy to Architecture+ in the amount of $35,000.00. The motion was adopted unanimously.

10.2 Amendment No. 2 to Contract No. SC-1203: Plumbing Services BPI Piping, Inc.

Mr. Mokey requested authorization to issue Amendment No. 2 to Contract No. SC-1203 to BPI Piping, Inc. in the amount of $150,000.

He advised the Airport relies upon the services of an independent contractor to provide plumbing and drain repairs and maintenance as directed by the Airport Engineering and Maintenance Departments on an as needed basis. Due to increased demand related to the many major construction projects and the age of the airport infrastructure, immediate repairs and maintenance has become increasingly necessary.

Mr. Hicks moved to approve Amendment No. 2 to Contract No. SC-1203 to BPI Piping, In. in the amount of $150,000. The motion was adopted unanimously.

10.3 Intentionally left blank.

10.4 Intentionally left blank.

10.5 Amendment No. 1 to Service Contract SC-1262 Art Domantay Artwork, LLC to add Phase 4 to installation of artwork.

Mr. O'Donnell and Ms. Greenwood requested authorization to amend Services Agreement, Contract SC-1262 with Art Domantay Artwork, LLC, to add Phase 4 to installation of artwork in Contract SC-1247 (Flying Close to Rosewater by Jean Shin) in the amount of $51,094.55

They advised authorization is requested to amend Services Agreement, Contract SC-1262 with Art Domantay Artwork, LLC to add a fourth phase of installation for the artwork in Contract SC-1247, Flying Close to Rosewater. This additional phase will complete the installation of the artwork in the Departure Hall, suspending approximately 1500 cast resin and rose petal discs from the armature installed in Phases 1-3. As the number of required security checks, engineering documents and structural adaptations expanded during Phases 1-3, costs increased with the scope of the project.

As the installation of the ceiling was paused for corrective measures, this team's planned installation activity was also disrupted, causing delays and cost increases as well.

Mr. Iselin moved to approve amendment to Service Agreement, Contract SC-1262 with Art Domantay Artwork, LLC, to add Phase 4 to installation of artwork in Contract SC-1247 (Flying Close to Rosewater by Jean Shin) in the amount of $51,094.55. The motion was adopted unanimously.

10.6 Approve Operating Permit with Trexity, Inc. to provide Baggage Handling Services to United Airlines, Inc. - TABLED

10.7 Purchase Order to Miller Environmental Group, Inc. for Clean-Up from Release of PFOA

Mr. O'Donnell requested authorization to issue a Purchase Order for the clean-up from the release of PFOA onto an active ramp adjacent to the Airport Fire House to Miller Environmental Group, Inc. in the amount of $82,147.65.

He advised On May 28, 2026, the airport experienced an accidental release of concentrated perfluorooctanoic acid (PFOA) onto an active tarmac surface. PFOA is a persistent polyfluoroalkyl substance (PFAS) of environmental and regulatory concern due to its high chemical stability, resistance to degradation, mobility in aqueous systems, and potential for long-term impacts to soil, stormwater infrastructure, groundwater, and receiving waters. The spill required immediate implementation of hazardous-materials response procedures to prevent migration of the contaminant beyond the affected apron area.

Following discovery of the release, airport personnel initiated preliminary containment measures and engaged a qualified environmental response contractor with demonstrated experience in PFAS/PFOA containment, decontamination, waste characterization, and regulated disposal. The response contractor, Miller Environmental Group Inc., mobilized specialized personnel, equipment, containment materials, and transportation resources to the site.

Work activities were conducted under appropriate site-specific health and safety controls, including the use of chemical-resistant personal protective equipment and protective clothing as required by the hazard assessment and applicable safety protocols.

The cleanup operation included isolation of the impacted tarmac area, control of surface runoff, recovery of free liquid, collection of contaminated rinse water, and removal of affected debris and absorbent materials. Due to the solubility and persistence of PFOA, particular emphasis was placed on preventing the compound from entering storm drains, subsurface drainage systems, soil interfaces, or adjacent operational areas of the airport. Decontamination procedures were performed by Miller staff and Albany Firefighting staff using controlled wash-down and recovery methods to ensure that generated liquids were captured rather than allowed to disperse across the pavement or into the airport's stormwater management system.

Contaminated liquids and associated response materials were containerized for off-site management. The operation required approximately sixty-four 55-gallon drums for temporary storage, segregation, and transport of PFOA-impacted water and absorbents. Multiple service vehicles and specialized trucks were used throughout the response, including vacuum trucks for liquid recovery, drum transport vehicles, support trucks for equipment and materials, and waste-hauling vehicles suitable for transporting regulated or potentially hazardous PFAS-impacted waste. Waste materials were subsequently transported to an approved disposal facility located in New Jersey capable of accepting PFOA-contaminated media in accordance with applicable federal, state, and local

environmental regulations.

The overall remediation effort was substantial in scope and duration. Activities included emergency containment, site assessment, waste recovery, surface decontamination, transportation coordination, documentation, and final verification of cleanup effectiveness. Because of the chemical persistence of PFOA and the need to ensure that residual contamination was adequately addressed, the cleanup and associated environmental management activities extended over approximately five weeks before completion.

Ray Camilli, Airport Manager, Don Brundage, Safety, Environmental and Health Manager, along with the Airport Firefighters actively participated in the clean-up and monitored the work of Miller Environmental Group, Inc. Please see email attached from Don Brundage concurring with the quantities and duration of the remediation.

Mr. Iselin moved to approve the award of a Purchase Order for the clean-up from the release of PFOA onto an active ramp adjacent to the Airport Fire House to Miller Environmental Group, Inc. in the amount of $82,147.65. The motion was adopted unanimously.

11. Authorization of Change Orders

11.1 Change Order 23: Authorization to Award Contract Change Order No. 23 to Construction Contract 21-1082-GC for the Pre-TSA Terminal Expansion to MLB Construction Services, LLC.

Mr. O'Donnell requested authorization to Award Contract Change Order No. 23 to Construction Contract 21-1082-GC for the Pre-TSA Terminal Expansion to MLB Construction Services, LLC in the amount of $191,000.

He advised this Change Order request includes a global settlement of $400,000 for the fabrication labor, detailing time, modeling, field erection and project management/supervision beyond what could have been reasonably anticipated in the establishment of a connection detailing tonnage allowance.

As a result of ACAA previously release $209,000 in Approval Letter 02 on November 19, 2024 to partially fund the work while the claim was being evaluated, should the ACAA board approve the global settlement, this would release a balance of $191,000 to resolve this claim 04 with no time added to the contract. Please reference the attached Exhibit A.

This payment is accepted as a complete compromise of a disputed claim and does not constitute an admission of liability by either party. Upon receipt of the payment of $191,000 the claimant releases and discharges the Albany County Airport of any future claims connected to the detailing tonnage allowance.

Mr. Hicks moved to approve Change Order No. 23 to Construction Contract 21-1082-GC for the Pre-TSA Terminal Expansion to MLB Construction Services, LLC in the amount of $191,000. The motion was adopted unanimously.

12. **Authorization of Federal and State Grants - None**

13. **Informational - None**

Old Business: None

New Business: None

Executive Session - Attorney-Client Privilege Matters

Mr. Iselin made a motion to go into executive session at 10:15 a.m. to discuss:

ES-1 Matter Involving a Particular Corporation

ES-2 Matter Involving a Particular Individual

There was no action being taken and no further business, the meeting was adjourned at 11:13 a.m.

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3A. **Reports of Committees**

Reports:

4. **Chief Operating Officer**
   - **Main Terminal Expansion Update**
5. **Chief Financial Officer**
6. **Project Development**
   - **Concourse A Update**

6 B. **Planning**

7. **Counsel**
8. **Concessions/Ambassador Program**
9. **Public Affairs**

9 A. **Art & Culture Program**

Action Items:

10. Authorization of Contracts, Leases, Contract Negotiations, Contract Amendments and Action Items

10.1 Amendment No. 1 Design Services to Contract No. S-1267 for Design Services for a Guest Amenity Strategy to Architecture+

10.2 Issue Purchase Order for Plumbing Services to Remove and Replace Valves to BPI Piping

10.3 Intentionally left blank.

10.4 Intentionally left blank.

10.5 Amendment No. 1 to Service Contract SC-1262 Art Domantay Artwork, LLC to add Phase 4 to installation of artwork.

10.6 Approve Operating Permit with Trexity, Inc. to provide Baggage Handling Services to United Airlines, Inc.

10.7 Purchase Order to Miller Environmental Group, Inc. for Clean-Up from Release of PFOA

11. Authorization of Change Orders

11.1 Change Order 23: Authorization to Award Contract Change Order #23 to Construction Contract 21-1082-GC for the Pre-TSA Terminal Expansion to MLB Construction Services, LLC.

12. Authorization of Federal and State Grants

13. Informational - None

Old Business:

New Business:

Executive Session - Attorney-Client Privilege Matters

ES-1 Matter Involving a Particular Corporation

ES-2 Matter Involving a Particular Individual



1

WELCOME

STEPHEN CLARK
Chief Executive Officer
Albany International Airport



ALB

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CEO'S REPORT



ALB

3

INTERNATIONAL FLIGHTS DIVERT TO ALB

ALB teams coordinate successful *response to Newark ground stop*



ALB

4

INTERNATIONAL FLIGHTS DIVERT TO ALB

ALB teams coordinate successful *response to Newark ground stop*

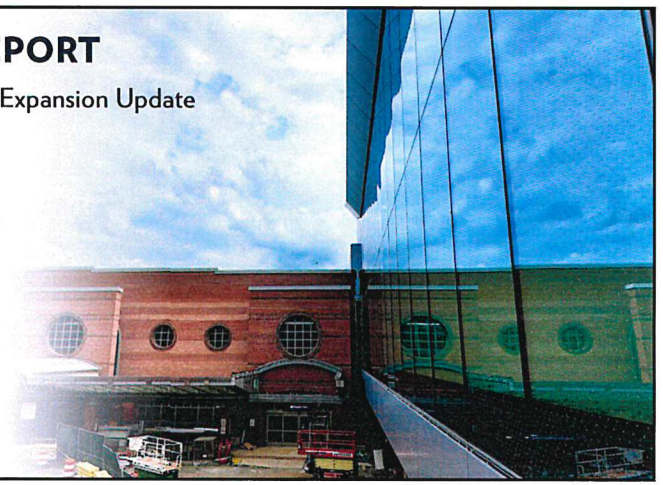


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COO'S REPORT

Main Terminal Expansion Update



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MAIN TERMINAL EXPANSION

Project Milestones

Recently Completed:

- 2nd floor restrooms completed and secured



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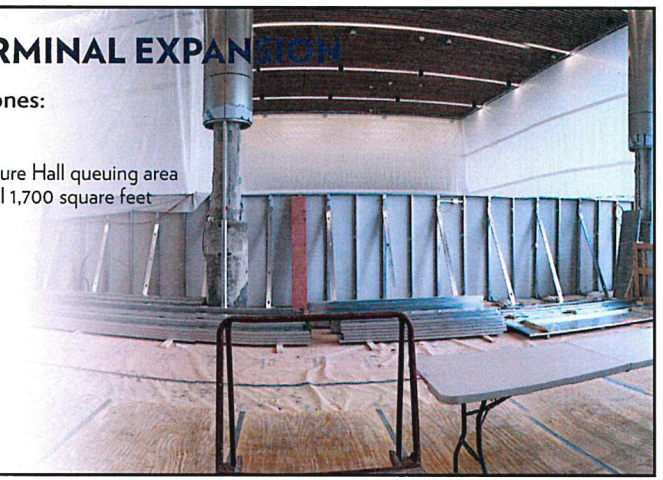
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MAIN TERMINAL EXPANSION

Project Milestones:

October 2026

- Expand Departure Hall queuing area by an additional 1,700 square feet



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MAIN TERMINAL EXPANSION

Project Milestones:

October 2026

- Expand Departure Hall queuing area by an additional 1,700 square feet



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MAIN TERMINAL EXPANSION

Project Milestones:

October 2026

- Expand Departure Hall Queuing Area by an additional 1,700 square feet
- Installation of glass in 3rd Floor ACAA offices



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MAIN TERMINAL EXPANSION

Project Milestones:

October 2026

- Expand Departure Hall Queuing Area by an additional 1,700 square feet
- Installation of glass in 3rd Floor ACAA offices



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MAIN TERMINAL EXPANSION

Project Milestones:

October 2026

- Expand Departure Hall Queuing Area by an additional 1,700 square feet
- Installation of glass in 3rd Floor ACAA offices
- Installation of stairwell & escalator glass railings



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MAIN TERMINAL EXPANSION

Project Milestones:

<u>October 2026</u>

- Expand Departure Hall Queuing Area by an additional 1,700 square feet
- Installation of glass in 3rd Floor ACAA offices
- Installation of stairwell & escalator railings



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MAIN TERMINAL EXPANSION

Project Milestones:

<u>October 2026</u>

- Expand Departure Hall Queuing Area by an additional 1,700 square feet
- Installation of glass in 3rd Floor ACAA offices
- Installation of stairwell & escalator railings
- Completion of low ceilings in ticketing area



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MAIN TERMINAL EXPANSION

Project Milestones:

<u>October 2026</u>

- Expand Departure Hall Queuing Area by an additional 1,700 square feet
- Installation glass in 3rd Floor ACAA offices
- Installation of stairwell & escalator railings
- Completion of low ceilings in ticketing area
- Painting behind airline ticket counters



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MAIN TERMINAL EXPANSION

Project Milestones:

<u>December 2026</u>

- Curbside vestibule enhancements



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MAIN TERMINAL EXPANSION

Project Milestones:

December 2026

- Curbside vestibule enhancements
- Sliding doors at North Parking Garage vestibules



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MAIN TERMINAL EXPANSION

Project Milestones:

December 2026

- Curbside vestibule enhancements
- Sliding doors at North Parking Garage vestibules
- Completion of Elevators #4 and #5, with access to North Parking Garage



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MAIN TERMINAL EXPANSION

Project Milestones:

December 2026

- Curbside vestibule enhancements
- Sliding doors at North Parking Garage vestibules
- Completion of Elevators #4 and #5, with access to North Parking Garage
- Installation of TSA digital banner



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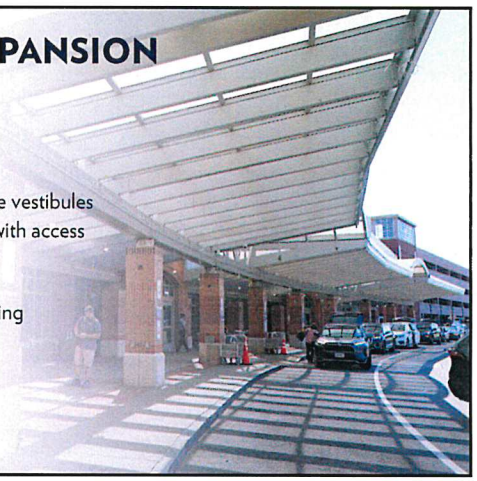
19

MAIN TERMINAL EXPANSION

Project Milestones:

December 2026

- Curbside vestibule enhancements
- Sliding doors at North Parking Garage vestibules
- Completion of Elevators #4 and #5, with access to North Garage
- Installation of TSA digital banner
- Canopy lighting and new metal cladding



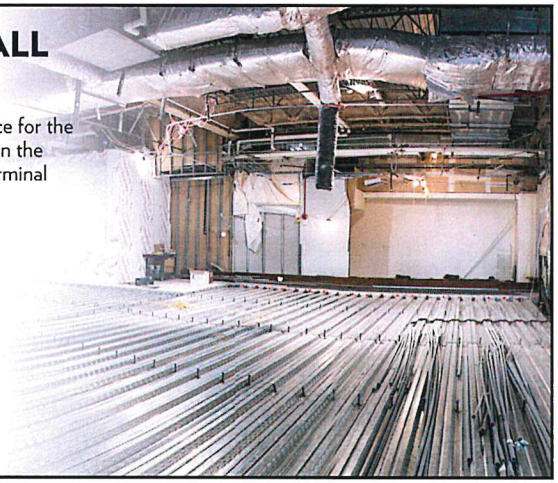
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DEPARTURE HALL

East Side Connection

- Structural steel is now in place for the east-side connection between the Departure Hall and Main Terminal



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DEPARTURE HALL

East Side Connection

- Structural steel is now in place for the east-side connection between the Departure Hall and Main Terminal



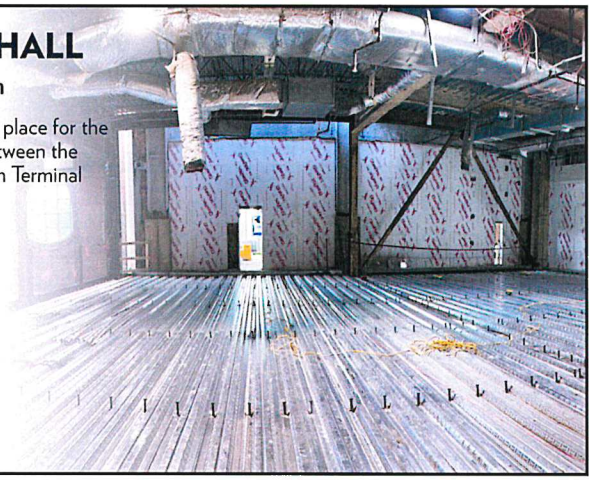
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22

DEPARTURE HALL

East Side Connection

- Structural steel is now in place for the east-side connection between the Departure Hall and Main Terminal



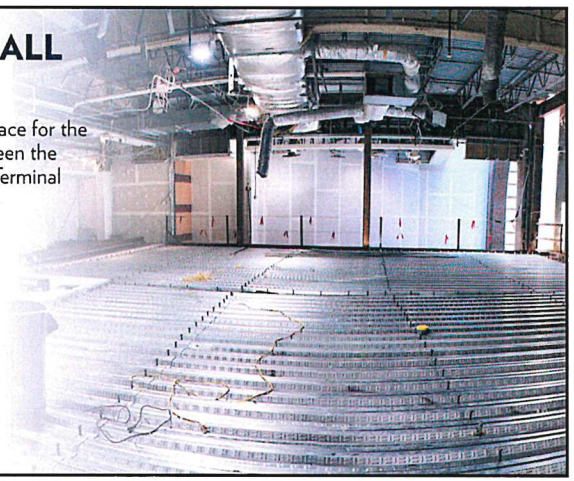
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DEPARTURE HALL

East Side Connection

- Structural steel is now in place for the east-side connection between the Departure Hall and Main Terminal



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DEPARTURE HALL

East Side Exterior Work Continues



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DEPARTURE HALL

Covered Roadway Ceiling Installation



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DEPARTURE HALL

Terrazzo Floor Installation

- First & Second Floor complete



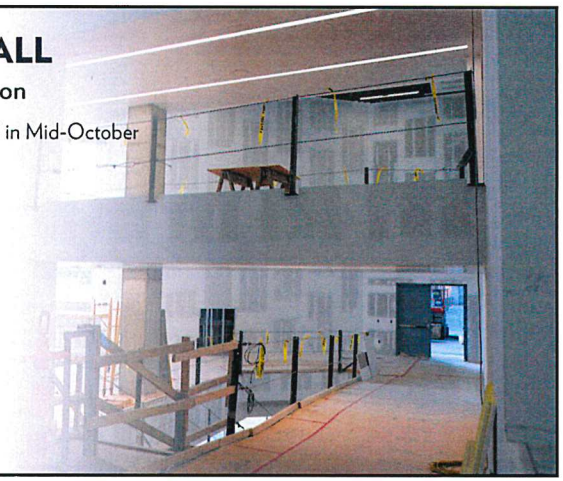
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DEPARTURE HALL

North Garage Connection

- Metal railings to be installed in Mid-October



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DEPARTURE HALL

North Garage Connection

- Painting to be complete by Mid-October



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MAIN TERMINAL

Retail Renovations

On The Fly
Concourse A



- Construction Begins: 10/13
- Duration: 4 weeks

Capital Marketplace
Concourse B



- Construction Begins: 11/19
- Duration: 12 weeks

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INTERNATIONAL AIRPORT

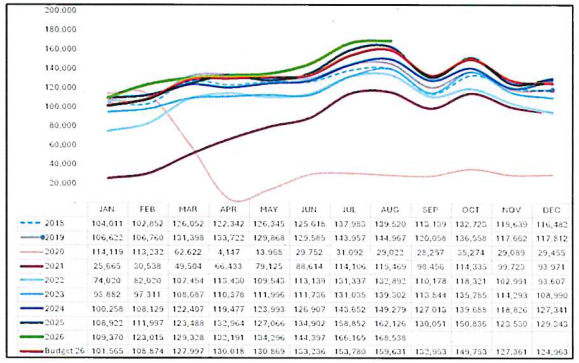
FINANCIAL REPORT

July 2026

September 29, 2026

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Monthly Enplanements

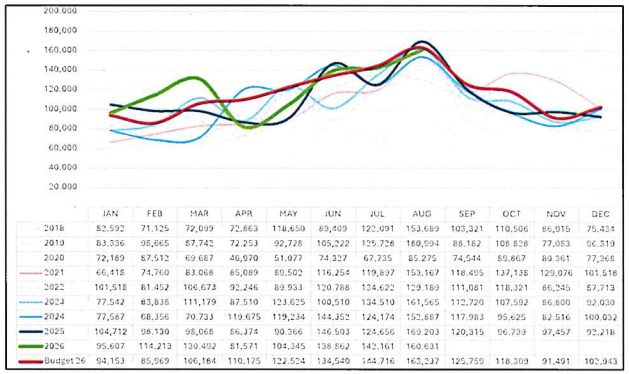


	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Annual
2018	104,611	102,652	126,052	122,342	126,345	125,618	137,985	129,520	113,159	132,725	119,639	116,482	1,466,706
2019	106,622	106,760	131,398	133,722	129,868	129,585	143,957	134,967	120,058	136,558	117,662	117,812	1,518,969
2020	114,119	113,232	62,622	4,147	13,968	29,752	31,092	29,023	28,257	35,274	29,089	29,455	520,029
2021	25,665	30,538	49,504	66,433	79,125	88,614	114,106	115,469	98,456	114,335	99,723	93,971	975,939
2022	74,020	82,020	107,454	113,450	109,543	113,139	131,337	132,892	110,178	118,321	102,991	93,607	1,288,932
2023	93,882	97,311	108,687	110,378	111,996	111,756	131,035	139,502	113,844	135,785	114,293	108,990	1,376,639
2024	100,258	108,129	122,407	119,477	123,993	126,907	143,652	149,279	127,015	139,688	118,826	127,341	1,507,130
2025	108,922	111,997	123,488	132,964	127,066	134,902	158,852	162,126	130,051	150,836	123,550	129,543	1,594,077
2026	109,370	123,015	129,328	132,191	134,296	144,397	166,365	168,538					
Budget 26	101,565	108,874	122,997	130,018	130,869	153,236	153,780	159,631	132,953	149,793	127,361	124,963	

Monthly Financial Report 32

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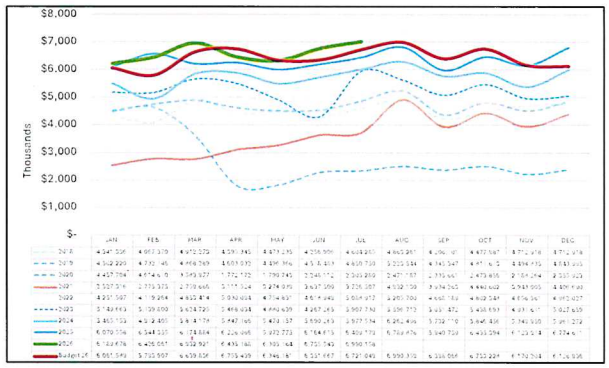
Monthly Jet A FBO only (gallons)



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Annual
2018	82,592	71,125	72,099	72,863	118,650	89,409	122,091	153,689	103,321	110,506	86,915	75,434	996,302
2019	83,336	98,665	87,742	72,253	92,728	105,222	125,728	160,094	88,182	108,828	77,083	96,519	1,158,694
2020	72,189	87,512	69,687	46,070	51,077	74,327	67,735	85,275	74,544	89,867	80,361	77,366	1,217,080
2021	66,418	74,760	83,068	85,089	89,502	116,254	119,837	153,167	118,495	137,138	129,076	101,518	876,912
2022	101,518	81,452	106,673	92,246	89,933	120,788	124,622	129,189	111,081	118,321	86,245	87,713	1,274,382
2023	77,542	83,838	111,179	87,510	123,625	100,510	134,510	161,565	112,720	107,592	86,800	92,030	1,259,781
2024	77,567	68,356	70,733	119,675	119,234	144,352	124,174	152,887	117,983	95,625	82,516	100,032	1,279,421
2025	104,712	98,130	98,068	86,374	90,366	146,503	124,656	169,203	120,315	96,739	97,457	92,218	1,266,446
2026	95,607	114,213	130,492	81,571	104,345	138,862	142,161	160,631					1,324,744
Budget 26	94,153	85,569	106,164	110,175	122,524	134,540	144,716	163,237	125,759	118,389	91,491	102,943	

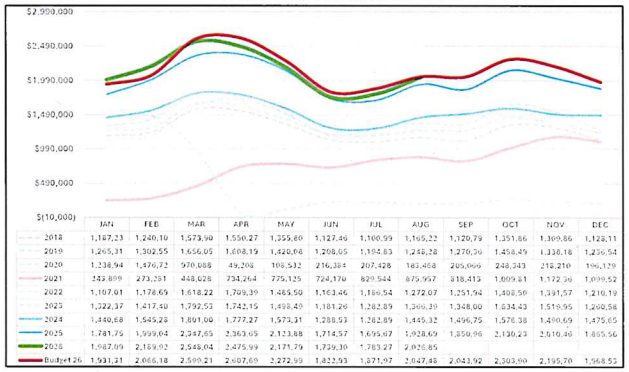
33

Operating Revenue (including FBO)



34

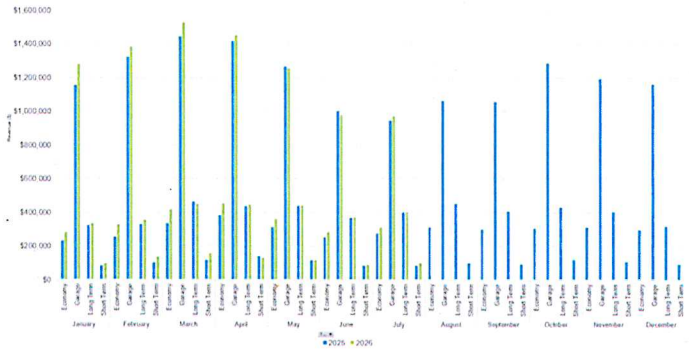
Parking Revenues



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2018	1,167.23	1,240.10	1,573.90	1,550.27	1,355.80	1,127.46	1,100.99	1,165.22	1,120.79	1,351.86	1,369.86	1,128.11
2019	1,265.31	1,302.55	1,656.05	1,608.19	1,420.68	1,208.05	1,195.83	1,248.28	1,270.36	1,458.49	1,338.18	1,236.94
2020	1,238.94	1,476.72	970.088	49.204	108.532	216.384	207.428	183.468	205.009	248.343	219.210	196.129
2021	343.899	273.251	448.028	734.264	775.125	724.170	829.544	875.957	818.413	1,009.81	1,172.36	1,099.52
2022	1,107.01	1,178.69	1,618.22	1,709.39	1,485.50	1,163.46	1,186.94	1,272.07	1,251.94	1,408.50	1,391.57	1,210.19
2023	1,222.37	1,417.40	1,792.53	1,742.15	1,498.40	1,181.26	1,282.89	1,369.30	1,348.00	1,634.43	1,519.95	1,260.58
2024	1,440.68	1,545.28	1,891.00	1,777.27	1,573.31	1,288.53	1,282.89	1,445.32	1,496.75	1,576.38	1,490.69	1,475.65
2025	1,781.75	1,999.04	2,347.65	2,363.05	2,133.88	1,714.57	1,695.67	1,928.69	1,850.96	2,130.23	2,010.46	1,865.56
2026	1,987.09	2,189.92	2,548.04	2,475.99	2,171.79	1,729.30	1,783.27	2,026.85				
Budget 26	1,931.21	2,066.18	2,590.21	2,607.68	2,272.99	1,822.93	1,871.97	2,047.48	2,043.92	2,393.90	2,195.70	1,968.53

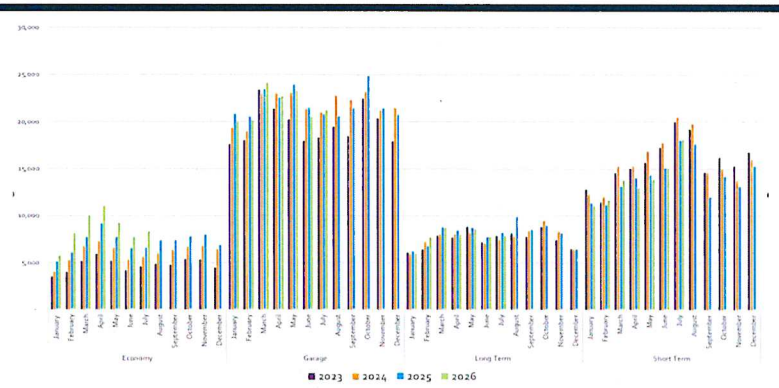
35

Monthly Parking Revenues by Lot 2025 & 2026



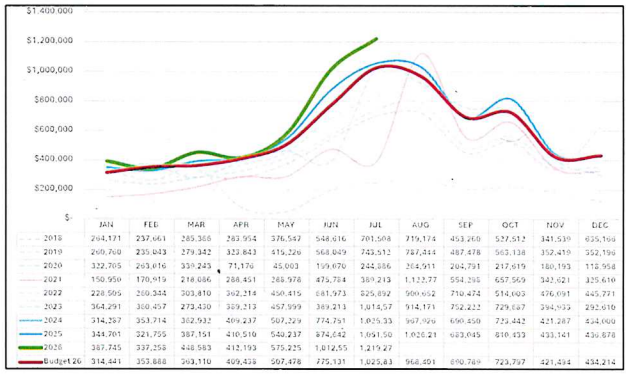
36

Monthly Parking Lot Count 2023-2026



37

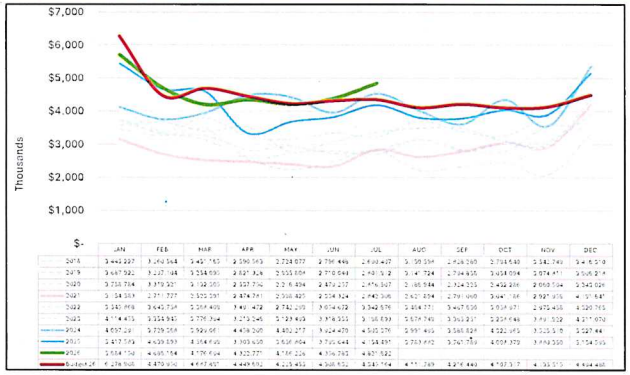
Rental Car Revenues



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2018	294,171	237,661	289,366	283,954	376,547	548,616	701,508	719,174	453,260	527,512	341,539	635,166
2019	269,760	235,043	279,342	323,843	415,226	568,049	743,512	787,444	487,478	563,138	352,419	552,196
2020	322,705	263,016	339,243	71,176	45,003	199,670	244,886	264,911	204,791	217,619	180,193	118,958
2021	150,959	170,919	218,086	288,451	288,978	475,784	389,213	1,122,77	554,295	657,569	342,621	325,619
2022	228,505	260,344	303,810	362,214	450,415	681,973	525,892	900,652	710,474	514,003	476,091	445,771
2023	364,291	360,457	273,430	389,213	457,999	389,213	1,014,57	914,171	752,222	729,687	394,933	292,619
2024	314,297	353,714	382,932	409,237	507,229	774,751	1,025,33	997,926	690,450	723,442	421,287	434,009
2025	344,701	321,755	387,151	410,519	549,237	874,642	1,051,50	1,026,21	683,045	810,433	433,141	436,878
2026	387,745	337,258	448,583	412,193	575,225	1,012,55	1,219,27					
Budget 26	314,441	353,888	393,110	409,438	567,478	775,131	1,025,83	968,401	690,749	723,797	421,494	434,214

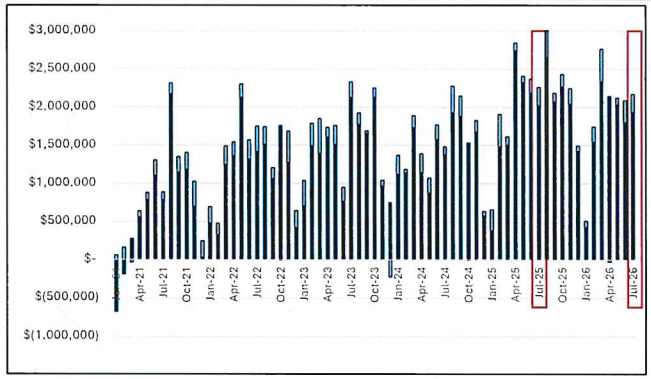
38

Operating Expense (including FBO)



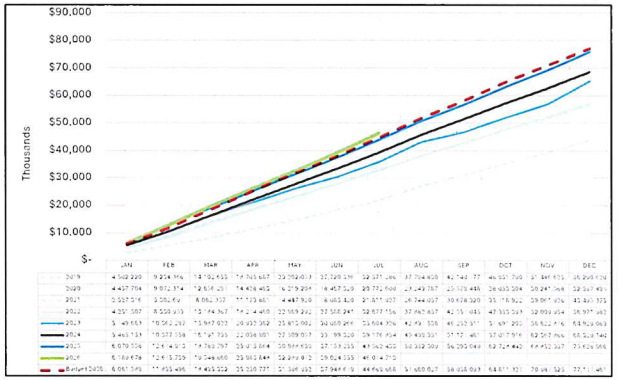
39

Operating Net Profit, Airport and FBO



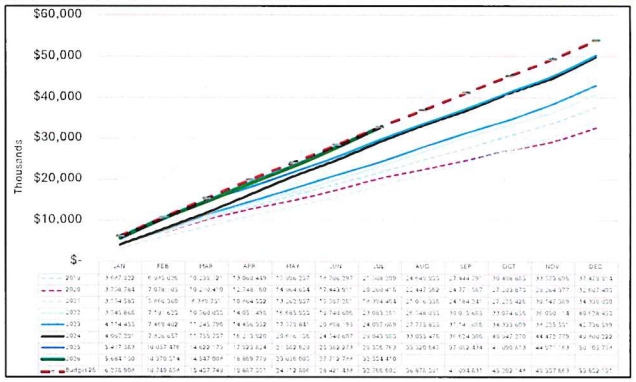
40

YTD Operating Revenue (excluding CARES) vs. YTD Budget (including FBO)



41

YTD Operating Expense vs. YTD Budget (including FBO)



42

Line of Credit Draws

Line of Credit Activity

	Draw Date	Amount	Repayment Date	Partial Repayment Amount	Partial Repayment Date	Partial Repayment Amount	Partial Repayment Date	Current LOC Balance
LOC Draw 01	6-Mar-24	$ 984,381.73	12-Aug-24					
LOC Draw 02	6-Mar-24	761,816.97	2-Apr-24					
LOC Draw 03	20-Mar-24	969,655.24	8-Apr-24					
LOC Draw 04	9-May-24	2,152,308.12	1-Jul-24					
LOC Draw 05	9-May-24	1,285,737.86	1-Jul-24					
LOC Draw 06	14-Jun-24	2,580,897.15	2-Oct-24					
LOC Draw 07	14-Jun-24	2,337,750.23	2-Oct-24					
LOC Draw 08	22-Aug-24	4,055,372.75	16-Oct-24					
LOC Draw 09	15-Nov-24	3,159,332.29	10-Jan-25					
LOC Draw 10	23-Dec-24	1,554,653.15		293,829.45	15-Jul-25	1,260,823.70	14-Nov-25	
LOC Draw 11	16-Jan-25	1,045,137.75		197,531.03	15-Jul-25	847,606.72	14-Nov-25	
LOC Draw 11	16-Jan-25	1,667,596.47	27-Mar-25					
LOC Draw 12	27-Feb-25	879,236.80		165,419.76	15-Jul-25	709,817.04	14-Nov-25	
LOC Draw 12	27-Feb-25	1,342,431.04	18-Apr-25					
LOC Draw 13	5-Mar-25	1,104,266.22	18-Apr-25					
LOC Draw 13	5-Mar-25	1,368,011.17	18-Apr-25					
LOC Draw 14	28-Apr-25	618,447.81		116,886.64	15-Jul-25	501,561.17	14-Nov-25	
LOC Draw 14	28-Apr-25	579,232.10	2-Jun-25					
LOC Draw 15	12-May-25	391,933.11	2-Jun-25					
LOC Draw 15	12-May-25	937,919.23		177,266.73	15-Jul-25	760,652.50	14-Nov-25	
LOC Draw 16	28-May-25	896,225.85	15-Jul-25					
LOC Draw 16	28-May-25	1,099,420.41	14-Nov-25					
LOC Draw 17	23-Jun-25	326,556.42	4-Sep-25					
LOC Draw 17	23-Jun-25	1,442,159.62	14-Nov-25					
LOC Draw 18	4-Aug-25	448,729.65	30-Oct-25					
LOC Draw 18	4-Aug-25	2,761,014.98	14-Nov-25					
LOC Draw 19	22-Sep-25	502,138.65	29-Dec-25					
LOC Draw 19	22-Sep-25	1,712,359.32	14-Nov-25					
LOC Draw 19	22-Sep-25	1,547,250.22	14-Nov-25					
LOC Draw 20	9-Dec-25	788,486.03	2-Feb-26					
LOC Draw 20	9-Dec-25	2,438,083.80	13-Apr-26					
LOC Draw 21	14-Jan-26	1,863,455.39	13-Apr-26					
LOC Draw 21	14-Jan-26	1,642,515.80	13-Apr-26					
	Outstanding							$ -

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Airline Schedules

Albany International Airport
Airline and Direct Market Flights
For the week of September 19, 2026

AIRLINE	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Allegiant	3	3			3	3	
American	17	16	15	15	16	16	13
Avelo	1				1		
Breeze	1	1			1	1	
Delta	9	9	9	9	9	9	6
Jet Blue	1	2	2			2	2
Southwest	11	10	10	10	10	10	11
United	9	9	9	9	9	9	9
	52	50	45	43	49	50	41

DIRECT MARKET	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Atlanta	3	3	3	3	3	3	2
Baltimore	4	4	4	4	4	4	4
Charleston		1				1	
Charlotte	4	3	3	3	3	3	3
Charlotte/Concord	1				1		
Chicago-Midway	3	3	3	3	3	3	2
Chicago-O'Hare	7	7	7	7	7	7	7
Denver	2	2	2	2	2	2	2
Detroit	4	4	4	4	4	4	3
Fort Lauderdale	2	1	1		1	1	1
Myrtle Beach		1				1	
Nashville	1	2	1	1	1	2	1
New York LaGuardia	2	2	2	2	2	2	1
Orlando	2	2	2	1	1	2	3
Orlando/Sanford	1				1		
Philadelphia	6	6	5	5	6	6	4
Punta Gorda	1				1		
Raleigh Durham	1				1		
St. Petersberg		1				1	
Tampa							1
Washington/Dulles	4	4	4	4	4	4	4
Washington/Reagan	4	4	4	4	4	4	3
	52	50	45	43	49	50	41

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THANK YOU

ALB
ALBANY
INTERNATIONAL AIRPORT

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PROJECT DEVELOPMENT



ALB

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WAYFINDING & PARKING



ALB

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WAYFINDING & PARKING

Heritage Lot: Laundry Facility Demolition





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WAYFINDING & PARKING

Cell Phone Lot Reconfiguration

- Project began September 9th



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WAYFINDING & PARKING

Cell Phone Lot Reconfiguration

- Lot temporarily relocated to Heritage Lane during construction



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WAYFINDING & PARKING

Cell Phone Lot Reconfiguration

- Lot temporarily relocated to Heritage Lane during construction



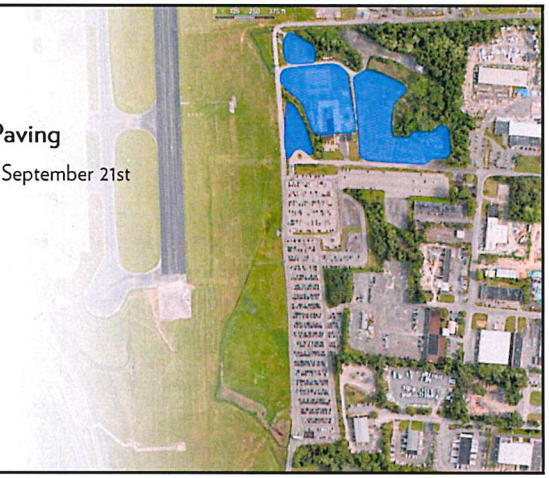
ALB

51

WAYFINDING & PARKING

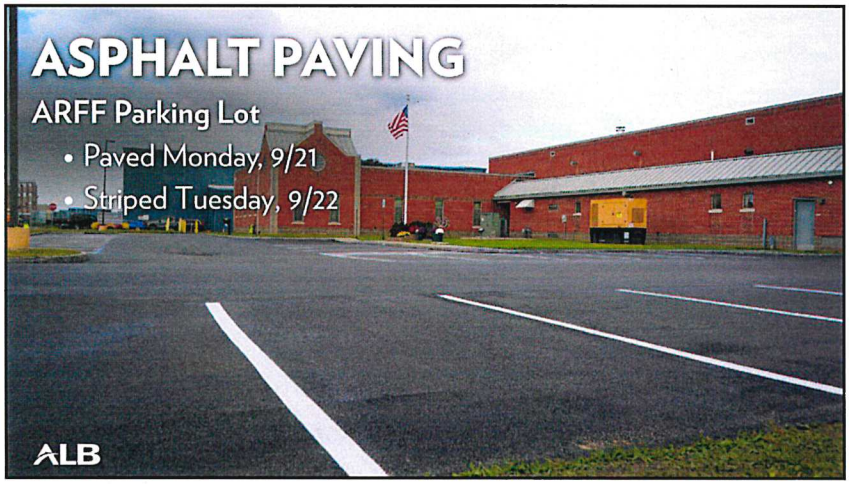
Economy Lot Parking & Paving

- Phase 1 work begins week of September 21st

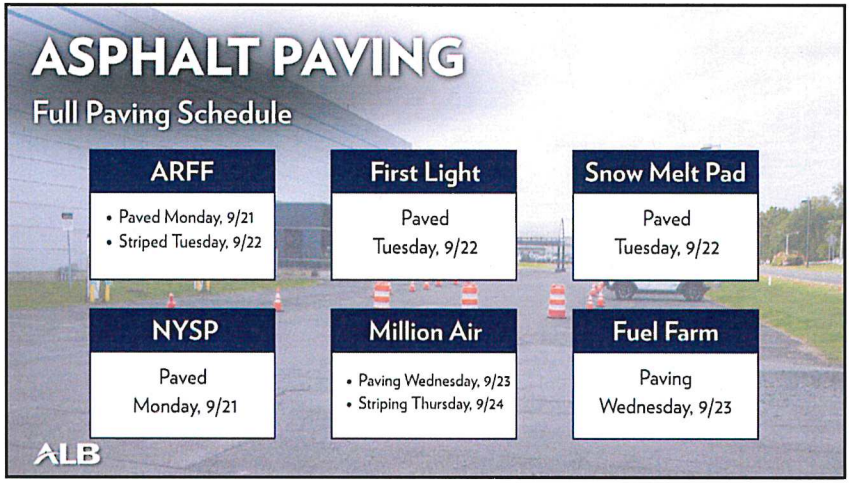


ALB

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ASPHALT PAVING
ARFF Parking Lot
• Paved Monday, 9/21
• Striped Tuesday, 9/22
ALB

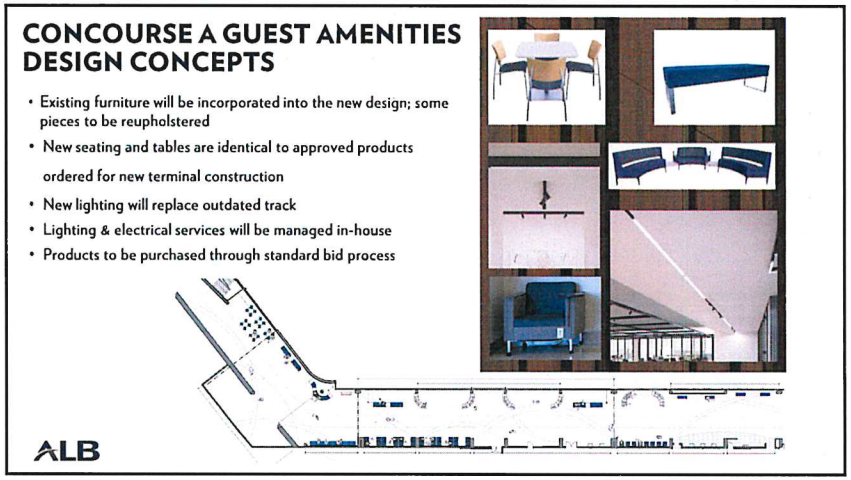
53


ASPHALT PAVING
Full Paving Schedule
ARFF
• Paved Monday, 9/21
• Striped Tuesday, 9/22
First Light
Paved
Tuesday, 9/22
Snow Melt Pad
Paved
Tuesday, 9/22
NYSP
Paved
Monday, 9/21
Million Air
• Paving Wednesday, 9/23
• Striping Thursday, 9/24
Fuel Farm
Paving
Wednesday, 9/23
ALB

54

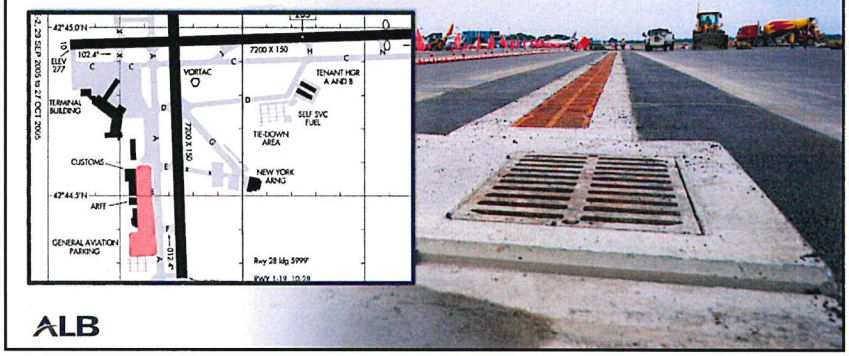

CONCOURSE A
& GATE EXPANSION
A6
ALB

55


CONCOURSE A GUEST AMENITIES
DESIGN CONCEPTS
• Existing furniture will be incorporated into the new design; some pieces to be reupholstered
• New seating and tables are identical to approved products ordered for new terminal construction
• New lighting will replace outdated track
• Lighting & electrical services will be managed in-house
• Products to be purchased through standard bid process
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GENERAL AVIATION APRON REHAB



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FUEL FARM FIRE SUPPRESSION



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RUNWAY 1 MALSR LIGHTS



ALB

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TRANSFORMER PROJECT

National Grid Crews On-Site



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LOADING DOCK ENHANCEMENTS

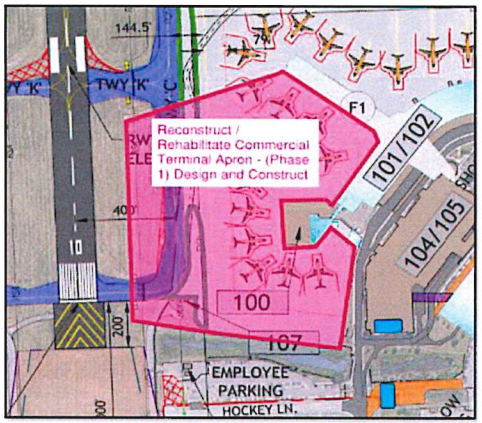


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MAIN TERMINAL APRON DESIGN

- Site investigation complete
- Currently in design phase
- Construction in 2027



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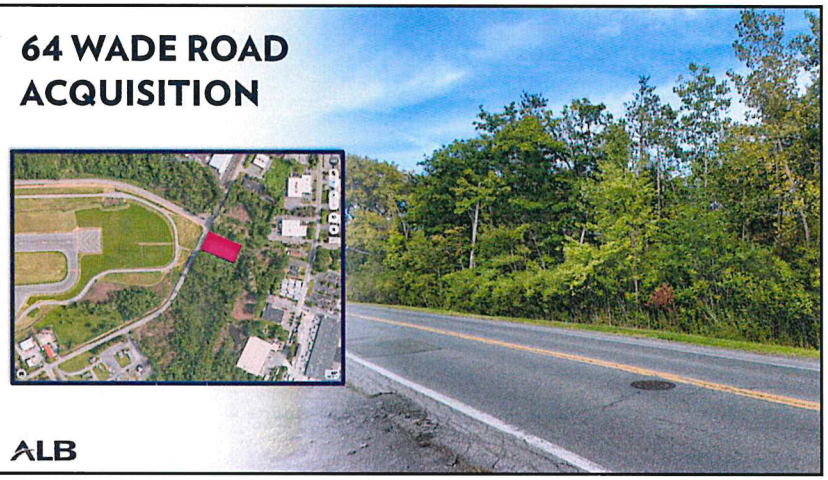
AIRPORT PLANNING



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64 WADE ROAD ACQUISITION



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64

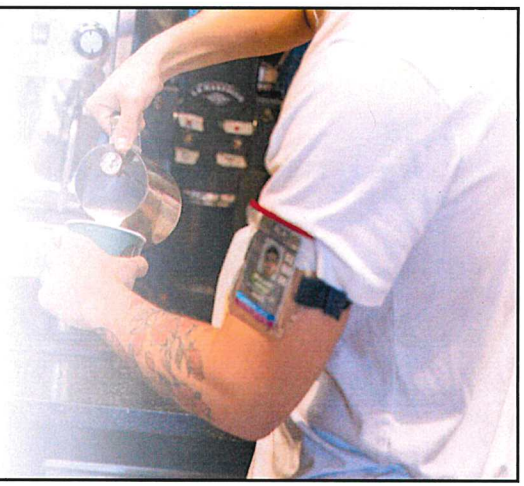
LAW ENFORCEMENT GRANT FROM TSA



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CONCESSIONS & AMBASSADOR PROGRAM



ALB

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PUBLIC AFFAIRS



ALB

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RECENT MEDIA COVERAGE

European Diversions Land at ALB



ALB

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RECENT MEDIA COVERAGE
ALB September 11th Remembrance
ALB

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RECENT MEDIA COVERAGE
Cell Phone Lot Expansion
ALB

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RECENT MEDIA COVERAGE
Gateside by TSA PreCheck
Coming to Upstate Airports
ALB

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RECENT MEDIA COVERAGE
U.S. Secretary of Transportation
Visits Albany International Airport
WRGB
ALB

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RECENT MEDIA COVERAGE

U.S. Marine Corps Ospreys
Touch Down at ALB

NEWS 10 abc



ALB

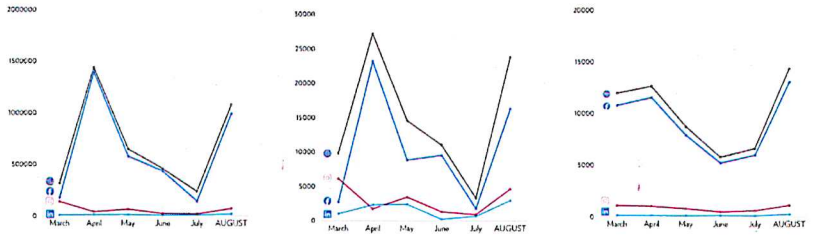
73

SOCIAL MEDIA PERFORMANCE

1,078,299
Views

23,796
Interactions

14,388
Profile Visits



ALB

August 2026

74

TOP PERFORMING SOCIAL POSTS

TITLE		VIEWS	INTERACTIONS
1) BOEING 767 LANDS AT ALB (REEL)			
	• Facebook	426,325*	4,419
	• Instagram	20,983	1,062
2) MARINE CORPS OSPREYS AT ALB (REEL)			
	• Facebook	232,015	6,244*
	• Instagram	16,449	1,511
3) U.S. TRANSPORTATION SECRETARY VISITS ALB			
	• Facebook	102,492	1,806
	• Instagram	4,229	175



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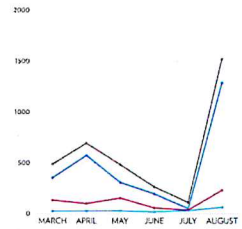
August 2026

75

SOCIAL MEDIA AUDIENCE

Facebook	23,018 Followers
Instagram	3,553 Followers
LinkedIn	1,676 Followers
Total	28,247 Followers

1,517
New Followers (Net)



ALB

August 2026

76

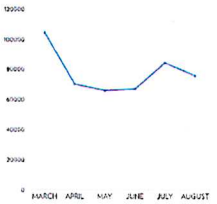
WEBSITE TRAFFIC

August 2026

45,625
Users



75,582
Sessions



132,192
Page Views



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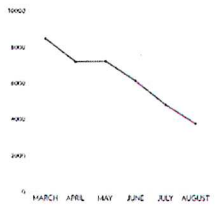
albanyairport.com

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POINTR METRICS

August 2026

3,763
Sessions



2,728
Devices (Users)



93
Avg. Users Per Day



ALB

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SPECIAL RECOGNITIONS

ALB Named One of Nation's "Best Small Airports" by USA Today

- Voting ends October 14th

VOTE FOR ALB



ALB

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SPECIAL RECOGNITIONS

Million Air Albany Recognized by Southwest as Outstanding Service Provider

- Award ceremony in Dallas
- Ranked #1 out of 26 Level 4 airports (2,500 – 5,000 annual Southwest flights)
- Recognizes top performing airports with low delay counts, excellent fuel accounting and best overall performance



ALB

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COMMUNITY CONNECTIONS

Creating memorable experiences while supporting one of our own

A behind-the-scenes tour of ALB was offered through a charitable silent auction benefiting the grandson of an ALB employee who's battling a rare illness.



ARFF



Million Air



Control Tower



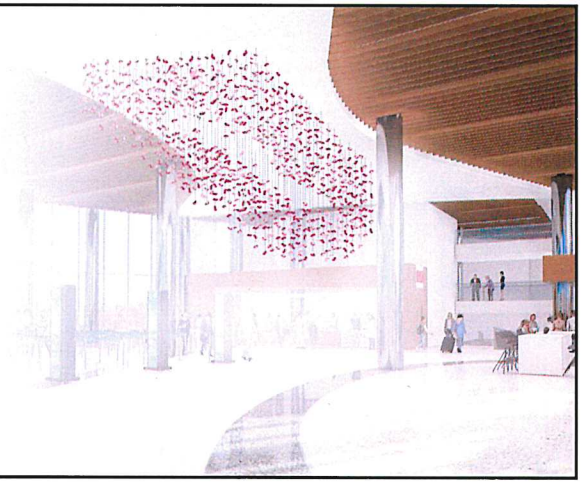
Warbird Factory

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ART & CULTURE PROGRAM

ALBANY INTERNATIONAL AIRPORT



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INTERNATIONAL AIRPORT

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AGENDA ITEM NO. 3

Communications and

Report of Chief Executive Officer

AGENDA ITEM NO. 4

Chief Operating Officer

AGENDA ITEM NO. 5

Chief Financial Officer



Albany County Airport Authority

Monthly Financial Report

As of August 31, 2026

August 2026 Financial Performance

INTRODUCTION

The attached report includes the Airport's August 2026 statistical highlights, financial information, and operating information. This financial information is presented for the purposes of comparing budget to actual results and for indicating generally how revenues and expenses have compared to budgeted revenues and expenses through August 2026. The financial information presented herewith is prepared on the Albany County Airport Authority's budgetary basis of accounting. The information provided in this report does not include a forecast of the effects of the final settlement based upon the calculation provided for in the 2026 Airport Use and Lease Agreement or make any provision for accrual of funds owed to or from the Signatory Airlines. *This report includes preliminary operating and performance statistics and financial forecasts based upon the budgetary basis of accounting estimates that involve uncertainties that could result in actual financial results differing materially from preliminary estimates.* This report is divided into the following sections: Statistical Information, Financial Information, Airline Rates & Charges, Airport Revenues, Combined Management Expenses, Other Revenues and Expenses, Airline Incentives, Million Air FBO Operations, Line of Credit, Federal (FAA) & State Grants and Employee Counts.

STATISTICAL INFORMATION

Below are the key performance indicators for ALB through August:

		2026 Budget	2026 Actual	Budget Variance	2025 Actual	% Actual 2026 vs. 2025
Enplanements	Current Month	159,631	168,538	5.3%	162,126	4.0%
	Year-to-Date	1,045,970	1,107,390	5.5%	1,060,317	4.4%
Aircraft Seats	Current Month		192,162		178,940	7.4%
	Year-to-Date		1,372,829		1,298,807	5.7%
Load Factor	Current Month		88%		91%	-3.2%
	Year-to-Date		81%		82%	-1.2%
Aircraft Operations	Current Month	5,179	5,674	8.7%	5,592	1.5%
	Year-to-Date	35,843	39,739	9.8%	38,200	4.0%
Landed Weight (1,000#)	Current Month	189,640	179,036	-5.9%	166,566	7.5%
	Year-to-Date	1,337,637	1,285,039	-4.1%	1,197,777	7.3%
Cargo & Mail (Tons)	Current Month	1,944	1,427	-36.2%	751	2.0%
	Year-to-Date	13,492	11,251	-19.9%	10,862	3.6%

FINANCIAL INFORMATION

Unrestricted working capital has improved by $13,390,942 since January 1, 2026. Total unrestricted cash as of August 31, 2026 is $47,857,219, an increase of $7,214,063 since the beginning of 2026.

	8/31/2026	12/31/2025	Change
Cash	$47,857,219	$40,643,156	$ 7,214,063
Accounts Receivable	3,997,417	6,867,441	(2,870,024)
Prepaid Expenses	673,415	1,426,597	(753,182)
Unrestricted Assets	52,528,051	48,937,194	3,590,857
Payables from Unrestricted Assets	(5,197,315)	(14,997,300)	9,799,985
Unrestricted Working Capital	$47,330,736	$33,939,894	$13,390,842

The summary of Revenues, Expenses and Net Results shows YTD 2026 results compared to the 2026 budgeted amounts and 2025 actual amounts is shown below. The summary shows the YTD net operating results for 2026 are more than the amount budgeted by $3,565,673. These YTD results do not reflect the adjustments for year-end settlement or reflect other year-end adjustments for 2026 which affect the revenue sharing with the airlines.

	2026 YTD Budget	2026 YTD Actual	2025 YTD Actual	Prior Year Variance
Airport revenues	$43,301,789	$44,670,860	$42,483,905	2,186,955
FBO revenues less cost of sales	5,622,598	5,734,125	5,301,460	432,665
Total operating expenses	(34,142,753)	(34,256,764)	(30,753,700)	(3,503,064)
Operating results	14,781,634	16,148,221	17,031,665	(883,444)
Other revenue and (expenses), net	(2,655,011)	(455,925)	(2,499,844)	2,043,919
Net results	$12,126,623	$15,692,296	$14,531,821	
Net variances: (2026 Actual to Budget)		$ 3,565,673		
(2026 Actual to 2025 Actual)				$ 1,160,475

Under the revenue sharing formula, the net revenues or deficiency at year-end are split fifty (50) percent to the signatory airlines and fifty (50) percent to the Authority, subject to certain limitations which require the airlines to ensure the Authority's net revenues are not less than 125 percent of its annual debt service requirement.

The summary information above does not reflect the effect of allocating all budget variances in accordance with the Airport Use and Lease Agreement or the potential assessment of charges to meet debt service coverage requirements, and accordingly, does not reflect the amount of an accumulated potential year-end settlement with the signatory airlines.

AIRLINE RATES AND CHARGES

Airline Rates and Charges for 2026 are based on the adopted budget and are calculated using the formulas incorporated into the Airline Use and Lease Agreement. Final 2026 rates will be calculated in the final settlement and revenue sharing report. The signatory airlines will be billed or credited

for their share of any final variance and the Authority will fund its share of any negative variance from its reserves.

AIRPORT REVENUES

AIRPORT REVENUES for YTD 2026 are $44,670,860 and are $1,369,070 more than the $43,301,789 budget to date. The main contributors to the increase are landing fees, rental car and miscellaneous revenues.

FBO NET OPERATING REVENUES (revenues less cost of sales) for YTD 2026 are $5,734,125 and are $111,528 greater than the $5,622,598 YTD budget.

PUBLIC PARKING REVENUES for YTD 2026 total $16,924,816 compared to $15,954,935 in YTD 2025, a 6.1% increase and are $294,973 less than budgeted for 2026. Parking revenue per passenger increased from $15.05 in YTD 2025 to $15.28 in YTD 2026.

RENTAL CAR REVENUES for YTD 2026 total $5,512,004 compared to $4,956,714 in YTD 2025 and are $794,278 higher than budgeted for 2026. Rental car revenue per passenger was $4.98 in YTD 2026 compared to $4.67 in YTD 2025.

FOOD AND BEVERAGE REVENUES for YTD 2026 total $1,148,956 compared to $1,078,899 in YTD 2025 and are $92,688 higher than budgeted for 2026. Revenue per passenger was $1.04 in YTD 2026, which is an increase from $1.02 in YTD 2025.

RETAIL REVENUES for YTD 2026 total $766,654 compared to $737,672 in YTD 2025 and are $21,363 higher than budgeted. Revenue per passenger was $0.69 in YTD 2026 compared to $0.70 in YTD 2025.

		2026 Budget	2026 Actual	Budget Variance	2025 Actual	% Actual 2026 vs. 2025
Parking	Current Month	$ 2,047,486	$ 2,029,391	-0.9%	$ 1,928,698	5.2%
	Year-to-Date	$ 17,219,789	$ 16,924,816	-1.7%	$ 15,954,935	6.1%
	YTD Rev/Enp	*$ 16.46*	*$ 15.28*	*-7.7%*	*$ 15.05*	*1.6%*
Rental Cars	Current Month	$ 968,401	$ 1,119,166	13.5%	$ 1,026,217	9.1%
	Year-to-Date	$ 4,717,725	$ 5,512,004	14.4%	$ 4,956,714	11.2%
	YTD Rev/Enp	*$ 4.51*	*$ 4.98*	*9.4%*	*$ 4.67*	*6.5%*
Food and Beverage	Current Month	$ 163,535	$ 168,870	3.2%	$ 160,572	5.2%
	Year-to-Date	$ 1,056,269	$ 1,148,956	8.1%	$ 1,078,899	6.5%
	YTD Rev/Enp	*$ 1.01*	*$ 1.04*	*2.7%*	*$ 1.02*	*2.0%*
Retail	Current Month	$ 112,890	$ 111,940	-0.8%	$ 106,434	5.2%
	Year-to-Date	$ 745,591	$ 766,654	2.7%	$ 737,672	3.9%
	YTD Rev/Enp	*$ 0.71*	*$ 0.69*	*-3.0%*	*$ 0.70*	*-0.5%*

COMBINED MANAGEMENT OPERATING EXPENSES

The airports' three operating centers have combined operating expenses (including FBO cost of sales) as follows:

	2026 YTD Budget	2026 YTD Actual	Budget Variance	2025 YTD Actual	Prior Year Variance
AvPorts	$25,702,192	$25,713,680	$ 11,488	$23,151,188	$ 2,562,492
Million Air	7,205,193	7,034,104	(171,089)	6,101,430	932,674
Authority	3,971,008	4,416,081	445,073	4,068,026	348,055
Total	$36,878,393	$37,163,865	$ 285,472	$33,320,644	$ 3,843,221
Variance			0.8%		11.5%

OTHER REVENUES AND EXPENSES

Other revenues and expenses when netted together for YTD 2026 are $2,199,086 more than budgeted mainly due to more YTD PFCs collections.

AIRLINE INCENTIVES

Airline incentives paid to new entrant carriers or for new route services for YTD through August was $640,757 compared to $422,864 for YTD 2025.

MILLION AIR FBO OPERATIONS

The commercial and retail YTD revenues and cost of sales results are as follows:

	2026 YTD Budget	2026 YTD Actual	Budget Variance	2025 YTD Actual	Prior Year Variance
Revenues	$ 8,358,238	$ 8,641,227	$ 282,989	$ 7,868,404	$ 772,823
Cost of Sales	(2,735,640)	(2,907,101)	(171,461)	(2,566,944)	(340,157)
Net results before O & M Expenses	$ 5,622,598	$ 5,734,126	$ 111,528	$ 5,301,460	$ 432,666
			2.0%		8.2%

2026 YTD Net Results before YTD Operating and Maintenance expenses were $111,528 more than budgeted and $432,666 more than YTD 2025.

		2026 Budget	2026 Actual	Budget Variance	2025 Actual	% Actual 2026 vs. 2025
Jet A	Current Month	163,237	160,031	-2.0%	169,203	-5.4%
	Year-to-Date	961,498	967,282	0.6%	918,015	5.4%
AvGas	Current Month	8,106	11,843	31.6%	10,264	15.4%
	Year-to-Date	50,876	59,617	14.7%	53,840	10.7%
Deicing Gallons Sprayed	Current Month	-	-	0.0%	-	0.0%
	Year-to-Date	50,258	44,479	-13.0%	34,688	28.2%
Deicing Gallons Consortium	Current Month	-	-	0.0%	-	0.0%
	Year-to-Date	46,320	73,601	37.1%	48,128	52.9%

Operating expenses, not including the cost of retail sales, for YTD 2026 were $342,550 less than budgeted. A statement of FBO Results is included.

LINE OF CREDIT

On February 28, 2024 the Authority closed on a $30 million line of credit with M&T Bank to provide cash to help fund Authority payments on the terminal connector project until the reimbursements from the NYS DOT and FAA are received. Below is the activity on the line of credit:

	Draw Date	Amount	Repayment Date	Partial Repayment Amount	Partial Repayment Date	Partial Repayment Amount	Partial Repayment Date	Current LOC Balance
LOC Draw 01	8-Mar-24	$ 984,381.73	12-Aug-24					
LOC Draw 02	8-Mar-24	761,816.97	2-Apr-24					
LOC Draw 03	20-Mar-24	959,655.24	8-Apr-24					
LOC Draw 04	9-May-24	2,152,308.12	1-Jul-24					
LOC Draw 05	9-May-24	1,285,737.86	1-Jul-24					
LOC Draw 06	14-Jun-24	2,586,897.15	2-Oct-24					
LOC Draw 07	14-Jun-24	2,337,750.23	2-Oct-24					
LOC Draw 08	22-Aug-24	4,055,372.75	16-Oct-24					
LOC Draw 09	15-Nov-24	3,159,332.20	10-Jan-25					
LOC Draw 10	23-Dec-24	1,554,653.15		293,829.45	15-Jul-25	1,260,823.70	14-Nov-25	
LOC Draw 11	16-Jan-25	1,045,137.75		197,531.03	15-Jul-25	847,606.72	14-Nov-25	
LOC Draw 11	16-Jan-25	1,667,596.47	27-Mar-25					
LOC Draw 12	27-Feb-25	875,236.80		165,419.76	15-Jul-25	709,817.04	14-Nov-25	
LOC Draw 12	27-Feb-25	1,342,431.04	18-Apr-25					
LOC Draw 13	5-Mar-25	1,104,266.22	18-Apr-25					
LOC Draw 13	5-Mar-25	1,366,011.17	18-Apr-25					
LOC Draw 14	28-Apr-25	618,447.81		116,886.64	15-Jul-25	501,561.17	14-Nov-25	
LOC Draw 14	28-Apr-25	579,232.10	2-Jun-25					
LOC Draw 15	12-May-25	391,933.11	2-Jun-25					
LOC Draw 15	12-May-25	937,919.23		177,266.73	15-Jul-25	760,652.50	14-Nov-25	
LOC Draw 16	28-May-25	896,225.85	15-Jul-25					
LOC Draw 16	28-May-25	1,099,420.41	14-Nov-25					
LOC Draw 17	23-Jun-25	326,556.42	4-Sep-25					
LOC Draw 17	23-Jun-25	1,442,159.62	14-Nov-25					
LOC Draw 18	4-Aug-25	448,729.65	30-Oct-25					
LOC Draw 18	4-Aug-25	2,761,014.98	14-Nov-25					
LOC Draw 19	22-Sep-25	502,138.65	29-Dec-25					
LOC Draw 19	22-Sep-25	1,712,359.32	14-Nov-25					
LOC Draw 19	22-Sep-25	1,547,250.22	14-Nov-25					
LOC Draw 20	9-Dec-25	788,486.03	2-Feb-26					
LOC Draw 20	9-Dec-25	2,438,083.80	13-Apr-26					
LOC Draw 21	14-Jan-26	1,863,455.39	13-Apr-26					
LOC Draw 21	14-Jan-26	1,642,515.80	13-Apr-26					
	Outstanding							$ -

The line of credit renewed on February 28, 2025 with a two year term expiring on February 28, 2027.

FEDERAL (FAA) & NYS DOT GRANTS

The Authority accepts various FAA and NYS DOT grants to fund capital improvements at the Airport. Below is the status of the current grants as of August 31, 2026:

FAA Grants:	FAA Grant #	Grant Amount	Balance
Acquire Snow Removal Equipment	147-2021	$ 1,537,635	$ -
American Rescue Plan Act (ARPA)	148-2022	$ 12,113,224	$ -
Rehabilitate Rwy 10/28 & Taxiway C	150-2022	$ 7,144,824	$ -
Replace ATCT HVAC & Roof	151-2023	$ 2,000,000	$ 228,206
Reconstruct Terminal A & 2 PBBs	152-2025	$ 10,600,000	$ 1,336,944
Rehabilitate Rwy 1/19 & Perimeter Road	153-2025	$ 9,326,858	$ 932,685
Reconstruct 60,000 Sq Ft of Existing Terminal Building	154-2026	$ 21,915,184	$ 5,459,385
Reconstruct General Aviation Apron	155-2026	$ 12,936,210	$ 12,643,790
Reconstruct General Aviation Apron Ph II	156-2026	$ 5,390,559	$ 5,390,559

New York State DOT Grants:	State Grant #	Grant Amount	Balance
Rehabilitate Rwy 10/28 & Taxiway C	1A00.30	$ 394,777	$ -
Replace ATCT HVAC & Roof	1A00.31	$ 52,632	$ 52,632
Rehabilitate Rwy 1/19 & Perimeter Road	1A00.32	$ 518,159	$ 518,159
Reconstruct Terminal A & 2 PBBs	1A00.33	$ 278,948	$ 278,948
Reconstruct 60,000 Sq Ft of Existing Terminal Building	1A00.34	$ 1,217,510	$ 1,217,510
Reconstruct General Aviation Apron, Ph I and Ph II	1A00.35	$ 718,679	$ 718,679
Rehabilitate Elevators	1A00.94	$ 1,612,560	$ 1,080,009
Terminal Expansion Connector	1A00.95	$ 60,000,000	$ 14,211,900

EMPLOYEE COUNTS

	2025 Budget	Dec-25	2026 Budget	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Aug-26	Variance Budget vs. Aug-26
AvPorts:												
Airfield	29.5	22.5	31.5	19.5	21.5	21.5	21.5	19.5	18.5	20.5	20.5	11.0
Terminal	41.0	33.0	46.0	31.0	37.0	37.0	37.0	38.0	38.0	37.0	38.0	8.0
Loading Bridges	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	-
Parking	33.0	29.0	40.5	28.5	28.5	29.5	28.5	28.5	30.5	30.5	30.5	10.0
Curbside Security	3.0	4.0	3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	-
ARFF	26.0	25.0	26.0	25.0	25.0	25.0	25.0	24.0	24.0	24.0	24.0	2.0
Operations	22.0	17.0	22.0	17.0	17.0	18.0	19.0	18.0	19.0	18.0	18.0	4.0
Vehicles & Equipment	12.0	9.0	12.0	9.0	8.0	9.0	9.0	10.0	10.0	9.0	10.0	2.0
Administration	9.5	7.5	8.7	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	1.2
Total AvPorts Positions	179.0	150.0	192.7	144.5	151.5	153.5	153.5	151.5	153.5	152.5	154.5	38.2
Million Air:												
Commercial	11.0	11.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	13.0	13.0	1.0
General Aviation	22.0	22.0	23.0	21.0	21.0	21.0	21.0	23.0	23.0	23.0	23.0	-
Administration	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	-
Total Million Air Positions	38.0	37.0	42.0	40.0	40.0	40.0	40.0	42.0	42.0	41.0	41.0	1.0
Authority Positions	22.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	-
Total Positions	239.0	207.0	254.7	204.5	211.5	213.5	213.5	213.5	215.5	213.5	215.5	39.2

Albany International Airport
Airline and Direct Market Flights
For the week of October 11, 2026

AIRLINE	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Allegiant	4	3	1		4	3	
American	16	17	16	15	16	16	14
Avelo		1				1	
Breeze	1	1	1	1	1	1	1
Delta	9	9	9	9	9	9	6
Jet Blue	2	2	2	2	2	2	2
Southwest	13	12	12	12	12	12	13
United	9	9	9	9	9	9	9
	54	54	50	48	53	53	45

DIRECT MARKET	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Atlanta	3	3	3	3	3	3	2
Baltimore	5	5	5	5	5	5	5
Charleston		1				1	
Charlotte	4	4	3	4	4	4	4
Charlotte/Concord		1				1	
Chicago-Midway	2	2	2	2	2	2	2
Chicago-O'Hare	7	7	7	7	7	7	7
Denver	2	2	2	2	2	2	2
Detroit	4	4	4	4	4	4	3
Fort Lauderdale	2	1	1	1	2	1	1
Las Vegas	1	1	1	1	1	1	1
Ft. Myers				1			1
Myrtle Beach		1				1	
Nashville	1	2	1	1	1	2	1
New York LaGuardia	2	2	2	2	2	2	1
Orlando	3	2	2	2	2	2	3
Orlando/Sanford	1				1		
Philadelphia	5	6	6	4	5	5	4
Punta Gorda	1		1		1		
Sarasota Bradenton	1				1		
St. Petersberg		1				1	
Tampa	1	1	1	1	1	1	1
Washington/Dulles	4	4	4	4	4	4	4
Washington/Reagan	4	4	4	4	4	4	3
	54	54	50	48	53	53	45

Albany County Airport Authority
Statements of Net Position

	August 31, 2026	August 31, 2025
ASSETS		
CURRENT ASSETS		
Unrestricted Assets		
Cash and Cash Equivalents	$ 10,010,156	$ 13,613,232
Development Fund	37,847,063	27,478,968
Accounts Receivable	1,012,098	2,454,943
Leases	2,985,319	2,483,902
Prepaid Expenses	673,415	590,606
Total Unrestricted Assets	52,528,051	46,621,651
Restricted Assets		
Operating and Renewal Reserves	10,094,865	9,760,231
CFC Funds	517,949	500,780
Capital Funds	4,761,684	7,297,580
PFC Funds	7,160,412	6,303,931
Revenue Bond Funds	10,883,797	13,017,218
FAA Restricted Funds	234,718	226,937
Concession Improvement Funds	804,632	777,959
Total Restricted Assets	34,458,057	37,884,636
Total Current Assets	86,986,108	84,506,287
NON-CURRENT ASSETS		
Capital Assets	350,800,489	329,882,503
Lease Receivable	9,766,831	13,832,941
Prepaid Expenses	147,926	163,361
Total Non-Current Assets	360,715,246	343,878,805
Total Assets	447,701,354	428,385,092
DEFERRED OUTFLOWS OF RESOURCES		
Refunding	205,262	386,207
OPEB Expenses	324,737	622,429
Pension Expenses	731,279	930,867
Total Deferred Outflows of Resources	1,261,278	1,939,503
TOTAL ASSETS AND DEFERRED OUTFLOWS	448,962,632	430,324,595
LIABILITIES AND NET ASSETS		
CURRENT LIABILITIES		
Payable from Unrestriced Assets	5,197,315	3,026,575
Payable from Restricted Assets	18,374,399	28,062,807
Total Current Liabilities	23,571,714	31,089,382
NON-CURRENT LIABILITIES		
Bonds and other debt obligations	33,835,564	42,768,796
Net OPEB Liability	5,814,586	5,936,293
Net Pension Liability - proportionate share	898,392	891,807
Total Non-Current Liabilities	40,548,542	49,596,896
Total Liabilities	64,120,256	80,686,278
DEFERRED INFLOWS OF RESOURCES		
Concession Improvement Funds	1,278,757	1,156,302
OPEB Expenses	603,874	725,677
Pension Expenses	53,781	379,064
Leases	11,860,890	15,194,017
Total Deferred Inflows of Resources	13,797,302	17,455,060
NET POSITION		
Invested in Capital Assets, net of Related Debt	309,745,792	286,494,115
Restricted	22,769,727	10,126,037
Unrestricted	38,529,555	35,563,105
Net Position	371,045,074	332,183,257
TOTAL LIABILITES, DEFERRED INFLOWS AND NET POSITION	$ 448,962,632	$ 430,324,595

Albany County Airport Authority
2026 Summary of Revenues, Expenses and Net Results
For the eight months ended August 31, 2026

	2026 Adopted FY Budget	August 2026 Budget YTD	August 2026 Actual YTD	August 2026 Variance YTD	Variance %	August 2025 YTD Unaudited	2026 Actual/ Prior Year Variance %
AIRPORT OPERATING REVENUES							
Airline	$ 14,191,203	$ 14,210,011	$ 14,666,853	$ 456,842	3.2%	$ 14,281,927	2.7%
Non-Airline	43,420,569	29,091,778	30,004,007	912,228	3.1%	28,201,978	6.4%
Total Revenues	57,611,772	43,301,789	44,670,860	1,369,070	3.2%	42,483,905	5.1%
AIRPORT OPERATING EXPENSES							
Personal Services	15,047,390	10,017,457	8,880,617	(1,136,841)	-11.3%	8,355,861	6.3%
Employee Benefits	7,316,856	4,910,656	4,578,522	(332,133)	-6.8%	4,240,195	8.0%
Utilities & Communications	2,865,614	2,007,631	2,461,690	454,060	22.6%	1,951,946	26.1%
Purchased Services	9,084,020	6,681,289	7,508,344	827,056	12.4%	6,807,940	10.3%
Material & Supplies	6,631,003	4,369,774	5,181,275	811,501	18.6%	4,124,022	25.6%
Office	1,168,560	887,576	694,885	(192,691)	-21.7%	643,381	8.0%
Administration	1,181,471	780,817	755,978	(24,838)	-3.2%	709,713	6.5%
Non-Capital Equipment	18,000	18,000	68,450	50,450	0.0%	386,156	-82.3%
Total Expenses	43,312,914	29,673,200	30,129,761	456,564	1.5%	27,219,214	10.7%
AIRPORT OPERATING RESULTS	14,298,858	13,628,589	14,541,099	912,506	6.7%	15,264,691	-4.7%
FBO OPERATING RESULTS	1,836,297	1,153,045	1,607,123	454,078	39.4%	1,766,974	-9.0%
TOTAL OPERATING RESULTS	16,135,155	14,781,634	16,148,222	1,366,584	9.2%	17,031,665	-5.2%
OTHER REVENUES (EXPENSES)							
Interest Earnings	2,241,000	1,494,000	1,527,481	33,481	2.2%	1,600,176	-4.5%
Passenger Facility Charges	3,648,084	2,432,056	4,465,385	2,033,329	83.6%	2,427,648	83.9%
ACAA Debt Service	(9,940,000)	(6,626,667)	(6,626,667)	-	0.0%	(6,610,840)	0.2%
Insurance Recoveries	-	-	15,925	15,925	0.0%	-	100.0%
Line of Credit Interest	(200,000)	(200,000)	(92,192)	107,808	-53.9%	(221,647)	0.0%
Grant Income	-	-	8,543	8,543	0.0%	59,219	0.0%
Improvement Charges	368,400	245,600	245,600	-	0.0%	245,600	0.0%
Total Other Revenues(Expenses)	(3,882,516)	(2,655,011)	(455,925)	2,199,086	-82.8%	(2,499,844)	-81.8%
INCOME/(LOSS) BEFORE CAPITAL CONTRIBUTIONS	**12,252,639**	**12,126,623**	**15,692,297**	**3,565,670**	29.4%	**14,531,821**	**8.0%**
AIRLINE INCENTIVES	(400,000)	(266,667)	(640,757)	(374,090)	140.3%	(422,864)	51.5%
CAPITAL CONTRIBUTIONS	-	-	8,999,151	8,999,151	0.0%	12,290,051	0.0%
INCREASE (DECREASE) IN NET POSITION	$ 11,852,639	$ 11,859,957	$ 24,050,691	$ 12,190,735	102.8%	$ 26,399,008	-8.9%
NET POSITION, BEGINNING OF PERIOD			346,994,383			305,784,249	
NET POSITION, END OF PERIOD			$ 371,045,074			$ 332,183,257	
RECONCIATION TO AIRLINE FUNDS REMAINING:							
NET RESULTS BEFORE CAPITAL CONTRIBUTION	12,252,639	12,126,623	15,692,297	3,565,670	29.4%	14,531,821	8.0%
Less: Capital Improvements	(6,000,000)	(4,000,000)	(4,000,000)	-	0.0%	(4,044,255)	-1.1%
Less: Reserve Requirements	66,020	44,013	44,013	-	0.0%	(650,670)	-106.8%
NET RESULTS	6,318,659	8,170,637	11,736,311	3,565,670	43.6%	9,836,896	19.3%
Revenue Sharing:							
Transfer to/from Airlines (50%)	3,159,330	4,085,318	5,868,155	1,782,835	43.6%	4,918,448	19.3%
Authority Share (50%)	3,159,330	4,085,318	5,868,155	1,782,835	43.6%	4,918,448	19.3%
Less: Airline Incentives	(400,000)	(266,667)	(640,757)	(374,090)	140.3%	(422,864)	51.5%
Net Authority Share	$ 2,759,330	$ 3,818,652	$ 5,227,398	$ 1,408,745	36.9%	$ 4,495,584	16.3%

Albany County Airport Authority
Operating Revenues
For the eight months ended August 31, 2026

	2026 Adopted FY Budget	August 2026 Budget YTD	August 2026 Actual YTD	August 2026 Variance YTD	August 2026 Variance %	August 2025 YTD Unaudited	2026 Actual/ Prior Year Variance %
AIRLINE REVENUES							
COMMERCIAL							
Landing Fees-Signatory	$ 7,550,919	$ 5,812,660	$ 6,178,494	$ 365,834	6.3%	$ 5,680,702	8.8%
Airline Apron Fees	1,138,138	758,759	799,091	40,332	5.3%	669,225	19.4%
Glycol Disposal Fee	317,500	275,000	271,933	(3,067)	-1.1%	253,771	7.2%
CARGO							
Landing Fees-Signatory	854,000	537,609	508,769	(28,840)	-5.4%	498,312	2.1%
TERMINAL							
Loading Bridges	745,324	496,881	434,773	(62,108)	-12.5%	555,525	-21.7%
Space Rental	3,585,322	6,329,102	6,404,688	75,586	1.2%	6,574,598	-2.6%
Non-Signatory Per Turn Fee	0	0	69,105	69,105	0.0%	49,795	38.8%
TOTAL AIRLINE REVENUES	14,191,203	14,210,011	14,666,853	456,842	3.2%	14,281,927	2.7%
NON-AIRLINE REVENUES							
AIRFIELD							
Tenant Maintenance	43,708	29,139	0	(29,139)	-100.0%	32,457	-100.0%
Total Airfield	43,708	29,139	0	(29,139)	-100.0%	32,457	-100.0%
TERMINAL							
Utility Reimbursement	44,155	28,823	28,755	(68)	-0.2%	27,068	6.2%
Tenant Maintenance	24,000	16,000	(18,401)	(34,401)	-215.0%	22,036	-183.5%
Space Rent - Non Airline	196,915	131,277	155,072	23,795	18.1%	165,054	-6.0%
Space Rent - Fixed Non Airline	565,554	377,036	425,315	48,279	12.8%	377,036	12.8%
Food & Beverage	1,596,810	1,056,270	1,148,956	92,686	8.8%	1,078,900	6.5%
Retail	1,059,270	745,292	766,655	21,363	2.9%	737,672	3.9%
Advertising	0	0	3,000	3,000	0.0%	0	0.0%
ATM	14,480	9,653	9,646	(7)	-0.1%	9,620	0.3%
Operating Permits	395,253	259,470	317,885	58,415	22.5%	285,467	11.4%
Vending Machines	19,800	13,200	13,537	337	2.6%	14,068	-3.8%
Baggage Cart Rentals	15,000	10,000	(1,579)	(11,579)	-115.8%	11,850	-113.3%
Total Terminal	3,931,237	2,647,021	2,848,841	201,820	7.6%	2,728,770	4.4%
GROUND TRANSPORTATION							
Parking	25,731,850	17,219,789	16,924,816	(294,973)	-1.7%	15,954,935	6.1%
Rental Cars	6,988,020	4,717,726	5,512,004	794,278	16.8%	4,956,714	11.2%
Access Fees	0	0	0	0	0.0%	65,005	-100.0%
TNCs	408,000	272,000	334,916	62,916	23.1%	320,040	4.6%
Garage Space Rent	93,294	62,196	62,155	(41)	-0.1%	58,932	5.5%
Garage Kiosk Rent	21,600	14,400	14,400	0	0.0%	14,400	0.0%
Total Ground Transportation	33,242,764	22,286,110	22,848,291	562,180	2.5%	21,370,025	6.9%
OTHER AIRPORT							
Telephone System - Tenants	45,916	30,611	29,368	(1,243)	-4.1%	30,475	-3.6%
Building Rental	105,752	50,823	50,823	0	0.0%	50,220	1.2%
Control Tower Rental	824,812	548,392	548,392	0	0.0%	527,098	4.0%
Air Cargo Facility	1,315,376	876,918	870,314	(6,603)	-0.8%	876,918	-0.8%
State Executive Hangar	1,247,083	831,389	831,389	0	0.0%	831,389	0.0%
T Hangars	195,960	130,640	120,100	(10,540)	-8.1%	107,534	11.7%
Tie Downs	1,680	1,120	(17,242)	(18,362)	-1639.4%	1,520	-1234.0%
Industrial Park	627,302	415,969	467,247	51,278	12.3%	435,734	7.2%
Land Rental	391,994	262,252	256,902	(5,350)	-2.0%	273,406	-6.0%
Hangar Rental	1,013,693	672,958	672,447	(511)	-0.1%	644,613	4.3%
Antenna Space Rental	86,006	57,259	57,259	0	0.0%	56,352	1.6%
Internet and Cable Access	2,660	1,940	1,940	0	0.0%	1,940	0.0%
Fingerprinting	45,600	30,400	32,476	2,076	6.8%	34,189	-5.0%
Tenant Maintenance	998	667	0	(667)	-100.0%	0	0.0%
Ebay/Scrap/Equipment Sales	5,000	3,333	2,723	(610)	-18.3%	14,831	-81.6%
Utility Reimbursement	176,030	121,838	188,601	66,764	54.8%	136,685	38.0%
Reimbursement of Property Taxes	45,000	45,000	11,598	(33,402)	-74.2%	19,919	-41.8%
Other	72,000	48,000	182,535	134,535	280.3%	27,905	554.1%
Total Other Airport	6,202,860	4,129,508	4,306,875	177,367	4.3%	4,070,726	5.8%
TOTAL NON AIRLINE REVENUES	43,420,569	29,091,778	30,004,007	912,228	3.1%	28,201,978	6.4%
TOTAL REVENUES	$ 57,611,772	$ 43,301,790	$ 44,670,860	$ 1,369,070	3.2%	$ 42,483,905	5.1%

Albany County Airport Authority
FBO Results
For the eight months ended August 31, 2026

	2026 Adopted FY Budget	August 2026 Budget YTD	Actual YTD	Variance YTD	Variance %	August 2025 YTD Unaudited	2026 Actual/ Prior Year Variance %
REVENUES							
Retail Fuel							
Jet A Fuel Sales	$ 6,167,000	$ 4,258,354	$ 3,917,764	$ (340,590)	-8.0%	$ 3,475,852	12.7%
AvGas Fuel Sales	462,400	302,317	385,745	83,427	27.6%	294,743	30.9%
Commercial AvGas Fuel Sales	18,000	12,000	8,825	(3,175)	-26.5%	10,052	-12.2%
Auto & Diesel Fuel Sales	290,000	189,968	222,662	32,693	17.2%	172,848	28.8%
Retail Fuel Sales	6,937,400	4,762,640	4,534,995	(227,645)	-4.8%	3,953,495	14.7%
Into Plane Fees	875,000	571,534	559,555	(11,979)	-2.1%	553,065	1.2%
Fuel Farm Fees	1,230,000	791,769	748,028	(43,740)	-5.5%	766,447	-2.4%
General Aviation Landing Fees	482,500	317,500	340,107	22,607	7.1%	320,600	6.1%
Aircraft Parking Fees	650,000	440,000	760,232	320,232	72.8%	421,805	80.2%
Deicing Services	1,603,790	1,081,350	1,228,602	147,252	13.6%	1,341,002	-8.4%
FBO Properties	441,344	302,945	339,832	36,887	12.2%	397,193	-14.4%
FBO Services	135,500	90,500	129,875	39,375	43.5%	114,797	13.1%
TOTAL REVENUES	12,355,534	8,358,238	8,641,227	282,989	3.4%	7,868,404	9.8%
COST OF SALES							
Fuel Costs - Jet A	2,107,000	1,496,688	1,449,505	(47,182)	-3.2%	1,310,041	10.6%
Fuel Discounts - Jet A	150,000	66,142	75,415	9,272	14.0%	78,410	-3.8%
Fuel Costs - SAF	0	0	0	0	0.0%	0	0.0%
Fuel Costs - AvGas	330,400	216,169	284,841	68,673	31.8%	215,585	32.1%
Fuel Discounts - AvGas	12,000	8,472	11,180	2,708	32.0%	6,504	71.9%
Fuel Costs - Commercial AvGas	13,000	8,667	7,342	(1,325)	-15.3%	8,361	-12.2%
Fuel Costs - Auto & Diesel	228,000	141,000	192,089	51,089	36.2%	139,482	37.7%
Total Fuel Costs	2,840,400	1,937,138	2,020,372	83,235	4.3%	1,758,382	14.9%
Deicing Costs - Type I & IV	1,180,590	755,847	840,985	85,138	11.3%	760,880	10.5%
Customs Garbage, Oil & Other	64,000	42,656	45,744	3,088	7.2%	47,682	-4.1%
Total Cost of Sales	4,084,990	2,735,640	2,907,101	171,461	6.3%	2,566,944	13.3%
Net Operating	8,270,544	5,622,598	5,734,125	111,528	2.0%	5,301,460	8.2%
OPERATING EXPENSES BY CATEGORY							
Personal Services							
Salaries	2,585,398	1,723,120	1,621,493	(101,627)	-5.9%	1,514,108	7.1%
Overtime	232,878	155,965	199,515	43,550	27.9%	162,888	22.5%
Total Personal Services	2,818,276	1,879,085	1,821,007	(58,077)	-3.1%	1,676,996	8.6%
Employee Benefits	860,516	588,586	542,131	(46,454)	-7.9%	442,591	22.5%
Utilities & Communications	116,800	78,869	98,686	19,817	25.1%	82,186	20.1%
Purchased Services	812,592	604,066	560,386	(43,680)	-7.2%	569,629	-1.6%
Materials & Supplies							
Buildings	221,500	184,196	51,528	(132,668)	-72.0%	45,155	14.1%
Grounds	37,500	24,750	23,464	(1,286)	-5.2%	8,950	162.2%
Vehicles	991,744	668,020	736,010	67,990	10.2%	497,550	47.9%
Total Materials & Supplies	1,250,744	876,966	811,003	(65,963)	-7.5%	551,656	47.0%
Admistrative Expenses	425,319	291,981	231,032	(60,949)	-20.9%	188,925	22.3%
Non-Capital Equipment	150,000	150,000	62,758	(87,243)	-58.2%	22,504	178.9%
TOTAL EXPENSES	6,434,247	4,469,553	4,127,003	(342,550)	-7.7%	3,534,486	16.8%
FBO Net Direct Cost	$ 1,836,297	$ 1,153,045	$ 1,607,123	$ 454,078	39.4%	$ 1,766,974	-9.0%

AGENDA ITEM NO. 6

Project Development

AGENDA ITEM NO. 7

Counsel

AGENDA ITEM NO. 8

Concessions/Ambassador Program

ALB ALBANY
INTERNATIONAL AIRPORT

October 13, 2026

Concessions & Ambassador Program Report

Minority Representation in the Concessions Workforce

Date 2026	HMSHost	Paradies	Chick fil A (OHM)	Dunkin	Uncommon Grounds	Minority/Total %
January	21/55=38%	10/19=53%	23/30=77%	3/7=43%	14/25=56%	71/136=52%
February	27/53=51%	11/22=50%	23/30=77%	4/6=67%	14/21=67%	79/132=60%
March	24/62=38%	11/22=50%	23/30=77%	4/6=67%	12/21=57%	83/141=59%
April	27/61=44%	11/23=48%	23/31=74%	4/6=67%	12/17=77%	77/138=58%
May	27/63=43%	11/22=50%	24/32=75%	4/6=67%	15/21=72%	81/144=57%
June	29/64=46%	13/27=49%	24/32=75%	4/7=57%	18/24=75%	88/154=58%
July	28/59=48%	10/21=48%	25/30=84%	1/7=15%	11/24=48%	75/141=53%
August	28/60=47%	9/21=43%	26/30=87%	3/7=43%	12/23=52%	78/141=55%
September	22/54=41%	9/19=48%	29/37=79%	3/7=43%	12/25=48%	75/142=53%
October						
November						
December						

CDTA Bus Pass Participation – 124 – Representing 14 Tenants

Concourse A Food & Beverage Location Update.

HMSHost will conduct a site visit on Tuesday, October 6, 2026 for new restaurant on A.

Concourse A – Retail/News & Gift – The Paradies Shops "On The Fly" remodel to start October 14, 2026

Concourse B – Retail/News & Gift – The Paradies Shops "Capital Market Place" remodel to start Mid-November.
(Dunkin work started - September)

ALB ALBANY
INTERNATIONAL AIRPORT

Concession Revenue

2026						
Date	HMSHost	OHM Chick fil A	Paradies	Uncommon Grounds	Total	$/Enp
January	545,399	194,850	345,633	151,806	1,237,688	$11.32/enp
February	797,984	Closed	449,825	189,106	1,434,915	$11.67/enp
March	888,373	42,183	498,381	206,502	1,632,439	$12.62/enp
April	742,000	208,579	453,228	175,002	1,578,809	$11.94/enp.
May	733,398	264,035	437,990	167,405	1,602,828	$11.94/enp.
June	814,334	321,380	504,644	171,200	1,811,558	$12.55/enp.
July	932,182	367,585	583,875	188,975	2,072,617	$12.48/enp.
August	904,323	314,527	559,700	229,021	2,007,571	$11.91/enp.
September						
October						
November						
December						

Enplanements

January 2026 – 109,370
February 2026 – 123,015
March 2026 – 129,328
April 2026 – 132,191
May 2026 – 134,296
June 2026 – 144,397
July 2026 - 166,165
August 2026 – 168,538

ALB ALBANY
INTERNATIONAL AIRPORT

Ambassador Program

2026 Totals

Tours

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
-	-	-	-	-	6	1	-					

Canines

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
3091	4014	5885	5309	4619	5063	5007	5518	5824				**44,330**

Guest Served

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
5789	4839	3627	7373	7146	4654	7408	6746	4600				**52,182**

Amb Hours

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
649	707	786	843	761	800	803	723	812				**6,884**

Amb Shifts

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
229	245	285	314	263	331	284	272	317				**2,540**

Business Center – 2923

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INTERNATIONAL AIRPORT

Ambassador Milestones 2026

HOURS

100 Hours

Jeff Brunt	2/24/2026 with Miss Tennessee
Janet Witbeck	2/24/2026
Christine Root	4/25/2026
Susan Browne	9/25/2026

250 Hours

Lois Whitford	3/04/2026
Debby Coan	4/24/2026
Daniel Chouiniere	5/06/2026 with "Doppler" and "Compass"
Barbara Martenis	8/29/2026

500 Hours

Larry Klein	2/24/2026
Benjamin Marvin	3/25/2026
Alan Okun	5/22/2026
Tom Burch	6/19/2026
Deborah LaMontagne	9/10/2026

750 Hours

Robert Mestemaker	12/19/2025
Frank Casey	1/24/2026
Katherine Roddy	3/30/2026

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1000 Hours

Beatrice Dougherty	4/17/2026
Bob Batson	5/01/2026
Maryann Hohman	6/08/2026
Stephen MacDaniel	7/29/2026 with "Bella"

1500 Hours – Elliot Schwebel 6/08/2026

2000 Hours - Christine Bourgeois 2/24/2026 with PepperJack & Kaytie

3000 Hours – Robert Reinhardt 8/18/2026

4500 Hours - Keith Prior 6/05/2026

5 Years – Christine Lambert 7/4/2026

10 Years - Jo-Ann Gannett 3/02/2026
JoAnn Read 8/28/2026

15 Years - Stephen Cremins 7/01/2026

News: Out Annual Holiday Celebration is scheduled for Friday, December 11, 2026 at the Desmond.

Lost & Found -

Hidden Disabilities Sunflower Program -

Make a Wish Program -

ALB ALBANY INTERNATIONAL AIRPORT

Champ has exciting news. He's one of the 10 finalists in People Magazine's World Cutest Rescue Dog Contest. They showed his picture on the CBS Morning Show last week and he will be in People Magazine that comes out on Friday. They will select the dogs with the three highest votes to make the semifinals and then celebrity judges will decide the ultimate winner. If you would like to vote for Champ, this is the link. http://www.people.com/rescuedogcontest.



AGENDA ITEM NO. 9

Public Affairs

AGENDA ITEM NO. 10

Authorization of Contracts/Leases/Contract Negotiations/Contract Amendments

AGENDA ITEM NO. 10.1

Purchase Order for purchase of Type I and Type IV Glycol from Ascent Aviation at a Fixed Cost Option

AGENDA ITEM NO: 10.1
MEETING DATE: October 13, 2026

ALBANY COUNTY AIRPORT AUTHORITY
REQUEST FOR AUTHORIZATION

DEPARTMENT: *Finance*

Contact Person: *Margaret Herrmann, Acting Chief Financial Officer*

PURPOSE OF REQUEST:

Issue Purchase Order for Purchase of Materials at Fixed Cost Option

CONTRACT AMOUNT:

Total Contract Amount: *$1,206,650 (estimated usage*)

BUDGET INFORMATION:

Anticipated in Current Budget: Yes √ No NA
Funding Account Number: 51109.60.0000 / 51111.60.0000

JUSTIFICATION:

Request is made to approve the purchase of Type I and Type IV glycol from Ascent Aviation Group, Inc. Type I and Type IV glycol is used in two ways: 1) for resale to the commercial airlines for their own use and 2) for use in deicing services performed by Million Air for commercial airlines that do not deice their own aircraft and other general aviation customers. The resale of glycol to airlines that do their own deicing is at cost plus 30 cents per gallon flowage fee and a $2.30/gallon glycol recovery fee. Deicing services performed by Million Air are priced at cost plus $5.50 a gallon and a $2.30/gallon Airport glycol recovery fee to the airlines which the cost of owning and operating the deicing equipment and staff required to perform the deicing service. The glycol recovery fee covers part of the cost of treating glycol contaminated water collected from the runoff.

Ascent Aviation Group, Inc. stores the deicing fluids in Albany for easy and quick transport during snow events. Ascent Aviation Group, Inc. has provided the current product and will require no change in product.

CHIEF EXECUTIVE OFFICER'S RECOMMENDATION:

Recommend approval to Ascent Aviation Group, Inc.

FINAL AGREEMENT SUBJECT TO APPROVAL BY COUNSEL: YES N/A √

A standard purchase order will be issued.

AGENDA ITEM NO: 10.1
MEETING DATE: October 13, 2026

PROCUREMENT DEPARTMENT APPROVAL:

Procurement complies with Authority Procurement Guidelines and Acting Chief Financial Officer has approved. **YES √ NA**

BACK-UP MATERIAL:

Please refer to the attached quote summary and quote form issued with response from Ascent Aviation Group, Inc.

Albany County Airport Authority
Quote 26-0908 September 8, 2026
Quote Results for Winter Season 2026-2027

	Est Usage	Current Product/Pricing	**Ascent Aviation Group, Inc.** Year 1	**Clariant Corporation** Year 1
Type I	100,000	$ 8.39	$ 9.99	$ 12.79
Type I Product		UCAR PG Conc ADF	UCAR PG Conc ADF	Safewing MP I LFD 88
Type IV	25,000	$ 6.59	$ 8.29	$ 11.19
Type IV Product		UCAR Flighguard AD-49	UCAR Flightguard AD-49	Safewing MP IV Launch
Total Est. Annual Cost			$ 1,206,250	$ 1,558,750
Delivery Time			48 Hours	48 Hours

REQUEST FOR QUOTATION

ALBANY COUNTY AIRPORT AUTHORITY

PURCHASING OFFICE
737 ALBANY SHAKER ROAD
ALBANY, NEW YORK 12211-1057
PHONE (518)242-2213 FAX (518)242-2640

TAX EXEMPT ID # 14-1768979

Quotation Request Number: 26-0908 dated September 8, 2026
Quote MUST be submitted: NO LATER THAN: September 23, 2026 @ 1:00 P.M. (EST)

ITEMS REQUESTED: Qualified Deicing/Anti-Icing Fluids per FAA Table 7 - Heavy Snow Procedures for Winter: 2026-2027

	Estimated Quantity	Fixed Pricing One Year Ending May-2027 Including Freight
1) TYPE I Concentrate - Cost to the Airport Identify Fluid Product Name:	100,000 gals	$ 9.99 ea min. 5000 gal. delivery
2) TYPE IV - Cost to the Airport Identify Fluid Product Name:	25,000 gals	$ 8.29 ea min. 4000 gal. delivery

Delivery to Airport: 48* **Hours after receipt of order (Maximum 2 Days).**
*Type IV is 2 business days from Carteret NJ.

Do you meet or exceed required FAA specifications (Submit supporting documentation) **YES** X **NO** ☐

COMPANY SUBMITTING QUOTE:

Name: Ascent Aviation Group, Inc.
Address: One Mill St.
Parish, NY 13131
Contact Person: April Andrews
Telephone: 315 440-7360
Fax: None
E-Mail: aandrews@wfscorp.com

** If vendor would like to also submit a variable price structure, please explain how prices will be determined and a base price for the beginning of the season on a separate page.

Quotes may be emailed to kkane@albanyairport.com.

AGENDA ITEM NO. 10.2

Purchase Order: Contract No. 1286: Filtered Sand with Holliston Sand Company

AGENDA ITEM NO: 10.2
MEETING DATE: October 13, 2026

ALBANY COUNTY AIRPORT AUTHORITY
REQUEST FOR AUTHORIZATION

DEPARTMENT: ***Finance***

Contact Person: ***Margaret Herrmann, Acting Chief Financial Officer***

PURPOSE OF REQUEST:

Purchase Order: ***Contract No. 1286: Filtered Sand with Holliston Sand Company***

CONTRACT AMOUNT:

PO Amount: ***$370,160*** ***(Estimated 2,000 tons @ $185.08 per Ton)***

BUDGET INFORMATION:

Anticipated in Current Budget: Yes √ No NA
Funding Accounts: 51019-10-0000
Appropriation: ***2026-2027 Operating Budget***

FISCAL IMPACT - FUNDING (Dollars or Percentages)

Federal **State** **Airport** ***100%***

JUSTIFICATION:

Authorization is requested for issuance of a Purchase Order for filtered sand that meets FAA specifications to be used during the 2026-2027 winter snow operations to the only responsible bidder, Holliston Sand Company at $185.08 per ton delivered. The estimated annual usage of filtered sand is 2,000 tons. This bid award is for one year with the Authority reserving the right to purchase at the same terms and conditions in the bid document for four (4) additional one year terms as it is deemed to be in the best interest of the Airport. Authorization is also requested to allow the Chief Executive Officer to exercise the Authority's right to purchase product at the same price in each of the four (4) option years.

CHIEF EXECUTIVE OFFICER'S RECOMMENDATION:

Recommend approval.

FINAL AGREEMENT SUBJECT TO APPROVAL BY COUNSEL: YES √ NA

AGENDA ITEM NO: 10.2
MEETING DATE: October 13, 2026

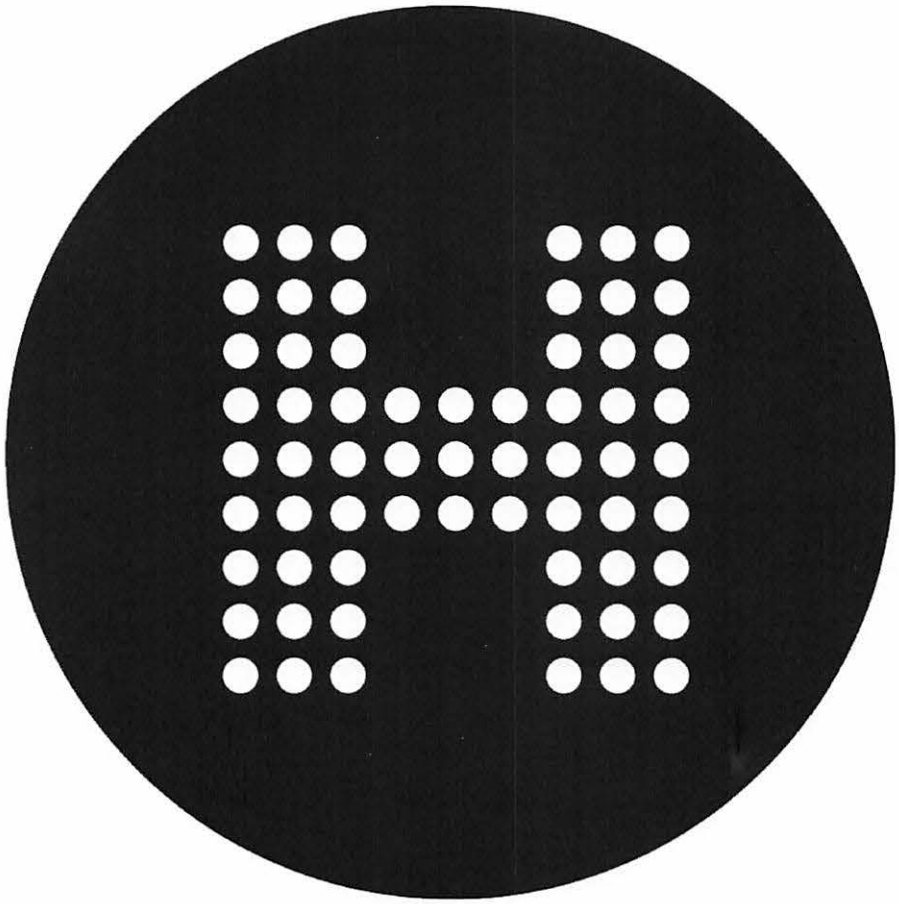
PROCUREMENT DEPARTMENT APPROVAL:

Procurement complies with Authority Procurement Guidelines and Acting Chief Financial Officer has approved. **YES √ NA**

BACK-UP MATERIAL: ***Bid received from Holliston Sand Company and Bid Opening Spreadsheet.***

HOLLISTON SAND COMPANY

PO Box 1168
Slatersville, RI 02876



CONTACTS

Wayne Demers: (401) 766-5010 x103 wayne@hollistonsand.com
Carmine Iacuone: (401) 766-5010 x1 carmine@hollistonsand.com

BID FOR IFB NO 1286: FILTERED SAND

Bid Author: Wayne Demers

MASTER BID

September 16, 2026

Albany County Airport Authority
Purchasing Office
737 Albany Shaker Road, Bldg #117
Albany, NY 12211-1057

RE: Affidavit of Compliance - AWWA B-100-16 Standards and NSF 61Certification

To whom it may concern,

Holliston Sand Company, Inc. is a manufacturer of filtration products that meet or exceed industry standards including AWWA B-100-16. This product line is tested and certified by the National Science Foundation (NSF) for potable water applications. All products sourced and manufactured at our Slatersville, RI plant are tested for compliance with required customer specifications prior to transport.

Holliston Sand Company, Inc., will provide filtered sand media for the Albany County Airport Authority. Reports will be provided upon request.

Holliston Sand Company, Inc. has been in business since 1953, providing high quality filtration and industrial products. References are included with this bid package. Do not hesitate if additional information is required.

Sincerely,

Wayne Demers
Administrator

We are NSF certified!!!

NSF
Certified to NSF/ANSI/CAN 61

P.O. Box 1168 Slatersville, RI 02876

HOLLISTON SAND

p: 401.766.5010 f: 401.762.4976 | hollistonsand.com

D-1: BID ACKNOWLEDGEMENT FORM

The Bidder acknowledges that he/she has carefully read the IFB and understands the specifications requested.

The Bidder warrants that if the Bid is accepted, he/she will contract with the Albany County Airport Authority using a Purchase Order and comply with the requirements of the IFB and the Terms and Conditions attached to the Purchase Order.

Name of Bidder: Holliston Sand Company, Inc.

Signature of Authorized Person: Wayne D Demers

Print Name and Title: Wayne Demers, Administrator

Business Address of Bidder: PO Box 1168

Slatersville, RI 02876

Business Phone Number: (401) 766-5010 x1

Business Fax Number: (401) 762-4976

Business E-Mail Address: sales@hollistonsand.com

Date: 9/16/2026

Subscribed and sworn to before me this 16th day of September, 2026.

Paul P. Baillargeon

Notary Public COM / EXPIRES 6/15/29

PAUL P. BAILLARGEON

Exhibit D-2:

Offerer Disclosure of Prior Non-Responsibility Determinations

Name of Individual or Entity Seeking to Enter into the Procurement Contract:

Holliston Sand Company, Inc.

Address: PO Box 1168, Slatersville RI 02876

Name and Title of Person Submitting this Form: Wayne Demers, Administrator

Contract Procurement Number: 1286

Date: 9/17/2026

1. Has any Governmental Entity made a finding of non-responsibility regarding the individual or entity seeking to enter into the Procurement Contract in the previous four years? (Please circle):

✓ No Yes

If yes, please answer the next questions:

2. Was the basis for the finding of non-responsibility due to a violation of State Finance Law §139-j (Please circle):

No Yes

3. Was the basis for the finding of non-responsibility due to the intentional provision of false or incomplete information to a Governmental Entity? (Please circle):

No Yes

4. If you answered yes to any of the above questions, please provide details regarding the finding of non-responsibility below.

Governmental Entity: _____

Date of Finding of Non-responsibility: _____

Basis of Finding of Non-Responsibility: _____

(Add additional pages as necessary)

5. Has any Governmental Entity or other governmental agency terminated or withheld a Procurement Contract with the above-named individual or entity due to the intentional provision of false or incomplete information? (Please circle):

✓ No Yes

6. If yes, please provide details below.

Governmental Entity: _____

Date of Termination or Withholding of Contract: _____

Basis of Termination or Withholding: _____

(Add additional pages as necessary)

Offerer certifies that all information provided to the Governmental Entity with respect to State Finance Law §139-k is complete, true and accurate.

By: _____ Date: 9/16/2026

Signature

Name: Wayne D Demers

Title: Administrator

EXHIBIT D-3: NON-COLLUSION AFFIDAVIT

AUTHORIZED OFFICER: Bidder's submittal containing statements, supporting documentation, letters, etc., shall be signed in the bid by a duly authorized officer of the company whose signature is binding on the bid.

The undersigned offers and agrees to furnish the product upon which specifications are stated in the enclosed bid. The period of acceptance of this bid will be ____ calendar days from the date of the acknowledgment. (Period of acceptance will be forty-five (45) calendar days unless otherwise indicated by Bidder).

STATE OF Rhode Island COUNTY OF Providence
BEFORE ME, the undersigned authority, a Notary Public in and for the State of Rhode Island on this day personally appeared Wayne D Demers who after being by me duly sworn did depose and say: I, Wayne D Demers am a duly authorized officer of/agent for Holliston Sand Company, Inc. and have been duly authorized to execute the foregoing on behalf of the said.

I hereby certify that the foregoing offer has not been prepared in collusion with any other proponent or other person or persons engaged in the same line of business prior to the official opening of this Bid. Further, I certify that the proponent is not now, nor has been for the past six (6) months, directly or indirectly concerned in any pool or agreement or combination, to control the type of product offered, or to influence any person or persons to offer or not to offer thereon.

By submission of this bid, the Bidder and each person signing on behalf of the Bidder certifies and in the case of a joint Bid each party thereto certifies as to its own organization, under penalty of perjury that to the best of his knowledge and belief:

A. The prices in this Bid have been arrived at independently without collusion, consultation, communication or agreement for the purpose of restricting competition as to any matter relating to such prices with any other Bidder or with any competitor;

B. Unless otherwise required by law, the prices which have been quoted in this Bid have not been knowingly disclosed by the Bidder and will not knowingly be disclosed by the Bidder prior to the opening, directly or indirectly to any other Bidder or to any competitor; and,

C. No attempt has been made or will be made by the proponent to induce any other person, partnership or corporation to submit or not to submit a proposal for the purpose of restricting competition.

Name and Address of Bidder: Holliston Sand Company, Inc
PO Box 1168
Slatersville, RI 02876

Telephone and Fax Numbers: (401) 766-5010 x1

E-Mail Address: wayne@hollistonsand.com

By: Wayne D. Demers Name and Title: Administrator
Name & Title

Signature Wayne D Demers

SUBSCRIBED AND SWORN to before me by the above-named on this 16th day of September, 2026.

Paul P. Baldorgo
COM EXPIRES 6/18/29

Notary Public in and for the State of R.I.

EXHIBIT D-4 BID BOND

KNOW ALL MEN BY THESE PRESENT, that we, the undersigned, _____ as Principal, and _____, as Surety, a corporation chartered and existing under the laws of the State of _____, and fully authorized to the business in the State of New York, and hereby held and firmly bound unto Albany County Airport Authority, as Owner in the sum of $0.00 _____ dollars and no cents in good and lawful money of the United States of America, to be paid upon demand to the Albany County Airport Authority, to which payment well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

The condition of the above obligation is such that whereas the Principal has submitted to Albany County Airport Authority, certain Bid attached hereto and hereby made a part hereof to enter into a contract in writing, for the delivery of the certain product to the Albany International Airport.

NOW, THEREFORE,

A. If said Bid shall be rejected, or in the alternate;

B. If said Bid shall be accepted and the Principal shall, within the time committed provide the specified product in faithful performance of said Purchase Order, and for the payment of all amounts in connection therewith, and shall in all other respects meet the conditions created by the acceptance of said Bid, then this obligation shall be void; otherwise the same shall remain in force and effect, it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulated and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the Authority accepts such Bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have cause their corporate seals to be hereto affixed and these presents to be signed by their proper officers.
Signed, this _____ day of _____, 201__.

Principal	Surety
By	By

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the Secretary of the Corporation named as Principal in the within bond; that _____, who signed the said bond of said Corporation is the President of said Corporation; that I know his signature, and his signature hereto is genuine; and that said bond was duly signed, sealed, and attested for in behalf of said Corporation by authority of its governing body.

_____

(Corporate Seal)

EXHIBIT D-5 **REFERENCES**

List three (3) businesses where like or similar product(s) has been provided within the last two (2) years:

1. **Company Name:** Albany International Airport

   Address: 130 Sicker Road, Latham NY 12110

   Contact Person and Title: Chris Pasquini, Deputy Maintenance Manager

   Phone / Fax/ E-Mail (518) 242-2379 / cpasquini@albanyairport.com

2. **Company Name:** NY/NJ Port Authority - La Guardia Airport

   Address: Hangar 7 South, Flushing NY 11371

   Contact Person and Title: Gordon Wurzer - Maintenance Manager

   Phone / Fax/ E-Mail (347) 374-1205 / gwurzer@panynj.gove

3. **Company Name:** Bradley International Airport

   Address: PO Box 16860, Washington DC 20041

   Contact Person and Title: Connor Long, Director of Facilities Management

   Phone / Fax/ E-Mail (703) 935-9773 / clong@avaitionfacilities.com

EXHIBIT D-6: BID SHEET(S)

1. COMPLIANCY

Listed in EXHIBIT C are the minimum specifications and standards intended to govern, in general, the filtered sand desired. Please check "Yes: or "No" if you can meet these specifications and standards. Variations offered as "or equal" should include a justification for each to be used in the evaluation of the product offered. The Authority reserves the right to make the final determination if the "as equal" variation is acceptable to the Authority.

All requirements of the Minimum Specifications and Standards will be met.

YES ✓ NO _____

2. PRODUCT PRICING

FILTERED SAND PER FAA SPECIFICAITONS

Estimated Annual Usage: 2,000 Tons

Approximate Order Quantity: 400-600 TONS

PRICE PER TON DELIVERED: $ 185.08 PER TON

3. DELIVERY:

Standard Delivery: within 7 Calendar Days

Emergency Delivery: within 2 Calendar Days

Haul Site Location: 167 Douglas Pike
Address

Harrisville, RI 02830
City, State

NOTE: SAND SAMPLES WILL BE TAKEN FROM THE DESIGNATED HAUL SITE LOCATION BY AN AIRPORT REPRESENTATIVE FOR TESTING AS PART OF THE EVALUATION PROCESS.

SAFETY DATA SHEET – JANUARY 15, 2026

Section 1 – Identification

Product Identifier:	Silica Sand
Trade Names:	Holliston Sand Products, Slater Farms Products
Product Uses:	Filtration Media, Foundry Sand, Industrial Fillers, Bio-retention and Agricultural Sand, Sports Turf, Recreational Products, Commercial Products, Traction Sand Not recommended for sand-blasting.
Manufacturer's Name:	Holliston Sand Company, Inc.
Manufacturer's Address	PO Box 1168, Slatersville, RI 02876
Manufacturer's Telephone	401.766.5010, Monday – Friday, 7:00am to 5:00pm
Manufacturer's Facsimile:	401.762.4976
Emergency Telephone	401.766.5010, Monday – Friday, 7:00am to 5:00pm

Section 2 – Hazards Identification

GHS – US Classification and Label Elements:

Health:

Category 1A – Carcinogen		
Category 1 - Specific Target Organ Toxicity (STOT) following repeated exposures		
Category 2B - Eye Irritation		
Signal Word (GHS-US) - DANGER		
GHS-US Labeling / Hazard Pictograms	 GHS08	 GHS07

Hazard Statements (GHS-US)

H335	May cause eye and respiratory irritation
H350	May cause cancer by inhalation
H372	Causes damage to organs through prolonged or repeated exposure by inhalation.

Precautionary Statements (GHS-US)

P202 – SDS - Read all safety precautions prior to handling.	P264 – Wash thoroughly after handling.
P308 / P313/P314/P304 – Call for medical attention if not well or uncomfortable. If inhaled, provide fresh air.	
P260 / P280 – Never breathe dust. Wear PPE prior to use.	P271 – Use in a well ventilated area.
P403 – Store properly. Closed container.	P501 – Dispose of according to local / regional regulations.

Section 3 – Composition

Name	Product Identifier	Percentage (%)	GHS-US Classification
Quartz	CAS #: 14808-60-7	85 – 99.9	Carc. 1A, H350, STOT SE 3, H335, STOT RE 1, H372

Section 4 – First Aid Measures

ANY SERIOUS INJURY OR UNCONSCIOUSNESS OBSERVATION SHOULD BE AN AUTOMATIC EMERGENCY CALL TO 911.

Inhalation – Move person to a clear area, provide fresh air. Provide medical or emergency attention.

Eye – Flush eye / eyes with water as needed. Provide medical attention as necessary.

Skin – Simple abrasions should be cleansed with mild soap and water. Provide medical attention as necessary.

Ingestion – Discomfort should be followed up with medical attention.

Signs and Symptoms of Exposure - Symptoms of silicosis may first appear 15 to 20 years after someone's exposure to crystalline silica. As the disease progresses, symptoms may include:

Shortness of breath	*Severe Cough*	*Weakness*

If you have silica in your lungs, your body may not be able to fight infections well. This can lead to other illnesses that can cause.

Chest Pains	*Weight Loss*	*Night Sweats*
Respiratory Failure	*Fever*	

As the disease progresses over time, these symptoms can become worse. The symptoms of acute silicosis which can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as six months, are the same as those associated with chronic silicosis. The symptoms of scleroderma, an autoimmune disease, include thickening and stiffness of the skin, particularly in the fingers, shortness of breath, difficulty swallowing and joint problems.

Section 5 – Fire Fighting Measures

Extinguishing Media:	Compatible with all media. Use appropriate media for surrounding fire.
Unusual Fire and Explosion Habits:	None known.
Special Fire Fighting Procedure:	None known. Not flammable. Use normal fire fighting equipment.
Hazardous Combustion Products:	None known.

Section 6 – Accidental Release Measures

- Personal precautions, protective equipment and emergency procedures
    - General measures.
        - Do not breathe dust. Avoid generation of dust during clean-up of spills. Recover the product by vacuuming, shoveling or sweeping. Vacuum must be fitted with HEPA filter to prevent release of particulates during clean-up. Use water to wet down clean up area to minimize particulate.
    - For non-emergency / emergency personnel.
        - Wear suitable protective clothing, gloves, eye and face protection. Use recommended respiratory protection. Collect as any solid.
- Environmental Precautions – no additional information available
- Methods and Material for Containment and Clean-up
        - Avoid generation of dust during clean-up of spills. Recover the product by vacuuming, shoveling or sweeping. Vacuum must be fitted with HEPA filter to prevent release of particulates during clean-up. Use water to wet down clean up area to minimize particulate.

Section 7 – Handling and Storage

- This product is not to be used for abrasive blasting without proper equipment and training. Do not breathe dust, which may be created during handling of this product.
- Engineering measures and good housekeeping are essential to preventing accumulation of silica dust in the workplace. Use adequate ventilation and dust collection systems.
- Testing can ensure engineering measures are sufficient. PPE is a solution until verification is established. Refer to Section 8 – Exposure Controls / Personal Protection for further information.
- Silica dust is not always visible in a form of a cloud. Use PPE.
- In accordance with OSHA's Hazard Communication Standard (29CFR 1910.12, 1915.99, 1917.28, 1918.90, 1926.59, 1928.21), state, and / or local right to know laws and regulations, familiarize your employees with this SDS and the information contained herein.
- Warn your employees, your customers and other third parties (in case of resale or distribution to others) of the potential health risks associated with the use of this product and train them in the appropriate use of PPE and engineering controls, which will reduce their risks of exposure.
- See ASTM International standard practice E1132-06, "Standard Practice for Health Requirements Relating to Occupational Exposure to Respirable Crystalline Silica."
- Store in a dry, cool place. Keep container tightly closed.

Section 8: Exposure Controls / Personal Protection

Control Parameters

Quartz (14808-60-7) – Occupational exposure limits (respirable fraction) in air for dust containing crystalline silica.		
USA ACGIH	ACGIH TWA (mg/m³) (8 hour weighted average)	0.025 mg/m³
USA IDLH	US IDLH (mg/m³)	50 mg/m³
USA NIOSH	NIOSH REL (TWA) (mg/m³) (10 hour weighted average)	0.05 mg/m³
USA MSHA/OSHA	MSHA/OSHA PEL (TWA) (mg/m³) (8 hour weighted average) (Mineral Dust)	(30)/(%SiO_2 +2) mg/m³ – total dust (10)/(% SiO_2 +2) mg/m³ – respirable fraction

Occupational exposure limits in air for inert / nuisance dust.			
USA ACGIH	ACGIH TLV	3 mg/m³	10mg/m³
USA MSHA/OSHA	MSHA/OSHA PEL (As Inert or Nuisance Dust)	5 mg/m³	15 mg/m³

Exposure Controls

Engineering controls	Ensure adequate ventilation, especially in confined areas. Avoid dust production.
Personal protection equipment (PPE)	Use dust suits, protective goggles and respiratory protection in dusty areas. Self contained breathing apparatus is also a good option during dust production. Get training on the use of all PPE equipment. Respirator fit testing is mandatory. Contact NIOSH at 800.35.NIOSH, WWW.CDC.GOV/NIOSH
	Use impermeable gloves for hand protection.
	Use protective goggles for eye protection
	Use NIOSH approved respirators in areas containing airborne dust.
Hygiene	Always wash your hands after handling
Do not breathe dust. Use PPE. Research and engineer a solution for each application.	

California Inhalation Reference Exposure Limit (REL) as of 12/08: Crystalline silica (quartz, cristobalite, tridymite) is 3 ug/m^3.
Canadian OEL:
• Canada Labour Code: 0.025 mg/m^3 (respirable)
• Alberta, British Columbia: 0.025 mg/m^3 (respirable quartz and cristobalite)
• Saskatchewen: 2 mg/m3 (respirable, amorphous: silica fume); 0.1 mg/m^3 (respirable, amorphous: silica fused); 0.05 mg/m^3 (respirable, cristobalite); 0.05 mg/m^3 (respirable tridymite); 0.1 mg/m^3 (respirable, quartz); 0.1 mg/m^3 (respirable, tripoli)
• Manitoba, Newfoundland, Prince Edward Island: 0.025 mg/m3 (respirable)
• Ontario: 0.05 mg/m^3 (respirable cristobalite, tridymite); 0.1 mg/m^3 (quartz, tripoli); 0.1 mg/m^3 (silica fused); 2 mg/m^3 (silica fume)
• Quebec: 0.05 mg/m^3 (respirable, cristobalite, tridymite); 0.1 mg/m^3 (quartz, tripoli)
• New Brunswick: 0.1 mg/m^3 (quartz); 0.05 mg/m^3 (cristobalite)
• Nova Scotia: 0.025 mg/m^3 (quartz, cristobalite)
• Yukon: 2 mg/m^3 (respirable, amorphous); 300 particles/ml measured with a konimeter (quartz, and tripoli); 150 particles/ML measured with a konimeter (cristobalite and tridymite)
• Northwest Territories, Nunavut: 2 mg/m^3 (respirable, amorphous); 0.05 mg/m^3 (respirable, cristobalite, tridymite, silica flour); 0.1 mg/m^3 (respirable, fused silica, quartz, tripoli)
Austria OEL - Maximum concentration 0.15 mg/m^3
Japan OEL - Japan Society of Occupational Health Respirable crystalline silica 0.03 mg/m^3
Poland OEL TWA -2 mg/m^3 (total inhalable dust, containing >50% free crystalline silica);
• 0.3 mg/ mg/m^3 m^3 (respirable dust, containing >50% free crystalline silica);
• 4.0 mg/m^3 (total inhalable dust, containing 2% to 50% free crystalline silica);
• 1.0 mg/m^3 (respirable dust, containing 2% to 50% free crystalline silica)
United Kingdom OEL – 0.1 mg/m^3
Mexico – 0.1 mg/m^3 (quartz, inhalable)
• 0.05 mg/m^3 (cristobalite, inhalable)
• 0.05 mg/m^3 (tridymite, inhalable)
• 0.1 mg/m^3 (tripoli containing respirable quartz powder, inhalable)
• (Also refer to ACGIH)
Argentina – 0.05 mg/m^3 (quartz, respirable)
• 0.05 mg/m^3 (cristobalite, respirable)
• 0.05 mg/m^3 (tridymite, respirable)
• 0.1 mg/m^3 (tripoli, respirable)

Section 9: Physical and chemical properties

Physical State / Appearance	Solid / Crystalline
Odor	None
Odor Threshold	No data available
Color	Natural
pH	No data available
Evaporation rate	No data available
Melting point	1710°C (3110°F)
Freezing point	No data available
Boiling point	2230°C (4046°F)
Flash point	No data available
Self ignition temperature	No data available

Decomposition temperature	No data available
Flammability (solid, gas)	Non-combustible solid
Vapour pressure	No data available
Relative vapour density at 20 °C	No data available
Relative density	No data available
Density	2.65 (approx.)
Solubility	Practically insoluble.
Log Pow	No data available
Log Kow	No data available
Viscosity	No data available
Explosive Limits	None known.
Oxidizing properties	None known.
Explosive limits	No data available

Section 10: Stability and Reactivity

Reactivity	None under normal conditions. Reactive with strong oxidizing agents.
Chemical / Thermal Stability	Chemically stable under normal temperature and pressure. Thermal instability occurs under high temperatures above 870°C (1598°F). It can change to crystalline silica such as tridymite and cristobalite.
Incompatible Materials	Avoid strong oxidizers such as fluorine, chlorine tri-fluoride, hydrogen fluoride, oxygen di-fluoride, hydrogen peroxide, acetylene, ammonia.
Hazardous Decomposition	Quartz (silica) will dissolve in hydrofluoric acid producing a corrosive gas, silicon tetra-fluoride.
Hazardous Polymerization	Not know to polymerize.

Section 11: Toxicological Information

Acute toxicity	Not classified	
Aspiration hazard	Not classified	
Skin Irritation	Not classified	
Eye Irritation	Not classified	
Respiratory or skin sensitization	Not classified	
Reproductive toxicity	Not classified	
Specific target organ toxicity (single exposure)	Not classified	
Specific target organ toxicity (repeated exposure)	Causes damage to organs (lung/respiratory system) through prolonged or repeated exposure (inhalation)	
Germ cell mutagenicity	Not classified	
Carcinogenicity	May cause cancer - inhalation	
Quartz (14808-60-7)	**IARC Group – Group 1**	**National Toxicity Program (NTP) Status: Known Human Carcinogen**
Silica – All grades (14808-60-7)	Repeated or prolonged exposure to respirable crystalline silica dust will cause lung damage in the form of silicosis. Symptoms will include progressively more difficult breathing, cough, fever, and weight loss. Acute silicosis can be fatal.	

Section 12: Ecological Information

Crystalline silica is not known to be eco-toxic, not readily biodegradable and not expected to bio-accumulate.

Section 13: Disposal Considerations

AS SOLD, our crystalline silica (quartz) products are not considered hazardous waste under the Resource Conservation and Recovery Act, or its regulations, 40 CFR 261 et seq. Dispose according to applicable local, state and federal regulations.

Section 14: Transport Information

Crystalline silica (quartz) is not a hazardous material for purposes of transportation under the U. S. Department of Transportation Table of Hazardous Materials, 49 CFR §172.101, and Transportation of Dangerous Goods Regulations in the European Union, Canada, Argentina, Republic of Uzbekistan and Japan. Consult applicable international, national, state, provincial or local laws. In accordance with DOT / TDG / ADR / RID / ADNR / IMDG / ACAO / IATA, crystalline silica is not a dangerous product in the sense of transport regulations.

Section 15: Regulatory Information

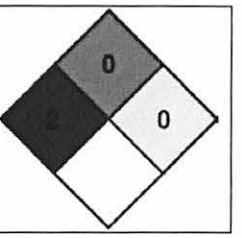
US Federal Regulations	Silica / Quartz 14808-60-7	Immediate health hazard - acute Delayed health hazard – chronic.	On US TSCA (Toxic Substances Control Act) inventory listing.
Canada Regulations		WHMIS Classification. Class D Division 2 Subdivision A – Very toxic material causing other toxic effects.	
International Info		IARC (International Agency for Research on Cancer) listing.	NTP (National Toxicology Program) specifies as a carcinogen.
U State Regulations		See below.	

U.S. - California - Proposition 65 - Carcinogens List . This product contains Quartz, a substance known to the state of California to cause cancer.
U.S. - Hawaii - Occupational Exposure Limits - TWAs
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Acceptable Ambient Concentrations
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Emission Levels (ELs)
U.S. - Idaho - Occupational Exposure Limits - Mineral Dusts
U.S. - Illinois - Toxic Air Contaminant Carcinogens
U.S. - Maine - Chemicals of High Concern
U.S. - Massachusetts - Right To Know List
U.S. - Michigan - Occupational Exposure Limits - TWAs U.S. - Minnesota - Chemicals of High Concern
U.S. - Minnesota - Hazardous Substance List
U.S. - Minnesota - Permissible Exposure Limits - TWAs
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Special Health Hazards Substances List
U.S. - Oregon - Permissible Exposure Limits - Mineral Dusts
U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Tennessee - Occupational Exposure Limits - TWAs
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term
U.S. - Vermont - Permissible Exposure Limits - TWAs
U.S. - Washington - Permissible Exposure Limits - STELs
U.S. - Washington - Permissible Exposure Limits - TWAs

Section 16 – Other Information

NFPA

Health Hazard	2 – intense or continued exposure could cause temporary or incapacitation or possible residual injury unless prompt medical attention is given
Fire Hazard	0 – materials that will not burn
Reactivity	0 – normally stable, even under fire exposure conditions, are not reactive with water



HMIS III Rating

Health	2 - moderate hazard, temporary injury may occur
Flammability	0 – minimal hazard
Physical	0 – minimal hazard
Personal Protection	All equipment required plus engineering measures.

Definitions

Carc. 1A	Carcinogenicity Category 1A
STOT RE 1	Specific target organ toxicity (repeated exposure) Category 1
STOT SE 3	Specific target organ toxicity (single exposure) Category 3

User's Responsibility: The OSHA Hazard Communication Standard 29 CFR 1910.1200 requires that this SDS be made available to your employees who handle or may be exposed to this product. Educate and train your employees regarding applicable precautions. Instruct your employees to handle this product properly.

Disclaimer: The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for one's own particular use. Since the actual use of the product described herein is beyond our control, Holliston Sand company, Inc., assumes no liability arising out of the use of the product by others. Appropriate warnings and safe handling procedures should be provided to handlers and users.
More information on the effects of crystalline silica exposure may be obtained from OSHA website: http://www.osha.gov or from NIOSH website: http://www.cdc.gov/niosh).

CONTRACT #1286
Filtered Sand

Company Name	Holliston Sand Company
Meet or Exceed Specifications	YES
Price per Ton Delivered	$185.08
Bid Bond	
Offerer Disclosure	X
Non-Collusion	X
References	X
Acknowledgment	X

I, Bobbi Matthews, certify that this bid tabulation is a true copy of the prices submitted by each bidder for the construction project shown above.

Albany Airport Authority Purchasing Department

Bobbi Matthews

Bobbi Matthews
Purchasing Agent

Sworn to before me this 22nd day of September 2026

Jennifer A. Munger
Notary Public

JENNIFER A. MUNGER
Notary Public, State of New York
No. 01MU6246332
Qualified in Schenectady County
Commission Expires Aug. 08, 2027

AGENDA ITEM NO. 10.3

Solid Deicer Product in 40 lb. Bags & 1000 lb. Mini Sacks from New Deal Deicing Sourcewell Contract # 031423-NDD

AGENDA ITEM NO: 10.3
MEETING DATE: October 13, 2026

ALBANY COUNTY AIRPORT AUTHORITY
REQUEST FOR AUTH`ORIZATION

DEPARTMENT: ***Finance***

Contact Person: ***Margaret Herrmann, Acting Chief Financial Officer***

PURPOSE OF REQUEST:

Solid Deicer Product in 40 lb. Bags & 1000 lb. Mini Sacks from New Deal Deicing Sourcewell Contract # 031423-NDD

CONTRACT AMOUNT:

Estimated annual costs: $175,000

BUDGET INFORMATION:

Anticipated in Current Budget: Yes √ No NA

FISCAL IMPACT - FUNDING (Dollars or Percentages)

Federal **State** **Airport** ***100%***
Funding Source: Airport Operating Budget

JUSTIFICATION:

The Airport Authority release a Request for Bid for deicing products for runways, taxiways, and ramps. (Contract #1284). No bids were received for the sodium formate / acetate blend deicing product. This product is needed for deicing various locations around the Airport property to insure public safety. The pricing provided for this deicer is under the current New Deal Deicing Sourcewell Contract (#031423-NDD). The annual costs is estimated based on past usage and is dependent on weather conditions.

CHIEF EXECUTIVE OFFICER'S RECOMMENDATION:

Recommend award of Purchase Order to New Deal Deicing in accordance with the Authority's procurement guidelines.

FINAL AGREEMENT SUBJECT TO APPROVAL BY COUNSEL: YES √ NA

PROCUREMENT DEPARTMENT APPROVAL:

Procurement complies with Authority Procurement Guidelines and Acting Chief Financial Officer has approved. **YES √ NA**

BACK-UP MATERIAL: ***Quote from New Deal Deicing***

New Deal Deicing

Specialist in Solids *Unique Product, Premium Service ™*

January 7, 2026

Price Quote for: Albany International Airport

NEWDEAL® - The Real Deal

Sourcewell
Awarded Contract
Contract # 031423-NDD

NEWDEAL® Solid Airfield Deicer:	Unit Price	Amount
1) 55 x 40 lbs bags per Pallet: **21 PLT**	$ 2,636.00	$ 55,356.00
2) Shipping via Dedicated Flatbed Truck:		$ 1,895.00
	Total:	**$ 57,251.00**



- √ **Sourcewell Contract# 031423-NDD.**
- √ **Price is valid till January 31, 2026.**
- √ NEWDEAL® is FAA approved, certified under AMS 1431 solid standard and AMS 1435 liquid standard, can be used in both solid and liquid forms.
- √ Normal transit time - 2 business days after receipt of order.
- √ Thank you for supporting your Colorado small business!
- √ Thank you for supporting American manufacturing!
- √ New Deal proudly serves more than 200 aviation users nationwide. Call 303-459-2500 or email laura@newdealdeicing.com to place an order.

New Deal Deicing

Specialist in Solids — *Unique Product, Premium Service ™*

January 6, 2026

Price Quote for: Albany International Airport

NEWDEAL® - The Real Deal

Sourcewell Awarded Contract
Contract # 031423-NDD



	NEWDEAL® Solid Airfield Deicer:	Unit Price	Amount
1)	2 x 1000 lbs Mini Sacks per Pallet: **22 PLT**	$ 2,395.00	$ 52,690.00
2)	Shipping via Dedicated Flatbed Truck:		$ 1,895.00
		Total:	**$ 54,585.00**

- √ **Sourcewell Contract# 031423-NDD.**
- √ **Price is valid till January 31, 2026.**
- √ NEWDEAL® is FAA approved, certified under AMS 1431 solid standard and AMS 1435 liquid standard, can be used in both solid and liquid forms.
- √ Normal transit time - 2 business days after receipt of order.
- √ Thank you for supporting your Colorado small business!
- √ Thank you for supporting American manufacturing!
- √ New Deal proudly serves more than 200 aviation users nationwide. Call 303-459-2500 or email laura@newdealdeicing.com to place an order.

AGENDA ITEM NO. 10.4

Authorization to make purchases using State of New York Contract for Road Salt. (Award #23449 / Contract # PC71087) Contract Period September 9, 2026 – August 31, 2027

AGENDA ITEM NO: 10.4
MEETING DATE: October 13, 2026

ALBANY COUNTY AIRPORT AUTHORITY
REQUEST FOR AUTHORIZATION

DEPARTMENT:

Contact Person: *Margaret Herrmann, Acting Chief Financial Officer*

PURPOSE OF REQUEST:

Authorization to make purchases using State of New York Contract for Road Salt. (Award #23449 / Contract # PC71087) Contract Period September 9, 2026 – August 31, 2027

CONTRACT AMOUNT:

Contract Price: *$74.80 Per Ton*

BUDGET INFORMATION:

Anticipated in Current Budget: Yes √ No ____ NA ____

FISCAL IMPACT - FUNDING (Dollars or Percentages)

Federal _____ State _____ Airport ____√____ NA _____

JUSTIFICATION:

New York State Office of General Services Procurement Services has conducted competitive bidding for the above mentioned contract. The awarded vendor has agreed to offer the Airport the same terms and conditions in that contract. The amount of usage depends on weather conditions. The estimated usage is 1,000 tons.

CHIEF EXECUTIVE OFFICER'S RECOMMENDATION:

Recommend approval.

FINAL AGREEMENT SUBJECT TO APPROVAL BY COUNSEL: YES √ NA _____

PROCUREMENT DEPARTMENT APPROVAL:

Procurement complies with Authority Procurement Guidelines and Acting Chief Financial Officer has approved. **Yes √ NA ____**

BACK-UP MATERIAL:

NYS OGS Contract Award Notification for Road Salt & Pricing by award for Albany County.

NEW YORK STATE | Office of General Services
Procurement Services

Corning Tower, Empire State Plaza, Albany, NY 12242 | https://ogs.ny.gov/procurement | customer.services@ogs.ny.gov | 518-474-6717

Contract Award Notification

Title:	:	**Group 01800 –** **Road Salt and Treated Salt – Types 1 & 2 (Statewide)** **Classification Code(s): 12**
Award Number	:	**23449** **(Replaces Award 23409)**
Contract Period	:	**September 9, 2026 - August 31, 2027**
Bid Opening Date	:	**July 22, 2026**
Date of Issue	:	**September 10, 2026**
Specification Reference	:	**As Incorporated In The Invitation for Bids**
Contractor Information	:	**Appears on Page 2 of this Award**

Address Inquiries To:

Name : Jamison Tamer Title : Contract Management Specialist 1 Phone : 518-473-2663 E-mail : OGS.sm.SST_roadsalt@ogs.ny.gov	**Procurement Services** **Customer Services** Phone : 518-474-6717 E-mail : customer.services@ogs.ny.gov

Procurement Services values your input.
Complete and return "Contract Performance Report" at end of document.

Description

Road Salt is used for snow and ice control. Treated Salt is granular sodium chloride (Rock Salt) treated with corrosion inhibited liquid magnesium chloride – Types 1 and 2.

Authorized Users are obligated to purchase a minimum of **60%** of the total filed requirement amount per salt type **with the exception of the following counties**, which are obligated to purchase **50%** of the total filed requirement: Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Suffolk, Westchester.

Authorized Users with multiple delivery sites (e.g., NYSDOT, County Highways and NYS Thruway) shall have their minimum/maximum delivery quantities determined based on the sum of all their sites serviced by a Contractor per lot.

Automatic price increase becomes effective once deliveries exceed 120% of the Authorized User's filed requirement.

There are MBE and WBE participation goals totaling 10% in New York State on this contract.

There are 0% SDVOB participation goals.

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SECTION 1: INTRODUCTION

1.1 Contractor Information

NOTE: See individual contract items to determine actual awardees.
See separate document PRICING for contact information to place NYS Contract Orders.

Contract	Contractor Name & Address	Contract Admin	Federal ID#/ NYS Vendor ID#
PC71083	American Rock Salt Co LLC PO Box 190 Mt. Morris, NY 14510	Toll Free #: 888-762-7258 Phone #: 585-991-6817 Contact: Jamie A. McClain Title: Marketing Manager Email: Jamie.McClain@AmericanRockSalt.com	16-1516458 1000008297
	Contractor does not accept NYS Procurement Card		

Contract	Contractor Name & Address	Contract Admin	Federal ID#/ NYS Vendor ID#
PC71084 SB	Apalachee LLC 1423 Highland Ave Rochester, NY 14620	Toll Free #: 800-724-5037 Phone #: 585-442-4131 Contact: Ellen Pouthier Title: VP Sales Email: Sales@ApalacheeSalt.com	47-2089879 1100213604
	Contractor does not accept NYS Procurement Card		

Contract	Contractor Name & Address	Contract Admin	Federal ID#/ NYS Vendor ID#
PC71085	Atlantic Salt Inc 134 Middle Street, Suite 210 Lowell, MA 01852	Phone #: 978-453-4911 Contact: Donna Capillo Title: Assistant Corporate Secretary Email: DCapillo@EasternMinerals.com	13-2914699 1000026327
	Contractor does not accept NYS Procurement Card		

Contract	Contractor Name & Address	Contract Admin	Federal ID#/ NYS Vendor ID#
PC71086	Cargill Incorporated – Deicing Solutions 24950 Country Club Blvd, Suite 450 North Olmsted, NY 44070	Phone: 800-600-7258 Contact: Amanda Knaus Title: Sales Account Manager Email: Salt_customercareroadsafety@Cargill.com	41-0117680 1000048669
	Contractor accepts NYS Procurement Card orders for up to $50,000.		

Contract	Contractor Name & Address		Contract Admin	Federal ID#/ NYS Vendor ID#
PC71087	Morton Salt Inc 444 West Lake Street, Suite 3000 Chicago, IL 60606	Phone #: Contact: Title: Email:	312-807-2384 Na-Tia Douglas Senior Bid Analyst NDouglas@MortonSalt.com	27-3146174 1100010394
	Contractor accepts NYS Procurement Card for orders up to $50,000			

Cash Discount, If Shown, should be Given Special Attention.

Authorized users should notify New York State procurement services promptly if the Contractor fails to meet delivery or other terms of this contract. Products or services which do not comply with the specifications or are otherwise unsatisfactory to the Authorized User should also be reported to OGS procurement services.

1.2 Overview

This Solicitation is issued by the New York State ("NYS") Office of General Services ("OGS"), Procurement Services for Road Salt and Treated Salt (Types 1 & 2) as specified herein for all Authorized Users eligible to make purchases under the Contracts resulting from this Solicitation.

This Solicitation outlines the terms and conditions, and all applicable information required for submitting a Bid. **Bidders should pay strict attention to the Bid submission date and time to prevent disqualification**. Bidders are strongly encouraged to read the language of this Solicitation thoroughly and to precisely follow the instructions included in the Solicitation and all attachments.

1.3 Scope

The resultant Contract(s) are to provide Road Salt (Rock) in bulk, Treated Salt (Types 1 & 2) in bulk, to various locations throughout the State.

State and eligible non-State agencies may participate and become Authorized Users of the resulting Contract awards. Authorized User shall have the meaning set forth in State Finance Law Section 163(1)(k) and includes, but is not limited to, New York State Agencies, political subdivisions, local governments, public authorities, public school and fire districts, public and nonprofit libraries, and certain other nonpublic/nonprofit organizations.

This Solicitation includes the Lots identified below:

- Lot I – Road Salt (Rock)
- Lot II – Treated Salt – Type 1
- Lot III – Treated Salt – Type 2

1.4 Estimated Quantities

A Contract resulting from this Solicitation shall be an estimated quantity Contract. No specific quantities are represented or guaranteed, and the State provides no guarantee of individual Authorized User participation. The Contractor must furnish all quantities actually ordered at or below the Contract prices. The anticipated dollar value of the award for this Solicitation, based on historical purchases under previous awards, is approximately $240,000,000 annually. The individual value of each resultant Contract is indeterminate and will depend upon the number of Contracts issued and the competitiveness of the pricing offered. See Appendix B *Estimated/Specific Quantity Contracts* and *Participation in Centralized Contracts*.

Numerous factors could cause the actual quantities of Products purchased under a Contract resulting from this Solicitation to vary substantially from the estimates in the Solicitation. Such factors include, but are not limited to, the following:

- Such Contracts may be non-exclusive Contracts.
- There is no guarantee that demand will continue in any manner consistent with previous purchases.
- The individual value of each Contract is indeterminate and will depend upon actual Authorized User demand and actual quantities ordered during the Contract period.
- The State reserves the right to terminate any Contract for cause or convenience prior to the end of the term pursuant to the terms and conditions of the Contract.
- Contract pricing that is lower than anticipated could result in a higher quantity of purchases by Authorized Users than anticipated.
- Contract pricing that is higher than anticipated could result in a lower quantity of purchases by Authorized Users than anticipated.

By submitting a Bid, Bidder acknowledges the foregoing and agrees that actual good faith purchasing volumes during the term of the resulting Contracts could vary substantially from the estimates provided in this Solicitation.

1.5 Small, Minority and Women-Owned Businesses:

The letters SB listed under the Contract Number indicate the contractor is a NYS small business. Additionally, the letters MBE and WBE indicate the contractor is a Minority-owned Business Enterprise and/or Woman-owned Business Enterprise.

1.6 Recycled, Remanufactured and Energy Efficient Products:

Procurement Services supports and encourages the purchase of recycled, remanufactured, energy efficient and "energy star" products. If one of the following codes appears as a suffix in the Award Number or is noted under the individual Contract Number(s) in this Contract Award Notification, please look at the individual awarded items for more information on products meeting the suffix description.

Code	Type
RS, RP, RA	Recycled
RM	Remanufactured
SW	Solid Waste Impact
EE	Energy Efficient
E*	EPA Energy Star
ES	Environmentally Sensitive

1.7 Note to Authorized Users:

When placing purchase orders under the contract(s), the authorized user should be familiar with and follow the terms and conditions governing its use which usually appears at the end of this document. The authorized user is accountable and responsible for compliance with the requirements of public procurement processes. The authorized user must periodically sample the results of its procurements to determine its compliance. In sampling its procurements, an authorized user should test for reasonableness of results to ensure that such results can withstand public scrutiny.

The authorized user, when purchasing from OGS contracts, should hold the contractor accountable for contract compliance and meeting the contract terms, conditions, specifications, and other requirements. Also, in recognition of market fluctuations over time, authorized users are encouraged to seek improved pricing whenever possible.

Authorized users have the responsibility to document purchases, particularly when using OGS multiple award contracts for the same or similar product(s)/service(s), which should include:

- a statement of need and associated requirements,
- a summary of the contract alternatives considered for the purchase,
- the reason(s) supporting the resulting purchase (e.g., show the basis for the selection among multiple contracts at the time of purchase was the most practical and economical alternative and was in the best interests of the State).

SECTION 2: PRICING

For specific pricing information per county and salt type please refer to the price pages' link published at the webpage for this contract on the OGS Procurement Services website:

https://ogs.ny.gov/procurement/ogs-centralized-awards-list

SECTION 3: CONTRACT ADMINISTRATION

Contractor shall provide a sufficient number of Customer Service employees who are knowledgeable and responsive to Authorized User needs and who can effectively service the Contract. Contractor shall also provide an Emergency Contact in the event of an emergency occurring after business hours or on weekend/holidays.

Contractor shall provide a dedicated Contract Administrator to support the updating and management of the Contract on a timely basis. Contractor must notify OGS within five Business Days if it's Contract Administrator, Emergency Contact, or Customer Service employees change, and provide an interim contact person until the position is filled. Changes shall be submitted electronically via e-mail to the OGS Contract Management Specialist.

SECTION 4: TERMS AND CONDITIONS

4.1 Contract Term and Extensions

A. Base Term. The Contract shall be in effect for a term of up to one (1) year. The Contract term shall commence after all necessary approvals and shall become effective September 1, 2026, or upon the date of OSC approval of the final executed documents, whichever is later, and the Contract term shall end August 31, 2027.

B. Extensions. At the State's option, and subject to the approval of OSC, the Contract may be extended for up to three (3) years, in increments as deemed to be in the best interest of the State. Whether the optional extensions are exercised is at the sole discretion of the State. A Contractor shall retain the right to decline a Contract extension offered under this section. Any Contract extension will be under the same terms and conditions, subject to any additional applicable statutory and policy requirements. Any extensions provided under this section shall apply in addition to any rights set forth in Appendix B *Contract Term – Extension*.

C. The Contract term provided for in this section shall extend six (6) months beyond its termination date only for Authorized Users whose Contracts must be registered with the Office of the New York City Comptroller. During the six (6) month period the definition of Authorized User shall be deemed to refer only to Authorized Users whose Contracts must be registered with the Office of the New York City Comptroller. This extension is in addition to any other extensions available under the Contract. The extension provided for in this paragraph shall be upon the then-existing terms and conditions; provided, however, during such extension an Authorized User, as defined in this paragraph, may agree to amend such terms and conditions solely to comply with changes in statutory requirements (e.g. changes in minimum, prevailing or living wages, or regulated services).

4.2 Short term Extension

This section shall apply in addition to any rights set forth in Appendix B *Contract Term – Extension*. In the event that OGS determines that a short term extension is in the best interest of the State, (e.g., a replacement Contract has not been issued, or an extended period is needed for Authorized Users to transition to another procurement method), any Contract let and awarded hereunder by the State may be extended unilaterally by the State for an additional period of up to thirty (30) calendar days upon notice to the Contractor with the same terms and conditions as the original Contract and any previously approved modifications. With the concurrence of the Contractor, the extension may be for a period of up to ninety (90) calendar days in lieu of thirty (30) calendar days. However, unless otherwise noted in the extension notification or agreement, this extension automatically terminates should a replacement Contract be issued in the interim.

4.3 Price

Price shall include all customs and duties and be net per ton, FOB destination designated on purchase order, including unloading of the bulk salt.

Contract prices shall be firm except for price revisions permitted in accordance with the following clauses:

- Section 4.1 - *Contract Term and Extensions*
- Section 4.3.1 - *Fuel Price Adjustment*
- Section 4.3.2 - *Price Escalation*
- Section 4.3.3 – *Price Reductions*

Should the price structure utilized by the parties become unworkable for the State, detrimental or injurious to the State, or result in prices which are not truly reflective of current market conditions and the price is deemed unreasonable or excessive by the Commissioner of General Services, and no adjustment in price is mutually agreeable, the Commissioner of General Services reserves the sole right upon ten (10) days written notice mailed to the Contractor to terminate any Contract resulting from this Bid opening. If the Contractor is unable or unwilling to meet Contractual requirements in whole or in part, it shall immediately notify the State of that fact, so that the State may take appropriate action.

Such notification shall be in writing and shall be directed to the OGS Procurement Services. Such notification shall not relieve the Contractor of its responsibilities under the Contract.

4.3.1 Fuel Price Adjustment

A fuel price adjustment may be made to Contract pricing in accordance with the following procedure:

- On a monthly basis an amount may be added or deducted from Contract pricing based on calculations made referencing prices posted in the "EIA Retail On-Highway Diesel Prices".
- The New England PADD 1A shall be the designated posting for the adjustments. If this source becomes unavailable, unworkable, unsuitable, or not reflective of the market conditions, then another source may be selected by the Commissioner of General Services in their sole discretion.
- Fuel Price adjustments will be applicable for deliveries of road salt & treated salt made during the Contract period. The fuel price adjustment shall be applied for the **date of delivery**.

  Ex.: If a Purchase Order for salt is received on January 30, and the salt is delivered on February 2, the fuel price adjustment used will be that for the month of February.
- The base rate used for calculating adjustments shall be the rate shown in the referenced EIA on the date of the Bid Opening indicated on page 1 of this Invitation for Bids and adjustments will be permitted monthly.

- The monthly average will be arrived at by using the Monday prices for a given month as displayed in the EIA Retail On-Highway Diesel Prices and determining an average for that month. The previous month's prices shall be used to determine the monthly average (i.e. – August's prices will be used to determine September's adjustment). All prices will be rounded to two (2) decimal places. Fuel Price Adjustment calculations will be posted monthly to the Contract award page on the OGS website:

EXAMPLE FUEL PRICE ADJUSTMENT INCREASE:

Published rate on date of Bid opening $4.07
Monthly Average Price $4.17
Monthly Average Price – Published rate on date of Bid opening = Fuel Price Adjustment
$4.17 - $4.07 = $0.10 = Additional amount allowed to be *added* to price per ton.

EXAMPLE FUEL PRICE ADJUSTMENT DECREASE:

Published rate on date of Bid opening $4.07
Monthly Average Price $3.97
Monthly Average Price – Published rate on date of Bid opening = Fuel Price Adjustment
$3.97 - $4.07 = - $0.10 = Amount allowed to be *deducted* from price per ton.

Deliveries made to meet minimum filed requirement obligations after Contract expiration on August 31, 2027 (where no extension has been granted) will apply the Fuel Price adjustment average for the month in which the Product was delivered which will be calculated using the base price established for the Invitation for Bids.

Should postings become unavailable, not reflective of market conditions, or differ from current description and/or format, a posting determined by the Commissioner of General Services at their sole discretion to be most reflective of market conditions will be used. Corrections to posted prices will be considered only when caused by a typographical or clerical error on the part of said posting.

In the event of an extension, the base rate for calculating adjustments will be the rate shown in the referenced EIA on the date of the next Bid year's Bid opening and for subsequent years additional extensions would follow this format. If there is no Bid opening date for the next year, the base rate for calculating adjustments will be the rate shown in the referenced EIA one year after the last Bid opening date. If the date is not a business date when the posting occurs, the next business day will be the date used for the adjustment.

Price adjustments are limited to changes as noted above. Increases in Contract costs or prices to compensate for other increases in the cost of doing business, regardless of the cause or nature of such costs of the Contractor, will not be allowed during the Contract period, except as indicated under the fuel price adjustment and price escalation clause herein.

4.3.2 Price Escalation

A price escalation will be permitted when the awarded Contractor has delivered quantities that exceed 120%, and again at 130% of an Authorized User's filed requirement.

Contractors shall notify Authorized Users of the applicable price escalation amount at the time an order is placed (if an escalation in price for future purchases is to be applied).

A price increase of 10% over awarded Contract price will be allowed once quantities delivered are over 120% of an Authorized User's filed requirement. And a price increase of 15% over awarded Contract price will be allowed once quantities delivered are over 130% of an Authorized User's filed requirement.

Once the Contractor notifies the Authorized User that a price escalation is applicable, Authorized Users are allowed to solicit prices from other suppliers. If a lower price is secured, the awarded Contractor, for the specific location/salt type, must be given an opportunity to match or better the price offered by the other supplier offering the lower price. If the awarded Contractor will not or cannot match or better the lower offered price, Authorized Users may meet their needs from the supplier offering the lower price.

Authorized Users with multiple delivery sites (e.g. NYSDOT, NYS Thruway and County Highways, etc) shall have their minimum/maximum delivery quantities determined based on the sum of all their sites serviced by awarded Contractor.

Contractors will continue to deliver to all Authorized Users including up to 130% of the Authorized User's filed requirement. Failure to deliver may result in a "Buy Against" or a delivery deduction to the Contractor (see Section 4.12 – *Provision of Product by Alternate Contractor* for more information).

Price escalation is only applicable towards the tonnage delivered by the Contractor.

In the event of the application of provisions under Section 4.12 – *Provision of Product by Alternate Contractor*, the tonnage amount supplied by an alternate Contractor does not factor into the original awarded Contractor's ability to apply a price escalation.

4.3.3 Price Reductions

Contractors shall be permitted to reduce their pricing any time during the Contract term.

4.3.4 Storage Fees

Price per ton is not to exceed $3.60/ton to store salt on behalf of the Authorized User from September 1, 2026, until December 31, 2027. Salt stored from January 1, 2028, and beyond will be priced per ton, per month not to exceed $8.00/ton.

4.4 Best Pricing Offer

During the Contract term, if the Commissioner becomes aware that the Contractor is selling substantially the same or a smaller quantity of a Product outside of this Contract upon the same or similar terms and conditions as that of this Contract at a lower price to a federal, state or local governmental entity, the price under this Contract, after consultation with the Contractor, may be reduced to a lower price on a prospective basis at the discretion of the Commissioner. The Commissioner reserves the right to request information to verify pricing for the purposes of this clause.

4.5 Price Structure

If, during the Contract Term, the Contractor is unable or unwilling to meet Contractual requirements in whole or in part based on the price structure of the Contract, it shall immediately notify the Office of General Services, Procurement Services in writing. Such notification shall not relieve the Contractor of its responsibilities under the Contract. The State may, but is not required to, consider an equitable adjustment in the Contract terms and/or pricing in the circumstances outlined in Appendix B *Savings/Force Majeure*.

Should the Commissioner in his or her sole discretion determine during the Contract Term that (i) the Contract price structure is unworkable, detrimental, or injurious to the State, or (ii) the Contract price structure results in prices which are unreasonable, excessive, or not truly reflective of current market conditions, and no adjustment in the Contract terms and/or pricing is mutually agreeable, the State may terminate the Contract upon ten (10) Business Days written notice mailed to the Contractor.

4.6 Ordering

Purchase Orders shall be made in accordance with the terms set forth in Appendix B *Purchase Orders*. Authorized Users may submit orders over the phone, and, if available, may submit orders electronically via web-based ordering, email, or facsimile at any time. Orders submitted shall be deemed received by Contractor on the date submitted.

All orders shall reference Contract number, requisition, and/or Purchase Order number (if applicable). Upon Contractor's receipt of an order, confirmation is to be provided to the Authorized User electronically or via facsimile. Order confirmation should be sufficiently detailed, and include, at a minimum, purchase price, date of order, delivery information (if applicable), Authorized Username, and sales representative (if applicable).

If an Authorized User is unable to contact a Contractor to place an order with a reasonable amount of outreach, OGS will reach out to the Contractor directly to discuss this issue and may consider the application of Section 4.12 – *Provision of Product by Alternate Contractor*, for that purchase.

4.7 Purchasing Card Orders

If the Contractor accepts orders using the State's Purchasing Card (see Appendix B *Purchasing Card*), also referred to as the Procurement Card, the Contractor shall not charge or bill the Authorized User for any additional charges related to the use of the Purchasing Card, including but not limited to processing charges, surcharges or other fees.

4.8 Minimum Order

The minimum order for this Contract is 22 tons.

4.9 Minimum/Maximum Purchase Obligation

Authorized Users are obligated to purchase a minimum of 60% of the total filed requirement amount per salt type **with the exception of the counties listed below.**

Authorized Users with delivery locations in the following nine (9) counties are obligated to purchase a **minimum of 50%** of the total filed requirement amount per salt type:

Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Suffolk, Westchester.

Authorized Users with multiple delivery sites (e.g., NYSDOT, County Highways and NYS Thruway) shall have their minimum/maximum delivery quantities determined based on the sum of all their sites serviced by a Contractor per lot.

Contractors are obligated to deliver up to 130% of the filed requirement for Road Salt and Treated Salt.

In the event of the application of provisions under Section 4.12 – *Provision of Product by Alternate Contractor*, a "Buy Against" purchase the awarded Contractor is still obligated to provide up to 130% of the Authorized Users filed requirement, not including the "Buy Against" tonnage provided by an alternate Contractor.

4.9.1 Storage Fees for Unpurchased Minimums

If the Authorized User is not able to take the minimum filed requirement amount, the awarded Contractor for the specific location will store salt for the Authorized User until December 31, 2027, for a one time/per ton storage fee not to exceed $3.60/ton. Storage Fees are capped and invoiceable as follows: (a) September 1, 2027, through December 31, 2027: not to exceed $3.60 per ton (one-time fee) _; and (b) on and after January 1, 2028: not to exceed $8.00 per ton per month. If storage is necessary for an Authorized User from January 1, 2028, and beyond, the awarded Contractor may offer storage at a per month per ton rate not to exceed $8.00 per ton/per month.

4.10 Invoicing and Payment

Invoicing and payment shall be made in accordance with the terms set forth in Appendix B *Contract Invoicing*.

The Contractor is required to provide the Authorized User with one (1) invoice for each Purchase Order at the time of delivery. The invoice must include detailed line item information to allow Authorized Users to verify that pricing at point of receipt matches the Contract price on the original date of order. At a minimum, the following fields must be included on each invoice:

- Contractor Name
- Contractor Billing Address
- Contractor Federal ID Number
- NYS Vendor ID Number
- Account Number
- NYS Contract Number
- Name of Authorized User indicated on the Purchase Order
- NYS Agency Unit ID (if applicable)
- Authorized User's Purchase Order Number
- Order Date
- Invoice Date
- Invoice Number
- Invoice Amount
- Product Descriptions
- Unit Price
- Quantity

- Unit of Measure
- Dates of Service (if applicable)

Cost centers or branch offices within an Authorized User may require separate invoicing as specified by each Authorized User. The Contractor's billing system shall be flexible enough to meet the needs of varying ordering systems in use by different Authorized Users. Visit the following link for further guidance for vendors on invoicing: https://bsc.ogs.ny.gov/nys-vendors .

4.11 Delivery Terms

4.11.1 Delivery Schedule

The *Delivery Schedule* for this Solicitation is included as an Attachment. It is provided as a guide to indicate proposed delivery points and estimated annual requirements. Contractors shall be obligated to add any State Agency that submits new filed requirement(s) for a delivery location on or before October 31 of the Contract term as long as the tonnage does not cause the awarded Contractor to exceed their maximum Bid capacity amount indicated for the salt type.

OGS shall review and approve any State Agency filed requirement submission prior to outreach to the awarded Contractor. Any State Agency that submits filed requirement(s) on or after November 1 shall be eligible to be added to the delivery schedule and receive deliveries at the Contractor’s discretion only.

Any political subdivision or other non-state entity which has not filed a requirement with OGS Procurement Services as of the date of the Bid opening shall be eligible to be added to the delivery schedule and receive deliveries at the Contractor’s discretion only.

4.11.2 Compliance with Delivery Schedule & Purchase Orders

Delivery shall be made in accordance with instructions on the Purchase Order from each Authorized User.

If no representative of the Authorized User is available at the time of delivery, the Contractor shall make a reasonable effort to notify the Authorized User of the delivery, either by phone or by email.

4.11.3 Ordering Timeliness

Orders must be placed before 2 p.m. Any orders placed after 2 p.m. shall be deemed as having been placed on the next business day.

4.11.4 Holidays/Weekends

If the scheduled delivery is to occur on a holiday or weekend, the delivery date will be the next business day, unless the Contractor and the ordering Authorized User mutually agree differently.

4.11.5 Prevention of Contamination

Delivery trucks shall be inspected (and cleaned if necessary) prior to loading to prevent contamination of salt loads by residual materials found in the truck bodies. Any loads found to be contaminated may be subject to rejection with all related cleanup and/or replacement costs to be borne by the Contractor.

All shipments of salt shall be totally covered with a waterproof, non-porous tarpaulin, or similar sheeting material. Torn, ripped or mesh coverings may be cause for rejection of shipment. Also, evidence of free-flowing water/brine in particular shipments may be cause for rejection.

Upon inspection of delivered salt, the material shall be uniform in appearance, free flowing and free from visual evidence of foreign matter including but not limited to dirt, stone, chips, trash or any other material that could reasonably be expected to interfere with the use, handling or storage of the salt. Salt shall be received in a free-flowing and usable condition.

The right is reserved to consider truckloads of salt delivered by the Contractor to any one Authorized User on a single day to be a single delivery. Price deductions imposed because of contamination may be imposed on the total day's delivery.

If the Authorized User accepts contaminated salt (or salt delivered in a lumpy condition which requires reprocessing in order to make it usable) this shall be cause for rejection of the entire delivery, with a replacement delivery to be made at no additional charge to the Authorized User.

If, because of emergency conditions, it is necessary for the Authorized User to accept and reprocess the Salt for use, all costs of reprocessing will be charged to the Contractor.

For operational reasons, an additional 10% price deduction may be placed on the Contractor by the Authorized User after consultation with the Contractor and OGS Procurement Services.

Agencies will submit to OGS supporting documentation for price deduction in regard to contamination. OGS Procurement Services will review and will have final approval as to price deduction applied.

4.11.6 Non-Complying Product – Price Deduction

A non-complying product price deduction is not to be assessed unless the proper analysis and test procedures are followed.

If the Contractor consistently delivers salt found to be outside the specification requirements for moisture content, or consistently not conforming to the gradation requirements, the Contract shall be subject to cancellation either in whole or in parts.

The right is reserved to consider truckloads of salt delivered by the Contractor to any one Authorized User on a single day to be a single delivery. Price deductions imposed because of deviation from specifications may be imposed on the total day's delivery.

4.11.7 Acceptance

The salt may be rejected if it fails to conform to any of the requirements of this Solicitation or the specifications in Attachment 10 – *Road & Treated Salt Specifications*.

4.11.8 Weight Tickets

All shipments of bulk salt shall be accompanied by a weight ticket of a licensed weigh master indicating the producer, net weight of the delivery, and in the case of bulk delivery, the stockpile source.

Tickets should be filled out with hauler name (printed and signed) and AU rep name printed and signed (if AU rep is present at the time of delivery).

The certification must bear the weigh master's signature; weights shall be recorded from a scale equipped with a weight printing device. **Handwritten weights are not acceptable** without prior approval of OGS.

If handwritten tickets must be used, the Contractor must contact OGS Procurement Services to obtain approval prior to delivery of the order.

4.11.9 Delivery Timetable

Completed delivery, at the latest, is required as follows:

- Contractor is required to deliver orders of 600 tons or less* within three (3) Business Days of Authorized User placing an order.
- Contractors will be required to deliver a minimum of 100 tons per day after the initial 600-ton delivery.
- Multiple orders placed for the same delivery site that overlap will be viewed as a single order, still subject to the overall 100 tons per day minimum delivery.

Single Order Placed on (Day)	First 600 Tons Or Less * Delivered by	Over 600 Tons Minimum 100 Tons/Day until completion
Monday	Thursday	100 Tons/Day/Location
Tuesday	Friday	
Wednesday	Monday	
Thursday	Tuesday	
Friday	Wednesday	

**if full amount of order is less than 600 tons*

Authorized Users are advised that their supply should be replenished on an ongoing basis, as it is depleted. It is not advised to allow the supply of product on-hand to reach a level that is dangerously low. This can cause undue stress to the delivery network during high levels of demand, which can be compounded by inclement weather conditions that adversely impact transit times for deliveries.

Note: If OGS identifies an ongoing issue indicating that the awarded Contractor is consistently failing to meet the delivery timetable as shown above, then OGS and/or the AU may take steps to initiate the actions listed in Section 4.12 - *Provision of Product by Alternate Contractor*, for the order(s) that are impacted by the delay.

4.11.10 Delivery Rate Guarantees/Exceptions

From September 1 through the following May 31 of each Contract term, Contractors shall be required to make deliveries within the timetables set forth in Section 4.11.9 - *Delivery Timetable*. However, from June 1 through August 31 of each Contract term, delivery shall be at the discretion of the Contractor.

Contractor shall notify the Authorized User and OGS Procurement Services promptly regarding any actual or anticipated performance issues, including but not limited to issues such as low supply, late delivery, lack of Product, and insufficient hauling capability.

Contractor shall provide OGS with the following information:

- A summary of the issue
- A description of the impact the issue is anticipated to have on the Contractor's compliance with OGS contract terms
- A proposed resolution by the Contractor; and
- A plan for remediation of the issue

Failure by the Contractor to do so may result in liquidated damages and/or a buy against in accordance with Section 4.11.11 - *Liquidated Damages* and Section 4.12.4 – *Provision of Product by Alternate Contractor - Buy Against Process*.

Although Contractors are expected to make every effort to meet these delivery timeframes, some exceptions may be made for extreme road and/or weather conditions (e.g. roads or waterways that are closed, obstructed, or impassable, due to winter weather conditions).

Allowance for exceptions must be approved by the Office of General Services, Procurement Services, whose decision shall be final.

Delivery will be allowed during the weekend and on State holidays only if the Contractor and the ordering Authorized User mutually agree. No additional remuneration will be made for Saturday, Sunday, or holiday delivery.

4.11.11 Liquidated Damages

During the Contract period, each September through the following May 31, deliveries that do not meet the daily delivery tonnage requirements and/or the established order completions period specified, shall be considered cause for interruption of the proper implementation of the State's winter roadway safety.

OGS Procurement Services and the Contractor agree that in the event of any such delay the awarded Contractor shall pay such amount as liquidated damages.

During times when an Authorized User must work with the Contractor to prioritize/coordinate deliveries due to delays, the Contractor is not absolved from meeting delivery timetable requirements at other locations.

During times of extreme weather activity that impact deliveries system-wide, OGS may consider waiving liquidated damages.

If it is determined that the interruption is caused by non-performance or negligence on the part of the Contractor, OGS Procurement Services and the Contractor presume that in the event of any such delay, the amount of damage that is sustained from a delay in daily delivery tonnage requirements and/or the established order completions period specified, is the greater of either:

1. $100.00 per Business Day per Purchase Order or individual orders against blanket Purchase Orders, as applicable; or
2. 1% of the value of the Purchase Order or individual orders against blanket Purchase Orders, as applicable, for each Business Day that the breach is not cured by the Contractor.

   The following options may be used by Authorized Users for deducting amounts due to the Contractor because of liquidated damages:

   1. Authorized User may deduct such amount from any money payable to the Contractor,

      or

   2. Authorized User may bill the Contractor separately

Costs incurred include, but are not limited to the following:

- Increased personnel costs due to demurrage.
- Increased costs incurred for treatment of salt on hand to extend usage;
- Costs for clean-up after required application of alternative snow and ice control materials (i.e. salt mixed with sand).

Liquidated damages may be applied to the Contractor only after consultation with the Contractor and OGS Procurement Services. A request for the application of liquidated damages must be made by the Authorized User to OGS within thirty (30) days of the event. Request for application of Liquidated Damages must contain supporting documentation provided to OGS Procurement Services for review prior to determination.

Liquidated damages may be applied to the Contractor only after consultation with the Contractor and upon receipt of formal approval by OGS Procurement Services.

4.12 Provision of Product by Alternate Contractor

Provision of Product by an Alternate Contractor may be utilized when an awarded Contractor is unable to provide delivery of product required by an Authorized User.

Provision of Product is eligible to be performed by any Contractor that holds an active award with NYS OGS Procurement Services under any Group 01800 Contract.

This clause may be utilized if:

A. The Contractor has failed to perform, either in a single instance or because of an ongoing issue,

B. An Authorized User has a need to purchase due to an extenuating circumstance; or

C. Authorization for the purchase has been granted by OGS Procurement Services

4.12.1 Lot I – Road Salt

If a Contractor has failed to perform, because of either an isolated incident or an ongoing issue, Authorized Users who filed requirements for the current Road Salt Contracts under Group 01800 – Lot I, may be approved by OGS to make purchases using an alternate Contractor.

If the current awarded Contractor for an OGS Item under Lot I - Road Salt is unable to supply needed Product, the Authorized User may “charge back” the difference in price to the awarded Contractor.. This action will be identified as a “Buy Against”.

If an Authorized User has been impacted by extenuating circumstances, outside of the Contractor’s responsibility to provide product, approval to purchase using an alternate Contractor may be granted by OGS Procurement Services. This action will not result in a charge back to the awarded Contractor and is not dependent on the Authorized User having filed requirements for delivery under Group 01800 Lot I.

4.12.2 Lot II and Lot III – Treated Salt – Types 1 & 2

OGS Procurement Services may, on a case-by-case basis, approve alternate Contractor purchases to be made by Authorized Users who filed requirements under Group 01800 – Lots II and III (Treated Salt – Types 1 & 2)

In these cases, Road Salt would be provided in lieu of Treated Salt only if the Treated Salt type is not available or is quoted at a price that is deemed unacceptable by the Authorized User.

Authorized Users may charge back the difference in price to their original Treated Salt Contractor under Group 01800, as applicable.

4.12.3 Provision of Product by Alternate Contractor – Ordering Process

After receiving OGS Procurement Services approval, outreach will be performed either by the Authorized User or by OGS to any Contractors awarded a NYS OGS Procurement Services contract under Group 01800 to provide the amount of product required.

The Authorized User or OGS may request a quote from all awarded Contractors and use the results to place a Purchase Order. The quote should specifically address delivery time and ability to deliver which may be a determining factor in the choice of Contractor.

Upon receipt, the information will be reviewed by either the Authorized User or OGS. If OGS facilitated the quotes, then the Contractor and Authorized User will be contacted via email with the final approval to initiate provision of product.

4.12.4 Provision of Product by Alternate Contractor – Buy Against Process

Awarded Contractors must supply Product in accordance with the terms of the Contract and instructions on Purchase Orders. In the event of the awarded Contractor's failure to deliver in accordance with Contract requirements, purchase of a specific quantity (pre-determined by OGS), utilizing an alternate Contractor or the open market at the awarded Contractor's expense may be authorized by OGS. Such authorized purchases will result in chargeback or "Buy Against" of the cost above the Contract price to the awarded Contractor who fails to comply with delivery terms.

The Authorized User must make OGS Procurement Services aware of the need or of non-delivery/delay in delivery, of product and allow OGS Procurement Services to ascertain if immediate delivery can be made by the awarded Contractor prior to obtaining authorization from OGS Procurement Services to make purchase from an alternate Contractor or a purchase on the open market.

If open market Treated Salt is not readily available, the Authorized User at their discretion may agree to a purchase of Road Salt, in lieu of Treated Salt, for the undelivered quantity or if that option is not available, from the open market.

Any price difference above the Contract price of Treated Salt (Lot II and/or Lot III) will be deducted from future payments or billed to the awarded Contractor. The Contractor of the Road Salt in this case may not be the non-performing awarded Contractor of the Treated Salt (Lot II and/or Lot III). The Authorized User must obtain prior authorization from OGS Procurement Services to utilize this option.

4.12.5 Provision of Product by Alternate Contractor - Buy Against Credit/Refund

If the awarded Contractor has failed to perform, the difference between the current awarded price for the applicable Lot and the amount paid for the provision of salt by an

alternate Contractor may either be deducted or "charged back" by the Authorized User in one of the following ways:

a). When an invoice is due:

Authorized User may deduct the additional increased amount from the amount due to the awarded Contractor in that invoice under the applicable OGS Item.

b). When an invoice is not due:

The awarded Contractor will issue a credit or refund to the Authorized User for the amount owed as indicated in the executed Buy Against letter issued to the Contractor by OGS

Procurement Services. The Authorized User will have the option to indicate which method, either credit or refund, is preferred.

Credits or refunds are required to be issued within thirty days of receipt of the executed Buy Against letter issued to the Contractor by OGS.

Any remaining credited amounts outstanding for Authorized Users shall be converted to a refund and issued prior to contract expiration.

In either case, OGS Procurement Services will receive a copy of the final invoice as well as all the delivery tickets associated with the delivery. Authorized Users should document in detail the following:

- The date Purchase Orders were placed with their current Contractor,
- The quantity(ies) ordered,
- The date(s) and quantity(ies) received,
- Current Inventory, and
- All correspondence with current Contractor relative to late delivery(ies).

This information should be emailed to OGS Procurement Services at: OGS.sm.SST_roadsalt@ogs.ny.gov

Tonnage approved by OGS Procurement Services to be purchased from an alternate Contractor will be deducted from the Authorized Users minimum filed requirement thereby reducing the final tonnage amount required to meet the Contract minimum purchase requirement.

4.13 On-Ground/Delivered Inventory

Contractor shall have the following on-ground/delivered inventory reserved solely for Office of General Services Authorized Users, and shall confirm this information using the form provided by OGS for certification of the tonnage amounts per the schedule listed below:

- October 1, 2026 - 35% of filed requirement for awarded counties
- November 1, 2026 - 50% of filed requirement for awarded counties
- December 1, 2026 - 70% of filed requirement for awarded counties

The completed and notarized form will be provided by the Contractor to OGS by the date indicated above, or upon request by OGS at any time during the course of the Contract term.

After December 1, 2026, the Contractor is obligated to maintain inventories adequate to provide deliveries as required in the time frames and quantities requested.

Any failure by the Contractor to deliver pursuant to Contract terms may result in a “Buy Against” to that Contractor in accordance Section 4.12 – *Provision of Product by Alternate Contractor*

Upon request, Contractor shall be required to provide OGS Procurement Services with weekly status updates of inventory on hand and production rates throughout the winter season that is

dedicated to Authorized Users under the Contract. This shall include detailed information regarding tonnage currently in inventory at all stockpile locations which are dedicated to Authorized Users of the Contract, and anticipated production and delivery of additional tonnage necessary to meet Contractual requirements.

4.14 Unanticipated Excessive Purchase

The State reserves the right to negotiate lower pricing, or to advertise for Bids, for any unanticipated excessive purchase.

4.15 Contract Administration

The Contractor shall provide a sufficient number of Customer Service employees who are knowledgeable and responsive to Authorized User needs and who can effectively service the Contract. Contractor shall also provide an Emergency Contact in the event of an emergency occurring after business hours or on weekend/NYS Holidays.

Contractor shall provide a minimum of one (1) dedicated Contract Administrator to support the updating and management of the Contract on a timely basis. Information regarding the Customer Service, Emergency Contact, and Contract Administrator shall be set forth in the published Pricing. Contractor must notify OGS within five (5) Business Days if it's Contract Administrator, Emergency Contact, or Customer Service employees change, and provide an interim contact person until the position is filled. Changes shall be submitted electronically via email to the OGS Contract Management Specialist.

4.16 NYS Financial System (SFS)

New York State is currently operating on an Enterprise Resource Planning (ERP) system, Oracle PeopleSoft software, referred to as the Statewide Financial System (SFS). SFS supports requisition-to-payment processing and financial management functions. Further information regarding business processes, interfaces, and file layouts currently in place may be found at: http://www.sfs.ny.gov and https://www.osc.ny.gov/state-agencies/gfo/chapter-iii/iii1-statewide-financial-system-sfs-overview.

4.17 Americans with Disabilities Act (ADA)

The federal ADA bars employment discrimination and requires all levels of government to provide necessary and reasonable accommodations to qualified workers with disabilities. Bidder is required to identify and offer any Products it manufactures or adapts that may be used or adapted for use by persons with visual, hearing, or any other physical disabilities. Although it is not mandatory for Bidder to have these Products in order to receive an award, it is necessary to identify any such Products offered that fall into the above category.

4.18 N.Y. State Finance Law § 139-l

Pursuant to N.Y. State Finance Law § 139-l, every Bid made on or after January 1, 2019 to the State or any public department or agency thereof, where competitive Bidding is required by statute, rule or regulation, for work or services performed or to be performed or goods sold or to be sold, and where otherwise required by such public department or agency, shall contain a certification that the Bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all of its employees. Such policy shall, at a minimum, meet the requirements of N.Y. State Labor Law § 201-g.

N.Y. State Labor Law § 201-g provides requirements for such policy and training and directs the Department of Labor, in consultation with the Division of Human Rights, to create and publish a model sexual harassment prevention guidance document, sexual harassment prevention policy and sexual harassment prevention training program that employers may utilize to meet the requirements of N.Y. State Labor Law § 201-g. The model sexual harassment prevention policy, model sexual harassment training materials, and further guidance for employers, can be found online at the following URL: https://www.ny.gov/combating-sexual-harassment-workplace/employers.

Pursuant to N.Y. State Finance Law § 139-l, any Bid by a corporate Bidder containing the certification required above shall be deemed to have been authorized by the board of directors of such Bidder, and such authorization shall be deemed to include the signing and submission of such Bid and the inclusion therein of such statement as the act and deed of the Bidder.

If the Bidder cannot make the required certification, such Bidder shall so state and shall furnish with the Bid a signed statement that sets forth in detail the reasons that the Bidder cannot make the certification. After review and consideration of such statement, OGS may reject the Bid or may decide that there are sufficient reasons to accept the bid without such certification.

The certification required above can be found on Attachment 2 – *NYS Required Certifications*, which Bidder must submit with its Bid.

4.19 Insurance

The Contractor shall maintain in force at all times during the terms of the Contract, policies of insurance pursuant to the requirements outlined in Attachment – *Insurance Requirements*.

4.20 Report of Contract Usage

Contractor shall submit Attachment 8 – *Report of Contract Usage* including total sales to Authorized Users of this Contract by Contractor, and all authorized resellers, dealers and distributors, if any, by no later than the 10th of each month. If the Contract period begins or ends in a fractional portion of a reporting period, only the actual Contract sales for this fractional period should be included in the report.

Contractors shall specify if any authorized resellers, dealers or distributors are NYS Certified Minority- and/or Women-Owned Business Enterprises (MWBEs), small business enterprises (SBEs), or Service-Disabled Veteran-Owned Businesses (SDVOBs).

The report is to be submitted electronically via email in Microsoft Excel to OGS Procurement Services, to the attention of the individual listed on the front page of the Contract Award Notification and shall reference the Contract Group Number, Award Number, Contract Number, Sales Period, and Contractor's name.

The report in Attachment 8 – *Report of Contract Usage* contains the minimum information required. Additional related sales information, such as detailed user purchases, may be required by OGS and must be supplied upon request. Failure to submit reports on a timely basis may result in Contract cancellation and designation of Contractor as non-responsible.

In accordance with Section 4.24 - *Environmental Sustainability and NYS Executive Order Number 22*, Products that meet GreenNY Specifications are identified as Lots II & III on Contract Usage Reports.

The Authorized User reserves the right to request its applicable sales data from the Contractor, based on criteria identified by the Authorized User, over the life of the contract. If sales data is requested, Contractor must provide datapoints that are required by Attachment 8 – *Report of Contract Usage*.

4.21 Audits

OGS reserves the right, directly or through a designated agent, to audit the accuracy of the Contract Usage Reports (see Section 4.20 Report of Contract Usage). Audits shall be conducted during regular business hours, upon not less than fifteen (15) Business Days prior written notice. OGS reserves the right, directly or through an agent, to review Contract Usage Reports and other such documentation for accuracy of all required reporting documents for both NYS Authorized Users and other parties using this Contract or resulting agreement. As a result of such review, if inaccuracies of more than 5% are found in any of the reporting documents, Contractors shall pay the cost of such audit or three (3) times the discrepancy, whichever is higher. Failure to make such payments or repeated errors on subsequent audits may result in the scheduling of a responsibility meeting in relation to this Contract.

4.22 Contractor Requirements and Procedures for Business Participation Opportunities for NYS Certified Minority- and Women-Owned Business Enterprises and Equal Employment Opportunities for Minority Group Members and Women

I. New York State Law

Pursuant to New York State Executive Law Article 15-A and Parts 140-145 of Title 5 of the New York Codes, Rules and Regulations ("NYCRR"), the New York State Office of General Services ("OGS") is required to promote opportunities for the maximum feasible participation of New York State-certified Minority- and Women-owned Business Enterprises ("MWBEs") and the employment of minority group members and women in the performance of OGS contracts.

II. General Provisions

A. OGS is required to implement the provisions of New York State Executive Law Article 15-A and 5 NYCRR Parts 140-145 ("MWBE Regulations") for all State contracts as defined therein, with a value (1) in excess of $25,000 for labor, services, equipment, materials, or any combination of the foregoing or (2) in excess of $100,000 for real property renovations and construction.

B. The Contractor agrees, in addition to any other nondiscrimination provision of the Contract and at no additional cost to OGS, to fully comply and cooperate with OGS in the implementation of New York State Executive Law Article 15-A and the regulations promulgated thereunder. These requirements include equal employment opportunities for minority group members and women ("EEO") and contracting opportunities for MWBEs. Contractor's demonstration of "good faith efforts" pursuant to 5 NYCRR §142.8 shall be a part of these requirements. These provisions shall be deemed supplementary to, and not in lieu of, the nondiscrimination provisions required by New York State Executive Law Article 15 (the "Human Rights Law") or other applicable federal, State or local laws.

C. Failure to comply with all of the requirements herein may result in a finding of non-responsiveness, a finding of non-responsibility, breach of contract, withholding of funds, liquidated damages pursuant to clause IX of this section, and/or enforcement proceedings as allowed by the Contract and applicable law.

III. Equal Employment Opportunity (EEO)

A. The provisions of Article 15-A of the Executive Law and the rules and regulations promulgated thereunder pertaining to equal employment opportunities for minority group members and women shall apply to all Contractors, and any subcontractors, awarded a subcontract over $25,000, for labor, services, including legal, financial and other professional services, travel, supplies, equipment, materials, or any combination of the foregoing, to be performed for, or rendered or furnished to, the contracting State agency (the "Work") except where the Work is for the beneficial use of the Contractor.

1. Contractor and subcontractors shall undertake or continue existing EEO programs to ensure that minority group members and women are afforded equal employment opportunities without discrimination because of race, creed, color, national origin, sex, age, disability, or marital status. For these purposes, EEO shall apply in the areas of recruitment, employment, job assignment, promotion, upgrading, demotion, transfer, layoff, or termination and rates of pay or other forms of compensation. This requirement does not apply to: (i) the performance of work or the provision of services or any other activity that is unrelated, separate or distinct from the Contract; or (ii) employment outside New York State.
2. By entering into this Contract, Contractor certifies that the text set forth in clause 12 of Appendix A, attached hereto and made a part hereof, is Contractor's equal employment opportunity policy. In addition, Contractor agrees to comply with the Non-Discrimination Requirements set forth in clause 5 of Appendix A.

B. Form EEO 100 - Staffing Plan. Plan

To ensure compliance with this section, the Contractor agrees to submit or has submitted with the Bid a staffing plan on Form EEO 100 to OGS to document the composition of the proposed workforce to be utilized in the performance of the Contract by the specified categories listed, including ethnic background, gender, and federal occupational categories.

C. NYS Contract System Workforce Utilization Reporting Module (Commodities & Services)

The Contractor shall complete, and shall require each of its subcontractors to complete a Workforce Audit on a quarterly basis throughout the term of this Contract, by the 10th day of April, July, October, and January to report the actual workforce utilized during the previous quarter in the performance of the Contract by the specified categories listed including ethnic background, gender, and Federal occupational categories. Contractor shall coordinate with its subcontractors to ensure that all workers associated with this Contract are properly counted and reported. To prepare the report, Contractor and its subcontractors shall use the NYS Contract System Workforce Audit Module found at the following website: https://ny.newnycontracts.com

The Workforce Audits must be completed electronically in the NYS Contract System Workforce Audit Module. Separate audits shall be completed by Contractor and all subcontractors, and the Contractor is responsible for ensuring timely submission of the Workforce Audit by their subcontractors. In limited instances, the Contractor or subcontractor may not be able to separate out the workforce utilized in the performance of the Contract from its total workforce. When a separation can be made, the Contractor or subcontractor shall complete the Workforce Audit and indicate that the information provided relates to the actual workforce utilized on the Contract. When the workforce to be utilized on the Contract cannot be separated out from the Contractor's or subcontractor's total workforce, the Contractor or subcontractor shall complete the Workforce Audit and indicate that the information provided is the Contractor's or subcontractor's total workforce during the subject time frame, not limited to work specifically performed under the Contract.

D. Contractor shall comply with the provisions of the Human Rights Law, all other State and federal statutory and constitutional non-discrimination provisions. Contractor and subcontractors shall not discriminate against any employee or applicant for employment because of race, creed (religion), color, sex, national origin, sexual orientation, military status, age, disability, predisposing genetic characteristic, marital status or domestic violence victim status, and shall also follow the requirements of the Human Rights Law with regard to non-discrimination on the basis of prior criminal conviction and prior arrest.

IV. Contract Goals

A. OGS hereby establishes an overall goal of 10% for MWBE participation, 5% for Minority-Owned Business Enterprises ("MBE") participation and 5% for Women-Owned Business Enterprises ("WBE") participation (based on the current availability of qualified MBEs and WBEs). The total Contract goal can be obtained by utilizing any combination of MBE and /or WBE participation for subcontracting and supplies acquired under the Contract.

B. For purposes of providing meaningful participation by MWBEs on the Contract and achieving the Contract goals established in clause IV-A hereof, Contractor should reference the directory of New York State Certified MWBEs found at the following internet address:. https://ny.newnycontracts.com/. The MWBE Regulations are located at 5 NYCRR § 140 – 145. Questions regarding compliance with MWBE participation goals should be directed to the Designated Contacts within the OGS Office of Business Diversity. Additionally, following Contract execution, Contractor is encouraged to contact the Division of Minority and Women's Business Development ((518) 292-5250; (212) 803-2414; or (716) 846-8200) to discuss additional methods of maximizing participation by MWBEs on the Contract.

C. Contractor must document "good faith efforts" to provide meaningful participation by MWBEs as subcontractors or suppliers in the performance of the Contract (see clause VII below).

V. MWBE Utilization Plan

A. In accordance with 5 NYCRR § 142.4, Bidders are required to submit a completed Utilization Plan on Form MWBE 100 with their bid.

B. The Utilization Plan shall list the MWBEs the Bidder intends to use to perform the Contract, a description of the Contract scope of work the Bidder intends the MWBE to perform to meet the goals on the Contract, the estimated or, if known, actual dollar amounts to be paid to an MWBE. By signing the Utilization Plan, the Bidder acknowledges that making false representations or including information evidencing a lack of good faith as part of, or in conjunction with, the submission of a Utilization Plan is prohibited by law and may result in penalties including, but not limited to, termination of a contract for cause, loss of eligibility to submit future bids, and/or withholding of payments. Any modifications or changes to the agreed participation by New York State Certified MWBEs after the Contract award and during the term of the Contract must be reported on a revised MWBE Utilization Plan and submitted to OGS.

C. By entering into the Contract, Bidder/Contractor understands that only sums paid to MWBEs for the performance of a commercially useful function, as that term is defined in 5 NYCRR § 140.1, may be applied towards the achievement of the applicable MWBE participation goal. When an MWBE is serving as a broker on the Contract, only 25 percent of all sums paid to a broker shall be deemed to represent the commercially useful function performed by the MWBE

D. OGS will review the submitted MWBE Utilization Plan and advise the Bidder of OGS acceptance or issue a notice of deficiency within 30 days of receipt.

E. If a notice of deficiency is issued; Bidder agrees that it shall respond to the notice of deficiency, within seven (7) business days of receipt, by submitting to OGS a written remedy in response to the notice of deficiency. If the written remedy that is submitted is not timely or is found by OGS to be inadequate, OGS shall notify the Bidder and direct the Bidder to submit, within five (5) business days of notification by OGS, a request for a partial or total waiver of MWBE participation goals on Form BDC 333.1. Failure to file the waiver form in a timely manner may be grounds for disqualification of the bid or proposal.

F. OGS may disqualify a Bidder's bid/proposal as being non-responsive under the following circumstances:

(a) If a Bidder fails to submit an MWBE Utilization Plan;

(b) If a Bidder fails to submit a written remedy to a notice of deficiency;

(c) If a Bidder fails to submit a request for waiver; or

(d) If OGS determines that the Bidder has failed to document good faith efforts.

G. If awarded a Contract, Contractor certifies that it will follow the submitted MWBE Utilization Plan for the performance of MWBEs on the Contract pursuant to the prescribed MWBE goals set forth in clause IV-A of this Section.

H. Bidder/Contractor further agrees that a failure to submit and/or use such completed MWBE Utilization Plan shall constitute a material breach of the terms of the Contract. Upon the occurrence of such a material breach, OGS shall be entitled to any remedy provided herein, including but not limited to, a finding of Contractor non-responsiveness.

VI. Request for Waiver

A. Prior to submission of a request for a partial or total waiver, Bidder shall contact the Designated Contacts listed on page 1 of this document for guidance.

B. In accordance with 5 NYCRR § 142.7, a Bidder/Contractor who is able to document good faith efforts to meet the goal requirements, as set forth in clause VII below, may submit a request for a partial or total waiver on Form BDC 333.1, accompanied by supporting documentation. A Bidder may submit the request for waiver at the same time it submits its MWBE Utilization Plan. If a request for waiver is submitted with the MWBE Utilization Plan and is not accepted by OGS at that time, the provisions of clauses V(C), (D) & (E) will apply. If the documentation included with the Bidder's/Contractor's waiver

request is complete, OGS shall evaluate the request and issue a written notice of acceptance or denial within twenty (20) business days of receipt.

C. Contractor shall attempt to utilize, in good faith, any MBE or WBE identified within its MWBE Utilization Plan, during the performance of the Contract. Requests for a partial or total waiver of established goal requirements made subsequent to Contract award may be made at any time during the term of the Contract to OGS, but must be made no later than prior to the submission of a request for final payment on the Contract.

D. If OGS, upon review of the MWBE Utilization Plan and Monthly MWBE Contractor Compliance Reports determines that Contractor is failing or refusing to comply with the contract goals and no waiver has been issued in regards to such non-compliance, OGS may issue a notice of deficiency to the Contractor. The Contractor must respond to the notice of deficiency within seven (7) business days of receipt. Such response may include a request for partial or total waiver of MWBE contract goals.

VII. Required Good Faith Efforts

In accordance with 5 NYCRR § 142.8, Contractors must document their good faith efforts toward utilizing MWBEs on the Contract. Evidence of required good faith efforts shall include, but not be limited to, the following:

1. A list of the general circulation, trade and MWBE-oriented publications and dates of publications in which the Contractor solicited the participation of certified MWBEs as subcontractors/suppliers, copies of such solicitations and any responses thereto.
2. A list of the certified MWBEs appearing in the Empire State Development (“ESD”) MWBE directory that were solicited for this Contract. Provide proof of dates or copies of the solicitations and copies of the responses made by the certified MWBEs. Describe specific reasons that responding certified MWBEs were not selected.
3. Descriptions of the Contract documents/plans/specifications made available to certified MWBEs by the Contractor when soliciting their participation and steps taken to structure the scope of work for the purpose of subcontracting with, or obtaining supplies from, certified MWBEs.
4. A description of the negotiations between the Contractor and certified MWBEs for the purposes of complying with the MWBE goals of this Contract.
5. Dates of any pre-bid, pre-award or other meetings attended by Contractor, if any, scheduled by OGS with certified MWBEs whom OGS determined were capable of fulfilling the MWBE goals set in the Contract.
6. Other information deemed relevant to the request.

VIII. Monthly MWBE Contractor Compliance Report

A. In accordance with 5 NYCRR § 142.10, Contractor is required to report Monthly MWBE Contractor Compliance to OGS during the term of the Contract for the preceding month’s activity, documenting progress made towards achievement of the Contract MWBE goals. OGS requests that all Contractors use the New York State Contract System (“NYSCS”) to report subcontractor and supplier payments made by

Contractor to MWBEs performing work under the Contract. The NYSCS may be accessed at https://ny.newnycontracts.com/. This is a New York State-based system that all State agencies and authorities will be implementing to ensure uniform contract compliance reporting throughout New York State.

B. When a Contractor receives a payment from a State agency, it is the Contractor's responsibility to pay its subcontractors and suppliers in a timely manner. On or after the first day of each month, the Contractor will receive an email or fax notification ("audit notice") indicating that a representative of its company needs to log-in to the NYSCS to report the company's MWBE subcontractor and supplier payments for the preceding month. The Contractor must also report when no payments have been made to a subcontractor or supplier in a particular month in the NYSCS. Once subcontractor and supplier payments have been entered into the NYSCS, the subcontractor(s) and supplier(s) will receive an email or fax notification advising them to log into the NYSCS to confirm that they actually received the reported payments from the Contractor. It is the Contractor's responsibility to educate its MWBE subcontractors and suppliers about the NYSCS and the need to confirm payments made to them in the NYSCS.

C. To assist in the use of the NYSCS, OGS recommends that all Contractors and MWBE subcontractors and suppliers sign up for the following two webinar trainings offered through the NYSCS: "**Introduction to the System - Vendor training**" and "**Contract Compliance Reporting - Vendor Training**" to become familiar with the NYSCS. To view the training schedule and to register visit: https://ny.newnycontracts.com/FrontEnd/TrainingList.asp

D. As soon as possible after the Contract is approved, Contractor should visit https://ny.newnycontracts.com and click on "**Vendor Account Lookup**" to identify the Contractor's account by company name. Contact information should be reviewed and updated if necessary by choosing "**Change Info**." It is important that the staff member who is responsible for reporting payment information for the Contractor be listed as a user in the NYSCS. Users who are not already listed may be added through "**Request New User**." When identifying the person responsible, please add "**- MWBE Contact**" after his or her last name (i.e., John Doe – MWBE Contact) to ensure that the correct person receives audit notices from the NYSCS. NYSCS Technical Support should be contacted for any technical support questions by clicking on the links for "**Contact Us & Support**" then "**Technical Support**" on the NYSCS website.

E. If Contractor is unable to report MWBE Contractor Compliance via the NYSCS, Contractor must submit a Monthly MWBE Contractor Compliance Report on Form MWBE 102 to OGS, by the 10th day of each month during the term of the Contract, for the preceding month's activity to: OGS OBD Office, 29th floor Corning Tower, Empire State Plaza, Albany, NY 12242. Phone: 518-486-9284; Fax: 518-486-9285.

F. It is the Contractor's responsibility to report subcontractor and supplier payments. Failure to respond to payment audits in a timely fashion through the NYSCS, or by paper to OGS, may jeopardize future payments pursuant to the MWBE liquidated damages clause in clause IX below.

IX. Breach of Contract and Liquidated Damages

A. Where OGS determines that the Contractor is not in compliance with the MWBE requirements of this Section, and the Contractor refuses to comply with such requirements, or if it is found to have willfully and intentionally failed to comply with the MWBE participation goals set forth in the Contract, the Contractor shall be obligated to pay liquidated damages to OGS.

B. Such liquidated damages shall be calculated as an amount equaling the difference between:

1. All sums identified for payment to MWBEs had the Contractor achieved the contractual MWBE goals; and

2. All sums actually paid to MWBEs for work performed or materials supplied under the Contract.

C. If OGS determines that Contractor is liable for liquidated damages and such identified sums have not been withheld by OGS, Contractor shall pay such liquidated damages to OGS within sixty (60) days after they are assessed. Provided, however, that if the Contractor has filed a complaint with the Director of the Division of Minority and Women's Business Development pursuant to 5 NYCRR § 142.12, liquidated damages shall be payable only in the event of a determination adverse to the Contractor following the complaint process.

X. Fraud

Any suspicion of fraud, waste, or abuse involving the contracting or certification of MWBEs shall be immediately reported to ESD's Division of Minority and Women's Business Development at (855) 373-4692.

ALL FORMS ARE AVAILABLE AT: https://ogs.ny.gov/MWBE

Vendor must scroll down to the section titled COMMODITY & SERVICE CONTRACTS and use the appropriate forms under this section only.

4.23 Participation Opportunities For New York State Certified Service-Disabled Veteran Owned Businesses

Article 3 of the New York State Veterans' Services Law provides for more meaningful participation in public procurement by certified Service-Disabled Veteran-Owned Businesses ("SDVOBs"), thereby further integrating such businesses into New York State's economy. OGS recognizes the need to promote the employment of service-disabled veterans and to ensure that certified service-disabled veteran-owned businesses have opportunities for maximum feasible participation in the performance of OGS contracts.

In recognition of the service and sacrifices made by service-disabled veterans and in recognition of their economic activity in doing business in New York State, Bidders/Contractors are strongly encouraged and expected to consider SDVOBs in the fulfillment of the requirements of the Contract. Such participation may be as subcontractors or suppliers, as protégés, or in other partnering or supporting roles.

For purposes of this procurement, OGS conducted a comprehensive search and determined that the Contract does not offer sufficient opportunities to set specific goals for participation by SDVOBs as subcontractors, service providers, and suppliers to Contractor. Nevertheless, Bidder/Contractor is encouraged to make good faith efforts to promote and assist in the participation of SDVOBs on the Contract for the provision of services and materials. The directory of New York State Certified SDVOBs can be viewed at: https://ogs.ny.gov/Veterans/.

Bidder/Contractor is encouraged to contact the Office of General Services' Division of Service-Disabled Veteran's Business Development at 518-474-2015 or VeteranDevelopment@ogs.ny.gov to discuss methods of maximizing participation by SDVOBs on the Contract.

ALL FORMS ARE AVAILABLE AT: https://ogs.ny.gov/Veterans/

4.24 Environmental Sustainability and NYS Executive Order Number 22

New York State is committed to environmental sustainability and seeks to minimize the environmental impact of any Products that the State Procures. Executive Order No. 22 *Leading By Example: Directing State Agencies to Adopt a Sustainability and Decarbonization Program* ("EO 22"), requires State Agencies, authorities, and public benefit corporations ("Affected Entities") to follow GreenNY procurement specifications for commodities, services and technology.

The GreenNY specifications consider a wide range of factors including avoidance of toxic substances, pollution reduction and prevention, sustainable manufacturing, reduction of greenhouse gas emissions, packaging, and water conservation. Resources are available on the OGS website at https://ogs.ny.gov/greenny-purchasing-requirements-and-tools for procurement managers and Contractors to learn about which Contracts provide environmentally preferable Products.

A. GreenNY Specifications.

A list of GreenNY specifications is located on the OGS website at https://ogs.ny.gov/greenny/approved-greenny-specifications. Specification(s) currently applicable to this Contract are "Treated Road Salt" (see https://ogs.ny.gov/greenny/treated-road-salt). See Attachment 10 – *Road & Treated Salt Specifications for the applicable specifications*.

B. Product Labeling per GreenNY Specifications

Over the life of the Contract, the Contractor must label the environmental attributes of all environmentally preferable Products per the GreenNY specifications, or other applicable environmental specifications for this Contract, on its Contract pricelist (see Attachment 1 – *Pricing*), and in any catalogs, marketing materials, or online ordering portal associated with this Contract.

Contractor(s) shall also note Products that meet GreenNY Specifications on Contract Usage Reports (see Section 4.20 *Report of Contract Usage*), in the format requested by OGS.

All claims made about the environmental attributes of the Products and packaging offered shall be consistent with the Federal Trade Commission's (FTC's) *Guidelines for the Use of Environmental Marketing Terms*. The State of New York reserves the right to require the Contractor to remove any environmental claims that are false, vague, misleading or unsubstantiated in catalogs, price sheets, websites or other marketing materials that are provided to the Authorized User under this Contract.

C. Verification of Contractor Compliance with GreenNY Requirements and Other Environmental Claims

At the request of OGS or the Authorized User, Contractor must provide verification of Product and packaging compliance with GreenNY specifications, required third-party certification(s),

minimum amount of recycled content, or other environmental attributes required in the Contract. OGS and the Authorized User also reserve the right to request information documenting the Product and packaging desirable attributes and other Contractor environmental claims. The following types of verification documentation will be accepted:

- Third-party certification
- Product test results
- Compliance certification or affidavit signed by the manufacturer
- Other acceptable documentation as approved by OGS or the Authorized User

4.25 Consumer Products Containing Mercury

Contractor shall comply with the requirements of Title 21 of Article 27 of the NYS Environmental Conservation Law regarding restrictions on the sale, purchasing, labeling and management of any Products containing elemental mercury under this Contract.

4.26 Diesel Emission Reduction Act

Pursuant to N.Y. Environmental Conservation Law § 19-0323 (the “Law”), it is a requirement that heavy duty diesel vehicles in excess of 8,500 pounds use the best available retrofit technology (“BART”) and ultra-low sulfur diesel fuel (“ULSD”). The requirement of the Law applies to all vehicles owned, operated by or on behalf of, or leased by State Agencies and State or regional public authorities. It also requires that such vehicles owned, operated by or on behalf of, or leased by State Agencies and State or regional public authorities with more than half of its governing body appointed by the Governor utilize BART.

The Law may be applicable to vehicles used by Contractors “on behalf of” State Agencies and public authorities and require certain reports from Contractors. All heavy-duty diesel vehicles must have BART by the deadline provided in the Law. The Law also provides a list of exempted vehicles. Regulations set forth in 6 NYCRR Parts 248 and 249 provide further guidance. The Bidder hereby certifies and warrants that all heavy-duty vehicles, as defined in the Law, to be used under this Contract, will comply with the specifications and provisions of the Law, and 6 NYCRR Parts 248 and 249.

4.27 Prohibition on Contracting for Certain Telecommunications and Video Surveillance Services or Equipment

In accordance with Section 889 of the National Defense Authorization Act (NDAA) for fiscal year 2019, under any Contract or subcontract resulting from this Solicitation, Bidder or resultant Contractor or Subcontractor shall not provide to the State or Authorized User any equipment, system, or service that uses covered telecommunications equipment or services, as defined by the NDAA, as a substantial or essential component of any system, or as critical technology as part of any system, unless an exception applies or the covered telecommunications equipment or services are covered by a waiver, as set forth in the NDAA and the rules and regulations promulgated thereunder.

4.28 Overlapping Contract Products

Products available under the resulting Contract may also be available from other New York State Contracts. Authorized Users will be advised to select the most cost effective procurement alternative that meets their program requirements and to maintain a procurement record documenting the basis for this selection.

4.29 Preferred Source Products

Section 162 of the State Finance Law requires that Authorized Users afford first priority to the Products of Preferred Source Program suppliers such as Corcraft (the marketplace name for the NYS Department of Corrections and Community Supervision, Division of Industries), New York State Preferred Source Program for People who are Blind (NYSPSP), and New York State Industries for the Disabled (NYSID), and others determined by law, when such Products meet the form, function and utility of the Authorized User. Some Products in the resultant Contract may be available from one (1) or more Preferred Source Program suppliers. An Authorized User must determine if a particular Product is an approved Preferred Source Product and follow the requirements of State Finance Law § 162(3) or (4)(b), respectively, before engaging the Contractor.

4.30 NYS Vendor Responsibility

OGS conducts a review of prospective Contractors ("Bidders") to provide reasonable assurances that the Bidder is responsive and responsible. A For-Profit Business Entity Questionnaire (hereinafter "Questionnaire") is used for non-construction Contracts and is designed to provide information to assess a Bidder's responsibility to conduct business in New York based upon financial and organizational capacity, legal authority, business integrity, and past performance history. By submitting a Bid, Bidder agrees to fully and accurately complete the Questionnaire. The Bidder acknowledges that the State's execution of the Contract will be contingent upon the State's determination that the Bidder is responsible, and that the State will be relying upon the Bidder's responses to the Questionnaire, in addition to all other information the State may obtain from other sources, when making its responsibility determination.

OGS recommends each Bidder file the required Questionnaire online via the New York State VendRep System. To enroll in and use the VendRep System, please refer to the VendRep System Instructions and User Support for Vendors available at the Office of the State Comptroller's (OSC) website at http://www.osc.state.ny.us/vendors/index.htm or to enroll, go directly to the VendRep System online at https://www.osc.state.ny.us/state-vendors/vendrep/vendrep-system.

Vendors must provide their New York State Vendor Identification Number when enrolling. For information on how to request assignment of a Vendor ID, see the *NYS Vendor File Registration* section. OSC provides direct support for the VendRep System through user assistance, documents, online help, and a help desk. The OSC Help Desk contact information is located at http://www.osc.state.ny.us/portal/contactbuss.htm. Bidders opting to complete and

submit the paper questionnaire can access this form and associated definitions via the OSC website at http://www.osc.state.ny.us/vendrep/forms_vendor.htm.

In order to assist the State in determining the responsibility of the Bidder prior to Contract award, the Bidder must complete and certify (or recertify) the Questionnaire no more than six (6) months prior to the Bid due date. A Bidder's Questionnaire cannot be viewed by OGS until the Bidder has certified the Questionnaire. It is recommended that all Bidders become familiar with all of the requirements of the Questionnaire in advance of the Bid opening to provide sufficient time to complete the Questionnaire.

The Bidder agrees that if it is awarded a Contract the following shall apply:

The Contractor shall at all times during the Contract term remain responsible. The Contractor agrees, if requested by the Commissioner of OGS, to present evidence of its continuing legal authority to do business in New York State, integrity, experience, ability, prior performance, and organizational and financial capacity.

The Commissioner of OGS, in his or her sole discretion, reserves the right to suspend any or all activities under this Contract, at any time, when he or she discovers information that calls into question the responsibility of the Contractor. In the event of such suspension, the Contractor will be given written notice outlining the particulars of such suspension. Upon issuance of such notice, the Contractor must comply with the terms of the suspension order. Contract activity may resume at such time as the Commissioner of OGS issues a written notice authorizing a resumption of performance under the Contract.

The Contractor agrees that if it is found by the State that Contractor's responses to the Questionnaire were intentionally false or intentionally incomplete, on such finding, the Commissioner may terminate the Contract.

Upon written notice to the Contractor, and a reasonable opportunity to be heard with appropriate OGS officials or staff, the Contract may be terminated by the Commissioner of OGS at the Contractor's expense where the Contractor is determined by the Commissioner of OGS to be non-responsible. In such event, the Commissioner of OGS may complete the contractual requirements in any manner he or she may deem advisable and pursue available legal or equitable remedies for breach.

In no case shall such termination of the Contract by the State be deemed a breach thereof, nor shall the State be liable for any damages for lost profits or otherwise, which may be sustained by the Contractor as a result of such termination.

4.31 NYS Tax Law Section 5-a

Tax Law § 5-a requires certain Contractors awarded State Contracts for commodities, services and technology valued at more than $100,000 to certify to NYS Department of Taxation and Finance (DTF) that they are registered to collect New York State and local sales and compensating use taxes. The law applies to Contracts where the total amount of such Contractors' sales delivered into New York State is in excess of $300,000 for the four (4)

quarterly periods immediately preceding the quarterly period in which the certification is made, and with respect to any affiliates and Subcontractors whose sales delivered into New York State exceeded $300,000 for the four (4) quarterly periods immediately preceding the quarterly period in which the certification is made.

A Contractor is required to file the completed and notarized Form ST-220-CA with the Bid to OGS certifying that the Contractor filed the ST-220-TD with DTF. Only the Form ST-220-CA is required to be filed with OGS. The ST-220-CA can be found at https://www.tax.ny.gov/pdf/current_forms/st/st220ca_fill_in.pdf. The ST-220-TD can be found at https://www.tax.ny.gov/pdf/current_forms/st/st220td_fill_in.pdf. Contractor should complete and return the certification forms within five (5) Business Days of request (if the forms are not completed and returned with Bid submission). Failure to make either of these filings may render a Contractor non-responsive and non-responsible. Contractor shall take the necessary steps to provide properly certified forms within a timely manner to ensure compliance with the law. The ST-220-TD only needs to be filed once with DTF, unless the information changes for the Contractor, its affiliates, or its Subcontractors.

Vendors may call DTF at 518-485-2889 with questions or visit the DTF web site at https://www.tax.ny.gov/ for additional information.

4.32 Non-State Agencies Participation in Centralized Contracts

New York State political subdivisions and others authorized by New York State law may participate in Centralized Contracts. These include, but are not limited to, local governments, public authorities, public school and fire districts, public and nonprofit libraries, and certain other nonpublic/nonprofit organizations. See Appendix B *Participation in Centralized Contracts*. For Purchase Orders issued by the Port Authority of New York and New Jersey (or any other authorized entity that may have delivery locations adjacent to New York State), the terms of the *Price* clause shall be modified to include delivery to locations adjacent to New York State.

Upon request, all eligible non-State agencies must furnish Contractors with the proper tax exemption certificates and documentation certifying eligibility to use State contracts. A list of categories of eligible entities is available on the OGS web site (https://ogs.ny.gov/procurement/nys-laws-extending-use-state-centralized-contracts). Questions regarding an organization's eligibility to purchase from New York State Contracts may also be directed to NYS Procurement Services Customer Services at 518-474-6717.

4.33 Extension of Use

Any Contract resulting from this Solicitation may be extended to additional States or governmental jurisdictions upon mutual written agreement between New York State and the Contractor. Political subdivisions and other authorized entities within each participating state or governmental jurisdiction may also participate in any resultant Contract if such state normally allows participation by such entities. New York State reserves the right to negotiate additional discounts based on any increased volume generated by such extensions.

4.34 New Accounts

Contractor may ask State Agencies and other Authorized Users to provide information in order to facilitate the opening of a customer account, including documentation of eligibility to use New York State Contracts, agency code, name, address, and contact person. State Agencies shall not be required to provide credit references.

4.35 Drug and Alcohol Use Prohibited

For reasons of safety and public policy, in any Contract resulting from this Solicitation, the Contractor's personnel shall not be impaired by alcohol or drugs of any kind in the performance of the Contract.

4.36 Traffic Infractions

Neither the State nor Authorized Users will be liable for any expense incurred by the Contractor's personnel for any parking fees or as a consequence of any traffic infraction or parking violation attributable to employees of the Contractor in performance of the Contract.

4.37 Contract Documents; Electronic Format

OGS requires Contractor to submit all documents to OGS in an electronic format, including electronic copies of documents that require original signatures. Documents requested by OGS should be submitted in the format specified by OGS, which may include a requirement for an electronic signature that has been generated by software (e.g., DocuSign or Adobe Acrobat Sign). Contractor is responsible for retaining all copies and originals (if applicable) of documents submitted to OGS for the term of the Contract and any extensions thereof, and for a period of six (6) years after the term of the Contract has ended. This requirement includes both electronic documents, and original paper documents with required original signatures that have been scanned and submitted electronically. Contractor shall submit such retained documents to OGS upon request. If Contractor seeks to assign the Contract during the term, Contractor shall provide all documents relating to the bid and Contract that it has retained to the successor Contractor (transferee/assignee) upon OGS consent to the assignment.

Pricing - Lot I Road Salt

AWARD	CONTRACT NUMBER	COUNTY	CONTRACTOR	PRICE PER TON	SALT TYPE
23449	PC71087	**Albany**	Morton Salt, Inc.	**$74.80**	ROAD SALT
23449	PC71083	**Allegany**	American Rock Salt Company LLC	**$78.63**	ROAD SALT
23449	PC71085	**Bronx***	Atlantic Salt, Inc.	**$99.00**	ROAD SALT
23449	PC71086	**Broome**	Cargill, Incorporated- Deicing Solutions	**$81.41**	ROAD SALT
23449	PC71083	**Cattaraugus**	American Rock Salt Company LLC	**$89.02**	ROAD SALT
23449	PC71083	**Cayuga**	American Rock Salt Company LLC	**$75.11**	ROAD SALT
23449	PC71083	**Chautauqua**	American Rock Salt Company LLC	**$97.40**	ROAD SALT
23449	PC71083	**Chemung**	American Rock Salt Company LLC	**$72.67**	ROAD SALT
23449	PC71086	**Chenango**	Cargill, Incorporated- Deicing Solutions	**$81.52**	ROAD SALT
23449	PC71083	**Clinton**	American Rock Salt Company LLC	**$103.26**	ROAD SALT
23449	PC71084	**Columbia**	Apalachee, LLC	**$95.00**	ROAD SALT
23449	PC71086	**Cortland**	Cargill, Incorporated- Deicing Solutions	**$79.53**	ROAD SALT
23449	PC71086	**Delaware**	Cargill, Incorporated- Deicing Solutions	**$83.82**	ROAD SALT
23449	PC71084	**Dutchess**	Apalachee, LLC	**$101.00**	ROAD SALT
23449	PC71083	**Erie**	American Rock Salt Company LLC	**$84.75**	ROAD SALT
23449	PC71083	**Essex**	American Rock Salt Company LLC	**$99.00**	ROAD SALT
23449	PC71083	**Franklin**	American Rock Salt Company LLC	**$93.80**	ROAD SALT
23449	PC71086	**Fulton**	Cargill, Incorporated- Deicing Solutions	**$91.49**	ROAD SALT
23449	PC71083	**Genesee**	American Rock Salt Company LLC	**$73.94**	ROAD SALT
23449	PC71084	**Greene**	Apalachee, LLC	**$99.00**	ROAD SALT
23449	PC71084	**Hamilton**	Apalachee, LLC	**$115.00**	ROAD SALT
23449	PC71086	**Herkimer**	Cargill, Incorporated- Deicing Solutions	**$85.00**	ROAD SALT
23449	PC71083	**Jefferson**	American Rock Salt Company LLC	**$93.65**	ROAD SALT
23449	PC71085	**Kings***	Atlantic Salt, Inc.	**$99.00**	ROAD SALT
23449	PC71086	**Lewis**	Cargill, Incorporated- Deicing Solutions	**$88.24**	ROAD SALT

AGENDA ITEM NO. 10.5

Purchase of One (1) Structural Pumper -
Sourcewell Contract #082025-PMI
Vendor: Firematic Supply Company, Inc.

AGENDA ITEM NO: 10.5
MEETING DATE: October 13, 2026

ALBANY COUNTY AIRPORT AUTHORITY
REQUEST FOR AUTHORIZATION

DEPARTMENT: *Finance*

Contact Person: *Margaret Herrmann, Acting Chief Financial Officer*

PURPOSE OF REQUEST:

Purchase of One (1) Structural Pumper - Sourcewell Contract #082025-PMI
Vendor: Firematic Supply Company, Inc.

CONTRACT AMOUNT:

Total Contract Amount: *$1,185,000.00*

BUDGET INFORMATION:

Anticipated in Current ALB Capital Plan: Yes √ No ___ NA ___

FISCAL IMPACT - FUNDING (Dollars or Percentages)

Federal _____ State_____ Airport _____ PFCs 100%
Funding Source: *2190-Capital Equipment*

JUSTIFICATION:

Authorization is requested to purchase on Structural Pumper to Replace Engine 8, the Airport Fire Department's 2009 structural pumper. This ARFF vehicle responds to every call for service at the airport. It is especially important for fires and other emergencies in the terminal and buildings that support Part 139 airport operations. Now approaching the end of its projected service life, the engine faces increasing maintenance and operating costs, while replacement parts are becoming harder to obtain. Its reliability remains essential to the department's daily response capability. Replacing Engine 8 will provide a modern structural pumper built to applicable NFPA standards and eliminate the current engine's PFOA-containing foam system. The purchase is a key step in fleet modernization and will help sustain reliable service as the existing apparatus continues to age. With an anticipated two-year build time, procurement should begin now so the replacement can be placed in service before Engine 8's condition creates a gap in response capability. This pumper is under Sourcewell Contract # 082025-PMI. A Purchase Order will be issued upon approval.

CHIEF EXECUTIVE OFFICER'S RECOMMENDATION:

Recommend approval.

AGENDA ITEM NO: 10.5
MEETING DATE: October 13, 2026

PROCUREMENT DEPARTMENT APPROVAL:

Procurement complies with Authority Procurement Guidelines and Acting Chief Financial Officer has approved. **Yes √ NA**

FINAL AGREEMENT SUBJECT TO APPROVAL BY COUNSEL: YES √ NA

BACK-UP MATERIAL:

Written proposal from Firematic Supply Company, Specifications and Purchase Contract.

Option List

9/25/2026

Customer:	Albany International Airport	**Bid Number:**	1057
Representative	Muller, Ray	**Job Number:**	
Organization:	Firematic Supply Co, Inc	**Number of Units:**	1
Requirements Manager:		**Bid Date:**	10/14/2026
Description:	Albany International r/s Rescue pumper	**Stock Number:**	
Body:	Pumper, PUC, Aluminum	**Price Level:**	55 (Current: 55)
Chassis:	Enforcer Chassis, PUC-NG	**Lane:**	

Line	Option	Type	Option Description	Qty
1	0766589		Boiler Plates, PUC Pumper	1
			Fire Department/Customer - Albany International Airport Operating/In conjunction W-Service Center - Operating Miles - 50 Miles Number of Fire Dept/Municipalities - 15 Bidder/Sales Organization - Firematic Supply Co Delivery - Delivery representative Dealership/Sales Organization, Service - Firematic Supply Co Inc	
2	0661794		Single Source Compliance	1
3	0584456		Manufacture Location, Appleton, Wisconsin	1
4	0584452		RFP Location: Appleton, Wisconsin	1
5	0588609		Vehicle Destination, US	1
6	0816491		Comply NFPA 1900 Changes Effective Jan 1, 2024, With Exceptions	1
7	0533347		Pumper/Pumper with Aerial Device Fire Apparatus	1
8	0588611		Vehicle Certification, Pumper	1
9	0661778		Agency, Apparatus Certification, Pumper/Tanker, U.L.	1
10	0816495		Certification, Vehicle Inspection Program, NFPA 1900	1
11	0766110		Consortium, Sourcewell	1
12	0537375		Unit of Measure, US Gallons	1
13	0030006		Bid Bond Not Requested	1
14	0816569		Performance Bond, Not Requested, PPI Terms	1
15	0000007		Approval Drawing	1
16	0002928		Electrical Diagrams	1
17	0889378		Enforcer Chassis, PUC-NG	1
18	0000110		Wheelbase	1
			Wheelbase - 194.00"	
19	0000070		GVW Rating	1
			GVW rating - 46500	
20	0729280		Frame Rails, 13.38 x 3.50 x .375, Enforcer/Saber	1
21	0020018		Frame Liner Not Req'd	1
22	0630705		Axle, Front, Oshkosh TAK-4, Non Drive, 19,500 lb, Enforcer	1
23	0030264		Suspension, Front TAK-4, 19,500 lb, Qtm/AXT/Imp/Vel/Enf/SFR	1
24	0087572		Shock Absorbers, KONI, TAK-4, Qtm/AXT/Imp/Vel/Enf	1
25	0000322		Oil Seals, Front Axle	1
26	0899438		Tires, Front, Goodyear, Armor MAX MSA, 425/65R22.50, 20 ply	1
27	0890369		Wheels, Front, 22.50" x 12.25", Steel, Hub Pilot	1
28	0530460		Axle, Rear, Meritor RS26-185, 27,000 lb, Saber/Enforcer	1
29	0544250		Top Speed of Vehicle, 65 MPH /104 KPH	1
30	0565380		Suspen, Rear, Single Slipper Spring, 27,000 lb, Saber/Enforcer	1
31	0000485		Oil Seals, Rear Axle	1
32	0782805		Tires, Rear, Goodyear, Armor Max MSD, 12R22.50, LRH, Single	1
33	0654797		Wheels, Rear, Accuride, 22.50" x 9.00", Steel, Hub Pilot, Single	1
34	0568081		Tire Balancing, Counteract Beads	1
35	0620570		Tire Pressure Monitoring, RealWheels, AirSecure, Valve Cap, Single Axle	1
			Qty, Tire Pressure Ind - 6	
36	0801909		Lug Nut, Covers, Chrome	1
37	0003245		Axle Hub Covers w/center hole, S/S, Front Axle	1
38	0001960		Axle Hub Covers, Rear, S/S, High Hat (Pair)	1
39	0002045		Mud Flap, Front and Rear, Pierce Logo	1
40	0544802		Chocks, Wheel, SAC-44-E, Folding, (Up to 44" Diameter Tires)	1
			Qty, Pair - 01	

Line	Option	Type	Option Description	Qty
41	0544806		Mounting Brackets, Chocks, SAC-44-E, Folding, Horizontal	1
			Qty, Pair - 01	
			Location, Wheel Chocks - Left Side Rear Tire, Forward and Rearward	
42	0820509		ESC/ABS/ATC Wabco Brake System, Single Rear Axle, NFPA 1900/ULC	1
43	0030185		Brakes, Knorr/Bendix 17", Disc, Front, TAK-4	1
44	0000730		Brakes, Meritor, Cam, Rear, 16.50 x 7.00"	1
45	0735527		Air Compressor, Brake, Wabco 26.8 CI, Paccar	1
46	0644232		Brake Reservoirs, 4,272 Cubic Inch Minimum Capacity, Saber FR/Enforcer	1
			Paint Color, Air Tanks - Frame color	
47	0568012		Air Dryer, Wabco System Saver 1200, Heater, 2010	1
48	0000790		Brake Lines, Nylon	1
49	0000854		Air Inlet, w/Disconnect Coupling	1
			Location, Air Coupling(s) - DS Step Well, Forward	
			Qty, Air Coupling (s) - 1	
50	0808515		Engine, Paccar MX, 510HP, 1850 lb-ftW/OBD, EPA 2027, Saber FR/Enforcer	1
51	0811409		Not Required, Engine Contingency Adjustment	1
52	0001244		High Idle w/Electronic Engine, Custom	1
53	0735687		Engine Brake, Fully Integrated, Paccar MX13 Engine	1
			Switch, Engine Brake - Paccar	
54	0644227		Clutch, Fan, Air Actuated, Saber FR/Enforcer	1
55	0644573		Air Intake, Water & Ember Screen, Saber FR/Enforcer	1
56	0814375		Exhaust System, Horizontal, Right Side	1
			Exhaust, Diffuser - Aluminized Steel (Standard)	
			Exhaust, Material/Finish - Aluminized Steel (Standard)	
			Location, Diffuser Termination - 2.00" Past Rub Rail (Standard)	
			Tip, Exhaust - Straight Tip (Standard)	
57	0788765		Radiator, Saber FR/Enforcer	1
58	0001090		Cooling Hoses, Rubber	1
59	0770792		Fuel Tank, 65 Gallon, Left Side Fill, Common Air Bottle Door	1
60	0001129		Lines, Fuel	1
61	0889521		DEF Tank, 7.3 Gallon, LS Fill, Under Cab, Paccar, Lift Up Fill Dr, Spring, ENF	1
			Door, Material & Finish, DEF Tank - Painted	
62	0552793		Not Required, Fuel Priming Pump	1
63	0552712		Not Required, Shutoff Valve, Fuel Line	1
64	0699437		Cooler, Chassis Fuel, Not Req'd.	1
65	0011125		Door, Fuel Fill Painted Job Color	1
			Qty, - 01	
66	0690880		No Selection Required From This Category	1
67	0887546		Trans, Allison 6th Gen, 4000 EVS P, w/Prognostics, Imp/Vel/SFR/Enf	1
68	0625331		Transmission, Shifter, 6-Spd, Push Button, 4000 EVS	1
69	0517604		Transmission Programming, Park to Neutral, PUC	1
70	0684459		Transmission Oil Cooler, Modine, External	1
71	0001375		Driveline, Spicer 1810	1
72	0734211		Steering, Sheppard M110 w/Tilt, TAK-4, Paccar Pump, w/Cooler, Paccar	1
73	0802950		Steering Wheel, 4 Spoke w/Wiper Control, Saber FR/Enforcer	1
74	0559647		Pierce Logo on Horn Button	1
75	0747106		Bumper, 19" Ext, Underslung, Fab, .25" Steel, Paint Feat, SFR/Enf	1
			Paint, Color - TBD	
76	0633479		Hose Restraint, Bumper Tray, Velcro Straps, Pair	1
			Qty, Pair - 01	
77	0614646		No Lift & Tow Package, Imp/Vel, AXT, SFR/Enf	1
78	0002270		Tow Hooks, Chrome, Below Deck	1
79	0610831		Tray, 3/4 Width, 19" Bumper, Under Slung Design,10" H Bumper,AXT/Qtm/SFR/Enf	1
			Capacity, Hose Tray - 200' of 2.5"	
			Grating, Bumper extension - Grating, Rubber	
80	0828609		Cover, Alum Treadplate, 2" Raised, Underslung	1
			Type of Fastener - (2) Paddle Latches	
			Stay arm, Tray Cover - h) Pneumatic Stay Arm, Dual/Mech Stay Arm	
81	0616216	SP	Notch, Bumper Tray Cover, Each	1
			Fill in Blank - r/s by discharge	
			Qty, Hose Tray Covers - 1	

Line	Option	Type	Option Description	Qty
82	0689308		Notch, Front For Recessing Of Q2B, Stainless Bumper	1
			Location - left side	
83	0030434		Travel Stops, Front Inlet/Outlet Swivel, Qty & Location	1
			Location - right side	
			Qty, - 1	
84	0698960		Coating, Top Flange, Front Bumper, Outside Exterior, UL-LX Coating, Black	1
85	0625646		Cab, Enforcer, 7010, PUC	1
86	0747442		Engine Tunnel, X12, MX13, Spray Insulation, Enforcer	1
87	0887601		Cab Insulation, Enforcer/Saber FR	1
88	0610508		Rear Wall, Interior, Adjustable Seating, Not Available	1
89	0804085		Rear Wall, Exterior, Cab, Alum Treadplate, Safe-Stride, SFR/Enforcer	1
			Material, Exterior Rear Wall - Aluminum Treadplate	
			Color, Safe-Stride - Black	
90	0639727		Cab Lift, Elec/Hyd, Manual Override, Saber FR/Enforcer	1
91	0695930		Grille, Bright Finished, Front of Cab, Enforcer	1
92	0647932		Not Required, Trim, S/S Band, Across Cab Face, AXT/Saber/Enforcer	1
93	0015440		No Chrome Molding, On side of cab	1
94	0809467		Mirrors, Retrac, West Coast Style, Htd/Rmt, w/Htd/Rmt Convex, Black, Painted Arm	1
95	0648172		Door, Full Height, Saber FR/Enforcer 4-Door Cab, Raised Roof	1
			Key Model, Cab Doors - 751	
			Cab, Exterior Door Handle, Finish - 4-Door, Black	
96	0655543		Door Panel, Brushed Stainless Steel, Saber/Enforcer 4-Door Cab	1
97	0630636		Controls, Electric Roll-Up Windows, 4dr, 4 Driver Controls, Saber FR/Enforcer	1
98	0638310		Steps, 4-Door Cab, Saber FR/Enforcer	1
			Step Well Material - Aluminum Treadplate	
99	0770192		Handrail, Exterior, Hansen, Knurled, Alum, Black, 4-Door Cab	1
100	0892638		Lights, Cab & Crw Cab Acs Stps, P25, LED w/Bezel, 6lts	1
			Color, Trim - Black Housing	
101	0057836		Crowns, Front Fender, Rubber, TAK-4	1
102	0627907		Window, Side of C/C, Fixed, w/Cabinet, SFR/Enf	1
103	0012090		Not Required, Windows, Front/Side of raised roof	1
104	0779033		Not Required, Windows Rear of Crew Cab, Saber FR/Enforcer	1
105	0786289		Window Tint, Crew Cab Door, Left Side, Medium Gray	1
106	0786283		Window Tint, Behind Cab Door, Right Side, Medium Gray	1
107	0786278		Window Tint, Crew Cab Door, Right Side, Medium Gray	1
108	0786293		Window Tint, Upper Crew Cab Door, Left Side, Medium Gray	1
109	0786285		Window Tint, Upper Crew Cab Door, Right Side, Medium Gray	1
110	0786295		Window Tint, Behind Cab Door, Left Side, Medium Gray	1
111	0001745		Trim, Locking, Window, Black IPO Chrome	1
112	0632163		Window Protector Bars, Knurled, Crew Doors, 2" Above Window Sill Plate, 45 Deg	1
113	0722796		Dash, Poly, Saber FR/Enforcer	1
114	0634206		Mounting Provisions, 1/4" Alum, Full Engine Tunnel, Saber FR/Enforcer	1
			Mounting Provision Spacing - .50"	
			Material Finish, Cab Interior - Painted	
115	0778711		Cab Interior, Painted Headliner, Saber FR/Enforcer	1
			Engine Tunnel Cover - Painted	
116	0753903		Cab Interior, Paint Color, Saber FR/Enforcer	1
			Color, Cab Interior Paint - i) fire smoke gray	
117	0888673		Floor, Rubber Padded, Cab & Crew Cab, Blister, Enforcer PUC-NG	1
118	0817805		HVAC, Heavy-Duty, Enforcer, Paccar, CARE	1
			Paint Color, A/C Condenser - Painted to Match Cab Roof	
			HVAC System, Filter Access - Tool Free Panel	
			Auxiliary Cab Heater - Both	
			HVAC System, Control Loc. - Panel Position #12	
			Plenum Cover Material - Metal, Painted	
119	0639675		Sun Visor, Smoked Lexan, AXT, Imp/Vel, SFR/Enf	1
			Sun Visor Retention - Thumb Latch	
120	0622887		Grab Handles, Driver Door Post, Officer Door Post Low, SFR/Enf	1
121	0693439		Lights, Engine Compt, Custom, Auto Sw, w/Fld Chk Dr Wln 3SC0CDCR, 3" LED Trim	1
			Qty, - 01	
122	0631830		Fluid Check Access, Saber FR/Enforcer, Arrow XT	1
			Latch, Door, Storage - Lift and Turn Latch, Flush	

Line	Option	Type	Option Description	Qty
123	0583039		Not Required, Side Roll and Frontal Impact Protection	1
124	0622619		Seating Capacity, 4 Belted Seats	1
125	0636957		Seat, Driver, Pierce PSV, Air Ride, High Back, PRIMARY, SFR/Enf	1
126	0632925		Seat, Officer, Pierce PSV, Air Ride, SCBA, PRIMARY, SFR/Enf	1
127	0002517		Not Required, Radio Compartment	1
128	0632852		Seat, Rr Fcng C/C, LS Otbrd, Pierce PSV, SCBA, PRIMARY, SFR/Enf	1
129	0102783		Not Required, Seat, Rr Facing C/C, Center	1
130	0632848		Seat, Rr Fcng C/C, RS Otbrd, Pierce PSV, SCBA, PRIMARY, SFR/Enf	1
131	0108189		Not Required, Seat, Forward Facing C/C, LS Outboard	1
132	0819959		Cabinet, Fwd Fcng, Ctr, 32 W x 50 H x 20 D, Roll, SFR/Enf	1
			Material Finish, Shelf - Painted - Cab Interior Shelf/Tray, Cabinet - (2) Shelves, Adjustable, 0.75" Up-Turned Lip Door, Cab Interior Cabinet - Rollup, Gortite, Anodized, Non-Locking Light, Tall Cabinet - Pierce, Interior, Left Side and Pierce, Interior, Right Side Louvers, Cabinet - 0-No Louvers	
133	0108190		Not Required, Seat, Forward Facing C/C, RS Outboard	1
134	0566653		Upholstery, Seats In Cab, Turnout Tuff	1
			Color, Cab Interior Vinyl/Fabric - c) Black	
135	0543991		Bracket, Air Bottle, IMMI, Gen 2 SmartDock, Hands-Free, Cab Seats	3
			Qty, - 03	
136	0603866		Seat Belt, Dual Retractor, ReadyReach, Saber FR/Enforcer	1
			Seat Belt Color - Red	
137	0817557		Helmet Storage, Provided by Fire Department, NFPA/ULC 2024	1
138	0647647		Lights, Dome, FRP Dual LED 4 Lts	1
			Color, Dome Lt - Red & White Color, Dome Lt Bzl - Grey Control, Dome Lt White - Door Switches and Lens Switch Control, Dome Lt Color - Lens Switch	
139	0896451		Enhanced Software for Cab and Crew Cab Dome Lts	1
140	0816997		Portable Hand Light, Provided by Fire Dept, NFPA/ULC 2024	1
141	0622803		Cab Instruments, Black Gauges, Black Bezels, Enforcer MUX	1
142	0509511		Air Restriction Indicator, Imp/Vel, AXT, Enf MUX	1
143	0543751		Light, Do Not Move Apparatus	1
			Alarm, Do Not Move Truck - Pulsing Alarm	
144	0509042		Messages, Open Dr/DNMT, Color Dsply,	1
145	0611683		Switching, Cab Instrument Lower Console & Overhead, Membrane, Enforcer WiFi MUX	1
146	0802946		Wiper Control, 2-Speed w/Intermittent, Steering Wheel, Left Pod, SFR/Enf	1
147	0834413		USB, Cab, 4, 12V DC, Dual USB Termination, Batt Dir. NFPA1900/ULC	1
			USB, Type - USB Combo A & C	
148	0820894		Wiring, Spare, 15 A 12V DC, Batt Dir, 1st NFPA1900/ULC	1
			Location, Wiring - Behind Officer Seat 12vdc power from - Battery direct Wire termination - 10-Place Bus Bar w/Cover	
149	0814201		Vehicle Information Center, 7" Color Display, Touchscreen, MUX, CL714	1
			System Of Measurement - US Customary	
150	0816633		Collision Mitigation, HAAS Alert (R2V), HA7	1
			Subscription, HAAS R2V - R2V - 5 Year Data Plan Subscription	
151	0606247		Vehicle Data Recorder w/CZ Display Seat Belt Monitor	1
152	0817058		Camera, Pierce, LS Mux, R Camera, SD, CL714	1
			Camera System Audio - Not Provided	
153	0814831		Not Required, Camera Switcher	1
154	0674566		Location, Rear Vision Camera	1
			Location - centered under traffic directing light.	
155	0890416		Pierce Command Zone, Advanced Electronics & Control System, Enforcer, WiFi CZT	1
			Color, Antenna - White Antenna Module Housings - See Through Housings with LED Cuircuit Indicators	
156	0896456		Prognostics, Electrical System	1
157	0624253		Electrical System, Enforcer MUX	1
158	0079211		Batteries, (6) Stryten/Exide Grp 31, 950 CCA each, Threaded Stud	1
159	0008621		Battery System, Single Start, All Custom Chassis	1

Line	Option	Type	Option Description	Qty
160	0002698		Battery Compartment, Saber/Enforcer	1
161	0812586		Charger, Sngl Sys, Kussmaul, Chief 091-266-12-60, 60 Amp	1
162	0814869		Location, Cab, Charger, Behind Driver Seat	1
163	0813791		Panel, Charger Display, Kussmaul, 091-94-12, Batt Dir	1
164	0814939		Location, Cab, Ind/Remote, Driver's Seat Riser	1
165	0811952		Not Required, Indicator/Remote Status	1
166	0824337		Not Required, Location Ind/Remote	1
167	0507624		Shoreline, 30A 120V, Kussmaul Auto Eject, 091-159-30-120, Super	1
			Qty, - 01 Color, Kussmaul Cover - h) black Connection, Shoreline - battery charger	
168	0026800		Shoreline Location	1
			Location, Shoreline(s) - DS Cab Side	
169	0647728		Alternator, 430 amp, Delco Remy 55SI	1
170	0092582		Load Manager/Sequencer, MUX	1
			Enable/Disable Hi-Idle - e)High Idle enable	
171	0766339		Headlights, Rect LED, HiViz FT-4X6-4KIT, AXT/Enf/Imp/Sab/Vel, Blk Alum Hous	1
			Color, Headlight Bez - Black Bezel	
172	0815831		Light, Directional, HiViz FT-TL-GSMJR-TURN, Cab Crn, Wrp Bzl Out HD Lts, Enf/Sab	1
			Color, Lens, LED's - c)clear Color, Trim - Black Trim	
173	0742133		Light, Directional/Marker, Intermediate, Truck-Lite 30375Y Grm Mt, Blk 2lts, MUX	1
174	0648048		Lights, Clearance/Marker/ID, Front, Wln 0SA00MCR LED 7 Lts	1
175	0756641		Lights, Directional, Cab Front Side, Truck-Lite 19036Y LED Blk Trm, AXT/Enf	1
176	0591889		Lights, Clearance/Marker/ID, Rear, Wln 0SR00MCR LED 7Lts	1
177	0815850		Lights, Tail, Hiviz FT-TL-GSMJR-TRIPLE-KIT, Stop/Tail, Turn & Backup LED, Tri	1
			Color, Trim - Black Trim	
178	0085910		Lights, Backup Included in Signal Cluster	1
179	0889577		Bracket, License Plate & Light, P25 LED, Stainless Brkt	1
			Color, Trim - Black Housing	
180	0589905		Alarm, Back-up Warning, PRECO 1040	1
181	0525907		Light, Marker, Wln 0S Series LED Marker Lights, Pair	3
			Location - (4) centered at the rear of the tailboard (1) on the LS 45 corner and (1) on the RS 45 degree corner Qty, Lights, Pair - 3	
182	0626588		Lights, Perimeter Cab, TecNiq T10-LC00-1 15" LED 4Dr	1
183	0617901		Lights, Perimeter Pump House, TecNiq T10-LC00-1 15" LED 2lts	1
184	0626579		Lights, Perimeter Body, TecNiq T10-LC00-1 15" LED 2lts, Rear Step	1
			Control, Perimeter Lts - Parking Brake Applied	
185	0896454		Enhanced Software for Perimeter Lts	1
186	0557322		Lights, Step, P25 at Rear Tailboard, PUC, 4lts Perm Lts	1
187	0760447		Light, Roof Mt, HiViz, FT-B-72-*-*, Cnt Feature, Mux	1
			Control, Scene Lts - Cab Sw Panel DS, Pump Panel Sw LS and Cab Sw Panel PS Color, Lt Housing HiViz - Black Scene Light Optics - Flood/Spot	
188	0736729		Lights, HiViz FT-GESM LED 2nd	1
			Location - p/s cab above window Qty, - 01 Control, Scene Lts - Cab Sw Panel DS, Cab Sw Panel PS and Cab and Crew Cab Dr Sw, PS Color, Lt Housing HiViz - Blk Opt Hold, Blk Bez, Blk Fix	
189	0736731		Lights, HiViz FT-GESM LED 1st	1
			Location - d/s cab above window Qty, - 01 Control, Scene Lts - Cab Sw Panel DS, Cab Sw Panel PS and Cab and Crew Cab Dr Sw, DS Color, Lt Housing HiViz - Blk Opt Hold, Blk Bez, Blk Fix	
190	0773332		Lights, HiViz FT-MB-2.15-*-*-CPREC 17.50" LED, 2nd	2
			Location - two on the p/s upper body one forward and one rearward inboard of warning lights Qty, - 02	

Line	Option	Type	Option Description	Qty
190			Control, Scene Lts - Cab Sw Panel DS, Cab Sw Panel PS, Pump Panel Sw RS and Body Switch, PS Rear SS Painted Black	
			Color, Lt Housing HiViz - Black	
			Scene Light Optics - combination	
191	0773346		Lights, HiViz FT-MB-2.15-*-*-CPREC 17.50" LED, 1st	2
			Location - two on the d/s upper body one forward and one rearward inboard of warning lights	
			Qty, - 02	
			Control, Scene Lts - Cab Sw Panel DS, Cab Sw Panel PS, Pump Panel Sw RS and Body Switch, DS Rear SS Painted Black	
			Color, Lt Housing HiViz - Black	
			Scene Light Optics - combination	
192	0773331		Lights, HiViz FT-MB-2.15-*-*-CPREC 17.50" LED, 3rd	2
			Location - one each side upper rear body	
			Qty, - 02	
			Control, Scene Lts - Pump Panel Sw RS and Body Switch, DS Rear SS Painted Black	
			Color, Lt Housing HiViz - Black	
			Scene Light Optics - combination	
193	0645877		Lights, Hose Bed, Sides, Dual LED Light Strips	1
			Control, Hose Bed Lts - With Rear Scene Lts	
194	0645677		Lights, Not Required, Rear Work, Alt. 12 Volt Lights At Rear Body	1
195	0768376		Lights, Walk Surf, FRP Flood, LED, Qty, Loc Fet	2
			Location - in tank dome fill area above water tank, and cargo compartment.	
			Qty, Surface Lights - 2	
196	0518282		Pumper, PUC, Aluminum	1
197	0554271		Body Skirt Height, 20"	1
198	0682617		Tank, Water, 750 Gallon, Poly, 67 LHB, PUC	1
199	0003405		Overflow, 4.00" Water Tank, Poly	1
200	0028104		Foam Cell Required	1
201	0553725		Restraint, Water Tank, Heavy Duty, Special Type Tank, 4x4, or Export	1
202	0003429		Not Required, Direct Tank Fill	1
203	0003424		Not Required, Dump Valve	1
204	0048710		Not Required, Jet Assist	1
205	0030007		Not Required, Dump Valve Chute	1
206	0514778		Not Required, Switch, Tank Dump Master	1
207	0597043		Body Height, PUC/HDRP	1
			Body Height - 92.00"	
208	0683290		Hose Bed, Aluminum, Pumper, PUC, 67 LHB	1
209	0723340		Unpainted/Brush Finished, Hose Bed, 3G PUC/HDRP	1
210	0003481		Hose Bed Capacity, Special	1
			Capacity, Hose Bed - 1000' of 5" 600' of 2.5" hose	
211	0003488		Divider, Hose Bed, Unpainted	1
			Qty, Hose Bed Dividers - 1	
212	0806306		Straps, Top of Hose Bed	1
213	0807424		Hose Restraint, Hose Bed, Web, Rear, Separate From Top	1
			Fastener, Rear Restraint, Top - Velcro Straps/Footman Loops	
			Fastener, Rear Restraint, Bottom - Velcro Straps/Footman Loops	
214	0823921		Stabilizer, Hose Bed Divider, Tied to Mounting Above	1
			Qty, - 01	
			Hose Bed Divider Type - Extruded Divider(s)	
			Hose Bed Divider Reinforcement Mounting - Crosstube/Hose Bed Cover w/Track	
215	0648736		Crosstube, Reinforcement, Above Hose Bed	1
			Location - flush with the back	
			Material/Finish, Cross Tube - Painted Match Lower	
216	0611509		Running Boards, Flip Out, PUC	1
217	0676723		Tailboard, 16" Deep, Full Width, Angled Corners, PUC/HDRP	1
218	0690029		Wall, Rear, Body Material, PUC/HDRP	1
219	0003531		Tow Bar, Under Tailboard	1
220	0656764		Construction, Compt, Alum, Pumper, PUC	1
221	0811243	SP	LS 177" Rollup, Standard Depth, RS Operator Panel, PUC	1
			Width, PUC Pump Operators Panel Partition - 2.5"	

Line	Option	Type	Option Description	Qty
222	0811244	SP	RS 177" Rollup, (1) 50" Fwd FH/FD, (1) 52" Rr, Std Depth, PUC, RS Operator Panel	1
			Width, PUC Pump Operators Panel Partition - 2.5"	
223	0692733		Doors, Rollup, Gortite, Side Compartments	6
			Qty, Door Accessory - 06	
			Color, Roll-up Door, Gortite - Painted to Match Lower Body	
			Latch, Roll-up Door, Gortite - Non-Locking Liftbar	
224	0599445		Rear, Rollup, 33.50" F-F, Tailboard, PUC/HDRP	1
225	0692743		Door, Gortite, Rollup, Rear Compartment, PUC	1
			Color, Roll-up Door, Gortite - Satin finish	
			Latch, Roll-up Door, Gortite - Non-Locking Liftbar	
226	0616670		Lights, Compt, Pierce LED, Dual Light Strips, Each Side of Door, Pumper/Tanker	7
			Qty, - 07	
			Location, Compartment Lights - All Body Compts	
227	0681343		177" Hatch, (2) Lift-up, 21" Wide Left Side, 14" Wide Right Side, PUC	1
			Size, Hatch Compt, Height - 22.00"	
			Trim, Body/Hatch Compt Seam, Horizontal, Pair - Molding	
			Trim, Body/Hatch Compt Seam, Vertical, Pair, PUC - Painted Extrusion	
			Matting, Floor, Hatch Compt - Rubber Matting	
228	0733406		Handrails, Hatch Step Area, (1) Curved & (1) Straight	1
229	0687514		Lights, Hatch Compt, LED Strip Light, 177", Both Sides	1
230	0687145		Shelf Tracks, Recessed, PUC/3rd Generation	1
231	0600350		Shelves, Adj, 500 lb Capacity, Full Width/Depth, Predefined Locations	4
			Qty, Shelf - 04	
			Material Finish, Shelf - Painted - Spatter Gray	
			Location, Shelves/Trays, Predefined - LS1-Transition Point, RS1-Centered, RS3-Upper Third and LS3-Transition Point	
232	0647044		Tray, Floor Mounted, Slide-Out, w/ Side Slides, FW/FD, 500lb, 2.00" Sides, 3G	2
			Qty, - 02	
			location - RS1 ans LS1	
			Material - paint to match compt interior	
233	0544614		Toolboard, Swing-out, Alum, .188", Peg Board, 3G	2
			Qty - 2	
			Location, Pivot - Front	
			Mounting, Toolboard - Adjustable Frt-back	
			Hole Diameter, Pegboard/Toolboard - .281" diameter	
			Finish, Pegboard/Toolboard - Painted - Spatter Gray	
			Location, Toolboard - LS2 - Full Height/Width and RS2 - Full Height/Width	
234	0726412		Partition, Trans Rear Compt, PUC/HDRP	2
			Qty, Partition - 02	
			Location, Partition - c) both sides	
			Material Finish, Partition - Painted - Spatter Gray	
235	0063064		Rub Rail, Aluminum Extruded, Side of Body, 3rd Gen Body	1
236	0515441		Fender Crowns, Rear, S/S, w/Removable Fender Liner, Pumper, 3G	1
			Material Finish, Fender Liner - Brushed Stainless	
237	0519849		Not Required, Hose, Hard Suction	1
238	0527021		Handrails Located @ Front Body	1
239	0664688		Handrails, Rear, PUC/HDRP	1
240	0011212		Handrail, Not Required, Rear Hose Bed, Pumper	1
241	0648325		Compt, Air Bottle, Double, Tri Door, Fender Panel	1
			Qty, Air Bottle Comp - 1	
			Door Finish, Fender Compt - Painted	
			Location, Fender Compt - Double - LS Rear - Fuel Combo	
			Latch, Air Bottle Compt - Southco C2 Black Raised	
			Insert, Air Bottle Compt - Rubber Matting	
242	0657522		Compt, Air Bottle, Triple, Fender Panel	3
			Qty, Air Bottle Comp - 3	
			Door Finish, Fender Compt - Painted	
			Location, Fender Compt - Triple - LS Fwd, Triple - RS Fwd and Triple - RS Rear	
			Latch, Air Bottle Compt - Southco C2 Black Raised	
			Insert, Air Bottle Compt - Rubber Matting	
243	0004225		Ladder, 24' Duo-Safety 900A 2-Section	1

Line	Option	Type	Option Description	Qty
244	0004230		Ladder, 14' Duo-Safety 775A Roof	1
245	0637942		Ladders Btwn Tank & S.Sht, LS, Built Into Body, Pumper Style, PUC	1
			Door, Material & Finish, Ladder Storage - aluminum treadplate	
			Latch, Door Ladder Storage - D-Handle latch	
246	0733387		Ladder, 10' Duo-Safety Folding 585A	1
247	0732963		Trough, Folding Ladder, Long Tool Storage Compt In Upper Body	1
			Location, Left Side, Right Side - Left Side	
248	0816920		Pike Pole, Provided by Fire Department, NFPA/ULC 2024	1
			Qty, - 01	
			Pike Pole Make/Model - Fire Hooks Unlimited New York Roof Hook, RH-8	
249	0732982		Tube, Pike Pole 8' or Longer, In Upper Body Long Tool Storage Compt	1
			Qty, Pike Poles - 1	
			Location, Left Side, Right Side - Left Side	
			Material/Finish, Tube, Pike Pole - Aluminum	
			Width, Notch, Pike Pole Tube - 1.38", NY Notch	
250	0816918		Pike Pole, 6', Provided by Fire Department, NFPA/ULC 2024	1
			Qty, - 01	
			Pike Pole Make/Model - Fire Hooks Unlimited 6' New Yorker Pike Pole	
251	0732992		Tube, Pike Pole 6', In Upper Body Long Tool Storage Compt	1
			Qty, Pike Poles - 1	
			Location, Left Side, Right Side - Left Side	
			Material/Finish, Tube, Pike Pole - Aluminum	
			Width, Notch, Pike Pole Tube - 1.38", NY Notch	
252	0740068		Compt, Long Tool Storage Compt, In Upper Body (1) LS, PUC/HDRP	1
			Door, Material & Finish, Storage - Smooth Aluminum	
			Latch, Door, Storage - Lift and Turn Latch, Flush	
			Hinge Location - Outboard	
253	0521734		No Steps Required, Front Of Body, PUC	1
254	0794171		Ladder, Top Access, Alum, Rear, PUC/HDRP, Opposite Ladder Storage	1
			Do Not Move Truck Indicator - DNMT indicator	
255	0515692		Pump Operators Panel, 31", Control Zone, PUC	1
256	0520016		Not Required, Pumphouse Structure, PUC	1
257	0889383		Pump, Pierce, 2000 GPM, Single Stage, PUC-NG	1
258	0515822		Seal, Mechanical, Silicon Carbide, PUC Pump	1
259	0889382		Gear Case, Integrated Pump Transmission, PUC-NG, Paccar	1
260	0804185		Pumping Mode, Pump and Roll/Stationary, Basic, MUX, PUC, Pump PSI in CZ Display	1
261	0515829		Pump Shift, Sure-Shift	1
262	0515833		Transmission Lock-up, Not Req'd, Park to Neutral, Pump, PUC	1
263	0515835		Auxiliary Cooling System, PUC	1
264	0014486		Not Required, Transfer Valve, Single Stage Pump	1
265	0840122		Not Required, Pump Intake Relief Valve, Provided on MIVs, Waterous, PUC	1
			Fill in Blank - .	
			Pressure Setting - 125 psig	
			Intake Relief Valve Control - Behind Left Side Pump Panel	
266	0724463		Controller, Pressure, Pierce LCD , PUC	1
			Pressure Governor Throttle Control - Clockwise	
			Pressure Governor Default Mode - RPM Setting	
267	0072153		Primer, Trident, Air Prime, Air Operated	1
268	0843147		Manual, Pump, Included with Master Loose Equipment Manual	1
269	0602496		Plumbing, Stainless Steel and Hose, Single Stage Pump, PUC	1
270	0795135		Plumbing, Stainless Steel, w/Foam System	1
271	0517852		Inlets, 6.00" - 1250-2000 GPM, Pierce PUC Pump	1
272	0840104		Valve, Relief, LS/RS Inlet, 6", Akron 9343 Controller, O-ride, 2000GPM, PUC	1
			Pressure Setting - 125 psig	
273	0004646		Cap, Main Pump Inlet, Long Handle, NST, VLH	1
274	0084610		Valves, Akron 8000 series- All	1
275	0520002		Valve, Inlet(s) Recessed, Side Cntrl, PUC	2
			Qty, Inlets - 2	
276	0004700		Control, Inlet, at Valve	1
277	0004660		Inlet (1), Left Side, 2.50"	1
278	0004680		Inlet, Right Side, 2.50"	1

Line	Option	Type	Option Description	Qty
279	0554979		Inlet, Rear, 4"-6" w/5" Plmb, LS Rear Bulkhead, w/Bleeder Valve, PUC	1
			Inlet, Size - Five	
280	0024831		Control, Rear Inlet, Electric, w/Indicator Lights	1
281	0520267		Cap, Rear Inlet, Rocker Lug, VLH	1
282	0840150		Valve, Relief Intake, Rear Inlet, Match Pump/Side MIV(s)	1
			Pressure Setting - 125 psig	
283	0092568		No Rear Auxiliary Inlet Requested	1
284	0723049		Valve, .75" Bleeder, Aux. Side Inlet, "T" Swing Handle	1
285	0520277		Tank to Pump, (1) 3.00" Valve, 4.00" Plumbing, PUC	1
286	0595508		Outlet, Tank Fill, 1.50", PUC	1
287	0837421		Control, Outlets, Swing Handle, Elec Right Outlets Akron 9345 w/Press Disp, PUC	1
288	0837412		Outlet, Left Side, 2.50" (2), Electric, Akron 9345 Controller, PUC	1
289	0055095		Not Required, Elbow, Left Side Outlets, 2.50"	1
290	0092570		Not Required, Outlets, Left Side Additional	1
291	0035094		Not Required, Elbow, Left Side Outlets, Additional	1
292	0837372		Outlet, Right Side, 2.50", (1), Electric Akron 9345 Controller, PUC	1
			Qty, Discharges - 01	
293	0021134		Not Required, Elbow, Right Side Outlets, 2.50"	1
294	0092571		Not Required, Outlets, Right Side Additional	1
295	0089584		Not Required, Elbow, Right Side Outlets, Additional	1
296	0818640		Outlet, Large Diameter, Right Side, Akron Valve, PUC	1
			Outlet, Large Diameter, Plumbing - 4.00"	
			Outlet, Large Diameter, NST Adapter - 4.00" MNST	
			Outlet, Large Diameter, Valve Actuation - PUC Akron 9343 w/analog pressure gauge	
297	0527969		Cap, Large Dia Outlet, 4.00", IPO Elbow	1
298	0607659		Outlet, Front, 1.50" w/2" Plumbing, Under Slung Bumper	1
			Fitting, Outlet - 1.50" NPSH thread with 90 degree swivel	
			Drain, Front Outlet - Automatic	
			Location, Front, Single - top of right bumper	
299	0092575		Not Required, Outlet, Rear	1
300	0045099		Not Required, Elbow, Rear Outlets	1
301	0537394		Not Required, Outlet, Rear, Additional, PUC	1
302	0537395		Not Required, Elbow, Rear Outlets, Additional	1
303	0752097		Caps/Plugs for 1.00" to 3.00" Discharges/Inlets, Chain	1
304	0723042		Valve, 0.75" Bleeder, Discharges, "T" Swing Handle	1
305	0516860		Outlet, 3.00" Deluge w/2.50" Valve, PUC	1
306	0770359		No Monitor Requested, Customer/Dealer Furnished and Installed	1
			Fill in Blank - No monitor required or requested	
307	0029304		No Nozzle Req'd	1
308	0005070		Deluge Mount, NPT	1
309	0750982		Crosslay Module, Full Width, Roll Up Doors, PUC	1
310	0750897		Doors, Crosslay, Roll-up Amdor, Each End, Full Height, PUC	1
			Color, Roll-up Door - AMDOR Painted to Match Lower Body	
			Latch, Roll-up Door - Non-Locking Liftbar	
			Drip Pan - Drip Pan (Standard)	
311	0747660		Lights, Crosslay Compt, Forward LED, 2Lts	1
312	0750916		Crosslays, (2) 1.50", W/Poly Trays, PUC	1
			Crosslay/Deadlay/Speedlay Capacity 1 - 200' of 1.75" double jacket hose	
313	0747055		Not Required, 2.50" Crosslay	1
314	0749401		Mounting, Backboard, Upper Crosslay Module, Strap, PUC	1
			Size, Backboard - 4" X 18" X 72"	
			Qty - 1	
315	0661221		Tray(s), Poly, Special Size, IPOS	3
			Location - 1.75" crosslays at 7.5" wide and the 2.5" crosslay at 10" wide	
			Qty, - 03	
			Size - 7.5 and 10	
316	0836583		Foam Sys, Husky 3 LCD, Single Agent, PUC, Multi Select Feature	1
			Discharge, Foam Locations - Crosslay Lower Rear, Crosslay Lower Front and Front Bumper Center	
317	0012126		Not Required, CAF Compressor	1
318	0592527		Refill, Foam Tank, Integral, Husky 3	1

Line	Option	Type	Option Description	Qty
319	0031896		Demonstration, Foam System, Dealer Provided	1
320	0530519		Foam Cell, 30 Gallon, Not Reducing, PUC	1
			Type of Foam - Class "B" Foam, Brand Name - TBD	
321	0697589		Drain, 1.00", Foam Tank #1, Husky 3 Foam System, Quarter Turn	1
322	0091079		Not Required, Foam Tank #2	1
323	0091112		Not Required, Foam Tank #2 Drain	1
324	0738072		Approval Dwg, Pump Panel(s), Not Required	1
325	0032479		Pump Panel Configuration, Control Zone	1
326	0831515		Material/Finish, Pump Panels, PUC	1
			Material/Finish, Pump Panels, Operator Panels, PUC - Brushed Stainless Steel	
			Material/Finish, Pump Panels, Side Panels, PUC - Brushed Stainless Steel	
327	0516978		Pump and Plumbing Access, Simple Tilt Service, PUC	1
328	0618458		Light, Pump Compt, Wln 3SC0CDCR LED White, PUC	1
			Qty, - 01	
329	0516983		Gauges, Engine, Included With Pressure Controller, PUC	1
330	0005601		Throttle, Engine, Incl'd w/Press Controller	1
331	0739224		Indicator Light @ Pump Panel, Throttle Ready, Incl w/Pressure Gov/Throttle,Green	1
332	0549333		Indicators, Engine, Included with Pressure Controller	1
333	0553643		Control, Air Horn at Pmp Pnl, Red Switch, Momentary	1
334	0511078		Gauges, 4.00" Master, Class 1, 30"-0-600psi	1
335	0511100		Gauge, 2.00" Pressure, Class 1, 30"-0-400psi	1
336	0517009		Gauge, Water Level, Pierce, In pressure Controller, w/Mini Slave, PUC	1
			Activation, Water Level G - pg) pump in gear	
337	0604028		Water Level Gauge, FRC, MaxVision WLA280-A00 Programmable Remote Display	2
			Location - each side of the crew cab Qty, - 02 Activation, Water Level G - pg) pump in gear	
338	0062992		Gauge, Foam Level, (1) Tank, Class 1, GAAAR 5lt	1
339	0653081		Light, Pump Operator & Panel, Side Ctrl, PUC, 60354C LED Cab & LED OH Chr Cvr	1
340	0837255		Air Horns, (2) Grover, Rect Bell Stuttertone, Through Underslung Bumper Flange	1
			Finish, Air Horns - Grover, Black	
341	0606834		Location, Air Horns, Bumper, Each Side, Outside Frame, (Pos #2 & #6)	1
342	0016064		Control, Air Horn, Horn Ring, PS Push Button	1
343	0534828		Siren, Wln 295SL101, 100 or 200W Removable Mic	1
344	0790527		Location, Electronic Siren, Center Dash Switch Panel, Saber FR, Enf	1
			Location, Electronic Siren - Switch Panel # 13	
345	0076156		Control, Elec Siren, Head Only	1
346	0601306		Speaker, (1) Wln, SA315P, w/Pierce Polished Stainless Steel Grille, 100 watt	1
			Connection, Speaker - siren head	
347	0601565		Location, Speaker, Frt Bumper, Recessed, Center (Pos 4)	1
348	0895310		Siren, Federal Q2B	1
			Finish, Q2B Siren - Chrome	
349	0614368		Siren, Mechanical, Mounted Above Deckplate, Under Slung Bumper	1
			Location, Siren, Mech - b) right	
350	0748305		Control, Mech Siren, Multi Select	1
351	0748281		Control Mech Siren, Ft Sw RS	1
352	0748282		Control Mech Siren, Ft Sw LS	1
353	0740391		Sw, Siren Brake, Momentary Chrome Push Button, RS	1
354	0840108		Emergency Warning System	1
			Emergency Switching - Individual Switches	
355	0746353		Not Required, Warning Lights Intensity	1
356	0740422		Lightbar, Wln, Freedom IV-Q, 72", RRWRRR____RRRWRR, Lw Int	1
			Filter, Whl Freedom Ltbrs - No Filters	
357	0016380		No Additional Lights Req'd, Side Zone Upper	1
358	0825757		Lights, Front Zone, Hiviz FT-HVC-GSMJR-WN-**, 6lts Wrap Wrn Bzl, HVC	1
			Color, Lt DS Frnt Outside - Dual Red/White Color, Lt PS Frnt Outside - Dual Red/White Color, Lt DS Front Inside - Dual Red/White Color, Lt PS Front Inside - Dual Red/White	

Line	Option	Type	Option Description	Qty
358			Color, Lt DS Frnt Out Corner - Red/White Color, Lt PS Frnt Out Corner - Red/White	
359	0558676		Daytime Running Lights, Headlights, Vel/Imp, Enf/AXT-MUX, (Low Beam)	1
360	0653937		Flasher, Headlight Alternating Headlt flash deactivation - a)w/high beam	1
361	0806203	SP	Lights, Side Zone Lower, Wln M6*C LED, Clear Lens, 3pr, Lw Int Location, Lights Front Side - b)each side bumper Color, Lt Side Front - Red Color, Lt Side Middle - Red Color, Lt Side Rear - Red Location, Lights Mid Side - Over Front Wheels Location, Lights Rear Side - Over Rear Wheels	1
362	0746425		Lights, Rear Zn Lwr, Wln M6**, For Tail Lt Housing, Lw Int Color, Lens, LED's - Clear Color, Lt DS Rear - r) DS Rear Lt Red Color, Lt PS Rear - r) PS Rear Lt Red	1
363	0829424	SP	Lights, Rear/Side Up Zone, Wln M9R* Side (4), M9** Rear (4), 8lts Lw Int Color, Lens, LED's - Clear Color, Lt, Rear Upper DS - Red Color, Lt, Rear Upper PS - Red Color, Lt, Rear Lower DS - Red Color, Lt, Rear Lower PS - Red Color, Trim - Chrome Trim	1
364	0006551		Not Required, Lights, Rear Upper Zone Blocking	1
365	0590000		No Hose Bed Warn Lts Brkts Required, Lts On Hatch/Body Compts,PUC	1
366	0762435		Light, Traffic Directing, Wln TAL85, 46.87" Long LED, Lens Feature Activation, Traffic Dir L - Not Connected Color, Lens, LED's - c)clear	1
367	0806661		Location, TDL, Over Hose Bed, On Cross Tube (Not Included)	1
368	0530282		Location, Traf Dir Lt Controller, Overhead Switch Panel DS Right End	1
369	0781579		Receptacle, 15/20A 120V 3-Pr 3-Wr, NEMA 5-20R SB Dup, 1st, Interior Cab Qty, - 02 Location 1 - Back wall of each EMS compartment. AC Power Source - Shoreline Cover, Receptacle - Interior Red Plastic Wall Plates(s)	2
370	0519934		Not Required, Brand, Hydraulic Tool System	1
371	0649753		Not Required, PTO Driven Hydraulic Tool System	1
372	0007150		Bag of Nuts and Bolts Qty, Bag Nuts and Bolts - 1	1
373	0816508		NFPA Required Loose Equipment, Pumper, NFPA/ULC 2024, Provided by Fire Dept	1
374	0519913		Not Required, Soft Suction Hose	1
375	0027023		No Strainer Required	1
376	0816939		Extinguisher, Dry Chemical, NFPA 2024, Provided by Fire Department	1
377	0816937		Extinguisher, 2.5 Gal. Pressurized Water, NFPA/ULC 2024, Provided by Fire Dept	1
378	0816998		Axe, Flathead, Provided by Fire Department	1
379	0817000		Axe, Pickhead, Provided by Fire Department	1
380	0741569		Paint Process / Environmental Requirements, Appleton	1
381	0709566		Paint, Two-Tone Color, Enforcer Paint Color, Upper Area, Predefined - #10 White Shield, Cab - Standard Shield Paint Color, Lower Area, Predefined - #90 Red Paint Break, Cab - Standard Two-Tone Cab Break	1
382	0709845		Paint, Single Color, Body Paint, Body - Match Lower Cab	1
383	0646897		Paint Chassis Frame Assy, E-Coat, Standard Paint Color, Frame Assembly, Predefined - Standard Black	1
384	0693798		Paint, Front Wheels Paint, Wheels - Black #101	1
385	0693793		Paint, Rear Wheels, Single Axle Paint, Wheels - Black #101	1
386	0733739		Paint, Axle Hubs Paint, Axle Hub - Lower Job Color	1
387	0007230		Compartment, Painted, Spatter Gray	1

Line	Option	Type	Option Description	Qty
388	0544129		Reflective Band, 1"-6"-1"	1
			Color, Reflect Band - A - i) gold Color, Reflect Band - B - p) black Color, Reflect Band - C - ze) gold	
389	0077356		Reflective, Cab Face, Below the S/S Trim Band	1
390	0593732		Stripe, Chevron, Rear, Diamond Grade, Pumper, PUC	1
			Color, Rear Chevron DG - fluorescent yellow green	
391	0073811		Folded "Z" Ribbon in Reflective Stripe, Pair	2
			Location - front of body, one each side of truck. Qty, - 02	
392	0593225		Stripe, Reflective, Cab Doors Interior, Diamond Grade	1
			Color, Reflect Band - A - p) fluorescent yellow green diamond grade	
393	0027286		Not Required, Lettering Specs	1
394	0007472		[Lettering not Requested]	1
395	0583553		Undercoating, Cab & Body, Stock/Demo Style, Pumper, Ziebart	1
396	0772003		Manual, Fire Apparatus Parts, USB Flash Drive, Custom	1
			Qty, - 01	
397	0772037		Manual, Chassis Service, USB Flash Drive, Custom	1
			Qty, - 01	
398	0772065		Manual, Chassis Operation, (2) USB Flash Drives, Custom, English	1
399	0030008		Warranty, Basic, 1 Year, Apparatus, WA0008	1
400	0735523		Warranty, Engine, Paccar MX13, 5 Year, WA0386	1
401	0684953		Warranty, Steering Gear, Sheppard M110, 3 Year WA0201	1
402	0596017		Warranty, Frame, 50 Year, Custom Chassis, WA0013	1
403	0595698		Warranty, Axle, 3 Year, TAK-4, WA0050	1
404	0733306		Warranty, Single Axle, 5 Year, Meritor, General Service, WA0384	1
405	0652758		Warranty, ABS Brake System, 3 Year, Meritor Wabco, WA0232	1
406	0019914		Warranty, Structure, 10 Year, Custom Cab, WA0012	1
407	0744240		Warranty, Paint, 10 Year, Cab, Pro-Rate, WA0055	1
408	0524627		Warranty, Electronics, 5 Year, MUX, WA0014	1
409	0695416		Warranty, Pierce Camera System, WA0188	1
410	0647720		Warranty, Pierce LED Strip Lights, WA0203	1
411	0046369		Warranty, 5-year EVS Transmission, Standard Custom, WA0187	1
412	0685945		Warranty, Transmission Cooler, WA0216	1
413	0688798		Warranty, Water Tank, Lifetime, UPF, Poly Tank, WA0195	1
414	0596025		Warranty, Structure, 10 Year, Body, WA0009	1
415	0693127		Warranty, Gortite, Roll-up Door, 6 Year, WA0190	1
416	0889364		Warranty, Pump, Pierce, PUC-NG, 7 Year Parts, 1 Year Labor, WA0390	1
417	0648675		Warranty, 10 Year S/S Pumbing, WA0035	1
418	0657990		Warranty, Foam System, Husky 3, WA0231	1
419	0595820		Warranty, Paint, 10 Year, Body, Pro-Rate, WA0057	1
420	0593921		Not Required, Warranty, No Lettering	1
421	0596159		Warranty, Extended, 3 Year, Pierce Body, PUC Pump, WA0151	1
422	0596347		Warranty, Extended, 3 Year, Custom Chassis, Class M, WA0061	1
423	0819254		Certification, Vehicle Stability, CD0196	1
424	0808565		Certification, Engine Installation, Enf, Paccar MX, 2027	1
425	0686786		Certification, Power Steering, CD0098	1
426	0892691		Certification, Cab Integrity, Saber FR/Enforcer, CD0189	1
427	0631973		Certification, Cab Door Durability, Saber FR/Enforcer, CD0137	1
428	0631978		Certification, Windshield Wiper Durability, Saber FR/Enforcer, CD0132	1
429	0631974		Certification, Electric Window Durability, Saber FR/Enforcer, CD0133	1
430	0631977		Certification, Seat Belt Anchors and Mounting, Saber FR/Enforcer, CD0134	1
431	0735949		Certification, Cab HVAC System Performance, SFR/Enf, CD0165/CD0167/CD0174/CD0175	1
432	0545073		Amp Draw Report, NFPA Current Edition	1
433	0002758		Amp Draw, NFPA/ULC Radio Allowance	1
434	0799248		Appleton/Florida BTO	1
435	0000048		PUMPER/TANKER, 3rd Gen	1
436	0000012		PIERCE CHASSIS	1
437	0735525		PACCAR MX13 ENGINE	1
438	0046396		EVS 4000 Series TRANSMISSION	1
439	0520324		PIERCE PUMP, PUC	1

Line	Option	Type	Option Description	Qty
440	0020009		POLY TANK	1
441	0028048		FOAM SYSTEM	1
442	0020006		SIDE CONTROL	1
443	0020007		AKRON VALVES	1
444	0020015		ABS SYSTEM	1
445	0658751		PUMPER BASE	1

Proposal for **Albany International Airport**

Prepared by **Firematic Supply Co, Inc**

09/25/2026 Sourcewell contract 082025-PMI



Firematic Supply Co is pleased to submit a proposal to Albany International Airport for a **Pierce® multi purpose response vehicle** per your request for quotation. The following paragraphs will describe in detail the apparatus, construction methods, and equipment proposed. This proposal will indicate size, type, model and make of components parts and equipment, providing proof of compliance with each and every item (except where noted) in the departments advertised specifications.

PIERCE MANUFACTURING was founded in 1913. Since then, we have been building bodies with one philosophy, "BUILD THE FINEST". Our skilled craftsmen take pride in their work, which is reflected, in the final product. We have been building fire apparatus since the early "forties" giving Pierce Manufacturing over 110 years of experience in the fire apparatus market. Pierce Manufacturing has built and put into service more than 75,000 apparatus. Our Wisconsin facilities have over 1.6 million total square feet of floor space situated on approximately 162 acres of land. Our Bradenton, Florida facilities have 410,000 square feet of floor space situated on approximately 35 acres of land.

Our beliefs in high ethical standards are carried through in all of our commitments and to everyone with whom we do business. Honesty, Integrity, Accountability and Citizenship are global tenets by which we all live and work. Consequently, we neither engage in, nor have we ever been convicted of price fixing, bid rigging, or collusion in any domestic or international fire apparatus market.

Pierce has only one brand of fire apparatus "Pierce", ensuring you are receiving top of the line product that meets your specification.

In accordance with the current edition of applicable NFPA standards, this proposal will specify whether the fire department, manufacturer, or apparatus dealership will provide required loose equipment.

Images and illustrative material in this proposal are as accurate as known at the time of publication, but are subject to change without notice. Images and illustrative material is for reference only, and may include optional equipment and accessories and may not include all standard equipment.

GENERAL DESIGN AND CONSTRUCTION

To control quality, ensure compatibility, and provide a single source for service and warranty, the custom cab, chassis, pump module and body will be entirely designed, assembled/welded and painted in Pierce owned manufacturing facilities. This includes, but not limited to the cab weldment, the pumphouse module assembly, the chassis assembly, the body and the electrical system.

QUALITY AND WORKMANSHIP

Pierce has set the pace for quality and workmanship in the fire apparatus field. Our tradition of building the highest quality units with craftsmen second to none has been the rule right from the beginning and we demonstrate that ongoing commitment by: Ensuring all steel welding follows American Welding Society D1.1-2025 recommendations for structural steel welding. All aluminum welding follows American Welding society and ANSI D1.2-2014 requirements for structural welding of aluminum. All sheet metal welding follows American welding Society D1.3 2018 requirements for structural welding of sheet metal. Our flux core arc welding uses Hobart FabCO Excel-Arc 71, AWS A5.20, E71T1C/M and is performed to American Welding Society standards A5.20-E70T1. Furthermore, all employees classified as welders are tested and certified to meet the American welding Society codes upon hire. Pierce also employs an American Welding Society certified welding inspector in plant during working hours to monitor weld quality.

Pierce Manufacturing operates a Quality Management System under the requirements of ISO 9001. A copy of the certificate of compliance is included with this proposal.

In addition to the Quality Management system, we also employ a Quality Achievement Supplier program to ensure the vendors and suppliers that we utilize meet the high standards we demand. That is just part of our overall "Quality at the Source" program at Pierce.

To demonstrate the quality of our products and services, a list of at least fifteen (15) fire departments/municipalities that have purchased vehicles for a second time is provided.

DELIVERY

The apparatus will be delivered under its own power to ensure proper break-in of all components while the apparatus is still under warranty. A qualified delivery representative shall deliver the apparatus and remain for a sufficient length of time to instruct personnel in proper operation, care and maintenance of the equipment delivered.

MANUAL AND SERVICE INFORMATION

At time of delivery, complete operation and maintenance manuals covering the apparatus will be provided. A permanent plate will be mounted in the driver's compartment specifying the quantity and type of fluids required including engine oil, engine coolant, transmission, pump transmission lubrication, pump primer and drive axle.

SAFETY VIDEO

At the time of delivery Pierce will also provide one (1) 39-minute, professionally produced apparatus safety video, in DVD format. A link to the video is also available at www.Pierceparts.com. This video will address key safety considerations for personnel to follow when they are driving, operating, and maintaining the apparatus, including the following: vehicle pre-trip inspection, chassis operation, pump operation, aerial operation, and safety during maintenance.

PERFORMANCE TESTS

A road test will be conducted with the apparatus fully loaded and a continuous run of no less than ten (10) miles. During that time the apparatus will show no loss of power nor will it overheat. The transmission drive shaft or shafts and the axles will run quietly and be free of abnormal vibration or noise. The apparatus when fully loaded will not have less than 25 percent nor more than 50 percent on the front axle, and not less than 50 percent nor more than 75 percent on the rear axle. The apparatus will meet the current edition of applicable NFPA standards acceleration and braking requirements.

SERVICE AND WARRANTY SUPPORT

Pierce dealership support will be provided by Firematic Supply Co Inc by operating a Pierce authorized service center. The service center will have factory-trained mechanics on staff versed in Pierce fire apparatus. The service facility will be located within fifty (50) miles of the fire department.

In addition to the dealership, Pierce has service facilities located in both, Weyauwega, Wisconsin and Bradenton, Florida. Pierce also maintains a dedicated parts facility of over 100,000 square feet in Appleton, Wisconsin. The parts facility stocks in excess of $15,000,000 in parts dedicated to service and replacement parts. The parts facility employs a staff dedicated solely for the distribution and shipment of service and replacement parts.

Service parts for the apparatus being proposed can be found via Pierceparts.com which, is an interactive online tool that delivers information regarding your specific apparatus as well as the opportunity to register for training classes.

As a Pierce customer you have the ability to view the complete bill of materials for your specific apparatus, including assembly drawings, piece part drawings, and beneficial parts notations. You will also have the ability to search the complete Pierce item master through a parts search function which offers all Pierce SKU's and descriptions offered on all Pierce apparatus. Published component catalogs, which include proprietary systems along with an extensive operator's manual library is available for easy reference.

Pierce Manufacturing maintains a dedicated service and warranty staff of over 80 personnel dedicated to customer support. Technical support is available 24/7/365 via the toll free hot line and has four (4) on staff EVTs that offer hands-on repair and maintenance training classes multiple times a year.

LIABILITY

The successful bidder will defend any and all suits and assume all liability for the use of any patented process including any device or article forming a part of the apparatus or any appliance furnished under the contract.

INSURANCE PROVIDED BY BIDDER

Commercial General Liability Insurance

The successful bidder will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of commercial general liability insurance:

Each Occurrence:	$1,000,000
Products/Completed Operations Aggregate:	$1,000,000
Personal and Advertising Injury:	$1,000,000
General Aggregate;	$2,000,000

Coverage will be written on a Commercial General Liability form. The policy will be written on an occurrence form and will include Contractual Liability coverage for bodily injury and property damage subject to the terms and conditions of the policy. The policy will include Owner as an additional insured when required by written contract.

Commercial Automobile Liability Insurance

The successful bidder will, during the performance of the contract, keep in force at least the following minimum limits of commercial automobile liability insurance and coverage will be written on a Commercial Automobile liability form:

Each Accident Combined Single Limit:	$1,000,000

Umbrella/Excess Liability Insurance

The successful bidder will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of umbrella liability insurance:

Aggregate:	$3,000,000
Each Occurrence:	$3,000,000

The umbrella policy will be written on an occurrence basis and at a minimum provide excess to the bidder's General Liability and Automobile Liability policies.

The required limits can be provided by one (1) or more policies provided all other insurance requirements are met.

Coverage will be provided by a carrier(s) rated A- or better by A.M. Best.

All policies will provide a 30-day notice of cancellation to the named insured. The Certificate of Insurance will provide the following cancellation clause: Should any of the above described

polices be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

Bidder agrees to furnish owner with a current Certificate of Insurance with the coverages listed above along with the bid. The certificate will show the purchaser as certificate holder.

INSURANCE PROVIDED BY MANUFACTURER

Product Liability Insurance

The manufacturer will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of Product Liability insurance:

Each Occurrence:	$1,000,000
Products/Completed Operations Aggregate:	$1,000,000

Coverage will be written on a Commercial General Liability form. The policy will be written on an occurrence form. The manufacturer's policy will include the owner as additional insured when required by written contract between the Owner and a Pierce authorized dealer.

Umbrella/Excess Liability Insurance

The manufacturer will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of umbrella liability insurance:

Each Occurrence:	$25,000,000
Aggregate:	$25,000,000

The umbrella policy will be written on an occurrence basis and provide excess to the manufacturer's General Liability/Products policies.

The required limits can be provided by one (1) or more policies provided all other insurance requirements are met.

Coverage will be provided by a carrier(s) rated A- or better by A.M. Best.

All policies will provide a 30-day notice of cancellation to the named insured. The Certificate of Insurance will provide the following cancellation clause: Should any of the above described polices be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

Manufacturer agrees to furnish owner with a current Certificate of Insurance with the coverages listed above along with the bid. The certificate will show the purchaser as the certificate holder.

SINGLE SOURCE MANUFACTURER

Pierce Manufacturing, Inc. provides an integrated approach to the design and manufacture of our products that delivers superior apparatus and a dedicated support team. From our facilities, the chassis, cab weldment, cab, pumphouse (including the sheet metal enclosure, valve controls, piping and operators panel) and body will be entirely designed, tested, and hand assembled to the customer's exact specifications. The electrical system either hardwired or multiplexed, will be both designed and integrated by Pierce Manufacturing. The warranties relative to these major components (excluding component warranties such as engine, transmission, axles, pump, etc.) will be provided by Pierce as a single source manufacturer. Pierce's single source solution adds value by providing a fully engineered product that offers durability, reliability, maintainability, performance, and a high level of quality.

Your apparatus will be manufactured in Appleton, Wisconsin.

NFPA 2024 STANDARDS

This unit will comply with the NFPA standards effective January 1, 2024, except for fire department directed exceptions. These exceptions will be set forth in the Statement of Exceptions.

Certification of slip resistance of all stepping, standing and walking surfaces will be supplied with delivery of the apparatus.

All horizontal surfaces designated as a standing or walking surface that are greater than 48.00" above the ground must be defined by a 1.00" wide line along its outside perimeter. Perimeter markings and designated access paths to destination points will be identified on the customer approval print and are shown as approximate. Actual location(s) will be determined based on materials used and actual conditions at final build. Access paths may pass through hose storage areas and opening or removal of covers or restraints may be required. Access paths may require the operation of devices and equipment such as the aerial device or ladder rack.

A plate that is highly visible to the driver while seated will be provided. This plate will show the overall height, length, and gross vehicle weight rating.

The manufacturer will have programs in place for training, proficiency testing and performance for any staff involved with certifications.

An official of the company will designate, in writing, who is qualified to witness and certify test results.

NFPA COMPLIANCY

Apparatus proposed by the bidder will meet the applicable requirements of the National Fire Protection Association (NFPA) as stated in current edition at time of contract execution. Fire department's specifications that differ from NFPA specifications will be indicated in the proposal as "non-NFPA".

PUMP TEST

Underwriters Laboratory (UL) will test, approved, and certify the pump. The test results and the pump manufacturer's certification of hydrostatic test; the engine manufacturer's certified brake horsepower curve; and the pump manufacturer's record of pump construction details will be forwarded to the Fire Department.

GENERATOR TEST

If the unit has a generator, Underwriters Laboratory (UL) will test, approved, and certify the generator. The test results will be provided to the Fire Department at the time of delivery.

BREATHING AIR TEST

If the unit has breathing air, Pierce Manufacturing will draw an air sample from the air system and have the sample certified that the air quality meets the requirements of NFPA 1989, *Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection.*

VEHICLE INSPECTION PROGRAM CERTIFICATION

To ensure the vehicle is built to current NFPA 1900 standards, the apparatus, in its entirety, will be third-party, independent, audit-certified through Underwriters Laboratory (UL) that it is built and complies to all applicable standards in the current edition. The certification includes: all design, production, operational, and performance testing of not only the apparatus, but those components that are installed on the apparatus.

A placard will be affixed in the driver's side area stating the third party agency, the date, the standard and the certificate number of the whole vehicle audit.

BID BOND NOT REQUESTED

A bid bond will not be included. If requested, the following will apply:

All bidders will provide a bid bond as security for the bid in the form of a 5 percent bid bond to accompany their bid. This bid bond will be issued by a Surety Company who is listed on the U.S. Treasury Departments list of acceptable sureties as published in Department Circular 570. The bid bond will be issued by an authorized representative of the Surety Company and will be accompanied by a certified power of attorney dated on or before the date of bid. The bid bond will include language, which assures that the bidder/principal will give a bond or bonds as may be specified in the bidding or contract documents, with good and sufficient surety for the faithful performance of the contract, including the Basic One (1) Year Limited

Warranty, and for the prompt payment of labor and material furnished in the prosecution of the contract.

Notwithstanding any document or assertion to the contrary, any surety bond related to the sale of a vehicle will apply only to the Basic One (1) Year Limited Warranty for such vehicle. Any surety bond related to the sale of a vehicle will not apply to any other warranties that are included within this bid (OEM or otherwise) or to the warranties (if any) of any third party of any part, component, attachment or accessory that is incorporated into or attached to the vehicle. In the event of any contradiction or inconsistency between this provision and any other document or assertion, this provision will prevail.

PERFORMANCE BOND NOT REQUESTED

A performance bond will not be included. If requested at a later date, one will be provided to you for an additional cost and the following will apply:

The successful bidder will furnish a Performance and Payment bond (Bond) equal to 100 percent of the total contract amount within 30 days of the notice of award. Such Bond will be in a form acceptable to the Owner and issued by a surety company included within the Department of Treasury's Listing of Approved Sureties (Department Circular 570) with a minimum A.M. Best Financial Strength Rating of A and Size Category of XV. In the event of a bond issued by a surety of a lesser Size Category, a minimum Financial Strength rating of A+ is required.

Bidder and Bidder's surety agree that the Bond issued hereunder, whether expressly stated or not, also includes the surety's guarantee of the vehicle manufacturer's Bumper to Bumper warranty period included within this proposal. Owner agrees that the penal amount of this bond will be simultaneously amended to 25 percent of the total contract amount upon satisfactory acceptance and delivery of the vehicle(s) included herein. Notwithstanding anything contained within this contract to the contrary, the surety's liability for any warranties of any type will not exceed three (3) years from the date of such satisfactory acceptance and delivery, or the actual Bumper to Bumper warranty period, whichever is shorter.

Due to global supply chain constraints, any delivery date contained herein is a good faith estimate as of the date of this order/contract, and merely an approximation based on current information. Delivery updates will be made available, and a final firm delivery date will be provided as soon as possible.

If the Producer Price Index of Components for Manufacturing [www.bls.gov Series ID: WPUID6112] ("PPI") has increased at a compounded annual growth rate of 5 percent or more between the month Pierce accepts the order ("Order Month") and a month 14 months prior to the then predicted Ready For Pickup date ("Evaluation Month"), then pricing may be updated in an amount equal to the increase in PPI over 5 percent for each year or fractional year between the Order Month and the Evaluation Month.

The seller will document any such updated price for the customer's approval before proceeding and provide an option to cancel the order.

APPROVAL DRAWING

A drawing of the proposed apparatus will be prepared and provided to the purchaser for approval before construction begins. The Pierce sales representative will also be provided with a copy of the same drawing. The finalized and approved drawing will become part of the contract documents. This drawing will indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc.

A "revised" approval drawing of the apparatus will be prepared and submitted by Pierce to the purchaser showing any changes made to the approval drawing.

ELECTRICAL WIRING DIAGRAMS

Two (2) electrical wiring diagrams, prepared for the model of chassis and body, will be provided.

ENFORCER CHASSIS

The Pierce Enforcer™ is the custom chassis developed exclusively for the fire service. Chassis provided will be a new, tilt-type custom fire apparatus. The chassis will be manufactured in the apparatus body builder's facility eliminating any split responsibility. The chassis will be designed and manufactured for heavy-duty service, with adequate strength, capacity for the intended load to be sustained, and the type of service required. The chassis will be the manufacturer's first line tilt cab.

WHEELBASE

The wheelbase of the vehicle will be 194.00".

GVW RATING

The gross vehicle weight rating will be 46500.

FRAME

The chassis frame will be built with two (2) steel channels bolted to five (5) cross members or more, depending on other options of the apparatus. The side rails will have a 13.38" tall web over the front and mid sections of the chassis, with a continuous smooth taper to 10.75" over the rear axle. Each rail will have a section modulus of 25.992 cubic inches and a resisting bending moment (rbm) of 3,119,040 in-lb over the critical regions of the frame assembly, with a section modulus of 18.96 cubic inches with an rbm of 2,275,200 in-lb over the rear axle. The frame rails will be constructed of 120,000 psi yield strength heat-treated 0.38" thick steel with 3.50" wide flanges.

FRONT NON DRIVE AXLE

The Oshkosh TAK-4® front axle will be of the independent suspension design with a ground rating of 19,500 lb.

Upper and lower control arms will be used on each side of the axle. Upper control arm castings will be made of 100,000-psi yield strength 8630 steel and the lower control arm casting will be made of 55,000-psi yield ductile iron.

The center cross members and side plates will be constructed out of 80,000-psi yield strength steel.

Each control arm will be mounted to the center section using elastomer bushings. These rubber bushings will rotate on low friction plain bearings and be lubricated for life. Each bushing will also have a flange end to absorb longitudinal impact loads, reducing noise and vibrations.

There will be nine (9) grease fittings supplied, one (1) on each control arm pivot and one (1) on the steering gear extension.

The upper control arm will be shorter than the lower arm so that wheel end geometry provides positive camber when deflected below rated load and negative camber above rated load.

Camber at load will be zero degrees for optimum tire life.

The ball joint bearing will be of low friction design and be maintenance free.

Toe links that are adjustable for alignment of the wheel to the center of the chassis will be provided.

The wheel ends must have little to no bump steer when the chassis encounters a hole or obstacle.

The steering linkage will provide proper steering angles for the inside and outside wheel, based on the vehicle wheelbase.

The axle will have a turning angle of up to 45 degrees.

FRONT SUSPENSION

Front Oshkosh TAK-4™ independent suspension will be provided with a minimum ground rating of 19,500 lb.

The independent suspension system will be designed to provide maximum ride comfort. The design will allow the vehicle to travel at highway speeds over improved road surfaces and at moderate speeds over rough terrain with minimal transfer of road shock and vibration to the vehicle's crew compartment.

Each wheel will have torsion bar type spring. In addition, each front wheel end will also have energy absorbing jounce bumpers to prevent bottoming of the suspension.

The suspension design will be such that there is at least 10.00" of total wheel travel and a minimum of 3.75" before suspension bottoms.

The torsion bar anchor lock system allows for simple lean adjustments, without the use of shims. One can adjust for a lean within 15 minutes per side. Anchor adjustment design is such that it allows for ride height adjustment on each side.

The independent suspension was put through a durability test that simulated 140,000 miles of inner city driving.

FRONT SHOCK ABSORBERS

KONI heavy-duty telescoping shock absorbers will be provided on the front suspension.

FRONT OIL SEALS

Oil seals with viewing window will be provided on the front axle.

FRONT TIRES

Front tires will be Goodyear 425/65R22.50 radials, 20 ply Armor Max MSA, rated for 22,800 lb maximum axle load and 68 mph maximum speed.

The tires will be mounted on 22.50" x 12.25" steel disc type wheels with a ten (10)-stud, 11.25" bolt circle.

REAR AXLE

The rear axle will be a Meritor™, Model RS-26-185, with a capacity of 27,000 lb.

TOP SPEED OF VEHICLE

A rear axle ratio will be furnished to allow the vehicle to reach a top speed of 65 MPH / 104 KPH.

REAR SUSPENSION

The rear suspension will be Standens, semi-elliptical, 3.00" wide x 52.50" long, 12-leaf pack with a ground rating of 27,000 lb. The spring hangers will be castings.

The two (2) top leaves will wrap the forward spring hanger pin, and the rear of the spring will be a slipper style end that will ride in a rear slipper hanger.

A steel encased rubber bushing will be used in the spring eye. The steel encased rubber bushing will be maintenance free and require no lubrication.

REAR OIL SEALS

Oil seals will be provided on the rear axle(s).

REAR TIRES
The rear tires will be four (4) Goodyear Armor Max MSD, 12R22.50 radials, load range H, rated for 27,120 lb maximum axle load and 68 mph maximum speed.

The tires will be mounted on Accuride® 22.50" x 9.00" steel disc type wheels with a ten (10) stud, 11.25" bolt circle.

TIRE BALANCE
All tires will be balanced with Counteract balancing beads. The beads will be inserted into the tire and eliminate the need for wheel weights.

TIRE PRESSURE MANAGEMENT
There will be a RealWheels LED AirSecure™ tire alert pressure management system provided, that will monitor each tire's pressure. A sensor will be provided on the valve stem of each tire for a total of six (6) tires.

The sensor will calibrate to the tire pressure when installed on the valve stem for pressures between 10 and 200 psi. The sensor will activate an integral battery operated LED when the pressure of that tire drops 5 to 8 psi.

Removing the cap from the sensor will indicate the functionality of the sensor and battery. If the sensor and battery are in working condition, the LED will immediately start to flash.

CHROME LUG NUT COVERS
Chrome plastic lug nut covers will be supplied on front and rear wheels.

FRONT HUB COVERS
Stainless steel hub covers will be provided on the front axle. An oil level viewing window will be provided.

REAR HUB COVERS
A pair of stainless steel high hat hub covers will be provided on rear axle hubs.

MUD FLAPS
Mud flaps with a Pierce logo will be installed behind the front and rear wheels.

WHEEL CHOCKS
There will be one (1) pair of folding Ziamatic, Model SAC-44-E, aluminum alloy, Quick-Choc wheel blocks, with easy-grip handle provided.

Wheel Chock Brackets
There will be one (1) pair of Zico, Model SQCH-44-H, horizontal mounting wheel chock brackets provided for the Ziamatic, Model SAC-44-E, folding wheel chocks. The brackets will be made of aluminum and consist of a quick release spring loaded rod to hold the wheel

chocks in place. The brackets will be mounted one (1) forward and one (1) rearward of the left side rear tire.

ELECTRONIC STABILITY CONTROL

A vehicle control system will be provided as an integral part of the ABS brake system from Meritor Wabco.

The system will monitor and update the lateral acceleration of the vehicle and compare it to a critical threshold where a side roll event may occur. If the critical threshold is met, the vehicle control system will automatically reduce engine RPM, engage the engine retarder (if equipped), and selectively apply brakes to the individual wheel ends of the front and rear axles to reduce the possibility of a side roll event.

The system will monitor directional stability through a lateral accelerometer, steer angle sensor and yaw rate sensor. If spinout or drift out is detected, the vehicle control system will selectively apply brakes to the individual wheel ends of the front and rear axles to bring the vehicle back to its intended direction.

ANTI-LOCK BRAKE SYSTEM

The vehicle will be equipped with a Wabco 4S4M, anti-lock braking system. The ABS will provide a four (4) channel anti-lock braking control on both the front and rear wheels. A digitally controlled system that utilizes microprocessor technology will control the anti-lock braking system. Each wheel will be monitored by the system. When any wheel begins to lockup, a signal will be sent to the control unit. This control unit will then reduce the braking of that wheel for a fraction of a second and then reapply the brake. This anti-lock brake system will eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control.

AUTOMATIC TRACTION CONTROL

An anti-slip feature will be included with the ABS. The Automatic Traction Control will be used for traction in poor road and weather conditions. The Automatic Traction Control will act as an electronic differential lock that will not allow a driving wheel to spin, thereby supplying traction at all times. The ABS electronic control unit (ECU) will work with the engine ECU, sharing information concerning wheel slip. Engine ECU will use information to control engine speed, allowing only as much throttle application as required for the available traction, regardless of how much the driver is asking for. An "off road traction" switch will be provided on the instrument panel. Activation of the switch will allow additional tire slip to let the truck climb out and get on top of deep snow or mud.

BRAKES

The service brake system will be full air type.

The front brakes will be Knorr/Bendix disc type with a 17.00" ventilated rotor for improved stopping distance.

The brake system will be certified, third party inspected, for improved stopping distance.

The rear brakes will be Meritor™ 16.50" x 7.00" cam operated with automatic slack adjusters. Dust shields will be provided.

AIR COMPRESSOR, BRAKE SYSTEM

The air compressor will be a Wabco single piston compressor with a 26.8 CI displacement.

BRAKE SYSTEM

The brake system will include:

- Brake treadle valve
- Heated automatic moisture ejector on air dryer
- Total air system minimum capacity of 4,272 cubic inches
- Two (2) air pressure gauges with a red warning light and an audible alarm, that activates when air pressure falls below 60 psi
- Spring set parking brake system
- Parking brake operated by a push-pull style control valve
- A parking "brake on" indicator light on instrument panel
- Park brake relay/inversion and anti-compounding valve, in conjunction with a double check valve system, with an automatic spring brake application at 40 psi
- A pressure protection valve to prevent all air operated accessories from drawing air from the air system when the system pressure drops below 80 psi (550 kPa)
- 1/4 turn drain valves on each air tank

The air tank will be primed and painted to meet a minimum 750 hour salt spray test.

The air tanks will be painted same as frame color.

To reduce the effects of corrosion, the air tank will be mounted with stainless steel brackets.

BRAKE SYSTEM AIR DRYER

The air dryer will be WABCO System Saver 1200 with spin-on coalescing filter cartridge and 100 watt heater.

BRAKE LINES

Color-coded nylon brake lines will be provided. The lines will be wrapped in a heat protective loom in the chassis areas that are subject to excessive heat.

AIR INLET

One (1) air inlet with 3D series male coupling will be provided. It will allow station air to be supplied to the apparatus brake system through a shoreline hose. The inlet will be located forward in the driver side lower step well of cab. A check valve will be provided to prevent reverse flow of air. The inlet will discharge into the "wet" tank of the brake system. A mating female fitting will also be provided with the loose equipment.

ENGINE

The chassis will be powered by an electronically controlled engine as described below:

Make:	Paccar
Model:	MX
Power:	510 hp at 1600rpm
Torque:	1850 lb-ft at 1000rpm
Governed Speed:	1900 rpm
Emissions Certification:	EPA 2027
Fuel:	Diesel
Cylinders:	Six (6)
Displacement:	12.9L
Starter:	DP60
Fuel Filters:	Dual cartridge style with check valve, water separator, and water in fuel sensor

The engine will include On-board diagnostics (OBD), which provides self diagnostic and reporting. The system will give the owner or repair technician access to state of health information for various vehicle sub systems. The system will monitor vehicle systems, engine and after treatment. The system will illuminate a malfunction indicator light on the dash console if a problem is detected.

HIGH IDLE

A high idle switch will be provided, inside the cab, on the instrument panel, that will automatically maintain a preset engine rpm. A switch will be installed, at the cab instrument panel, for activation/deactivation.

The high idle will be operational only when the parking brake is on and the truck transmission is in neutral. A green indicator light will be provided, adjacent to the switch. The light will illuminate when the above conditions are met. The light will be labeled "OK to Engage High Idle."

ENGINE BRAKE

The compression release brake option is a fully integrated MX engine braking system. It utilizes the turbocharger and back pressure valve, but adds in a hydraulically operated compression brake to increase overall retarding power.

To maximize the effectiveness of the compression brake the MX engine brake system works in conjunction with the turbocharger and back pressure valve.

The driver will be able to turn the engine brake system on/off and have a high, medium and low setting.

CLUTCH FAN

A fan clutch will be provided. The fan clutch will be automatic when the pump transmission is in "Road" position, and constantly engaged when in "Pump" position.

ENGINE AIR INTAKE

The engine air intake will be located above the engine cooling package. It will draw fresh air from the front of the apparatus through the radiator grille.

The ember separator is designed to prevent road dirt and recirculating hot air from entering the engine.

The ember separator will be easily accessible by tilting the cab.

EXHAUST SYSTEM

The exhaust system will be stainless steel from the turbo to the engine's aftertreatment device. The exhaust system will include an aftertreatment device to meet current EPA standards. An insulation wrap will be provided on all exhaust pipe between the turbo and the aftertreatment device to minimize the transfer of heat to the cab.

The exhaust will terminate horizontally ahead of the right side rear wheels and will extend 2.00" past the body rub rail. The exhaust pipes will be aluminized steel.

There will be an aluminized steel exhaust diffuser with a standard straight tip on the end provided to reduce the temperature of the exhaust as it exits. Heat deflector shields will be provided to isolate chassis and body components from the heat of the tailpipe diffuser.

RADIATOR

The radiator and the complete cooling system will meet or exceed the current edition of applicable NFPA and engine manufacturer cooling system standards.

For maximum corrosion resistance and cooling performance, the entire radiator core will be constructed using long life aluminum alloy. The radiator core will consist of aluminum fins, having a serpentine design, brazed to aluminum tubes.

The radiator core will have a minimum front area of 1060 square inches.

Supply tank will be made of heavy duty glass-reinforced nylon and the return tank will be made of aluminum. Both tanks will be crimped onto the core assembly using header tabs and a compression gasket to complete the radiator core assembly. There will be a full steel frame around the inserts to enhance cooling system durability and reliability.

The radiator will be compatible with commercial antifreeze solutions.

The radiator assembly will be isolated from the chassis frame rails with rubber isolators to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven terrain.

The radiator will include a de-aeration/expansion tank. For visual coolant level inspection, the radiator will have a built-in sight glass. The radiator will be equipped with a 15 psi pressure relief cap.

A drain port will be located at the lowest point of the cooling system and/or the bottom of the radiator to permit complete flushing of the coolant from the system.

Shields or baffles will be provided to prevent recirculation of hot air to the inlet side of the radiator.

COOLANT LINES

Gates, or Goodyear, rubber hose will be used for all engine coolant lines installed by Pierce Manufacturing.

Hose clamps will be stainless steel constant torque type to prevent coolant leakage. They will expand and contract according to coolant system temperature thereby keeping a constant clamping pressure on the hose.

FUEL TANK

A 65 gallon fuel tank will be provided and mounted at the rear of the chassis. The tank will be constructed of 12-gauge, hot rolled steel. It will be equipped with swash partitions and a vent. To eliminate the effects of corrosion, the fuel tank will be mounted with stainless steel straps.

A 0.75" drain plug will be located in a low point of the tank for drainage.

A fill inlet will be provided and marked "Ultra Low Sulfur - Diesel Fuel Only." The fill inlet will be located adjacent to the air bottle storage behind a common door on the left hand side of the vehicle.

A 0.50" diameter vent will be installed from tank top to just below fuel fill inlet.

The fuel tank will meet all FHWA 393.67 requirements including a fill capacity of 95 percent of tank volume.

All fuel lines will be provided as recommended by the engine manufacturer.

DIESEL EXHAUST FLUID TANK

A 7.3 gallon diesel exhaust fluid (DEF) tank will be provided and mounted under the cab on the driver's side.

A fill inlet will be provided on the driver's side of the cab. The lift up door will be spring loaded and be painted.

FUEL FILL DOOR

Fuel fill door will be painted job color.

TRANSMISSION

An Allison 6th generation, Model EVS 4000P, electronic, torque converting, automatic transmission will be provided.

The transmission will be equipped with prognostics to monitor oil life, filter life, and transmission health. A wrench icon on the shift selector's digital display will indicate when service is due.

Two (2) PTO openings will be located on left side and top of converter housing (positions 8 o'clock and 1 o'clock).

A transmission temperature gauge with an amber light and buzzer will be installed on the cab instrument panel.

TRANSMISSION SHIFTER

A six (6)-speed push button shift module will be mounted to right of driver on console. Shift position indicator will be indirectly lit for after dark operation.

The transmission ratio will be:

1st	3.51 to 1.00
2nd	1.91 to 1.00
3rd	1.43 to 1.00
4th	1.00 to 1.00
5th	0.75 to 1.00
6th	0.64 to 1.00
R	4.80 to 1.00

TRANSMISSION PROGRAMMING
The transmission will be programmed to automatically shift the transmission to neutral when the parking brake is set to simplify operation and increase operational safety.

TRANSMISSION COOLER
A Modine plate and fin transmission oil cooler will be provided using engine coolant to control the transmission oil temperature.

DRIVELINE
Drivelines will be a heavy-duty metal tube and be equipped with Spicer® 1810 universal joints.

The shafts will be dynamically balanced before installation.

A splined slip joint will be provided in each driveshaft where the driveline design requires it. The slip joint will be coated with Glidecoat® or equivalent.

STEERING
Dual Sheppard, Model M110, steering gears, with integral heavy-duty power steering, will be provided. For reduced system temperatures, the power steering will incorporate an air to oil cooler and Paccar hydraulic pump with integral pressure and flow control. All power steering lines will have wire braded lines with crimped fittings.

A tilt and telescopic steering column will be provided to improve fit for a broader range of driver configurations.

STEERING WHEEL
The steering wheel will be 18.00" in diameter, have tilting and telescoping capabilities, and a four (4)-spoke design.

There will be a switch pod provided on the left side of the steering wheel between the spokes. The switch pods will be an integral part of the steering wheel.

The following switches will be provided:

- Windshield wash
- Wiper intermittent speed increase
- Wiper intermittent speed decrease
- Hi/Lo wiper speed
- Wiper off

BUMPER
A one (1)-piece bumper manufactured from 0.25" formed steel with a 0.38" bend radius will be provided. The bumper will be a minimum of 10.00" high with a 1.50" top and bottom flange.

The bumper will be 95.28" wide with 45 degree corners. The bumper will be metal finished and painted TBD.

The bumper will be extended 19.00" from front face of cab.

The bumper extension frame will be fabricated using 0.38" gussets welded to 2.00" x 5.00" steel tubing running front to back with 0.50" front and rear plates mounted to the chassis frame. Fabricated "U" shaped channel supports the weight of the bumper and provides the main strength in frontal crash. 0.25" steel is formed into "C" shaped backing plates for mounting of the bumper and providing protection to the cab.

The bumper extension's cross section is considered expendable, and a crush zone. The bumper is not intended for pushing other vehicles or objects.

Tow hooks/eyes located under the bumper extension are for straight pull only.

Center Hose Tray Restraint

There will be one (1) pair of hose tray restraint straps located over the center mounted tray.

The restraints will be a pair of 2.00" wide black nylon straps with Velcro® fasteners provided. The strap(s) will be used to secure the hose in the tray.

TOW HOOKS

Two (2) chromed steel tow hooks will be installed under the bumper and attached to the front frame members. The tow hooks will be designed and positioned to allow up to a 6,000 lb straight horizontal pull in line with the centerline of the vehicle. The tow hooks will not be used for lifting of the apparatus.

BUMPER TRAY

A 3/4 width bumper tray, constructed of smooth aluminum, will be located in the bumper extension.

The tray will be a bolted modular design, 8.25" deep.The tray will have capacity for 200' of 2.5" .

Black rubber grating will be provided at the bottom of the tray. Drain holes are also provided.

TRAY COVER

A bright aluminum treadplate cover will be provided over the underslung bumper tray. The cover will be raised 2.00" above the gravel pan.

The cover will extend over the entire tray.

The cover will be attached with a stainless steel hinge.

The cover will be secured with (2) two paddle latches in the closed position and pneumatic stay arm on each side and single mechanical stay arm will hold the cover in the open position.

BUMPER COVER NOTCH

There will be one (1) hose tray notch(es) provided for the bumper tray cover(s) located r/s by discharge . Each notch will allow hose to be pre-connected to front outlets.

FRONT BUMPER NOTCH

The front bumper will be notched for recessing of the Q2B siren. The notch will be designed so that the bumper is one (1) continuous piece. The notch will be welded in place for strength with a continuous top and bottom flange. All areas will be polished for appearance. The siren will be located left side of the bumper.

SWIVEL STOPS

Installed on the front bumper extension will be one (1) sets of stainless steel rods to limit the travel of a front outlet or inlet swivel. Two (2) stainless steel rods, for each application, will be threaded into the bumper deck and mounted right side .

FRONT BUMPER UL-LX COATING

Protective black UL-LX® coating will be provided on the outside exterior of the top front bumper flange. It will not be sprayed on the underside of the flange.

The lining will be properly installed by an authorized UL-LX dealer.

CAB

The Enforcer cab will be designed specifically for the fire service and manufactured by the chassis builder.

The cab will be built by the apparatus manufacturer in a facility located on the manufacturer's premises.

For reasons of structural integrity and enhanced occupant protection, the cab will be a heavy duty design, constructed to the following minimal standards.

The cab will have 12 main vertical structural members located in the A-pillar (front cab corner posts), B-pillar (side center posts), C-pillar (rear corner posts), and rear wall areas. The A-pillar will be constructed of solid A356-T5 aluminum castings. The B-pillar and C-pillar will be constructed from 0.13" wall extrusions. The rear wall will be constructed of two (2) 2.00" x 2.00" outer aluminum extrusions and two (2) 2.00" x 1.00" inner aluminum extrusions. All main vertical structural members will run from the floor to 4.625" x 3.864" x 0.090" thick roof extrusions to provide a cage-like structure with the A-pillar and roof extrusions being welded into a 0.25" thick corner casting at each of the front corners of the roof assembly.

The front of the cab will be constructed of a 0.13" firewall plate, covered with a minimum 0.090" front skin thickness, and reinforced with a full width x 0.50" thick cross-cab support located just below the windshield and fully welded to the engine tunnel. The cross-cab support will run the full width of the cab and weld to each A-pillar, the 0.13" firewall plate, and the front skin.

The cab floors will be constructed of 0.125" thick aluminum plate and reinforced at the firewall with an additional 0.375" thick cross-floor support providing a total thickness of 0.50" of structural material at the front floor area. The front floor area will also be supported with two (2) triangular 0.30" wall extrusions that also provides the mounting point for the cab lift. This tubing will run from the floor wireway of the cab to the engine tunnel side plates, creating the structure to support the forces created when lifting the cab.

The cab will be 96.00" wide (outside door skin to outside door skin) to maintain maximum maneuverability.

The centerline of front axle to the rear of the cab will be 70.00" long.

The forward cab section will have an overall height (from the cab roof to the ground) of approximately 99.00". The crew cab section will have a 10.00" raised roof, with an overall cab height of approximately 109.00". The overall height listed will be calculated based on a truck configuration with the lowest suspension weight rating, the smallest diameter tires for the suspension, no water weight, no loose equipment weight, and no personnel weight. Larger tires, wheels, and suspension will increase the overall height listed.

The floor to ceiling height inside the crew cab will be 63.50" in the forward facing outboard positions and 54.50" in the forward facing center position.

The crew cab floor will measure 46.00" from the rear wall to the back side of the rear facing seat risers.

The medium block engine tunnel, at the rearward highest point (knee level), will measure 61.50" to the rear wall. The big block engine tunnel will measure between 45.00" and 51.50" to the rear wall.

The crew cab will be a totally enclosed design with the interior area completely open to improve visibility and verbal communication between the occupants.

The cab will be a full tilt cab style.

A 3-point cab mount system with rubber isolators will improve ride quality by isolating chassis vibrations from the cab.

CAB ROOF DRIP RAIL

For enhanced protection from inclement weather, a drip rail will be furnished on the sides of the cab. The drip rail will be secured to the sides of the cab with a tape adhesive. The drip rail will extend the full length of the cab roof.

CAB PUMP ENCLOSURE

The rear of the cab will be made to house the fire pump below the forward facing crew cab seats. The cab side panels will be notched to accommodate the pump panel.

FENDER LINERS

Full circular inner fender liners in the wheel wells will be provided.

PANORAMIC WINDSHIELD



A one (1)-piece safety glass windshield will be provided with over 2,775 square inches of clear viewing area. The windshield will be full width and will provide the occupants with a panoramic view. The windshield will consist of three (3) layers: outer light, middle safety laminate, and inner light. The outer light layer will provide superior chip resistance. The middle safety laminate layer will prevent the windshield glass pieces from detaching in the event of breakage. The inner light will provide yet another chip resistant layer. The cab windshield will be bonded to the aluminum windshield frame using a urethane adhesive. A custom frit pattern will be applied on the outside perimeter of the windshield for a finished automotive appearance.

WINDSHIELD WIPERS



Three (3) electric windshield wipers with washer will be provided that meet FMVSS and SAE requirements.

The washer reservoir will be able to be filled without raising the cab.



[Washer Reservoir Location]

ENGINE TUNNEL

Engine hood side walls will be constructed of 0.375" aluminum. The top will be constructed of 0.125" aluminum and will be tapered at the top to allow for more driver and passenger elbow room.

The engine hood will be insulated for protection from heat and sound. The noise insulation keeps the dBA level within the limits stated in the current edition of applicable NFPA standards.

The engine tunnel will be no higher than 17.00" off the crew cab floor.

CAB INSULATION

The cab will include 1.00" insulation in the ceiling, 1.50" insulation in the side walls, a minimum of 1.00" insulation in the crew cab floor, and 2.00" insulation in the rear wall to maximize acoustic absorption and thermal insulation.

CAB REAR WALL EXTERIOR COVERING

The exterior surface of the rear wall of the cab will be overlaid with bright aluminum treadplate except for areas that are not typically visible when the cab is lowered. The treadplate will be coated with black Safe-Stride® non-slip surface treatment.

CAB LIFT

A hydraulic cab lift system will be provided consisting of an electric powered hydraulic pump, dual lift cylinders, and necessary hoses and valves.

Hydraulic pump will have a manual override for backup in the event of electrical failure.

Lift controls will be located on the right side pump panel or front area of the body in a convenient location.



The cab will be capable of tilting 43 degrees to accommodate engine maintenance and removal.



The cab will be locked down by a 2-point normally closed spring loaded hook type latch that fully engages after the cab has been lowered. The system will be hydraulically actuated to release the normally closed locks when the cab lift control is in the raised position and cab lift system is under pressure. When the cab is completely lowered and system pressure has been relieved, the spring loaded latch mechanisms will return to the normally closed and locked position.

The hydraulic cylinders will be equipped with a velocity fuse that protects the cab from accidentally descending when the control is located in the tilt position.

For increased safety, a redundant mechanical stay arm will be provided that must be manually put in place on the left side between the chassis and cab frame when the cab is in the raised position. This device will be manually stowed to its original position before the cab can be lowered.

Cab Lift Interlock

The cab lift system will be interlocked to the parking brake. The cab tilt mechanism will be active only when the parking brake is set and the ignition switch is in the on position. If the parking brake is released, the cab tilt mechanism will be disabled.

GRILLE

A bright finished aluminum mesh grille screen, inserted behind a bright finished grille surround, will be provided on the front center of the cab.

MIRRORS

A Retrac, Model 613422, dual vision, motorized, west coast style mirror with black finish will be mounted on each side of the front cab door with spring loaded retractable arms. The flat glass and convex glass will be heated and adjustable with remote control within reach of the driver.

The mirror arms will be painted black.

DOORS

To enhance entry and egress to the cab, the forward cab doors will be a minimum of 37.50" wide x 75.50" high. The crew cab doors will be located on the sides of the cab and will be constructed in the same manner as the forward cab doors. The crew cab door openings will be a minimum of 34.30" wide x 85.50" high.

The forward cab and crew cab doors will be constructed of extruded aluminum with a nominal material thickness of 0.093". The exterior door skins will be constructed from 0.090" aluminum.

A customized, vertical, pull-down type door handle will be provided on the exterior of each cab door. The finish of the door handle will be black/black. The exterior handle will be designed specifically for the fire service to prevent accidental activation and will provide 4.00" wide x 2.00" deep hand clearance for ease of use with heavy gloved hands.



[Exterior Door Handle]

Each door will also be provided with an interior flush, open style paddle handle that will be readily operable from fore and aft positions and designed to prevent accidental activation. The interior handles will provide 4.00" wide x 1.25" deep hand clearance for ease of use with heavy gloved hands.



[Interior Door Handle]

The cab doors will be provided with both interior (rotary knob) and exterior (keyed) locks exceeding FMVSS standards. The keys will be Model 751. The locks will be capable of activating when the doors are open or closed. The doors will remain locked if locks are activated when the doors are opened, then closed.

A full length, heavy duty, stainless steel, piano-type hinge with a 0.38" pin and 11 gauge leaf will be provided on all cab doors. There will be double automotive-type rubber seals around the perimeter of the door framing and door edges to ensure a weather-tight fit.

A chrome grab handle will be provided on the inside of each cab door for ease of entry.

A red webbed grab handle will be installed on the crew cab door stop strap. The grab handles will be securely mounted.

The cab steps at each cab door location will be located inside the cab doors to protect the steps from weather elements.

Door Panels
The inner cab door panels will be constructed out of brushed stainless steel.

ELECTRIC OPERATED CAB DOOR WINDOWS
All four (4) cab doors will be equipped with electric operated windows with one (1) flush mounted automotive style switch on each door. The driver's door will have four (4) switches, one (1) to control each door window.

Each switch will allow intermittent or auto down operation for ease of use. Auto down operation will be actuated by holding the window down switch for approximately 1 second.

CAB STEPS
The forward cab and crew cab access steps will be a full size two (2) step design to provide largest possible stepping surfaces for safe ingress and egress. The bottom steps will be designed with a grip pattern punched into bright aluminum treadplate material to provide support, slip resistance, and drainage. The bottom steps will be a bolt-in design to minimize repair costs should they need to be replaced. The forward cab steps will be a minimum 25.00" wide, and the crew cab steps will be 21.65" wide with a 10.00" minimum depth. The inside cab steps will not exceed 16.50" in height.





The vertical surfaces of the step well will be aluminum treadplate.

CAB EXTERIOR HANDRAILS
A Hansen 1.25" diameter slip-resistant, black anodized knurled aluminum handrail will be provided adjacent to each cab and crew cab door opening to assist during cab ingress and egress. Each handrail will be e-coated and have black powder coated stanchions.

STEP LIGHTS
There will be six (6) white LED step lights with black housing installed for cab and crew cab access steps.

- One (1) light for the left side cab access steps.
- Two (2) lights for the left side crew cab access steps.
- Two (2) lights for the right side crew cab access steps.
- One (1) light for the right side cab access step.

In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15" x 15" square placed ten (10) inches below the light and a minimum of 1.5 fc covering an entire 30" x 30" square at the same ten (10) inch distance below the light.

The lights will be activated when the battery switch is on and the adjacent door is opened.

FENDER CROWNS

Rubber fender crowns will be provided around the cab wheel openings.

Crowns will be black.

CREW CAB WINDOWS

One (1) fixed window with tinted glass will be provided on each side of the cab, to the rear of the front cab door. The windows will be sized to enhance light penetration into the cab interior. The windows will measure 18.70" wide x 23.75" high with chrome window trim.

RIGHT SIDE UPPER CREW CAB DOOR WINDOW TINT

The upper window in the right side crew cab door will be tinted medium gray.

RIGHT SIDE ROLLUP CREW CAB DOOR WINDOW TINT

The rollup window in the right side crew cab door will be tinted medium gray.

LEFT SIDE UPPER CREW CAB DOOR WINDOW TINT

The upper window in the left side crew cab door will be tinted medium gray.

BEHIND RIGHT SIDE CAB DOOR WINDOW TINT

The window behind the right side front cab door will be tinted medium gray.

BEHIND LEFT SIDE CAB DOOR WINDOW TINT

The window behind the left side front cab door will be tinted medium gray.

LEFT SIDE ROLLUP CREW CAB DOOR WINDOW TINT

The rollup window in the left side crew cab door will be tinted medium gray.

BLACK WINDOW TRIM

The chrome locking trim in all the windows will be replaced by a solid black, rubber trim.

WINDOW PROTECTOR BARS, CREW CAB DOORS

A knurled window protector bar will be installed on each crew cab door, 2.00" above the bottom of the window opening. The bar will extend from the front of the crew cab door to the rear of the crew cab door, mounted as close to the door frame as possible. The ends will be angled 45 degrees.

CAB DASH

The driver side dash, switch panel located to the right of the driver, and center console will be an easily removable high impact resistant polymer cover.

The instrument gauge cluster will be surrounded with a high impact ABS plastic contoured to the same shape of the instrument gauge cluster.

The officer side dash will be a flat top design with an upper beveled edge to provide easy maintenance and will be constructed out of aluminum and painted to match the cab interior.

MOUNTING PLATE ON ENGINE TUNNEL

Equipment installation provisions will be installed on the engine tunnel.

A 0.25" smooth aluminum plate will be bolted to the top surface of the engine tunnel. The plate will follow the contour of the engine tunnel and will run the entire length of the engine tunnel. The plate will be spaced off the engine tunnel .50" to allow for wire routing below the plate.

The mounting surface will be painted to match the cab interior.

CAB INTERIOR

The cab interior will be constructed of primarily metal (painted aluminum) to withstand the severe duty cycles of the fire service.

The engine tunnel will be painted aluminum to match the cab interior.

The headliner will be installed in both forward and rear cab sections.The headliner will be constructed of aluminum and painted to match the cab interior.

Forward portion of cab headliner will permit easy access for service of electrical wiring or other maintenance needs.

All wiring will be placed in metal raceways.

CAB INTERIOR PAINT

The cab interior metal surfaces, excluding the rear heater panels, will be painted fire smoke gray, vinyl texture paint.

The rear heater panels will be painted black, vinyl textured paint.

CAB FLOOR

A small blister will be provided at the rear of the engine tunnel for chassis components.

The cab and crew cab floor areas will be covered with Polydamp™ acoustical floor mat consisting of a black pyramid rubber facing and closed cell foam decoupler.

The top surface of the material has a series of raised pyramid shapes evenly spaced, which offer a superior grip surface. Additionally, the material has a 0.25" thick closed cell foam (no water absorption) which offers a sound dampening material for reducing sound levels.

DEFROST/AIR CONDITIONING SYSTEM

A ceiling mounted combination heater, defroster and air conditioning system will be installed in the cab above the engine tunnel area.

Cab Defroster

A 54,000 BTU heater-defroster unit with 690 SCFM of air flow will be provided inside the cab. The heater-defrost will be installed in the forward portion of the cab ceiling. Air outlets will be strategically located in the cab header extrusion per the following:

- One (1) adjustable will be directed towards the left side cab window
- One (1) adjustable will be directed towards the right side cab window
- Six (6) fixed outlets will be directed at the windshield

The defroster will be capable of clearing 98 percent of the windshield and side glass when tested under conditions where the cab has been cold soaked at 0 degrees Fahrenheit for 10 hours, and a 2 ounce per square inch layer of frost/ice has been able to build up on the exterior windshield. The defroster system will meet or exceed SAE J382 requirements.

Cab/Crew Auxiliary Heater

There will be one (1) 31,000 BTU auxiliary heater with 560 SCFM of air flow provided in each outboard rear facing seat riser with a dual scroll blower. An aluminum plenum incorporated into the cab structure to be used to transfer heat to the forward positions.

Air Conditioning

A 13.10 cubic inch compressor will be installed on the engine.

A roof-mounted condenser with a 78,000 BTU output at 2,400 SCFM that meets and exceeds the performance specification will be installed on the cab roof. The condenser cover to be painted to match the cab roof.

The air conditioning system will be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 75 degrees Fahrenheit at 50 percent relative humidity within 30 minutes. The cooling performance test will be run only after the cab has been heat soaked at 100 degrees Fahrenheit for a minimum of 4 hours.

The evaporator unit will be installed in the rear portion of the cab ceiling over the engine tunnel. The evaporator will include one (1) high performance heating core, one (1) high performance cooling core with (1) plenum directed to the front and one (1) plenum directed to the rear of the cab. The rear plenum will be covered with a metal cover painted to match the cab interior.

The evaporator unit will have a 52,000 BTU at 690 SCFM rating that meets and exceeds the performance specifications.

Adjustable air outlets will be strategically located on the forward plenum cover per the following:

- Four (4) will be directed towards the seating position on the left side of the cab
- Four (4) will be directed towards the seating position on the right side of the cab

Adjustable air outlets will be strategically located on the rear plenum cover per the following:

- Minimum of five (5) will be directed towards crew cab area

A high efficiency particulate air (HEPA) filter will be included for the system. Access to the filter cover will be hinged with two (2) thumb latches.

The air conditioner refrigerant will be R-134A and will be installed by a certified technician.

Climate Control

An automotive style controller will be provided to control the heat and air conditioning system within the cab. The controller will have three (3) functional knobs for fan speed, temperature, and air flow distribution (front to rear) control.

The system will control the temperature of the cab and crew cab automatically by pushing the center of the fan speed control knob. Rotate the center temperature control knob to set the cab and crew cab temperature.

The AC system will be manually activated by pushing the center of the temperature control knob. Pushing the center of the air flow distribution knob will engage the AC for max defrost, setting the fan speeds to 100 percent and directing all air flow to the overhead forward position.

The system controller will be located within panel position #12.

Gravity Drain Tubes

Two (2) condensate drain tubes will be provided for the air conditioning evaporator. The drip pan will have two (2) drain tubes plumbed separately to allow for the condensate to exit the drip pan. No pumps will be provided.

SUN VISORS

Two (2) smoked Lexan™ sun visors will be provided. The sun visors will be located above the windshield with one (1) mounted on each side of the cab.

There will be a black plastic thumb latch provided to help secure each sun visor in the stowed position.

GRAB HANDLE

A black rubber covered grab handle will be mounted on the door post of the driver and officer's side cab door to assist in entering the cab. The officer's side grab handle will be mounted on the lower portion of the door post. The grab handle will be securely mounted to the post area between the door and windshield.

ENGINE COMPARTMENT LIGHTS

There will be one (1) Whelen®, Model 3SC0CDCR, 12 volt DC, 3.00" white LED light(s) with Model 3FLANGEC, chrome flange kit(s) installed under the cab to be used as engine compartment illumination.

These light(s) will be activated automatically when the cab is raised or when the dip stick door is opened.

ACCESS TO ENGINE DIPSTICKS



For access to the engine oil and transmission fluid dipsticks, there will be a door on the engine tunnel, inside the crew cab. The door will be on the rear wall of the engine tunnel, on the vertical surface.

The engine oil dipstick will allow for checking only. The transmission dipstick will allow for both checking and filling.

The door will have a rubber seal for thermal and acoustic insulation. One (1) flush lift and turn latch will be provided on the access door.

SEATING CAPACITY

The seating capacity of the vehicle (including tiller cab and belted seat positions in the rescue body) will be four (4).

DRIVER SEAT

A seat will be provided in the cab for the driver. The seat design will be a cam action type, with air suspension. For increased convenience, the seat will include a manual control to adjust the horizontal position (6.00" travel). The manual horizontal control will be a towel-bar style located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat will have an adjustable reclining back. The seat back will be a high back style with side bolster pads for maximum support. For optimal comfort, the seat will be provided with 17.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat will be furnished with a 3-point, shoulder type seat belt.

OFFICER SEAT

A seat will be provided in the cab for the passenger. The seat will be a cam action type with air suspension. For optimal comfort, the seat will be provided with a 17.00" deep foam cushion designed with EVC (elastomeric vibration control).

The seat back will be an SCBA back style with a 5 degree fixed recline angle. The SCBA cavity will be adjustable from front to rear in 1.00" increments to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will be furnished with a 3-point, shoulder type seat belt.

REAR FACING DRIVER SIDE OUTBOARD SEAT

There will be one (1) rear facing seat provided at the driver side outboard position in the crew cab. For optimal comfort, the seat will be provided with 15.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat back will be an SCBA back style with 5 degree fixed recline angle. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will be furnished with a 3-point, shoulder type seat belt.

REAR FACING PASSENGER SIDE OUTBOARD SEAT

There will be one (1) rear facing seat provided at the passenger side outboard position in the crew cab. For optimal comfort, the seat will be provided with 15.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat back will be an SCBA back style with 5 degree fixed recline angle. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will be furnished with a 3-point, shoulder type seat belt.

FORWARD FACING CENTER CABINET

A forward facing cabinet will be provided in the crew cab at the center position.

The cabinet will be 32.00" wide x 50.00" high x 20.00" deep with one (1) Gortite rollup door with satin anodized finish, non-locking. The frame to frame opening of the cabinet will be 29.50" wide x 44.75" high. The minimum clear door opening will be 26.75" wide x 38.87" high.

CLEAR DOOR OPENINGS (F-F = Frame to Frame)					
AMDOR		GORTITE		ROM	
HORIZONTAL	VERTICAL	HORIZONTAL	VERTICAL	HORIZONTAL	VERTICAL
Subtract 2.00" from F-F	Subtract 5.88" from F-F	Subtract 2.75" from F-F	Subtract 4.75" from F-F	Subtract 2.56" from F-F	Subtract 4.50" from F-F

The cabinet will include two (2) infinitely adjustable shelves with a 0.75" up-turned lippainted to match the cab interior.

The cabinet will include no louvers.

The cabinet will be constructed of smooth aluminum, and painted to match the cab interior.

Cabinet Light

There will be one (1) white LED strip light installed on the left side of the interior cabinet door opening and one (1) white LED strip light installed on the right side of the interior cabinet door opening. The lighting will be controlled by an automatic door switch.

SEAT UPHOLSTERY

All seat upholstery will be black Turnout Tuff material.

AIR BOTTLE HOLDERS

All SCBA type seats in the cab will have a "Hands-Free" auto clamp style bracket in its backrest. For efficiency and convenience, the bracket will include an automatic spring clamp that allows the occupant to store the SCBA bottle by simply pushing it into the seat back. For protection of all occupants in the cab, in the event of an accident, the inertial components within the clamp will constrain the SCBA bottle in the seat and will exceed the NFPA standard of 9G.

There will be a quantity of three (3) SCBA brackets.

SEAT BELTS

All cab and tiller cab (if applicable) seating positions will have red seat belts. To provide quick, easy use for occupants wearing bunker gear, the female buckle and seat belt webbing length will meet or exceed the current edition of applicable NFPA and CAN/ULC - S515 standards.

The 3-point shoulder type seat belts will include height adjustment. This adjustment will optimize the belts effectiveness and comfort for the seated firefighter. The 3-point shoulder type seat belts will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

The 3-point shoulder type belts will also include the ReadyReach® D-loop assembly to the shoulder belt system. The ReadyReach feature adds an extender arm to the D-loop location placing the D-loop in a closer, easier to reach location.

Any flip up seats will include 3-point shoulder type belts only.

To ensure safe operation, the seats will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled.

HELMET STORAGE PROVIDED BY FIRE DEPARTMENT

NFPA 1900, 2024 edition, section 11.1.8.4.1 and CAN/ULC 515:2024 edition, section 5.2, requires a location for helmet storage be provided.

There is no helmet storage on the apparatus as manufactured. The fire department will provide a location for storage of helmets.

CAB DOME LIGHTS

There will be four (4) dual LED dome lights with grey bezels provided. Two (2) lights will be mounted above the inside shoulder of the driver and officer and two (2) lights will be installed and located, one (1) on each side of the crew cab.

The color of the LED's will be red and white.

The white LED's will be controlled by the door switches and the lens switch.

The color LED's will be controlled by the lens switch.

All dome lights on the apparatus will be illuminated per the current edition of applicable NFPA standards per seating position.

ENHANCED SOFTWARE FOR CAB AND CREW CAB DOME LIGHTS

The cab and crew cab dome lights will remain on for 10 seconds for improved visibility after the doors are closed.

The dome lights will dim after 10 seconds or immediately if the vehicle's transmission is put into gear.

PORTABLE HAND LIGHTS PROVIDED BY FIRE DEPARTMENT

The hand lights are not on the apparatus as manufactured. The fire department will provide and mount these hand lights.

CAB INSTRUMENTATION

The cab instrument panel includes gauges, an LCD display, telltale indicator lamps, control switches, alarms, and a diagnostic panel. The function of the instrument panel controls and switches will be identified by a label adjacent to each item. Actuation of the headlight switch will illuminate the labels in low light conditions. Telltale indicator lamps will not be illuminated unless necessary. The cab instruments and controls will be conveniently located within the forward cab section, forward of the driver. The gauge assembly and switch panels are designed to be removable for ease of service and low cost of ownership.

Gauges

The gauge panel will include the following ten (10) black faced gauges with black bezels to monitor vehicle performance:

- Voltmeter gauge (volts):
  - Low volts (11.8 VDC)
    - Amber caution indicator on the information center with intermittent alarm
    - Amber caution light on gauge assembly
  - High volts (15.5 VDC)
    - Amber caution indicator on the information center with intermittent alarm
    - Amber caution light on gauge assembly
  - Very low volts (11.3 VDC)
    - Red warning indicator on the information center with a steady alarm
    - Amber caution light on gauge assembly
  - Very high volts (16.0 VDC)
    - Red warning indicator on the information center with a steady alarm
    - Amber caution light on gauge assembly
- Engine Tachometer (RPM)
- Speedometer MPH (Major Scale), KM/H (Minor Scale)
- Fuel level gauge (Empty - Full in fractions):
  - Low fuel (1/8 full)
    - Amber caution indicator on the information center with intermittent alarm
    - Amber caution light on gauge assembly
  - Very low fuel (1/32 full)
    - Red caution indicator on the information center with steady alarm
    - Amber caution light on gauge assembly
- Engine Oil pressure Gauge (PSI):
  - Low oil pressure to activate engine warning lights and alarms
    - Red caution indicator on the information center with steady alarm
    - Amber caution light on gauge assembly
- Front Air Pressure Gauges (PSI):
  - Low air pressure to activate warning lights and alarm
    - Red warning indicator on the information center with a steady alarm
    - Amber caution light on gauge assembly
- Rear Air Pressure Gauges (PSI):
  - Low air pressure to activate warning lights and alarm
    - Red warning indicator on the information center with a steady alarm
    - Amber caution light on gauge assembly
- Transmission Oil Temperature Gauge (Fahrenheit):
  - High transmission oil temperature activates warning lights and alarm

        - Amber caution indicator on the information center with intermittent alarm
        - Amber caution light on gauge assembly
- Engine Coolant Temperature Gauge (Fahrenheit):
    - High engine temperature activates an engine warning light and alarms
        - Amber caution indicator on the information center with intermittent alarm
        - Amber caution light on gauge assembly
- Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions):
    - Low fluid (1/8 full)
        - Amber indicator light in gauge dial

All gauges will perform prove out at initial power-up to ensure proper performance.

Indicator Lamps

To promote safety, the following telltale indicator lamps will be located on the instrument panel in clear view of the driver. The indicator lamps will be "dead-front" design that is only visible when active. The colored indicator lights will have descriptive text or symbols.

The following amber telltale lamps will be present:

- Low coolant
- Trac cntl (traction control) (where applicable)
- Check engine
- Check trans (check transmission
- Aux brake overheat (Auxiliary brake overheat)
- Air rest (air restriction)
- Caution (triangle symbol)
- Water in fuel
- DPF (engine diesel particulate filter regeneration)
- Trailer ABS (where applicable)
- Wait to start (where applicable)
- HET (engine high exhaust temperature) (where applicable)
- ABS (antilock brake system)
- MIL (engine emissions system malfunction indicator lamp) (where applicable)
- Side roll fault (where applicable)
- Front air bag fault (where applicable)

The following red telltale lamps will be present:

- Warning (stop sign symbol)
- Seat belt
- Parking brake
- Stop engine

- Rack down

The following green telltale lamps will be provided:

- Left turn
- Right turn
- Battery on

The following blue telltale lamp will be provided:

- High beam

Alarms

Audible steady tone warning alarm: A steady audible tone alarm will be provided whenever a warning message is present.

Audible pulsing tone caution alarm: A pulsing audible tone alarm (chime/chirp) will be provided whenever a caution message is present without a warning message being present.

Alarm silence: Any active audible alarm will be able to be silenced by holding the ignition switch at the top position for three (3) to five (5) seconds. For improved safety, silenced audible alarms will intermittently chirp every 30 seconds until the alarm condition no longer exists. The intermittent chirp will act as a reminder to the operator that a caution or warning condition still exists. Any new warning or caution condition will enable the steady or pulsing tones respectively.

Indicator Lamp and Alarm Prove-Out

A system will be provided which automatically tests telltale indicator lights and alarms located on the cab instrument panel. Telltale indicators and alarms will perform prove-out at initial power-up to ensure proper performance.

Control Switches

For ease of use, the following controls will be provided immediately adjacent to the cab instrument panel within easy reach of the driver. All switches will have backlit labels for low light applications.

Headlight/Parking light switch: A three (3)-position maintained rocker switch will be provided. The first switch position will deactivate all parking and headlights. The second switch position will activate the parking lights. The third switch will activate the headlights.

Panel back lighting intensity control switch: A three (3)-position momentary rocker switch will be provided. Pressing the top half of the switch, "Panel Up" increases the panel back lighting intensity and pressing the bottom half of the switch, "Panel Down" decreases the panel back lighting intensity. Pressing the half or bottom half of the switch several times will allow back

lighting intensity to be gradually varied from minimum to maximum intensity level for ease of use.

Ignition switch: A three (3)-position maintained/momentary rocker switch will be provided. The first switch position will turn off and deactivate vehicle ignition. The second switch position will activate vehicle ignition and will perform prove-out on the telltale indicators and alarms for 3 to 5 seconds after the switch is turned on. A green indicator lamp is activated with vehicle ignition. The third momentary position will temporarily silence all active cab alarms. An alarm "chirp" may continue as long as alarm condition exists. Switching ignition to off position will terminate the alarm silence feature and reset function of cab alarm system.

Engine start switch: A two (2)-position momentary rocker switch will be provided. The first switch position is the default switch position. The second switch position will activate the vehicle's engine. The switch actuator is designed to prevent accidental activation.

Hazard switch will be provided on the instrument panel or on the steering column.

Heater, defroster, and air conditioning control panel.

Turn signal arm: A self-canceling turn signal with high beam headlight controls will be provided.

Windshield wiper control will have high, low and intermittent modes.

Parking brake control: An air actuated push/pull park brake control valve will be provided.

Chassis horn control: Activation of the chassis horn control will be provided through the center of the steering wheel.

High idle engagement switch: A momentary rocker switch with integral indicator lamp will be provided. The switch will activate and deactivate the high idle function. The "OK To Engage High Idle" indicator lamp must be active for the high idle function to engage. A green indicator lamp integral to the high idle engagement switch will indicate when the high idle function is engaged.

"OK To Engage High Idle" indicator lamp: A green indicator light will be provided next to the high idle activation switch to indicate that the interlocks have been met to allow high idle engagement.

Custom Switch Panels

The design of cab instrumentation will allow for emergency lighting and other switches to be placed within easy reach of the operator thus improving safety. There will be positions for up to four (4) switch panels in the lower instrument console and up to six (6) switch panels in the overhead visor console. All switches have backlit labels for low light conditions.





Diagnostic Panel

A diagnostic panel will be accessible while standing on the ground and located inside the driver's side door left of the steering column. The diagnostic panel will allow diagnostic tools such as computers to connect to various vehicle systems for improved troubleshooting providing a lower cost of ownership. Diagnostic switches will allow ABS systems to provide blink codes should a problem exist.

The diagnostic panel will include the following:

- Engine diagnostic port
- Transmission diagnostic port
- ABS diagnostic port
- Roll sensor diagnostic port
- Command Zone USB diagnostic port
- ABS diagnostic switch (blink codes flashed on ABS telltale indicator)
- Diesel particulate filter regeneration switch (where applicable)
- Diesel particulate filter regeneration inhibit switch (where applicable)

Cab LCD Display

A digital four (4)-row by 20-character dot matrix display will be integral to the gauge panel. The display will be capable of showing simple graphical images as well as text. The display will be split into three (3) sections. Each section will have a dedicated function. The upper left section will display the outside ambient temperature.

The upper right section will display the following, along with other configuration specific information:

- Odometer
- Trip mileage
- PTO hours
- Fuel consumption
- Engine hours

The bottom section will display INFO, CAUTION, and WARNING messages. Text messages will automatically activate to describe the cause of an audible caution or warning alarm. The LCD will be capable of displaying multiple text messages should more than one caution or warning condition exist.

AIR RESTRICTION INDICATOR

A high air restriction warning indicator light LCD message with amber warning indicator and audible alarm will be provided.

"DO NOT MOVE APPARATUS" INDICATOR

A flashing red indicator light, located in the driving compartment, will be illuminated automatically per the current NFPA requirements. The light will be labeled "Do Not Move Apparatus If Light Is On."

The same circuit that activates the Do Not Move Apparatus indicator will activate a pulsing alarm when the parking brake is released.

DO NOT MOVE TRUCK MESSAGES

Messages will be displayed on the Command Zone™, color display located within sight of the driver whenever the Do Not Move Truck light is active. The messages will designate the item or items not in the stowed for vehicle travel position (parking brake disengaged).

The following messages will be displayed (where applicable):

- Do Not Move Truck
- DS Cab Door Open (Driver Side Cab Door Open)
- PS Cab Door Open (Passenger's Side Cab Door Open)
- DS Crew Cab Door Open (Driver Side Crew Cab Door Open)

- PS Crew Cab Door Open (Passenger's Side Crew Cab Door Open)
- DS Body Door Open (Driver Side Body Door Open)
- PS Body Door Open (Passenger's Side Body Door Open)
- Rear Body Door Open
- DS Ladder Rack Down (Driver Side Ladder Rack Down)
- PS Ladder Rack Down (Passenger Side Ladder Rack Down)
- Deck Gun Not Stowed
- Lt Tower Not Stowed (Light Tower Not Stowed)
- Fold Tank Not Stowed (Fold-A-Tank Not Stowed)
- Aerial Not Stowed (Aerial Device Not Stowed)
- Stabilizer Not Stowed
- Steps Not Stowed
- Handrail Not Stowed

Any other device that is opened, extended, or deployed that creates a hazard or is likely to cause major damage to the apparatus if the apparatus is moved will be displayed as a caution message after the parking brake is disengaged.

SWITCH PANELS

The emergency light switch panel will have a master switch for ease of use plus individual switches for selective control. Each switch panel will contain eight (8) membrane-type switches each rated for one million (1,000,000) cycles. Panels containing less than eight (8) switch assignments will include non-functioning black appliqués. The built-in switch panels will be located in the lower console or overhead console of the cab.

Additional switch panel(s) will be located in the overhead position(s) above the windshield or in designated locations on the lower instrument panel layout.

The switches will be membrane-type and also act as an integral indicator light. For quick, visual indication the entire surface of the switch will be illuminated white whenever back lighting is activated and illuminated green whenever the switch is active. An active illuminated switch will flash when interlock requirements are not met or device is actively being load managed. For ease of use, a two (2)-ply, scratch resistant laser engraved Gravoply label indicating the use of each switch will be placed in the center of the switch. The label will allow light to pass through the letters for ease of use in low light conditions.

WIPER CONTROL

Wiper control will consist of a two (2)-speed windshield wiper control with intermittent feature and windshield washer controls. The control will be located in the left hand pod of the steering wheel.

CAB USB

There will be four (4) USB terminations with a combination USB type A & C wired to battery direct power and provided per the following:

- One (1) within reach of the driver
- One (1) within reach of the passenger
- Two (2) on the rear of the engine tunnel, one (1) each side.

Battery direct loads cannot be load managed.

SPARE CIRCUIT

There will be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

The wires will have the following features:

- The positive wire will be connected directly to the battery power.
- The negative wire will be connected to ground.
- Wires will be capable of carrying 15 amps.
- Power and ground will terminate behind officer seat.
- Termination will be with a 10-place bus bar with screws and removable cover.
- Wires will be protected to meet the NFPA Automotive Fire Apparatus standard.

Battery direct loads cannot be Load Managed.

INFORMATION CENTER

An information center employing a 7.00" diagonal touch screen color LCD display will be encased in an ABS plastic housing.

The information center will have the following specifications:

- Operate in temperatures from -40 to 158 degrees Fahrenheit
- LCD optically bonded to hardened AR glass lens
- Five weather resistant user interface switches
- Grey with black accents
- Sunlight Readable
- Linux operating system
- Minimum of 1000nits rated display
- Display can be changed to an available foreign language
- A LCD display integral to the cab gauge panel will be included as outlined in the cab instrumentation area.
- Programmed to read US Customary

General Screen Design

Where possible, background colors will be used to provide "At a Glance" vehicle information. If information provided on a screen is within acceptable limits, a green background will be used.

If a caution or warning situation arises the following will occur:

- An amber background/text color will indicate a caution condition
- A red background/text color will indicate a warning condition
- The information center will utilize an "Alert Center" to display text messages for audible alarm tones. The text messages will be written to identify the item(s) causing the audible alarm to sound. If more than one (1) text message occurs, the messages will cycle every second until the problem(s) have been resolved. The background color for the "Alert Center" will change to indicate the severity of the "warning" message. If a warning and a caution condition occur simultaneously, the red background color will be shown for all alert center messages.
- A label for each button will exist. The label will indicate the function for each active button for each screen. Buttons that are not utilized on specific screens will have a button label with no text or symbol.

Home/Transit Screen

This screen will display the following:

- Vehicle Mitigation (if equipped)
- Water Level (if the water level system includes compatible communications to the information center)
- Foam Level (if the foam level system includes compatible communications to the information center)
- Seat Belt Monitoring Screen
- Tire Pressure Monitoring (if equipped)
- Digital Speedometer
- Active Alarms

On Scene Screen

This screen will display the following and will be auto activated with pump engaged (if equipped):

- Battery Voltage
- Fuel
- Oil Pressure
- Coolant Temperature
- RPM

- Water Level (if equipped)
- Foam Level (if equipped)
- Foam Concentration (if equipped)
- Water Flow Rate (if equipped)
- Water Used (if equipped)
- Active Alarms

Virtual Buttons

There will be four (4) virtual switch panel screens that match the overhead and lower lighting and HVAC switch panels.

Page Screen

The page screen will display the following and allow the user to progress into other screens for further functionality:

- Diagnostics
    - Faults
        - Listed by order of occurrence
        - Allows to sort by system
    - Interlock
        - Throttle Interlocks
        - Pump Interlocks (if equipped)
        - Aerial Interlocks (if equipped)
        - PTO Interlocks (if equipped)
    - Load Manager
        - A list of items to be load managed will be provided. The list will provide a description of the load.
        - The lower the priority numbers the earlier the device will be shed should a low voltage condition occur.
        - The screen will indicate if a load has been shed (disabled) or not shed.
        - "At a glance" color features are utilized on this screen.
    - Systems
        - Command Zone
            - Module type and ID number
            - Module Version
            - Input or output number
            - Circuit number connected to that input or output
            - Status of the input or output
            - Power and Constant Current module diagnostic information
        - Foam (if equipped)
        - Pressure Controller (if equipped)

        - Generator Frequency (if equipped)
    - Live Data
        - General Truck Data
- Maintenance
    - Engine oil and filter
    - Transmission oil and filter
    - Pump oil (if equipped)
    - Foam (if equipped)
    - Aerial (if equipped)
- Setup
    - Clock Setup
    - Date & Time
        - 12 or 24 hour format
        - Set time and date
    - Backlight
        - Daytime
        - Night time
        - Sensitivity
    - Unit Selection
    - Home Screen
    - Virtual Button Setup
    - On Scene Screen Setup
    - Configure Video Mode
        - Set Video Contrast
        - Set Video Color
        - Set Video Tint
- Do Not Move
    - The screen will indicate the approximate location and type of item that is open or is not stowed for travel. The actual status of the following devices will be indicated
        - Driver Side Cab Door
        - Passenger's Side Cab Door
        - Driver Side Crew Cab Door
        - Passenger's Side Crew Cab Door
        - Driver Side Body Doors
        - Passenger's Side Body Doors
        - Rear Body Door(s)
        - Ladder Rack (if applicable)
        - Deck Gun (if applicable)
        - Light Tower (if applicable)

        - Hatch Door (if applicable)
        - Stabilizers (if applicable)
        - Steps (if applicable)
- Notifications
    - View Active Alarms
        - Shows a list of all active alarms including date and time of the occurrence is shown with each alarm
        - Silence Alarms - All alarms are silenced
- Timer Screen
- HVAC (if equipped)
- Tire Information (if equipped)
- Ascendant Set Up Confirmation (if equipped)

Button functions and button labels may change with each screen.

COLLISION MITIGATION

There will be a HAAS Alert®, Model HA7 Responder-to-Vehicle (R2V) collision avoidance system provided on the apparatus. The HA7 cellular transponder module will be installed behind the cab windshield, as high and near to the center as practical, to allow clear visibility to the sky. The module dimensions are 5.40" long x 2.70" wide x 1.30" high, and operating temperature range is -40 degrees Celsius to 85 degrees Celsius.

The transponder will be connected to the vehicle's emergency master circuit and battery direct power and ground.

While responding with emergency lights on, the HA7 transponder sends alert messages via cellular network to motorists in the vicinity of the responding truck that are equipped with the WAZE app.

While on scene with emergency lights on, the HA7 transponder sends road hazard alerts to motorists in the vicinity of the truck that are equipped with the WAZE app.

The HA7 Responder-to-Vehicle (R2V) collision avoidance system will include the transponder and a 5 year cellular plan subscription.

Activation of the HAAS Alert system requires a representative of the customer to accept the End User License Agreement (EULA) via an on-line portal.

VEHICLE DATA RECORDER

There will be a vehicle data recorder (VDR) capable of reading and storing vehicle information provided.

The information stored on the VDR can be downloaded through a USB port mounted in a convenient location determined by cab model. A USB cable can be used to connect the VDR

to a laptop to retrieve required information. The program to download the information from the VDR will be available to download on-line.

The vehicle data recorder will be capable of recording the following data via hardwired and/or CAN inputs:

- Vehicle Speed - MPH
- Acceleration - MPH/sec
- Deceleration - MPH/sec
- Engine Speed - RPM
- Engine Throttle Position - % of Full Throttle
- ABS Event - On/Off
- Seat Occupied Status - Yes/No by Position
- Seat Belt Buckled Status - Yes/No by Position
- Master Optical Warning Device Switch - On/Off
- Internal clock syncs the time and date when a laptop is connected.

Seat Belt Monitoring System

A seat belt monitoring system (SBMS) will be provided on the Command Zone™ color display. The SBMS will be capable of monitoring up to 10 seating positions indicating the status of each seat position per the following:

- Seat Occupied & Buckled = Green LED indicator illuminated
- Seat Occupied & Unbuckled = Red LED indicator with audible alarm
- No Occupant & Buckled = Red LED indicator with audible alarm
- No Occupant & Unbuckled = No indicator and no alarm
- FAULT = Blue LED indicator illuminated

The seat belt monitoring screen will become active on the Command Zone color display when:

- The home screen is active:
    - and there is any occupant seated but not buckled or any belt buckled with an occupant.
    - and there are no other Do Not Move Apparatus conditions present. As soon as all Do Not Move Apparatus conditions are cleared, the SBMS will be activated.

The SBMS will include an audible alarm that will warn that an unbuckled occupant condition exists and the parking brake is released, or the transmission is not in park.

VEHICLE CAMERA SYSTEM

There will be a color vehicle camera system provided with the following:

- One (1) Standard Definition (SD) camera located at the rear of the apparatus, pointing rearward, displayed automatically with the vehicle in reverse.

The camera images will be displayed on the left side vehicle information center display. Audio from the microphone on the rear camera will be not provided.

The following components will be included:

- One (1) SV-CW134639CAI Camera
- All necessary cables

Camera Switcher

A camera switcher is not required.

REAR CAMERA LOCATION

The rear camera will be located centered under traffic directing light..

ELECTRICAL POWER CONTROL SYSTEM

The primary power distribution will be located forward of the officer's seating position and be easily accessible while standing on the ground for simplified maintenance and troubleshooting. Additional electrical distribution centers will be provided throughout the vehicle to house the vehicle's electrical power, circuit protection, and control components. The electrical distribution centers will be located strategically throughout the vehicle to minimize wire length. For ease of maintenance, all electrical distribution centers will be easily accessible. All distribution centers containing fuses, circuit breakers and/or relays will be easily accessible.

Distribution centers located throughout the vehicle will contain battery powered studs for supplying customer installed equipment thus providing a lower cost of ownership.

Circuit protection devices, which conform to SAE standards, will be utilized to protect electrical circuits. All circuit protection devices will be rated per NFPA requirements to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers will be Type-I automatic reset (continuously resetting). When required, automotive type fuses will be utilized to protect electronic equipment. Control relays and solenoid will have a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.

Solid-State Control System

A solid-state electronics based control system will be utilized to achieve advanced operation and control of the vehicle components. A fully computerized vehicle network will consist of electronic modules, electronic control modules to include a see through housing, a power indicator, a status indicator and circuit indicators located near their point of use to reduce harness lengths and improve reliability. The control system will comply with SAE J1939-11 recommended practices.

The control system will operate as a master-slave system whereas the main control module instructs all other system components. The system will contain patented Mission Critical software that maintains critical vehicle operations in the unlikely event of a main controller error. The system will utilize a Real Time Operating System (RTOS) fully compliant with OSEK/VDX™ specifications providing a lower cost of ownership.

For increased reliability and simplified use the control system modules will include the following attributes:

- Green LED indicator light for module power
- Red LED indicator light for network communication stability status
- Control system self test at activation and continually throughout vehicle operation
- No moving parts due to transistor logic
- Software logic control for NFPA mandated safety interlocks and indicators
- Integrated electrical system load management without additional components
- Integrated electrical load sequencing system without additional components
- Customized control software to the vehicle's configuration
- Factory and field programmable to accommodate changes to the vehicle's operating parameters

To assure long life and operation in a broad range of environmental conditions, the solid-state control system modules will meet the following specifications:

- Module circuit board will meet SAE J771 specifications
- Operating temperature from -40 degrees Celsius to +70 degrees Celsius (-40 degrees Fahrenheit to +158 degrees Fahrenheit)
- Storage temperature from -40 degrees Celsius to +70 degrees Celsius (-40 degrees Fahrenheit to +158 degrees Fahrenheit)
- Vibration to 50g
- IP67 rated enclosure (Totally protected against dust and also protected against the effect of temporary immersion between 15 centimeters and one (1) meter)
- Operating voltage from eight (8) volts to 32 volts DC

The main controller will activate status indicators and audible alarms designed to provide warning of problems before they become critical.

Circuit Protection and Control Diagram

Copies of all job-specific, computer network input and output (I/O) connections will be provided with each chassis. The sheets will indicate the function of each module connection point, circuit protection information (where applicable), wire numbers, wire colors and load management information.

On-Board Electrical System Diagnostics

The on-board information center will include the following diagnostic information:

- Text description of active warning or caution alarms
- Simplified warning indicators
- Amber caution indication with intermittent alarm
- Red warning indication with steady tone alarm

Advanced diagnostic feature will be provided in this control system. From the Command Zone display or connected wireless device, these features allow the user to monitor the real-time status of every input or output on the vehicle. It also allows users logged in as an administrator to force on inputs or outputs to assist the troubleshooting process.

TCU Module with WiFi

An in cab module will provide WiFi wireless interface and data logging capability. The WiFi interface will comply with IEEE 802.11 b/g/n capabilities while communicating at 2.4 Gigahertz. The module will communicate through a white WiFi antenna allowing a line of site communication range of up to 300 feet with a roof mounted antenna.

The module will transmit a password protected web page to a WiFi enabled device (i.e. most smart phones, tablets or laptops) allowing two levels of user interaction. The firefighter level will allow vehicle monitoring of the vehicle and firefighting systems on the apparatus. The technician level will allow diagnostic access to inputs and outputs installed on the Command Zone™, control and information system.

The TCU capability will record faults from the engine, transmission, ABS and Command Zone™, control and information systems as they occur. No other data will be recorded at the time the fault occurs. The data TCU will provide up to 2 Gigabytes of data storage.

The TCU will provide a means to download the TCU information and update software in the device.

Indicator Light and Alarm Prove-Out System

A system will be provided which automatically tests basic indicator lights and alarms located on the cab instrument panel.

Voltage Monitor System

A voltage monitoring system will be provided to indicate the status of the battery system connected to the vehicle's electrical load. The system will provide visual and audible warning when the system voltage is below or above optimum levels.

The alarm will activate if the system falls below 11.8 volts DC for more than two (2) minutes.

Dedicated Radio Equipment Connection Points

There will be three (3) studs provided in the primary power distribution center located in front of the officer for two-way radio equipment. The studs will consist of the following:

- 12-volt 40-amp battery switched power
- 12-volt 60-amp ignition switched power
- 12-volt 60-amp direct battery power

There will also be a 12-volt 100-amp ground stud located in or adjacent to the power distribution center.

EMI/RFI Protection

To prevent erroneous signals from crosstalk contamination and interference, the electrical system will meet, at a minimum, SAE J551/2, thus reducing undesired electromagnetic and radio frequency emissions. An advanced electrical system will be used to ensure radiated and conducted electromagnetic interference (EMI) or radio frequency interference (RFI) emissions are suppressed at their source.

The apparatus will have the ability to operate in the electromagnetic environment typically found in fire ground operations to ensure clean operations. The electrical system will meet, without exceptions, electromagnetic susceptibility conforming to SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter. The vehicle OEM, upon request, will provide EMC testing reports from testing conducted on an entire apparatus and will certify that the vehicle meets SAE J551/2 and SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter requirements. Component and partial (incomplete) vehicle testing is not adequate as overall vehicle design can impact test results and thus is not acceptable by itself.

EMI/RFI susceptibility will be controlled by applying appropriate circuit designs and shielding. The electrical system will be designed for full compatibility with low-level control signals and high-powered two-way radio communication systems. Harness and cable routing will be given careful attention to minimize the potential for conducting and radiated EMI/RFI susceptibility.

ELECTRICAL SYSTEM PROGNOSTICS

There will be a software based vehicle tool provided to predict remaining life of the vehicles critical fluid and events.

The system will send automatic indications to the Command Zone™ information center and/or wireless enabled devices to proactively alert of upcoming service intervals.

Prognostics will include the following:

- Engine oil and filter
- Transmission oil and filter

ELECTRICAL

All 12-volt electrical equipment installed by the apparatus manufacturer will conform to modern automotive practices. All wiring will be high temperature crosslink type. Wiring will be run, in loom or conduit, where exposed and have grommets where wire passes through sheet metal. Automatic reset circuit breakers will be provided which conform to SAE Standards. Wiring will be color, function and number coded. Function and number codes will be continuously imprinted on all wiring harness conductors at 2.00" intervals. Exterior exposed wire connectors will be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids.

Electrical wiring and equipment will be installed utilizing the following guidelines:

1. All holes made in the roof will be caulked with silicon. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof.
2. Any electrical component that is installed in an exposed area will be mounted in a manner that will not allow moisture to accumulate in it. Exposed area will be defined as any location outside of the cab or body.
3. Electrical components designed to be removed for maintenance will not be fastened with nuts and bolts. Metal screws will be used in mounting these devices. Also a coil of wire will be provided behind the appliance to allow them to be pulled away from mounting area for inspection and service work.
4. Corrosion preventative compound will be applied to all terminal plugs located outside of the cab or body. All non-waterproof connections will require this compound in the plug to prevent corrosion and for easy separation (of the plug).
5. All lights that have their sockets in a weather exposed area will have corrosion preventative compound added to the socket terminal area.
6. All electrical terminals in exposed areas will have silicon applied completely over the metal portion of the terminal.

All lights and reflectors, required to comply with Federal Motor Vehicle Safety Standard #108, will be furnished. Rear identification lights will be recessed mounted for protection. Lights and wiring mounted in the rear bulkheads will be protected from damage by installing a false bulkhead inside the rear compartments.

An operational test will be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order.

The results of the tests will be recorded and provided to the purchaser at time of delivery.

BATTERY SYSTEM

There will be six (6) 12 volt Stryten/Exide®, Model 31S950X3W, batteries that include the following features will be provided:

- 950 CCA, cold cranking amps
- 190 amp reserve capacity
- High cycle
- Group 31
- Rating of 5700 CCA at 0 degrees Fahrenheit
- 1140 minutes of reserve capacity
- Threaded stainless steel studs

Each battery case will be a black polypropylene material with a vertically ribbed container for increased vibration resistance. The cover will be manifold vented with a central venting location to allow a 45 degree tilt capacity.

The inside of each battery will consist of a "maintenance free" grid construction with poly wrapped separators and a flooded epoxy bottom anchoring for maximum vibration resistance.

BATTERY SYSTEM

There will be a single starting system with an ignition switch and starter button provided and located on the cab instrument panel.

MASTER BATTERY SWITCH

There will be a master battery switch provided within the cab within easy reach of the driver to activate the battery system.

An indicator light will be provided on the instrument panel to notify the driver of the status of the battery system.

BATTERY COMPARTMENTS

Batteries will be placed on non-corrosive mats and be stored in well ventilated compartments located under the cab and bolted directly to the chassis frame. The battery boxes will have reinforced sides. The battery compartments will be constructed of 0.188" steel plate and be designed to accommodate a maximum of three (3) group 31 batteries in each compartment. The battery hold-downs will be of a non-corrosive material. All bolts and nuts will be stainless steel.

Heavy-duty, 2/0 gauge, color coded battery cables will be provided. Battery terminal connections will be coated with anti-corrosion compound.

Battery solenoid terminal connections will be encapsulated with semi-permanent rubberized compound.

JUMPER STUDS

One (1) set of battery jumper studs with plastic color-coded covers will be included on the battery compartments.

BATTERY CHARGER

There will be a Kussmaul™, Chief Series Smart Charger 6012, product code 091-266-12-60, 60 amp battery charger with build-in touch screen display provided.

The battery charger will be wired to the AC shoreline inlet through a junction box located near the battery charger.

The battery charger will be located in the cab behind the driver seat.

REMOTE CONTROL PANEL - BATTERY CHARGER

There will be a Kussmaul™, Model 091-94-12 universal display panel included. It will be wired directly to the chassis batteries.

The battery charger indicator will be located on the driver's seat riser.

KUSSMAUL AUTO EJECT FOR SHORELINE

There will be one (1) Kussmaul Model 091-159-30-120, 30 amp 120 volt AC shoreline inlet(s) provided to operate the dedicated 120 volt AC circuits on the apparatus.

The shoreline inlet(s) will include black weatherproof flip up cover(s).

There will be a release solenoid wired to the vehicle's starter to eject the AC connector when the engine is starting.

The shoreline will be connected to battery charger .

A mating connector body will be supplied with the loose equipment.

There will be a label installed near the inlet(s) that state the following:

- Line Voltage
- Current Ratting (amps)
- Phase
- Frequency

The shoreline receptacle will be located on the driver side of cab, above wheel.

ALTERNATOR

A Delco Remy®, Model 55SI, alternator will be provided. It will have a rated output current of 430 amps, as measured by SAE method J56. The alternator will feature an integral regulator and rectifier system that has been tested and qualified to an ambient temperature of 257 degrees Fahrenheit (125 degrees Celsius). The alternator will be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.

ELECTRONIC LOAD MANAGER

An electronic load management (ELM) system will be provided that monitors the vehicles 12-volt electrical system, automatically reducing the electrical load in the event of a low voltage condition, and automatically restoring the shed electrical loads when a low voltage condition expires. This ensures the integrity of the electrical system.

For improved reliability and ease of use, the load manager system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load management tasks. Load management systems which require additional components will not be allowed.

The system will include the following features:

- System voltage monitoring.
- A shed load will remain inactive for a minimum of five minutes to prevent the load from cycling on and off.
- Sixteen available electronic load shedding levels.
- Priority levels can be set for individual outputs.
- High Idle to activate before any electric loads are shed and deactivate with the service brake.
    - If enabled:
        - "Load Man Hi-Idle On" will display on the information center.
        - Hi-Idle will not activate until 30 seconds after engine start up.
- Individual switch "on" indicator to flash when the particular load has been shed.
- The information center indicates system voltage.

The information center, where applicable, includes a "Load Manager" screen indicating the following:

- Load managed items list, with priority levels and item condition.
- Individual load managed item condition:
    - ON = not shed
    - SHED = shed

SEQUENCER

A sequencer will be provided that automatically activates and deactivates vehicle loads in a preset sequence thereby protecting the alternator from power surges. This sequencer operation will allow a gradual increase or decrease in alternator output, rather than loading or dumping the entire 12 volt load to prolong the life of the alternator.

For improved reliability and ease of use, the load sequencing system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load

sequencing tasks. Load sequencing systems which require additional components will not be allowed.

Emergency light sequencing will operate in conjunction with the emergency master light switch. When the emergency master switch is activated, the emergency lights will be activated one by one at half-second intervals. Sequenced emergency light switch indicators will flash while waiting for activation.

When the emergency master switch is deactivated, the sequencer will deactivate the warning light loads in the reverse order.

Sequencing of the following items will also occur, in conjunction with the ignition switch, at half-second intervals:

- Cab Heater and Air Conditioning
- Crew Cab Heater (if applicable)
- Crew Cab Air Conditioning (if applicable)
- Exhaust Fans (if applicable)
- Third Evaporator (if applicable)

HEADLIGHTS

There will be four (4) HiViz®, rectangular LED lights mounted in the front quad style, housing on each side of the cab grille:

- The outside light on each side will contain a part number FT-4X6-HL low beam module
- The inside light on each side will contain a part number FT-4X6-H high beam module
- The headlights to include black bezels
- The aluminum housing will be painted black

The low beam lights will be activated when the headlight switch is on.

The high beam and low beam lights will be activated when the headlight switch and the high beam switch is activated.

DIRECTIONAL LIGHTS

There will be two (2) HiViz FT-TL-GSMJR-TURN, LED directional lights with black trim provided. The lights will be located on the outside cab corners, next to the headlights.

The color of the lenses will be amber.

INTERMEDIATE LIGHT

There will be two (2) Truck-Lite®, part number 303757Y, 2.24" diameter lights with amber LEDs, grommet mount and black painted cover furnished, one (1) each side in the rear fender panel. The light will double as a turn signal and marker light.

CAB CLEARANCE/MARKER/ID LIGHTS

There will be seven (7) Whelen, Model 0SA00MCR, amber LED lights provided to indicate the presence and overall width of the vehicle in the following locations:

- Three (3) amber LED identification lights will be installed in the center of the cab above the windshield.
- Two (2) amber LED clearance lights will be installed, one (1) on each outboard side of the cab above the windshield.
- Two (2) amber LED marker lights will be installed, one (1) on each side above the cab doors.

FRONT CAB SIDE CLEARANCE/MARKER LIGHTS

There will be two (2) Truck-Lite®, Model 19036Y, amber LED lights with black painted trim installed to the outside of the chrome wrap around bezel, one (1) on each side of the cab.

The lights will activate as additional directional lights with the corresponding directional circuit.

REAR CLEARANCE/MARKER/ID LIGHTING

There will be three (3) Whelen®, Model 0SR00MCR, LED lights with a chrome flange used as identification lights located at the rear of the apparatus per the following:

- As close as practical to the vertical centerline
- Centers spaced not less than 6.00" or more than 12.00" apart
- Red in color
- All at the same height

There will be two (2) Whelen, Model 0SR00MCR, LED lights with a chrome flange installed at the rear of the apparatus used as clearance lights located at the rear of the apparatus per the following:

- To indicate the overall width of the vehicle
- One (1) each side of the vertical centerline
- As near the top as practical
- Red in color
- To be visible from the rear
- All at the same height

There will be two (2) Whelen, Model 0SR00MCR, LED lights with a chrome flange installed on the side of the apparatus as marker lights as close to the rear as practical per the following:

- To indicate the overall length of the vehicle

- One (1) each side of the vertical centerline
- As near the top as practical
- Red in color
- To be visible from the side
- All at the same height

There will be two (2) red reflectors located on the rear of the truck facing to the rear. One (1) each side, as far to the outside as practical, at a minimum of 15.00", but no more than 60.00", above the ground.

There will be two (2) red reflectors located on the side of the truck facing to the side. One (1) each side, as far to the rear as practical, at a minimum of 15.00", but no more than 60.00", above the ground.

Per FMVSS 108 and CMVSS 108 requirements.

REAR FMVSS LIGHTING

There will be one (1) HiViz FT-TL-GSMJR-TRIPLE-KIT tri-cluster LED modules with black trim provided on the face of the rear body compartments.

Each tri-cluster will include the following:

- One (1) LED stop/tail light
- One (1) LED directional light
- One (1) LED backup light

LICENSE PLATE BRACKET

One (1) license plate bracket constructed of stainless steel will be provided at the rear of the apparatus.

One (1) white LED light with black housing will be provided to illuminate the license plate. A stainless steel light shield will be provided over the light that will direct illumination downward, preventing white light to the rear.

BACK-UP ALARM

A PRECO, Model 1040, solid-state electronic audible back-up alarm that actuates when the truck is shifted into reverse will be provided. The device will sound at 60 pulses per minute and automatically adjust its volume to maintain a minimum ten (10) dBA above surrounding environmental noise levels.

MARKER LIGHTS

There will be three (3) pairs of Whelen®, Model 0S*00MCR, LED marker lights provided.

The marker lights will be wired to the running lights of the vehicle.

The lights will be located (4) centered at the rear of the tailboard (1) on the LS 45 corner and (1) on the RS 45 degree corner .

Amber lights will be installed in any location forward of the rear most point of the vehicle. A single red light will be installed at the rear most point of each side only.

CAB PERIMETER SCENE LIGHTS

There will be four (4) TecNiq, Model T10-LC00-1, 15.00" lights with white LEDs and 45 degree stainless steel brackets provided per the following:

- one (1) under the driver's side cab access step
- one (1) under the passenger's side cab access step
- one (1) under the passenger's side crew cab access step
- one (1) under the driver's side crew cab access step

The lights will be activated when the battery switch is on, when the respective door is open and by the same control selected for the body perimeter lights.

PUMP HOUSE PERIMETER LIGHTS

There will be two (2) TecNiq, Model T10-LC00-1, 15.00" white 12 volt DC LED weatherproof strip lights provided under the pump panel running boards, one (1) each side.

The lights will be controlled by the same means as the body perimeter lights.

BODY PERIMETER SCENE LIGHTS

There will be two (2) TecNiq, Model T10-LC00-1, 15.00" 12 volt DC LED strip lights provided at the rear step area of the body, one (1) each side shining to the rear.

The perimeter scene lights will be activated when the parking brake is applied.

ENHANCED SOFTWARE FOR PERIMETER LIGHTS

All perimeter lights will be deactivated when the parking brake is released unless alternate control is selected.

The cab and crew cab perimeter lights will remain on for ten (10) seconds for improved visibility after the doors closed.

STEP LIGHTS

There will be four (4) white LED step lights provided at the rear to illuminate the tailboard/step area.

These step lights will be actuated with the perimeter scene lights.

All other steps on the apparatus will be illuminated per the current edition of applicable NFPA standards.

12 VOLT LIGHTING

There will be a HiViz Model FT-B-72-*-*, 2.56" high x 72.69" long x 3.31" deep 21,067 effective lumens 12 volt DC light with white LEDs configured with a combination of flood and spot optics mounted, as far forward on the cab roof as practical.

The painted parts of the light housing and brackets to be black.

The light will be activated by a switch at the driver's side switch panel, by a switch at the left side pump panel and by a switch at the passenger's side switch panel.

The light may be load managed when the parking brake is applied.

12 VOLT LIGHTING

There will be one (1) HiViz®, Model FT-GESM, 20,500 equivalent lumens 8.65" high x 10.61" wide x 2.78" deep light(s) with white LEDs installed on the cab d/s cab above window . The light(s) to include black optic holders, black bezels and black fixture body.

The light(s) will be activated by a switch at the driver's side switch panel, by a switch at the passenger's side switch panel and when the cab or crew cab doors on the driver's side are open.

The light(s) may be load managed when the parking brake is applied.

12 VOLT LIGHTING

There will be one (1) HiViz®, Model FT-GESM, 20,500 equivalent lumens 8.65" high x 10.61" wide x 2.78" deep light(s) with white LEDs installed on the cab p/s cab above window . The light(s) to include black optic holders, black bezels and black fixture body.

The light(s) will be activated by a switch at the driver's side switch panel, by a switch at the passenger's side switch panel and when the cab or crew cab doors on the passenger's side are open.

The light(s) may be load managed when the parking brake is applied.

12 VOLT LIGHTING

There will two (2) HiViz Model FT-MB-2.15-*-*-CPREC, 11,100 lumens 6.13" high x 17.50" long x 3.05" deep 12 volt DC light(s) with aluminum trim, white LEDs and a combination of flood and spot optics installed on the apparatus located, two on the p/s upper body one forward and one rearward inboard of warning lights.

The painted parts of the light housing and brackets to be black.

The light(s) will be controlled by a switch at the driver's side switch panel, by a switch at the passenger's side switch panel, by a switch at the right side pump panel and by a switch in a

stainless steel cup that is painted black, located on the passenger's side at the rear of the apparatus no more than 72.00" from the ground.

The light(s) may be load managed when the parking brake is applied.

12 VOLT LIGHTING

There will two (2) HiViz Model FT-MB-2.15-*-*-CPREC, 11,100 lumens 6.13" high x 17.50" long x 3.05" deep 12 volt DC light(s) with aluminum trim, white LEDs and a combination of flood and spot optics installed on the apparatus located, two on the d/s upper body one forward and one rearward inboard of warning lights.

The painted parts of the light housing and brackets to be black.

The light(s) will be controlled by a switch at the driver's side switch panel, by a switch at the passenger's side switch panel, by a switch at the right side pump panel and by a switch in a stainless steel cup that is painted black, located on the driver's side at the rear of the apparatus no more than 72.00" from the ground.

The light(s) may be load managed when the parking brake is applied.

12 VOLT LIGHTING

There will two (2) HiViz Model FT-MB-2.15-*-*-CPREC, 11,100 lumens 6.13" high x 17.50" long x 3.05" deep 12 volt DC light(s) with aluminum trim, white LEDs and a combination of flood and spot optics installed on the apparatus located, one each side upper rear body .

The painted parts of the light housing and brackets to be black.

The light(s) will be controlled by a switch at the right side pump panel and by a switch in a stainless steel cup that is painted black, located on the driver's side at the rear of the apparatus no more than 72.00" from the ground.

The light(s) may be load managed when the parking brake is applied.

HOSE BED LIGHTS

There will be white 12 volt DC LED light strips with stainless steel protective cover, provided to light the hose bed area. Hose Bed lights will meet the photometric levels listed in the current edition of applicable NFPA standards for Hose Bed lighting requirements.

- Light strip(s) will be installed along the upper edge of the left side of the hose bed.
- Light strip(s) will be installed along the upper edge of the right side of the hose bed.

The lights will be activated when the rear scene lights are activated.

WALKING SURFACE LIGHT

There will be two (2) Model FRP, 4" round black 12 volt DC LED light(s) with bolt mount provided in tank dome fill area above water tank, and cargo compartment. to illuminate the designated walking surface on top of the body.

The light(s) will be activated when the body step lights are on.

WATER TANK

Booster tank will have a capacity of 750 gallons and be constructed of UV stabilized ultra high impact polypropylene plastic by a manufacturer with a minimum of 20 years experience building tanks, is ISO 9001:2000 certified in all its manufacturing facilities, and has over 50,000 tanks in service.

Tank joints and seams will be nitrogen welded inside and out.

Tank will be baffled in accordance with the current edition of applicable NFPA standards.

Baffles will have vent openings at both the top and bottom to permit movement of air and water between compartments.

Longitudinal partitions will be constructed of .38" polypropylene plastic and will extend from the bottom of the tank through the top cover to allow for positive welding.

Transverse partitions will extend from 4.00" off the bottom of the tank to the underside of the top cover.

All partitions will interlock and will be welded to the tank bottom and sides.

Tank top will be constructed of .50" polypropylene. It will be recessed .38" and will be welded to the tank sides and the longitudinal partitions.

Tank top will be sufficiently supported to keep it rigid during fast filling conditions.

Construction will include 2.00" polypropylene dowels spaced no more than 30.00" apart and welded to the transverse partitions. Two (2) of the dowels will be drilled and tapped (.50" diameter, 13.00" deep) to accommodate lifting eyes.

A sump that will be sized dependent on the tank to pump plumbing will be provided at the bottom of the water tank.

Sump will include a drain plug and the tank outlet.

Tank will be installed in a fabricated cradle assembly constructed of structural steel.

Sufficient crossmembers will be provided to properly support bottom of tank. Crossmembers will be constructed of steel bar channel or rectangular tubing.

Tank will "float" in cradle to avoid torsional stress caused by chassis frame flexing. Rubber cushions, .50" thick x 3.00" wide, will be placed on all horizontal surfaces that the tank rests on.

Stops or other provision will be provided to prevent an empty tank from bouncing excessively while moving vehicle.

Mounting system will be approved by the tank manufacturer.

Fill tower will be constructed of 0.50" polypropylene and will be a minimum of 8.00" wide x 14.00" long.

Fill tower will be furnished with a 0.25" thick polypropylene screen and a hinged cover.

An overflow pipe, constructed of 4.00" schedule 40 polypropylene, will be installed approximately halfway down the fill tower and extend through the water tank and exit to the rear of the rear axle.

WATER TANK RESTRAINT

A heavy-duty water tank restraint will be provided.

BODY HEIGHT

The height of the body will be 92.00" from the bottom of the body to the top of the body.

HOSE BED



The hose bed will be fabricated of .125"-5052 aluminum with a nominal 38,000 psi tensile strength.

Flooring of the hose bed will be removable aluminum grating with the top surface corrugated to aid in hose aeration. The grating slats will be a minimum of 0.50" x 4.50" with spacing between slats for hose ventilation.

A cross divider will be provided at the point the tank transitions from the lower section to the upper section. The divider will run from the top of the side sheet down below the hose bed grating.

The hose bed will be directly above the rear compartment door. The dimension from the ground will be approximately 67.00" depending on the suspension and equipment load.

The hose bed will be at a minimum 85.00" long.

The hose bed walls will be unpainted.

Hose bed will accommodate 1000' of 5" 600' of 2.5" hose.

HOSE BED DIVIDER

One (1) hosebed divider will be furnished for separating hose.

Each divider will be constructed of a .125" brushed aluminum sheet fitted and fastened into a slotted, 1.50" diameter radiused extrusion along the top, bottom, and rear edge.

Divider will be fully adjustable by sliding in tracks, located at the front and rear of the hose bed.

Divider will be held in place by tightening bolts, at each end.

Acorn nuts will be installed on all bolts in the hose bed which have exposed threads.

HOSE BED HOSE RESTRAINT

The hose in the hose bed will be restrained by two (2) black nylon Velcro® straps at the top of the hose bed. Each strap will be permanently attached to a footman loop on one side and will loop through the footman loop on the opposite side then fasten to itself with hook and loop fabric. One (1) strap will be approximately one third of the distance from the front of the hose bed and one (1) strap will be approximately one third of the distance from the rear of the hose bed.

HOSE BED RESTRAINT, REAR

The hose in the hose bed will be restrained by heavy duty 2.00" black nylon webbing with a 1.50" x 4.00" box pattern. The webbing will be installed at the rear of the hose bed with Velcro strap and footman loop at the top. At the bottom of the webbing, Velcro strap and footman loop will be provided.

REINFORCEMENT, HOSEBED DIVIDERS

The one (1)extruded divider(s) will be reinforced by attaching them to the crosstube or cross structure of the hose bed cover with an adjustable track.

CROSS TUBE REINFORCEMENT, HOSE BED

There will be one (1) rectangular cross tube mounted flush with the back above the hosebed. Reinforcement for the cross tube will be provided on each side sheet to support the tube.

The cross tube will be painted to match lower job color.

RUNNING BOARDS

A running board will be provided on each side of the front body to allow access to the backboard/crosslay storage area. The running boards will be designed with a grip pattern punched into .125" bright aluminum treadplate material providing support, slip resistance, and drainage.

The runningboard will have a flip out section design that allows easier access to the full width equipment area above. The flip out section will be tied to the "do not move truck indicator" with a sensor when it is flipped out. There will be a latch provided that secures the flip out section when not in use.

TAILBOARD



The tailboard will be constructed of .125" bright aluminum treadplate and spaced .50" from the body, as well as supported by a structural steel assembly.

The tailboard area will be 16.00" deep and full width of the body. The outboard sides of the tailboard will be angled at 45 degrees beginning at the point where the body meets the tailboard at the outboard edge angling rearward to the rear edge of the tailboard.

The exterior side will be flanged down and in for increased rigidity of tailboard structure.

REAR WALL, BODY MATERIAL, PUC

The rear wall will be smooth and the same material as the body.

The rear wall body material will be painted. Unpainted aluminum overlays will be provided to allow for chevron application and to provide continuously smooth rear wall panels.

The outboard edges of the rear wall will be trimmed in polished stainless steel.

TOW BAR

A tow bar will be installed under the tailboard at center of truck.

Tow bar will be fabricated of 1.00" CRS bar rolled into a 3.00" radius.

Tow bar assembly will be constructed of .38" structural angle. When force is applied to the bar, it will be transmitted to the frame rail.

Tow bar assembly will be designed and positioned to allow up to a 30-degree upward angled pull of 17,000 lb, or a 20,000 lb straight horizontal pull in line with the centerline of the vehicle.

Tow bar design will have been fully tested and evaluated using strain gauge testing and finite element analysis techniques.

COMPARTMENTATION

The apparatus body will be built of aluminum construction using a minimum of 0.125" thick, 5052-H32 aluminum.

The body panel assembly will be constructed in a fixture and consist of formed sheet metal for the front and rear bulkheads, door frames, floors, ceilings, and back walls. These parts will be welded together to ensure greatest longevity with no visible welds in compartment interior.

Welded construction will consist of 1.00" x 0.38" engineered plug weld holes that control the size, location, and the amount of weld required. The bodies will be assembled and welded from engineered prints that call out the size, location, and type of weld required.

In structural areas the sheet metal components will have flanges for welding. No butt joints will be allowed. Gussets and support posts will be provided for additional strength where needed.

The fender panel will be an integral part of the complete welded body assembly. All light and compartment holes are pre punched prior to construction to provide accuracy and rounded corners to prevent stress risers in the material.

Circular fender liners will be provided. For prevention of paint chips and ease of suspension maintenance the fender liners will be formed from brush finished 304L stainless steel, be unpainted, and removable for suspension maintenance.

Side compartment flooring will be of the sweep out design with the floor minimum of 1.00" higher than the compartment door lip.

Drip protection will be provided above the doors by means of aluminum extrusion, or formed bright aluminum treadplate.

The top of the compartment will be sheet metal and covered with bright aluminum treadplate rolled over the edges on the front, and rear. These covers will have the corners welded.

The aluminum treadplate covers will not make up the ceiling of the compartment.

All screws and bolts, which are not Grade 8, will be stainless steel and where they protrude into a compartment will have acorn nuts on the ends to prevent injury.

UNDERBODY SUPPORT SYSTEM

Due to the severe loading requirements of this pumper a method of body and compartment support suitable for the intended load will be provided.

The backbone of the body support system will begin with the chassis frame rails which is the strongest component of the chassis and is designed for sustaining maximum loads. The support system will include lateral frame rail extensions that are formed from 0.375" 80k high strength steel and bolted to the chassis frame rails with 0.625" diameter Grade 8 bolts.

The vertical and horizontal members of the frame rail extensions are to be reinforced with welded gussets and extend to the outside edge of the body. The lateral frame extensions will be electro-coated for superior corrosion resistance.

The floating substructure will be separated from the lateral frame extensions with neoprene elastomer isolators. These isolators will reduce the natural flex stress of the chassis from being transmitted to the body, and absorb road shock and vibration.

The isolators will have a broad load range, proven viability in vehicular applications, be of a fail safe design and allow for all necessary movement in three (3) transitional and rotational modes.

The neoprene isolators will be installed in a modified V three (3)-point mounting pattern to reduce the natural flex of the chassis being transmitted to the body. Two (2) 3.50" diameter isolators are provided at the front of the body near the centerline of the vehicle above the chassis frame. A minimum of eight (8) - 2.55" diameter isolators will be provided, two (2) under each front compartment and two (2) under each rear side compartment. A minimum of four (4) 3.50" diameter isolators will be provided under the rear compartment.

AGGRESSIVE WALKING SURFACE

All exterior surfaces designated as stepping, standing, and walking areas will comply with the required average slip resistance of the current NFPA standards. Documentation of the material meeting the standard will be provided at time of delivery.

LOUVERS

All body compartments will have a minimum of one (1) set of automotive style, dust resistant louvers pressed into a wall. The louvers will incorporate a one (1)-way rubber valve that provides airflow out of the compartment and prevents water and dirt from gaining access to the compartment. Compartments over the wheel will not have louvers.

TESTING OF BODY DESIGN

Body structural analysis will be fully tested. Proven engineering and test techniques such as finite element analysis and strain gauging have been performed with special attention given to fatigue life and structural integrity of the body and substructure.

The body will be tested while loaded to its greatest in-service weight.

The criteria used during the testing procedure will include:

- Raising opposite corners of the vehicle tires 9.00" to simulate the twisting a truck may experience when driving over a curb.
- Making a 90 degree turn, while driving at 20 mph to simulate aggressive driving conditions.
- Driving the vehicle on at 35 mph on a washboard road.
- Driving the vehicle at 55 mph on a smooth road.
- Accelerating the vehicle fully, until reaching the approximate speed of 45 mph on rough pavement.

Evidence of the actual testing techniques will be made available upon request.

FEA will have been performed on all substructure components.

LEFT SIDE COMPARTMENTATION

The left side compartmentation will consist of three (3) rollup door compartments.

A full height, roll-up door compartment ahead of the rear wheels will be provided. The interior dimensions of this compartment will be 50.00" wide x 54.50" high x 25.88" deep. The area behind the roll up door spool will be notched for exterior storage or larger capacity water tank tee. The clear door opening of this compartment will be 47.00" wide x 54.50" high.

A roll-up door compartment over the rear wheels will be provided. The interior dimensions of this compartment will be 60.00" wide x 22.75" high x 12.00" deep. The clear door opening of this compartment will be 57.00" wide x 22.75" high.

A full height, roll-up door compartment behind the rear wheels will be provided. The interior dimensions of this compartment will be 52.00" wide x 54.50" high x 25.88" deep in the lower 26.00" of the compartment and 12.00" deep in the remaining upper portion. The clear door opening of this compartment will be 49.00" wide x 54.50" high.

The interior height of the compartments will be measured from the compartment floor to the ceiling. The depth of the compartments will be measured from the back wall to the inside of the door frame.

The roll up door spool will be installed in a recess above the compartment ceiling. All compartments will include a drip pan below the roll of the door. The drip pan will be installed level with the compartment ceiling.

Closing of the doors will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

RIGHT SIDE COMPARTMENTATION

The right side compartmentation will consist of three (3) rollup door compartments.

Closing of the doors will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

A roll-up door compartment over the rear wheels will be provided. The interior dimensions of this compartment will be 60.00" wide x 23.00" high x 12.00" deep. The clear door opening of this compartment will be a minimum of 57.00" wide x 23.00" high.

A full height, roll-up door compartment behind the rear wheels will be provided. The interior dimensions of this compartment will be 52.00" wide x 54.50" high x 25.88" deep in the lower

26.00" of the compartment and 12.00" deep in the remaining upper portion. The clear door opening of this compartment will be a minimum of 49.00" wide x 54.50" high.

The interior height of the compartments will be measured from the compartment floor to the ceiling. The depth of the compartments will be measured from the back wall to the inside of the door frame.

All compartments will include a drip pan below the roll of the door.

Closing of the doors shall not require releasing, unlocking, or unlatching any mechanism and shall easily be accomplished with one hand.

SIDE COMPARTMENT ROLLUP DOOR(S)

There will be six (6) compartment doors installed on the side compartments. The doors will be double faced aluminum construction, painted one (1) color to match the lower portion of the body and manufactured by Gortite®.

Lath sections will be an interlocking rib design and will be individually replaceable without complete disassembly of door.

Between each slat at the pivoting joint will be a PVC inner seal to prevent metal to metal contact and prevent dirt or moisture from entering the compartments. Seals will allow door to operate in extreme temperatures ranging from 180 to -40 degrees Fahrenheit. Side, top and bottom seals will be provided to resist ingress of dirt and weather and be made of Santoprene.

All hinges, barrel clips and end pieces will be nylon 66. All nylon components will withstand temperatures from 300 to -40 degrees Fahrenheit.

A polished stainless steel lift bar to be provided for each roll-up door. Lift bar will be located at the bottom of door and have latches on the outer extrusion of the doors frame. A ledge will be supplied over lift bar for additional area to aid in closing the door.

Doors will be constructed from an aluminum box section. The exterior surface of each slat will be flat. The interior surfaces will be concave to provide strength and prevent loose equipment from jamming the door from inside.

To conserve space in the compartments, the spring roller assembly will not exceed 3.00" in diameter.

The header for the rollup door assembly will not exceed 4.00".

A heavy-duty magnetic switch will be used for control of open compartment door warning lights.

REAR COMPARTMENTATION

A roll-up door compartment above the rear tailboard will be provided.

The interior dimensions of this compartment will be 37.00" wide x 36.50" high x 25.88" deep in the lower 27.00" of the compartment and 15.00" deep in the remaining upper portion. The clear door opening will be a minimum of 33.88" wide x 26.63" high.

The interior height of the compartment will be measured from the floor to the ceiling. The depth of the compartment will be measured from the back wall to the inside of the door frame.

A drip pan will be installed below the roll of the door. A guard will be installed behind the roll of the door.

A removable access panel will be furnished on the back wall of the compartment.

The rear compartment will be open into the rear side compartments. The transverse opening will be a minimum of 22.00" wide x 27.50" high.

Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

ROLLUP REAR COMPARTMENT DOOR

The rear compartment will have a rollup door. The door will be double faced aluminum construction, an anodized satin finish and manufactured by Gortite®.

Lath sections will be an interlocking rib design and will be individually replaceable without complete disassembly of door.

Between each slat at the pivoting joint will be a PVC inner seal to prevent metal to metal contact and prevent dirt or moisture from entering the compartments. Seals will allow door to operate in extreme temperatures ranging from 180 to -40 degrees Fahrenheit. Side, top and bottom seals will be provided to resist ingress of dirt and weather and be made of Santoprene.

All hinges, barrel clips and end pieces will be nylon 66. All nylon components will withstand temperatures from 300 to -40 degrees Fahrenheit.

A polished stainless steel lift bar to be provided for each roll-up door. Lift bar will be located at the bottom of door and have latches on the outer extrusion of the doors frame. A ledge will be supplied over lift bar for additional area to aid in closing the door.

Door will be constructed from an aluminum box section. The exterior surface of each slat will be flat. The interior surface will be concave to provide strength and prevent loose equipment from jamming the door from inside.

To conserve space in the compartments, the spring roller assembly will not exceed 3.00" in diameter.

The header for the rollup door assembly will not exceed 4.00".

A heavy-duty magnetic switch will be used for control of open compartment door warning lights.

COMPARTMENT LIGHTING

There will be seven (7) compartment(s) with two (2) white 12 volt DC LED compartment light strips. The dual light strips will be centered vertically along each side of the door framing. There will be two (2) light strips per compartment. The dual light strips will be in all body compartment(s).

Any remaining compartments without light strips will have a 6.00" diameter Truck-Lite, Model: 79384 light. Each light will have a number 1076 one filament, two wire bulb.

Opening the compartment door will automatically turn the compartment lighting on.

HATCH COMPARTMENTS

A hatch compartment 177.00" long x 21.00" wide will be provided above the left side body compartment.

A hatch compartment 177.00" long x 14.00" wide will be provided above the right side body compartment.

The hatch compartments will have a 22.00" maximum depth and will be accessed through two (2) lift-up top opening hatch doors.

Compartment(s) will extend the full length of the side body compartmentation except for a 20.00" recessed step area at the rear of the compartment on the access side.

Sides of the compartment(s) will be constructed of the same material as the body and painted job color on the outside panels. A chrome and black vinyl molding will be provided to cover the seam between the top of the body panel and the bottom of the hatch compartment. The vertical outboard seam at the center of the compartment will have a 1.00" wide painted aluminum extrusion.

Top of the compartment(s) will be constructed of bright aluminum treadplate.

Two (2) lift-up, bright aluminum treadplate doors will be provided on the top of the compartment(s), each with a slam style latch with lever handle to hold the doors in the closed position.

Double pan doors will have lipped edges with a rubber seal for weather resistance.

Doors will be hinged on the outboard side. The 14.00" wide door will utilize a chain to keep the door within manageable reach when open. The 21.00" wide door will be held open with pneumatic stay arms.

Compartment will have a 3/4" drain that extends to below the body.

Black rubber matting shall be provided to help prevent stored equipment in pooled water.

Handrails will be provided at the step area to the rear of the hatch compartment. One (1) curved handrail will be mounted on the outboard side of the step area at the rear and curve over the top. One (1) straight handrail will be mounted vertically along the inboard side of the step area.

HATCH COMPARTMENT LIGHTING

There will be LED strip lights mounted full length on the interior, hinged side of each compartment.

Opening the hatch compartment door will automatically turn the hatch compartment lighting on.

MOUNTING TRACKS

There will be recessed tracks installed vertically to support the adjustable shelf(s).

Tracks will not protrude into any compartment in order to provide the greatest compartment space and widest shelves possible.

The tracks will be provided in each compartment except for the one that contains the pump operator's panel.

ADJUSTABLE SHELVES

There will be four (4) shelves with a capacity of 500 lb provided.

The shelf construction will consist of .188" aluminum painted spatter gray with 2.00" sides.

Each shelf will be infinitely adjustable by means of a threaded fastener, which slides in a track.

The shelves will be held in place by .12" thick stamped plated brackets and bolts.

The location(s) will be in LS1 at the depth transition point, in RS1 centered between the floor and the ceiling, in RS3 in the upper third and in LS3 at the depth transition point.

SLIDE-OUT FLOOR MOUNTED TRAY

There will be two (2) floor mounted slide-out tray with 2.00" sides provided RS1 ans LS1. Each tray will be rated for up to 500lb in the extended position. The tray(s) will be constructed of .19" aluminum with non-welded corners. The finish will be painted to match compartment interior.

The tray(s) will be designed for maximum compartment width and depth.

Slides will be equipped with ball bearings for ease of operation and years of dependable service. The slides will be located on the sides of the tray so that the tray can be located as close to the compartment floor as possible.

Automatic locks will be provided for both the "in" and "out" positions. The trip mechanism for the locks will be located at the front of the tray for ease of use with a gloved hand.

SWING OUT TOOLBOARD

A swing out aluminum toolboard will be provided.

It will be a minimum of 0.188" thick with .281" diameter holes in a pegboard pattern with 1.00" centers between holes.

A 1.00" x 1.00" aluminum tube frame will be welded to the edge of the pegboard.

The board will be mounted on a pivoting device at the front of the compartment on the top and bottom to allow easy movement in and out of the compartment. The maximum tool load will be 400 lb.

The board will have positive lock in the stowed and extended position.

The board will have a D-ring handle to secure it in the stowed position.

The board will be mounted on adjustable tracks from front to back within the compartment.

Two (2) toolboard(s) will be provided. The toolboard(s) will be spatter gray painted and installed in LS2 full height and width and RS2 full height and width.

PARTITION, TRANSVERSE REAR COMPARTMENT

Two (2) partitions will be bolted in place to separate the left and right side rear compartments from the rear tailboard compartment. The partition will be body material painted spatter gray.

RUB RAIL

Bottom edge of the side compartments will be trimmed with a bright aluminum extruded rub rail.

Trim will be 3.12" high with 1.50" flanges turned outward for rigidity.

The rub rails will not be an integral part of the body construction, which allows replacement in the event of damage.

Rub rails will be attached with bolts and spaced from the body with isolators that will help to absorb any moderate impact without damaging the body.

BODY FENDER CROWNS

Polished stainless steel fender crowns will be provided around the rear wheel openings.

A fender liner constructed of unpainted brushed stainless will be provided to avoid paint chipping. The liners will be removable to aid in the maintenance of rear suspension components.

A dielectric barrier will be provided between the fender crown fasteners (screws) and the fender sheet metal to prevent corrosion.

The fender crowns will be held in place with stainless steel screws that thread directly into a composite nut and not directly into the parent body sheet metal to eliminate dissimilar metals contact and greatly reduce the chance for corrosion.

HARD SUCTION HOSE

Hard suction hose will not be required.

HANDRAILS

The handrails will be 1.25" diameter knurled aluminum to provide a positive gripping surface.

Chrome plated end stanchions will support the handrail. Plastic gaskets will be used between end stanchions and any painted surfaces.

Drain holes will be provided in the bottom of all vertically mounted handrails.

Handrails will be located on the front of the body in positions needed to meet NFPA requirements.

Two (2) vertical handrails will be located at the rear, one (1) on each side of the rear compartment.

AIR BOTTLE STORAGE (DOUBLE)

A quantity of one (1) air bottle compartment, 15.25" wide x 7.75" tall x 26.00" deep, will be provided on the left side rearward of the rear wheels. The triangular door to cover the double air bottle opening and the fuel tank access. A painted stainless steel door with a Southco raised trigger C2 black lever latch will be provided to contain the air bottle. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal.

Inside the compartment, black rubber matting will be provided.

AIR BOTTLE COMPARTMENT STRAP

A strap will be provided in the air bottle compartment to help contain the air bottle when the vehicle is parked on an incline. The strap will wrap around the neck and attach to the wall of the compartment.

AIR BOTTLE STORAGE (TRIPLE)

A quantity of three (3) air bottle compartments designed to hold (3) air bottles up to 7.25" in diameter x 26.00" deep will be provided on the left side forward of the rear wheels, on the right side forward of the rear wheels and on the right side rearward of the rear wheels. A painted stainless steel door with a Southco raised trigger C2 black lever latch will be provided to contain the air bottle. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal.

Inside the compartment, black rubber matting will be provided.

Air Bottle Compartment Strap

A strap will be provided in the air bottle compartment(s) to help contain the air bottles when the vehicle is parked on an incline. The strap will wrap around the neck and attach to the wall of the compartment.

EXTENSION LADDER

There will be a 24' two-section aluminum Duo-Safety Series 900-A extension ladder provided.

ROOF LADDER

There will be a 14' aluminum Duo-Safety Series 775-A roof ladder provided.

LADDER STORAGE



The ladders will be stored inside the upper section of the left side compartments.

The ladders will be banked in separate storage troughs.

The ladder storage assembly will be fabricated of stainless steel track channels to aid in loading and removal of ladders. Each trough will be lined with Dura-Surf nylon slides.

The rear of the ladder storage area will have a vertically hinged aluminum treadplate door with a D-handle latch latch.

FOLDING LADDER

One (1) 10.00' aluminum, Series 585-A, Duo-Safety folding ladder will be installed.

FOLDING LADDER TROUGH

A stainless steel trough for the folding ladder will be provided in the long tool storage compartment on the left side. DuraSurf will be applied to the bottom of the trough to prevent damage to the ladder.

PIKE POLE PROVIDED BY FIRE DEPARTMENT

The pike poles are not on the apparatus as manufactured. The fire department will provide and mount the pike poles.

There will be one (1) pike pole(s) provided. The pike pole(s) will be a Fire Hooks Unlimited 8 foot roof hook.

PIKE POLE STORAGE

A aluminum tube with a 1.38" notch, to accommodate a New York style pike pole for an 8' or longer pike pole will be provided in the upper body compartment on the left side. One (1) pike pole will require a tube provided in this location.

6' PIKE POLE PROVIDED BY FIRE DEPARTMENT

The pike pole is not on the apparatus as manufactured. The fire department will provide and mount the pike poles.

There will be one (1) 6' pike pole(s) provided. The pike pole(s) will be a Fire Hooks Unlimited 6' New York pike pole.

PIKE POLE STORAGE

A aluminum tube for a 6' pike pole with 1.38" notch, to accommodate a New York style pike pole will be provided in the upper body compartment on the left side. One (1) pike pole will require a tube provided in this location.

LONG ITEM STORAGE COMPARTMENT

One (1) compartment will be provided, recessed in the upper, inside part of body compartment on the left side for storage of long handle tools. The door will be made of smooth aluminum and have a flush lift and turn latch. The door will be hinged along the outboard edge.

LADDER, TOP ACCESS

A wide easy climbing access ladder, constructed of aluminum rungs and extruded aluminum rails, will be provided on the opposite side of the ladder storage at the rear of the apparatus. The inside climbing area of the ladder will be 13.75" wide.

The lower section of the ladder will be retractable into the upper section to eliminate interference with the rear FMVSS lights. When lowered the bottom rung will be lower than the body, approximately 16.00" to 20.00" from the ground to allow a lower first step height.

The ladder will be slanted when in use for easy access, and fold against the body for storage to reduce the overall length. Corrosion resistant, stainless steel spring-loaded locks will hold the ladder in place.

There will be a "do not move truck" indicator activated in the cab if the ladder is not in the stowed position when the parking brake is disengaged.

PUMP CONTROL PANELS (LEFT SIDE CONTROL)



Pump controls and gauges will be located midship at the left side of the apparatus and properly identified.

The main pump operator's control panel will be completely enclosed and located in the forward section of the body compartment, to protect against road debris and weather elements. The pump operator's panels will be no more than 31.00" wide, and made in four (4) sections with the center section easily removable with simple hand tools. For the safety of the pump operator, there will be no discharge outlets or pump inlets located on the main pump operators panel.

Layout of the pump control panel will be ergonomically efficient and systematically organized. The upper section will contain the master gauges. This section will be angled down for easy visibility. The center section will contain the pump controls aligned in two horizontal rows. The pressure control device, engine monitoring gauges, electrical switches, and foam controls (if applicable) will be located on or adjacent to the center panel, on the side walls for easy operation and visibility. The lower section will contain the outlet drains.

Manual controls will be easy moving 8" long lever style controls that operate in a vertical, up and down swing motion. These handles will have a 2.25" diameter knob and be able to lock in place to prevent valve creep under any pressure. Bright finish bezels will encompass the opening, be securely mounted to the pump operator's panel, and will incorporate the discharge gauge bezel. Bezels will be bolted to the panel for easy removal and gauge service. The left side discharges will be controlled directly at the valve. There will be no push-pull style control handles.

Identification tags for the discharge controls will be recessed within the same bezel. The discharge identification tags will be color coded, with each discharge having its own unique color.

All remaining identification tags will be mounted on the pump panel in chrome-plated bezels.

All discharge outlets will be color coded and labeled to correspond with the discharge identification tag.

The pump panels for the midship discharge and intake ports will be located ahead of the body compartments with no side discharge or intake higher than the frame rail. The pump panels will be easily removable with simple hand tools.

A recessed cargo area will be provided at the front of the body, ahead of the water tank above the plumbing.

PUMP

Pump will be a Pierce, low profile, 2000 gpm single stage midship mounted centrifugal type, mounted below the cab. The pump will have a 15 percent reserve capacity to allow for extended time between pump rebuild. To ensure efficient pump/vehicle design the capacity to weight ratio will not be less than 1.5:1.

The pump casing will consist of three (3) discharge outlets, one (1) to each side in line with the impeller and one (1) to the rear. The pump casing will incorporate two (2) water strippers to maintain radial balance.

Pump will be the Class A type.

Pump will be certified to deliver the percentage of rated discharge from draft at pressure indicated below:

- 100 percent of rated capacity at 150 psi net pump pressure
- 70 percent of rated capacity at 200 psi net pump pressure
- 50 percent of rated capacity at 250 psi net pump pressure

The pump will have the capacity to deliver the percentage of rated discharge from a pressurized source as indicated below:

- 135 percent of rated capacity at 100 psi net pump pressure from a 5 psi source

Pump body will be fine-grained gray iron. Pump will incorporate a heater/cooling jacket integral to the pump housing.

The impeller will be high strength vacuum cast bronze alloy accurately machine balanced and splined to a ten 10) spline stainless steel pump shaft for precision fit, exceptional durability, and efficiency. Double replaceable reverse flow labyrinth type bronze wear ring design will help to minimize end thrust. The impeller will be a twisted vane design to create higher lift. No keyed shafts will be acceptable.

The pump will include o-ring gaskets throughout the pump.

Deep groove radial type oversize ball bearings will be provided. The bearings will be protected at the openings from road dirt and water with an oil seal and water slinger.

The pump will have a flat, patterned area on the top of the pump intake wye to allow standing for plumbing maintenance. The main inlet manifold will be 6.00" in diameter and will have a low profile design to facilitate low crosslays and high flows.

For ease of service, the pump housing, intake wye, impeller, mechanical seal, and gear case will be accessible from above the chassis frame by tilting the cab. Removal of the main inlet wyes will provide access to the impeller, mechanical seal, and wear ring.

The tank to pump line and the primary discharge line will be the only piping required to be removed for overhaul.

For ease of service and overhaul there will be no piping or manifolding located directly over the pump.

PUMP MOUNTING

Pump will be mounted to the chassis frame rails directly below the crew cab, to minimize wheelbase and facilitate service, using rubber isolators in a modified V pattern that include one (1) central mounted isolator located between the frame rails and one (1) on each side outside the frame rails. The mounting will allow chassis frame rails to flex independently without damage to the fire pump. Each isolator will be 2.55" in total outside diameter and will be rated at 490 lb. The pump will be completely accessible by tilting the cab with no piping located directly above the pump.

MECHANICAL SEALS

Silicon carbide mechanical seals will be provided. The seals will be spring loaded and self-adjusting. The seals will have a minimum thermal conductivity of 126 W/m*K to run cooler. Seals will have a minimum hardness of 2800 kg/mm2 to be more resistant to wear, and have thermal expansion characteristics of no more than 4.0 X106mm/mm*K to be more resistant to thermal shock.

PUMP GEAR CASE

The integrated pump transmission gear case will use a pressure-lubricated system to cool, lubricate, and filter the oil. The gear case will be constructed of lightweight aluminum, and impregnated with resin in accordance to MIL Spec MIL-I-17563. A sight glass, accessible by tilting the cab, will be provided for easy fluid level checks.

The gear case will consist of three (3) gears to drive the pump.

CLUTCH

There will be a heavy-duty hydraulic clutch mounted directly to the integrated pump transmission to engage and disengage the pump without gear clash. The clutch will be a multiple disc design for maximum torque. The clutch will be fully self-adjusting to provide automatic wear compensation, and consistent torque throughout the life of the clutch. Positive engagement and disengagement will be provided through a high efficient and dependable hydraulic system to assure superior performance.

LOW PRESSURE/HIGH TEMPERATURE LIGHTS

Lights will be provided to indicate when a high temperature or low pressure situation occurs. Lights will be provided next to the master gauges at the pump panel as well as on the control panel in the cab. A pair of lights will be provided in each location. One light will be provided to indicate high temperature. The second light will be provided to indicate a low pressure. All lights will be labelled accordingly.

PUMPING MODE

Pump will provide for both pump and roll mode and stationary pumping mode.

Stationary pumping mode will be accomplished by stopping the vehicle, setting the parking brake and engaging the water pump switch on the cab switch panel. The transmission will shift to "Neutral" range automatically when the parking brake is set. The "OK to Stationary Pump" indicator will also illuminate when the parking brake is set.

If the vehicle is equipped with a suitable Husky foam system or Hercules CAFS system, these systems will be engaged from the cab switch panel as well.

pump and roll mode will be accomplished by the use of the main pump and will not require the use of a secondary pump. pump and roll mode will use the same operation sequence as stationary pumping mode with a few additional steps. After the vehicle is setup for stationary pumping, the operator will leave the cab and setup the pump panel to discharge at the desired outlet(s). Upon returning to the cab, the operator will disengage the parking brake. An "OK to pump and roll" indicator will illuminate on the cab switch panel. First gear on the transmission gear selector will be selected by the operator for pump and roll operations. The operator as needed will apply the foot throttle. pump and roll mode will be maintained unless the transmission shifts out of first gear.

Stopping either stationary pumping mode or pump and roll mode will be accomplished by pressing the "Water Pump" switch down to disengage the pump.

The pump pressure reading will be displayed in the Command Zone information display in the cab within clear view of the driver.

PUMP SHIFT

Pump will be engaged in not more than two steps, by simply setting the parking brake, which will automatically put the transmission into neutral, and activating a rocker switch in the cab. Switches in the cab will also allow for water, foam, or CAFS if equipped, and activate the appropriate system to preset parameters. The engagement will provide simple two-step operation, enhance reliability, and completely eliminate gear clash. The shift will include the indicator lights as mandated by NFPA. A direct override switch will be located behind a door in the pump operator's panel. The switch will automatically disengage when the door is closed.

As the parking brake is applied, the pump panel throttle will be activated and deactivate the chassis foot throttle for stationary operation.

TRANSMISSION LOCK UP

Transmission lock up is not required as transmission will automatically shift to neutral as soon as the parking brake is set.

AUXILIARY COOLING SYSTEM

A supplementary heat exchange cooling system will be provided to allow the use of water from the discharge side of the pump for cooling the engine water. A water-to-coolant heat exchanger will be used.

INTAKE RELIEF VALVE

The intake relief valve for the pump is not required.

A Waterous intake relief valve will be installed on the MIVs on the suction side of the pump preset at 125 psig .

The relief valve will have a working range of 50 PSI to 350 PSI.

The outlet will terminate below the frame rails with a 2.50" National Standard hose thread adapter and will have a "do not cap" warning tag.

An adjustable air regulator and pressure indicating gauge will be located behind the left side pump panel with a stainless steel access door on a common bezel.

PIERCE PRESSURE CONTROLLER

A Pierce electronic pressure controller will be provided.

A pressure transducer will be installed in the discharge side of the water pump. The transducer continuously monitors pump pressure sending a signal to the electronic pressure controller.

The pressure controller can be used in two (2) modes of operation, RPM mode and pressure modes. The controller will be programmed to turn on/default to RPM Setting mode.

In the RPM mode, the controller can be activated after vehicle parking brake has been set. When in this mode, the controller will maintain the set engine speed, regardless of engine load (within engine operation capabilities).

In the pressure mode, the controller can be activated after vehicle parking brake has been set. When in this mode, the controller will automatically maintain the discharge pressure set by the operator (within the discharge capabilities of the pump and water supply) regardless of flow.

A 2.00" diameter throttle control knob with no mechanical stops, a serrated grip, and a red idle push button in the center will be a integrated/part of the pressure controller. The throttle control knob will be programmed for Clockwise rotation to increase engine speed.

Individual LED indicators for ok to pump, throttle ready, pressure mode and rpm mode will be located on the pressure controller for easy viewing.

A pump cavitation protection feature will also be provided which will return the engine to idle should the pump cavitate. Cavitation is sensed by the combination of pump pressure below 30 psi and engine speed above 2000 rpm for more than five (5) seconds.

Other safety features include recognition of low water and no water conditions with an automatic programmed response and a push button to return the engine to idle.

The pressure controller LCD screen will be 4.20" in size with a minimum brightness of 750 nits. The LCD screen and LED intensity will automatically adjust for day and nighttime operation. The LCD screen intensity can also be manually adjusted if needed.

The following information will be provided/displayed on the LCD screen:

- Engine RPM
- Check engine and stop engine warning indicators
- Engine oil pressure
- Engine coolant temperature
- Water pump transmission temperature
- Fuel Level
- Water tank level
- Battery voltage
- Operating mode (RPM or pressure)
- Pressure or RPM setting

On screen messaging show diagnostic and warning messages as they occur. It will show apparatus information, stored data, and program options when selected by the operator. It will monitor inputs outputs and support audible and visual warning alarms for the following conditions:

- High battery voltage
- Low battery voltage/engine off
- Low battery voltage/engine running
- High water pump temperature
- Low fuel
- Low engine oil pressure
- High engine coolant temperature

- Water tank out of water (visual alarm only)
- No engine response (visual alarm only)

The pressure controller will store the accumulated operating hours for the pump and engine. These items are to be displayed within the pressure controller menu.

The pressure controller will include a USB port on the back of the controller for easy software upgrades if needed.

PRIMING PUMP

The priming pump will be a Trident Emergency Products compressed air powered, high efficiency, multistage venturi based AirPrime System, conforming to standards outlined in the current edition of applicable NFPA standards.

All wetted metallic parts of the priming system are to be of brass and stainless steel construction.

One (1) priming control will open the priming valve and start the pump primer.

PUMP MANUALS

There will be one (1) pump manuals provided by the pump manufacturer and furnished with the apparatus along with the master loose equipment manuals.

PLUMBING, STAINLESS STEEL AND HOSE

All inlet and outlet lines will be plumbed with either stainless steel pipe, flexible polypropylene tubing or synthetic rubber hose reinforced with hi-tensile polyester braid. All hose's will be equipped with brass or stainless steel couplings. All stainless steel hard plumbing will be a minimum of a schedule 10 wall thickness.

Where vibration or chassis flexing may damage or loosen piping or where a coupling is required for servicing, the piping will be equipped with victaulic or rubber couplings.

Plumbing manifold bodies will be ductile cast iron or stainless steel.

All piping lines are to be drained through a master drain valve or will be equipped with individual drain valves. All drain lines will be extended with a hose to drain below the chassis frame.

All water carrying gauge lines will be of flexible polypropylene tubing.

All piping, hose and fittings will have a minimum of a 500 PSI hydrodynamic pressure rating.

FOAM SYSTEM PLUMBING

All piping that is in contact with the foam concentrate or foam/water solution will be stainless steel. The fittings will be stainless steel or brass. Cast iron pump manifolds will be allowed.

MAIN PUMP INLETS

A 6.00" pump manifold inlet will be provided on each side of the vehicle. The suction inlets will include removable die cast zinc screens that are designed to provide cathodic protection for the pump, thus reducing corrosion in the pump.

Main pump inlets will not be located on the main operator's panel and will maintain a low connection height by terminating below the top of the chassis frame rail.

MAIN INLET BUTTERFLY VALVE

There will be two (2) butterfly valve provided, one (1) on the right side and one (1) on the left side main pump inlet.

The 6.00" inlet valves will be recessed behind the pump panel.

The 6.00" inlet valves will be provided with an adjustable pressure relief valve, matching the intake relief valve of the pump, preset at 125 psig and a bleeder valve will be provided on the inlet side of the valve.

There will be an Akron 9343 electric valve controller provided on the pump operators panel. The electric control must be of a true position feedback design, requiring no clutches in the motor or current limiting. The unit must be completely sealed with momentary open, close as well and an optional one touch full open feature to operate the valve actuator. The controller will provide position indication with 5 colored LED's. It will have manual adjustment of the brightness as well as an auto dimming option.

The electric actuator will be furnished with a manual override, extended to the pump panel at the inlet.

A manual override wrench will be provide to manually open or close the valve.

A maintain switch will be provided near the manual override. The switch will cut off power to the valve to allow for manual override valve actuation.

MAIN PUMP INLET CAP

The main pump inlets will have National Standard Threads with a long handle chrome cap.

The cap will be the Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.



VALVES

All ball valves will be Akron® Brass. The Akron valves will be the 8000 series heavy-duty style with a stainless steel ball and a simple two-seat design. No lubrication or regular maintenance is required on the valve.

Valves will have a **ten (10) year** warranty.

The location of the valve for the two (2) inlets will be recessed behind the pump panel.

INLET CONTROL

The side auxiliary inlet(s) will incorporate a quarter-turn ball valve with the control located at the inlet valve. The valve operating mechanism will indicate the position of the valve.

LEFT SIDE INLET

There will be one (1) auxiliary inlet with a 2.50" valve at the left side pump panel, terminating with a 2.50" (F) National Standard hose thread adapter.

The auxiliary inlet will be provided with a strainer, chrome swivel and plug.

RIGHT SIDE INLET

There will be one (1) auxiliary inlet with a 2.50" valve at the right side pump panel, terminating with a 2.50" (F) National Standard hose thread adapter.

The auxiliary inlet will be provided with a strainer, chrome swivel and plug.

LARGE DIAMETER REAR INLET

A 5.00" inlet with screen will be provided using 5.00" piping and a 5.00" butterfly valve.

The screen will provide cathodic protection against corrosion in the piping.

The piping will contain only large radiused elbows, no mitered joints.

The plumbing will be routed to the rear below the water tank, between the frame rails, up the rear wall of the tank and into the left side rear compartment.

The inlet will terminate at the left side rear bulkhead.

Bleeder valves will be located near the threaded connection and the valve control.

REAR INLET CONTROL

The rear inlet will be gated with an electric operated control at the pump operator's panel. The control will be momentary to allow the valve to be gated for ease of operation. Indicator lights will be provided to show if the valve is open or closed.

REAR INLET CAP

The rear inlet will have a National Standard hose thread adapter with a rocker lug chrome cap.

The cap will be the Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.

REAR INLET INTAKE RELIEF VALVE

The rear inlet intake pressure relief valve will match those used on the pump/side MIVs and be preset at 125 psig .

The pressure relief valve will be adjustable from 50 to 250 psi.

The outlet will be 2.50" National Standard hose thread and terminate below the frame rails and will have a "do not cap" warning tag near the discharge outlet.

INLET BLEEDER VALVE

A 0.75" bleeder valve will be provided for each side gated inlet.

The valves will be located behind the panel with a "T" swing style handle control extended to the outside of the panel.

The handles will be chrome plated and provide a visual indication of valve position. The swing handle will provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage.

The water discharged by the bleeders will be routed below the chassis frame rails.

TANK TO PUMP

The booster tank will be connected to the intake side of the pump with heavy duty 4.00" piping and a quarter turn 3.00" full flow line valve with the control located at the operator's panel. A rubber coupling will be included in this line to prevent damage from vibration or chassis flexing.

A check valve will be provided in the tank to pump supply line to prevent the possibility of "back filling" the water tank.

TANK REFILL

A 1.50" combination tank refill and pump re-circulation line will be provided, using a quarter-turn full flow ball valve controlled from the pump operator's panel.

DISCHARGE OUTLET CONTROLS

The right side discharges will incorporate a quarter-turn ball valve and be controlled by Akron 9345 electric valve controllers provided on the pump operator's panel. The electric controls must be of a true position feedback design, requiring no clutches in the motor or current limiting. The units must be completely sealed with momentary open, close as well and an optional one touch full open feature to operate their corresponding valve actuator. The controllers will provide position indication on a full color, backlit LCD display. They will have manual adjustment of the brightness as well as an auto dimming option. In addition to the valve controls, the electric valve controllers will include a pressure display

All other outlets will have manual swing handles that operate in a vertical up and down motion. These handles will be able to lock in place to prevent valve creep under pressure.

LEFT SIDE DISCHARGE OUTLETS

There will be two (2) discharges with a 2.50" valves on the left side of the apparatus, terminating with 2.50" MNST threads. Discharges will be located below the cab and will be no higher than the top of the chassis frame rail.

There will be Akron 9345 electric valve controllers provided on the pump operators panel. The electric controls must be of a true position feedback design, requiring no clutches in the motor or current limiting. The units must be completely sealed with momentary open, close as well and an optional one touch full open feature to operate the valve actuator. The controllers will provide position indication on a full color, backlit LCD display. They will have manual adjustment of the brightness as well as an auto dimming option.

In addition to valve position, each controller will include a pressure display.

RIGHT SIDE DISCHARGE OUTLETS

One (1) discharge outlet with a 2.50" valve will be provided on the right side of the apparatus, terminating with a 2.50" MNST adapter. The discharge(s) will be located below the crew cab and will be no higher than the top of the chassis frame rail.

There will be Akron 9345 electric valve controller(s) provided on the pump operator's panel. The electric control(s) must be of a true position feedback design, requiring no clutches in the motor or current limiting. The unit(s) must be completely sealed with momentary open, close as well and an optional one touch full open feature to operate the valve actuator. The controller(s) will provide position indication on a full color, backlit LCD display. They will have manual adjustment of the brightness as well as an auto dimming option.

In addition to valve position, each controller will include a pressure display.

LARGE DIAMETER DISCHARGE OUTLET

There will be an Akron 8800 4.00" flat ball valve with 4.00" plumbing terminating with a 4.00" MNST chrome adapter on the right side pump panel.

The valve will be controlled with a(n) Akron 9343 w/analog pressure gauge located at the pump operator's panel.

LARGE DIAMETER OUTLET CAP

The large diameter outlet will have a National Standard hose thread adapter with a 4.00" rocker lug chrome plated cap and chain.

The cap will be the Pierce VLH, which incorporates a patent pending thread design to automatically relieve stored pressure in the line when disconnected.

FRONT DISCHARGE OUTLET

There will be one (1) 1.50" discharge outlet piped to the front of the apparatus and located on the top of the right side of the front bumper.

Plumbing will consist of 2.00" piping and flexible hose with a 2.00" full flow valve with control at the pump operator's panel. A fabricated weldment made of stainless steel pipe will be used in the plumbing where appropriate. The piping will terminate with a 1.50" NPSH thread with 90 degree swivel.

There will be automatic drains provided at all low points of the piping.

DISCHARGE CAPS/ INLET PLUGS

Chrome plated, rocker lug, caps with chain will be furnished for all discharge outlets 1.00" thru 3.00" in size, besides the pre-connected hose outlets.

Chrome plated, rocker lug, plugs with chain will be furnished for all auxiliary inlets 1.00" thru 3.00" in size.

The caps and plugs will incorporate a thread design to automatically relieve stored pressure in the line when disconnected.

OUTLET BLEEDER VALVE

A 0.75" bleeder valve will be provided for each outlet 1.50" or larger. Automatic drain valves are acceptable with some outlets if deemed appropriate with the application.

The valves will be located behind the panel with a T swing style handle control extended to the outside of the side pump panel.

The handles will be chrome plated and provide a visual indication of valve position.

The T swing handle will provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage.

Bleeders will be located at the bottom of the pump panel. They will be properly labeled identifying the discharge they are plumbed in to.

The water discharged by the bleeders will be routed below the chassis frame rails.

DELUGE RISER

A 3.00" deluge riser will be installed above the pump in such a manner that a monitor can be mounted and used effectively. 3.00" piping will be installed securely so no movement develops when the line is charged. A 2.50" gated valve will be installed and controlled at the pump operator's panel. The deluge outlet will flow a minimum 1000 GPM.

MONITOR

A customer/dealer supplied and installed make and model No monitor required or requested monitor will be properly installed on the deluge riser.

The deluge riser will have male National Pipe Threads for mounting the monitor.

CROSSLAY MODULE

The crosslay module will be full width of the rear body.

The forward, upper corners of the module will have full body corners.

The crosslay module will be manufactured for installation of roll up doors on each side.

ROLL-UP DOOR, CROSSLAY ENDS, PUC

All compartment doors will be roll-up style double faced, aluminum construction, painted one (1) color to match the lower portion of the body and manufactured by AMDOR™. The crosslay enclosure will be full width of the body.

The track will be the flanged track with the screws installed to the rear of the track guide.

The slats will be double wall box frame extrusion. The exterior surface will be flat and the interior surface will be concave to help loose equipment fall to the ground and prevent it from jamming the door.

Between each slat will be a PVC inner seal to prevent metal to metal contact and prevent dirt or moisture from entering the compartments.

Each door will have a 4.00" counter balance to assist in lifting.

A polished stainless steel lift bar to be provided for each roll-up door. The lift bar will be located at the bottom of door with striker latches installed at the base of the side frames. Side frame mounted door strikers will include support beneath the stainless steel lift bar to prevent door curtain bounce, improve bottom seal life expectancy and to avoid false door ajar signals.

The crosslays will have a standard drip pan below the roll of the door.

CROSSLAY COMPARTMENT LIGHTING

There will be two (2) 12 volt DC light strips with white LEDs and mechanical fasteners, provide behind the front door frame on the crosslay compartments per the following:

- One (1) strip light for the left side crosslay compartment door
- One (1) strip light for the right side crosslay compartment door

The lights will be activated when the battery switch is on and the respective door is opened.

LOWER CROSSLAY

There will be two (2) lower crosslays provided.

1.50" Crosslay

There will be two (2) 1.50" crosslays plumbed with 2.00" welded or formed schedule 10 304L stainless steel pipe.

The crosslays will be low mounted with the bottom of both crosslay trays no more than 11.00" above the frame rails for simple, safe reloading and deployment.

There will be a 1.50" National Standard hose thread 90-degree swivel provided in each hose bed, so that the hose may be removed from either side of apparatus. The swivel will be as far outbound as possible for ease of changing hose.

Each crosslay will be gated with a 2.00" quarter turn ball valve with the controls located at the pump operator's panel.

Each hose bed will be capable of carrying 200' of 1.75" double jacket hose.

Crosslay Hose Tray

A removable tray will be provided for each crosslay hose bed. The crosslay tray will be constructed of black poly to provide a lightweight sturdy tray. Two (2) hand holes will be in the floor and additional hand holes will be provided in the sides for easy removal and installation from the compartment. The floor of the trays will be perforated to allow for drainage and hose drying.

Trays will be held in place by a mechanical spring-loaded stainless-steel latch that automatically deploys upon loading the trays to hold the trays in place during transit.

BACKBOARD STORAGE

One (1) backboard(s) will be located in the upper crosslay module. The backboard(s) will be enclosed and removable from either side of the truck. A Velcro® strap will be provided on each end of the storage. The backboard(s) to be stored will be 4" X 18" X 72".

CROSSLAY TRAY

The three (3) poly tray(s) provided for the crosslays/speedlays will be of 7.5 and 10, and located 1.75" crosslays at 7.5" wide and the 2.5" crosslay at 10" wide.

FOAM PROPORTIONER

A foam proportioning system will be provided that is an on demand, automatic proportioning, single point, direct injection system suitable for all types of Class A and B foam concentrates, including the high viscosity (6000 cps), alcohol resistant Class B foams. Operations will be

based on direct measurement of water flow and remain consistent within the specified flows and pressures. The system will automatically proportion foam at rates from 0.1 percent to 3 percent regardless of variations in water pressure and flow, up to the maximum rated capacity of the foam concentrate pump.

The design of the system will allow operation from draft, hydrant, or relay operation.

System Capacity

The system will have the ability to deliver the following minimum foam solution flow rates at accuracies that meet or exceed NFPA requirements at a pump rating of 150 psi.

- 100 gpm @ 3 percent
- 300 gpm @ 1 percent
- 600 gpm @ 0.5 percent

Class A foam setting in 0.1 percent increments from 0.1 percent to 3 percent. Typical settings of 1 percent, 0.5 percent and 0.3 percent (maximum capacity will be limited to the plumbing and water pump capacity).

The percentage of injection will have a preset. This preset can be changed by the end user as desired. The percentage of foam injected will be changed through the display screen.

Hydraulic Drive System

The foam concentrate pump will be powered by an electric over hydraulic drive system. The hydraulic system and motor will be integrated into one (1) unit.

Foam Concentrate Pump

The foam concentrate pump will be of positive displacement, self-priming; linear actuated design, driven by the hydraulic system. The pump will be constructed of brass body; chrome plated stainless steel shaft, with a stainless-steel piston.

A relief system is provided to protect the drive system components and prevent over pressurizing of the foam concentrate pump.

One (1) check valve will be installed in the foam discharge plumbing to prevent foam from contaminating the water pump.

The foam concentrate pump will have minimum capacity for 3 gpm with all types of foam concentrates with a viscosity at or below 6000 cps including protein, fluor protein, AFFF, FFFP, or AR-AFFF. The system will deliver only the amount of foam concentrate flow required, without recirculating foam back to the storage tank. Recirculating foam concentrates back to the storage tank can cause agitation and premature foaming of the concentrate resulting in system failure. The foam concentrate pump will be self-priming with the ability to draw foam concentrate from external sources, such as drums or pails.

Control System

The system will be equipped with an LCD display located on the pump operator's panel and a control. Both the display and control will use a can network. The display will use a USB interface for software updates. The LCD display will have adjustment for screen brightness.

The control will house a microprocessor, which receives input from the systems water flow meter while also monitoring the position of the foam concentrate pump. The microprocessor will compare the values of the water flow versus the position/rate of the foam pump, to ensure the proportion rate is accurate.

Push button controls will be integrated into the LCD control for:

- System On/Off
- Foam Percentage Control
- Foam Pump Prime
- Paddle Wheel Auto/Manual Mode

The LCD control will display:

- Foam Pump Stroke Position
- Foam Inject Percentage
- Tank or Draft Mode Selection
- Foam Tank Low Level
- Inject/Fill Mode Selection
- Tank Refill

The display will have access to menu options for calibration and diagnostic needs.

External Foam Concentrate Connection

A 0.75" male connection GHT (garden hose thread) external foam pick-up will be provided on the pump panel to enable use of a foam agent that is not stored on the vehicle. The external foam pick-up will be designed to allow continued operation after the on-board foam tank is empty, or the use of foam which is different than that stored in the foam tank.

Panel Mounted Valved Manifold

A valved manifold (with an instruction plaque) will be mounted to the pump panel. The valved manifold will function as the foam system draft/tank foam inject source and inject/foam tank fill mode.

Pick-up Hose

A 0.75" flexible hose with an end for insertion into foam containers will be provided. The hose will be supplied with a 0.75" female swivel GHT (garden hose thread) swivel connector. The hose will be shipped loose.

Discharges
The foam system will be plumbed to lower rear crosslay, lower front crosslay and center of front bumper discharge(s).

System Electrical Load
The maximum current draw of the electric motor and system will be no more than 65 amperes at 12 VDC.

SINGLE FOAM TANK REFILL
The foam system's proportioning pump will be used to fill the foam tank. This will allow use of the auxiliary foam pick-up to pump the foam from pails or a drum on the ground into the foam tank. A foam shut-off switch will be installed in the fill dome of the tank to shut the system down when the tank is full. The fill operation will be controlled by a mode in the foam system controller. While the proportioner pump is filling the tank, the controller that the tank is filling. When the tank is full, as determined by the float switch in the tank dome, the pump will stop. If it attempted to use tank fill and the refill valve and suction valve are in the wrong position(s), the display will indicate the improper valve position(s). When the valves are positioned properly, then filling will commence.

FOAM CELL
The foam cell will be an integral portion of the polypropylene water tank. The cell will have a capacity of 30 gallons of foam with the intended use of Class B foam. The brand of foam stored in this tank will be TBD. The foam cell will not reduce the capacity of the water tank. The foam cell will have a screen in the fill dome and a breather in the lid.

FOAM TANK DRAIN
The foam tank drain will be a 1.00" quarter turn drain valve located inside the pump/plumbing compartment.

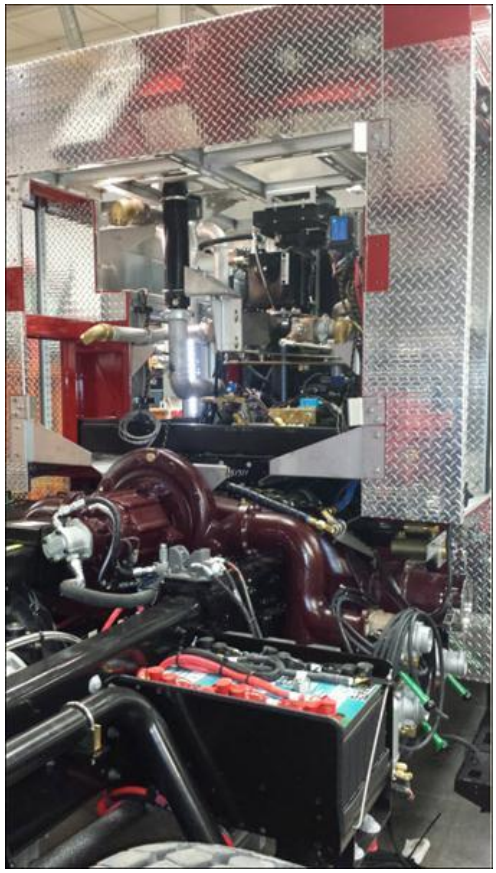
PUMP PANEL CONFIGURATION
The pump panel configuration will be arranged and installed in an organized manner that will provide user-friendly operation.

PUMP AND GAUGE PANEL
The pump operator's panel and gauge panels will be brushed stainless steel finish.

The side panels will be brushed stainless steel finish.

PUMP AND PLUMBING ACCESS
Simple access to the plumbing will be provided through the front of the body area by raising the cab for complete plumbing service and valve maintenance. Access to valves will not require removal of operator panels or pump panels. Access for rebuilding of the pump will not require removal of more than the tank to pump line and a single discharge line. This access

will allow for fast, easy valve or pump rebuilding, making for reduced out of service times. Steps will be provided for access to the top of the pump.



Access to the pump will be provided by raising the cab. The pump will be positioned such that all maintenance and overhaul work can be performed above the frame and under the tilted cab. The service and overhaul work on the pump will not require the removal of operator panels or pump panels. Complete pump casing and gear case removal will require no more than removal of the intake and discharge manifolds, driveline, coolers and a single discharge line. The pump case and gear case will be able to be removed by lifting upward without interference from piping and be removable in less than 3 hours.

PUMP COMPARTMENT LIGHT

There will be one (1) Whelen®, Model 3SC0CDCR, 3.00" white 12 volt DC LED light(s) with Whelen, Model 3FLANGEC, flange(s) installed in the plumbing area.

The light(s) will be activated by a toggle switch located in the pump compartment area.

Engine monitoring graduated LED indicators will be incorporated with the pressure controller.

THROTTLE READY GREEN INDICATOR LIGHT

There will be a green indicator light integrated with the pressure governor and/or engine throttle installed on the pump operators panel that is activated when the pump is in throttle ready mode.

AIR HORN SWITCH

An air horn control switch will be provided at the pump operator's control panel. This switch will be momentary red and properly labeled. The switch will be located within easy reach of the operator in the electrical switch panel.

VACUUM AND PRESSURE GAUGES

The pump vacuum and pressure gauges will be liquid filled and manufactured by Class 1 Incorporated.

The gauges will be a minimum of 4.00" in diameter and will have white faces with black lettering, with a pressure range of 30.00"-0-600#.

Gauge construction will include a Zytel nylon case with adhesive mounting gasket and threaded retaining nut.

The pump pressure and vacuum gauges will be installed adjacent to each other at the pump operator's control panel.

Test port connections will be provided at the pump operator's panel. One (1) will be connected to the intake side of the pump, and the other to the discharge manifold of the pump. They will have 0.25 in. standard pipe thread connections and non-corrosive polished stainless steel or brass plugs. They will be marked with a label.

This gauge will include a 10 year warranty against leakage, pointer defect, and defective bourdon tube.

PRESSURE GAUGES

The individual "line" pressure gauges for the discharges will be Class 1 interlube filled.

They will be a minimum of 2.00" in diameter and have white faces with black lettering.

Gauge construction will include a Zytel nylon case with adhesive mounting gasket and threaded retaining nut.

Gauges will have a pressure range of 30"-0-400#.

The individual pressure gauge will be installed as close to the outlet control as practical.

This gauge will include a 10 year warranty against leakage, pointer defect, and defective bourdon tube.

WATER LEVEL GAUGE

An electric water level gauge will be incorporated in the pressure controller that registers water level by means of nine (9) LEDs. They will be at 1/8 level increments with a tank empty LED. The LEDs will be a bright type that is readable in sunlight, and have a full 180-degree of clear viewing.

To further alert the pump operator, the gauge will have a warning flash when the tank volume is less than 25 percent. The gauge will have down chasing LEDs when the tank is almost empty.

The level measurement will be ascertained by sensing the head pressure of the fluid in the tank or cell.

MINI SLAVE UNIT

An electric water level gauge will be provided in the cab that registers water level by means of five (5) LEDs. They will be at 1/4 level increments with a tank empty LED. The LEDs will be a bright type that are readable in sunlight and have a full 180-degree of clear viewing.

The water level gauge in the cab will be activated when the pump is in gear.

ADDITIONAL WATER LEVEL GAUGE

There will be two (2) additional Fire Research MaxVision, model WLA280-A00, water tank remote indicator(s) provided and installed each side of the crew cab. The indicators will show the volume of water in the tank on 96 easy to see super bright Tri-color LEDs. The indicator case will be waterproof and manufactured of Polycarbonate material with an integrated lens.

The remote indicator will indicate the level as a single color:

- Red for 25 percent or less
- Amber for up to 50 percent volume
- Blue for up to 75 percent volume
- Green for up to 100 percent volume

When the level reaches 25 percent, the red LEDs will begin flashing. When the level is empty, the red LEDs will scroll in a down-chasing motion and then flash three (3) times.

The flash rate will be determined by the main water tank sensor.

It will have the program capability to adjust the brightness level for day time and night time viewing. The LEDs can also be programmed for different colors.

This module will be activated when the pump is in gear.

FOAM LEVEL GAUGE

An electronic foam level gauge will be provided on the operator's panel that registers foam level by means of five (5) colored LED lights. The lights will be durable, ultra-bright five (5) LED design viewable through 180 degrees. The foam level indicators will be as follows:

- 100 percent = Green
- 75 percent = Yellow
- 50 percent = Yellow
- 25 percent = Yellow
- Refill = Red

The light will flash when the level drops below the given level indicator to provide an eighth of a tank indication. To further alert the pump operator, the lights will flash sequentially when the foam tank is empty.

The level measurement will be based on the sensing of head pressure of the fluid in the tank.

The display will be constructed of a solid plastic material with a chrome plated die cast bezel to reduce vibrations that can cause broken wires and loose electronic components. The encapsulated design will provide complete protection from foam and environmental elements. An industrial pressure transducer will be mounted to the outside of the tank. The display will be able to be calibrated in the field and will measure head pressure to accurately show the tank level.

SIDE CONTROL PUMP OPERATOR'S/PUMP PANEL LIGHTING

Illumination will be provided for controls, switches, essential instructions, gauges, and instruments necessary for the operation of the apparatus and the equipment provided on it. Internal and external lights on the apparatus will be illuminated per the current edition of applicable NFPA standards.

The pump panels will be illuminated by two (2) Truck-Lite, Model 60354C, 6.00" x 2.00" oval white LED lights with Model 60700, grommets and chrome covers installed on the back of the cab, one (1) on the driver's side and one (1) on the passenger's side.

The pump operator's panel will utilize the same LED strip lighting at the forward doorframe as all other compartment lighting.

There will be a small white LED pump engaged indicator light installed overhead.

AIR HORN SYSTEM

There will be two (2) Grover rectangular bell air horns provided. The horns will be mounted low through the lower bumper flange.

The air horns will be black.

The horn system will be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve will be installed in-line to prevent the loss of air in the air brake system.

Air Horn Location
The air horns will be located on each side of the bumper, just outside of the frame rails.

AIR HORN CONTROL
The air horns will be actuated by a push button located on officer side instrument panel and by the horn button in the steering wheel. The driver will have the option to control the air horns or the chassis horns from the horn button by means of a selector switch located on the instrument panel.

ELECTRONIC SIREN
There will be a Whelen, Model 295SL 101, 100 or 200 watt electronic siren with noise canceling plug-in microphone will be provided.

This siren to be active when the battery switch is on and that emergency master switch is on.

The electronic siren head will be located in switch panel # 13 area of the center dash switch panel.

The electronic siren will be controlled on the siren head only. No horn button or foot switches will be provided.

SPEAKER
There will be one (1) Whelen®, Model SA315P, black nylon composite, 100-watt, speaker with through bumper mounting brackets and polished stainless steel grille provided. The speaker will be connected to the siren amplifier.

The speaker(s) will be recessed in the center of the front bumper.

AUXILIARY MECHANICAL SIREN
There will be a Federal Signal Model Q2B mechanical siren furnished and installed in the front of the apparatus.

The Q2B will be chrome finish.

The siren will have a 2-gauge cable connected to a power solenoid that is connected by a 2-gauge cable ran battery direct to the primary chassis batteries and will be labeled Q2B+ at the battery. The power solenoid will only be enabled when the emergency master switch is on.

The siren will have a 2-gauge ground wire connected to the chassis battery stud. The cable will be labeled Q2B- at the battery.

The mechanical siren will be mounted on the bumper deckplate. It will be mounted on the right side. A reinforcement plate will be furnished to support the siren.

MECHANICAL SIREN CONTROL

The mechanical siren will be activated by the following:

- Left side foot switch.
- Right side foot switch

A momentary chrome push button switch will be included in the right side dash panel to activate the siren brake.

EMERGENCY WARNING SYSTEM CONTROL

There will be an Emergency Warning System provided. The warning system will meet the current NFPA Requirements and be enabled and disabled through switches per the instrument panel layout.

Emergency switching will be controlled by multiple individual warning light switches for various groups or areas of emergency warning lights. An Emergency Master switch provided on the instrument panel that enables or disables all individual warning light switches is included.

Flash patterns and flash rates will be set through the individual lightheads per the manufacturer.

FRONT ZONE UPPER WARNING LIGHTS

There will be one (1) 72.00" Whelen Freedom IV LED lightbar mounted on the cab roof.

The lightbar will include the following:

- One (1) red flashing LED module in the driver's side end position.
- One (1) red flashing LED module in the driver's side front corner position.
- One (1) white flashing LED module in the driver's side first front position.
- One (1) red flashing LED module in the driver's side second front position.
- One (1) red flashing LED module in the driver's side third front position.
- One (1) red flashing LED module in the driver's side fourth front position.
- Open in the driver's side fifth front position.
- Open in the driver's side sixth front position.
- Open in the passenger's side sixth front position.
- Open in the passenger's side fifth front position.
- One (1) red flashing LED module in the passenger's side fourth front position.
- One (1) red flashing LED module in the passenger's side third front position.

- One (1) red flashing LED module in the passenger's side second front position.
- One (1) white flashing LED module in the passenger's side first front position.
- One (1) red flashing LED module in the passenger's side front corner position.
- One (1) red flashing LED module in the passenger's side end position.

There will be clear lenses included on the lightbar.

The light bar will have the low intensity mode wires connected to the controlling circuit.

There will be a switch in the cab on the switch panel to control this lightbar.

The white LEDs will be disabled when the parking brake is applied.

The six (6) red flashing LED modules in the front positions may be load managed when the parking brake is applied.

FRONT ZONE LOWER LIGHTS

There will be six (6) Hiviz®, Model FT-HVC-GSMJR-WN-**, 7.48" long x 5.11" tall x 1.63" deep flashing LED warning lights installed on the cab face above the headlights, in a common bezel matching the bezel for the headlamps.

- One (1) light installed on the left side corner position. The left side front outside corner light to include red and white LEDs.
- One (1) light installed in the left side outside position. The left side outside dual color flashing LED light(s) to include red alternating with white.
- One (1) light installed on the left side inside position. The left side front inside dual color flashing LED light(s) to include red alternating with white.
- One (1) light installed on the right side inside position. The right side front inside dual color flashing LED light(s) to include red alternating with white.
- One (1) light installed in the right side outside position. The right side outside dual color flashing LED light(s) to include red alternating with white.
- One (1) light installed on the right side corner position. The right side front outside corner light to include red and white LEDs.
- The color of the lens will be clear

There will be a switch located in the cab on the switch panel to control the lights and will execute functions based on the HVC system programming.

The light(s) will have the ability to execute ramping flash patterns, single or dual color modes and user defined patterns, modes, speeds, and intensities based on HVC system architecture.

Side-firing LEDs turn on when the e-master is on and parking brake is set, via setting in Command Zone™ display.

Fixture colors will automatically follow NFPA responding/blocking rules.

DAYTIME RUNNING LIGHTS (HEADLIGHTS)

The low-beam headlights used as daytime running lights will be activated with the following measures:

- Ignition switch is turned on
- Parking brake is released

These lights will be deactivated with any one of the following measures:

- Headlight switch is turned on
- High-beam flash is turned on
- Parking brake is set

HEADLIGHT FLASHER

The high beam headlights will flash alternately between the left and right side.

There will be a switch installed in the cab on the switch panel to control the high beam flash. This switch will be live when the battery switch and the emergency master switches are on.

The flashing will automatically cancel when the hi-beam headlight switch is activated or when the parking brake is set.

SIDE ZONE LOWER LIGHTING

There will be six (6) Whelen®, Model M6*C, flashing LED warning lights with chrome trim installed per the following:

- Two (2) lights, one (1) each side on the bumper extension. The side front lights to be red.
- Two (2) lights, one (1) each side above the front wheels. The side middle lights to be red.
- Two (2) lights, one (1) each side above rear wheels. The side rear lights to be red.
- The lights will include clear lenses.

There will be a switch in the cab on the switch panel to control the lights.

Each light will have the low intensity mode wire connected to the controlling circuit.

REAR ZONE LOWER LIGHTING

There will be two (2) Whelen®, Model M6**, LED flashing warning lights located at the rear of the apparatus.

- The driver's side rear light to be red
- The passenger's side rear light to be red

The lens color(s) to be clear.

There will be a switch located in the cab on the switch panel to control the lights.

The light(s) will have the low intensity mode wire connected to the controlling circuit.

WARNING LIGHTS (REAR AND SIDE UPPER ZONES)

There will be eight (8), Whelen®, Model M9**, 6.50" high x 10.37" wide x 1.37" deep flashing LED warning lights with chrome trim provided at the rear of the apparatus per the following:

- The side front upper light on the left side to include red flashing LEDs.
- The side rear upper light on the left side to include red flashing LEDs.
- The rear upper light on the left side to include red flashing LEDs.
- The rear lower light on the left side to include red LEDs.
- The rear lower light on the right side to include red LEDs.
- The rear upper light on the right side to include red flashing LEDs.
- The side rear upper light on the right side to include red flashing LEDs.
- The side front upper light on the right side to include red flashing LEDs.
- The warning light lens color(s) to be clear.

There will be a switch in the cab on the switch panel to control the lights.

Each light will have the low intensity mode wire connected to the controlling circuit.

TRAFFIC DIRECTING LIGHT

There will be one (1) Whelen® Model TAL85 46.87" long x 2.87" high x 2.25" deep, amber LED traffic directing light installed at the rear of the apparatus.

The lens color will be clear.

The control head will be included with this installation. The control head will be energized when the battery switch is on.

The auxiliary flash not activated.

This traffic directing light will be mounted over the hosebed, between the body side sheets, on a cross tube at the rear of the apparatus.

The traffic directing light control head will be located in the driver side overhead switch panel in the right panel position.

120 VOLT RECEPTACLE

There will be two (2), 15/20 amp 120 volt AC three (3) wire straight blade duplex receptacle(s) with interior red plastic wall plate(s), installed Back wall of each EMS compartment. . The NEMA configuration for the receptacle(s) will be 5-20R.

The receptacle(s) will be powered from the shoreline inlet.

There will be a label installed near the receptacle(s) that state the following:

- Line Voltage
- Current Ratting (amps)
- Phase
- Frequency

LOOSE EQUIPMENT

The following equipment will be furnished with the completed unit:

- One (1) bag of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit.

NFPA LOOSE EQUIPMENT

NFPA Required Loose Equipment Provided by Fire Department

The following loose equipment as outlined in NFPA 1900, 2024 edition, table 8.1 and CAN/ULC 515:2024 edition, section 5.2 will be provided by the fire department:

- One (1) traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, *Standard for High Visibility Public Safety Vests*, and have a five-point breakaway feature that includes two (2) at the shoulders, two (2) at the sides, and one (1) at the front.
- Five (5) fluorescent orange traffic cones not less than 28.00" (711 mm) in height, each equipped with a 6.00" (152 mm) retro-reflective white band no more than 4.00" (152 mm) from the top of the cone, and an additional 4.00" (102 mm) retro-reflective white band 2.00" (51 mm) below the 6.00" (152 mm) band.
- Five (5) illuminated warning devices such as highway flares, unless the five (5) fluorescent orange traffic cones have illuminating capabilities.

NFPA Loose Equipment That Should be Considered

The following loose equipment as outlined in NFPA 1900, 2024 edition, appendix table A.8.4 (a) and CAN/ULC 515:2024 edition, section 5.2 should be considered:

- 800 ft (60 m) of 2.50" (65 mm) or larger fire hose.
- 400 ft (120 m) of 1.50" (38 mm), 1.75" (45 mm), or 2.00" (52 mm) fire hose.
- One (1) handline nozzle, 200 gpm (750 L/min) minimum.
- Two (2) handline nozzles, 95 gpm (360 L/min) minimum.

- One (1) smooth bore or combination nozzle with shutoff and with 2.50" (65 mm) inlet that flows a minimum of 250 gpm (950 L/min).
- Four (4) SCBA apparatus
- Four (4) SCBA spare cylinders
- One (1) first aid kit.
- Four (4) combination spanner wrenches.
- Two (2) hydrant wrenches.
- One (1) double female 2.50" (65 mm) adapter with national hose (NH) threads.
- One (1) double male 2.50" (65 mm) adapter with national hose (NH) threads.
- One (1) rubber mallet, for use on suction hose connections.
- Two (2) salvage covers each a minimum size of 12 ft × 18 ft (3.7 m × 5.5 m).
- One (1) automatic external defibrillator (AED).

SOFT SUCTION HOSE

There will be no soft suction hose provided.

DRY CHEMICAL EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

WATER EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

FLATHEAD AXE PROVIDED BY FIRE DEPARTMENT

The axe is not on the apparatus as manufactured. The fire department will provide and mount the axe.

PICKHEAD AXE PROVIDED BY FIRE DEPARTMENT

The axe is not on the apparatus as manufactured. The fire department will provide and mount the axe.

PAINT PROCESS

The exterior custom cab and body painting procedure will consist of a seven (7) step finishing process as follows:

1. Manual Surface Preparation - All exposed metal surfaces on the custom cab and body will be thoroughly cleaned and prepared for painting. Imperfections on the exterior surfaces will be removed and sanded to a smooth finish. Exterior seams will be sealed before painting. Exterior surfaces that will not be painted include; chrome plating, polished stainless steel, anodized aluminum and bright aluminum treadplate.

2. Chemical Cleaning and Pretreatment - All surfaces will be chemically cleaned to remove dirt, oil, grease, and metal oxides to ensure the subsequent coatings bond well. The aluminum surfaces will be properly cleaned and treated using a high pressure, high temperature 4 step Acid Etch process. The steel and stainless surfaces will be properly cleaned and treated using a high temperature 3 step process specifically designed for steel or stainless. The chemical treatment converts the metal surface to a passive condition to help prevent corrosion.
3. Surfacer Primer - The Surfacer Primer will be applied to a chemically treated metal surface to provide a strong corrosion protective basecoat. A minimum thickness of 2 mils of Surfacer Primer is applied to surfaces that require a Critical aesthetic finish. The Surfacer Primer is a two-component high solids urethane that has excellent sanding properties and an extra smooth finish when sanded.
4. Finish Sanding - The Surfacer Primer will be sanded with a fine grit abrasive to achieve an ultra-smooth finish. This sanding process is critical to produce the smooth mirror like finish in the topcoat.
5. Sealer Primer - The Sealer Primer is applied prior to the Basecoat in all areas that have not been previously primed with the Surfacer Primer. The Sealer Primer is a two-component high solids urethane that goes on smooth and provides excellent gloss hold out when topcoated.
6. Basecoat Paint - Two coats of a high performance, two component high solids polyurethane basecoat will be applied. The Basecoat will be applied to a thickness that will achieve the proper color match. The Basecoat will be used in conjunction with a urethane clear coat to provide protection from the environment.
7. Clear Coat - Two (2) coats of Clear Coat will be applied over the Basecoat color. The Clear Coat is a two-component high solids urethane that provides superior gloss and durability to the exterior surfaces. Lap style and roll-up doors will be Clear Coated to match the body. Paint warranty for the roll-up doors will be provided by the roll-up door manufacturer.

After the cab and body are painted, the color will be verified to make sure that it matches the color standard. Electronic color measuring equipment will be used to compare the color sample to the color standard entered into the computer. Color specifications will be used to determine the color match. A Delta E reading will be used to determine a good color match within each family color.

All removable items such as brackets, compartment doors, door hinges, and trim will be removed and painted separately if required, to ensure paint behind all mounted items. Body assemblies that cannot be finish painted after assembly will be finish painted before assembly.

The paint finish quality levels for critical areas of the apparatus (cab front and sides, body sides and doors, and boom lettering panels) are to meet or exceed Cadillac/General Motors GMW15777 global paint requirements. Orange peel levels are to meet or exceed the #6

A.C.T. standard in critical areas. The manufacturer's written paint standards will be available upon request.

Environmental Impact

Contractor will meet or exceed all current state regulations concerning paint operations. Pollution control will include measures to protect the atmosphere, water and soil. Controls will include the following conditions:

- Topcoats and primers will be chrome and lead free.
- Metal treatment chemicals will be chrome free. The wastewater generated in the metal treatment process will be treated on-site to remove any other heavy metals.
- Particulate emission collection from sanding operations will have a 99.99 percent efficiency factor.
- Particulate emissions from painting operations will be collected by a dry filter or water wash process. If the dry filter is used, it will have an efficiency rating of 98 percent. Water wash systems will be 99.97 percent efficient.
- Water from water wash booths will be reused. Solids will be removed on a continual basis to keep the water clean.
- Paint wastes are disposed of in an environmentally safe manner.
- Empty metal paint containers will be recycled to recover the metal.
- Solvents used in clean-up operations will be recycled on-site or sent off-site for distillation and returned for reuse.

Additionally, the finished apparatus will not be manufactured with or contain products that have ozone depleting substances. Contractor will, upon demand, present evidence that the manufacturing facility meets the above conditions and that it is in compliance with his state EPA rules and regulations.

TWO-TONE CAB PAINT

The cab will be painted two-tone with the upper section painted #10 white and the lower section painted #90 red. There will be a standard two-tone cab paint break provided.

There will be a standard cab shield provided.

BODY PAINT

The body will be painted to match the lower section of the cab.

PAINT CHASSIS FRAME ASSEMBLY

The chassis frame assembly will be finished with a single system black top coat before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc.

FILM TECHNICAL PROPERTIES

PROPERTY	TEST METHOD	PERFORMANCE
Color	–	Black
Film Thickness	–	0.5 - 1.5 Mils
Gloss - 60 Degree	ASTM D523	65 - 85
Pencil Hardness	ASTM D3363	2H Minimum
Direct Impact	ASTM D2794	100 in. - lbs. Minimum
Reverse Impact	ASTM D2794	60 in. - lbs. Minimum
Crosshatch Adhesion	ASTM D3359	4B - 5B
Humidity	ASTM D1735	1000 Hours Minimum
Water Immersion	ASTM D870	250 Hours Minimum
Gravelometer	GM9508P	6 Minimum
Throwpower	GM9535P	12 - 15 in.

Cold rolled steel lab panels, Zinc Phosphate pretreatment, 0.6 mils average film thickness, cured 20 minutes @ 350°F.

PROPERTY	SUBSTRATE PRETREATMENT	SALT SPRAY* 1000 HOURS
Corrosion Resistance	CRS / Zinc Phos / Non-Chrome	1 - 2 mm

*Salt Spray - ASTM B117, cold rolled steel lab panels cured 20 minutes @ 350°F. (Average Total Scribe Creep)

Components treated with epoxy E-coat protection prior to paint:

- Two (2) C-channel frame rails

Components that are included with the chassis frame assembly that will be painted not e-coated (unless otherwise stated in a secondary option) are:

- Cross members
- Axles
- Suspensions
- Steering gear
- Battery boxes
- Bumper extension weldment
- Frame extensions
- Body mounting angles
- Rear Body support substructure (front and rear)
- Pump house substructure
- Steel fuel tank
- Castings
- Individual piece parts used in chassis and body assembly

The E-coat process will meet the technical properties shown.

FRONT WHEELS PAINT
All wheel surfaces, inside and outside, will be provided with paint black #101.

REAR WHEELS PAINT
All wheel surfaces, inside and outside, will be provided with paint black #101.



[Powder Coat Aluminum Paint Color]

AXLE HUB PAINT

All axle hubs will be painted to match lower job color.

COMPARTMENT INTERIOR PAINT

The interior of all compartments will be painted with a gray spatter finish for ease of cleaning and to make it easier to touch up scratches and nicks.

REFLECTIVE STRIPES

Three (3) reflective stripes will be provided across the front of the vehicle and along the sides of the body. The reflective band will consist of a 1.00" gold stripe at the top with a 1.00" gap then a 6.00" black stripe with a 1.00" gap and a 1.00" gold stripe on the bottom.

REFLECTIVE STRIPE ON CAB FACE

The reflective band provided on the cab face will be located below the stainless steel trim band and above the front bumper.

REAR CHEVRON STRIPING

There will be alternating chevron striping located on the rear-facing vertical surface of the apparatus. The rear surface, excluding the rear roll up door, will be covered.

The colors will be red and fluorescent yellow green diamond grade.

Each stripe will be 6.00" in width.

This will meet the requirements of the current edition of NFPA 1901, which states that 50% of the rear surface will be covered with chevron striping.

FOLDED RIBBON IN REFLECTIVE STRIPE

There will be two (2) pair(s) of a folded type ribbon(s) added to the reflective stripe, with the location being as follows: front of body, one each side of truck..

CAB DOOR REFLECTIVE STRIPE

A 6.00" x 16.00" fluorescent yellow green diamond grade reflective stripe will be provided across the interior of each cab door. The stripe will be located approximately 1.00" up from the bottom, on the door panel.

This stripe will meet the current edition of applicable NFPA standards.

CAB AND BODY UNDERCOATING

The apparatus will be properly treated by an authorized Ziebart dealer.

The underside of the apparatus will be undercoated with an asphalt petroleum based material, dark in color.

The undercoating material utilized on the apparatus will be formulated to resist corrosion and deaden unwanted sound or road noise.

Coating texture will appear firm, flexible, and resistant to abrasion. Minimum dry film thickness will be in the range of 8.00 to 12.00 mils.

The material will be applied to the following areas:

- Body and cab wheel well fender liners, on the back side only
- Underside of body and cab sheet metal, and structural components
- Underside and vertical sides of all sheet metal compartmentation, including support angles
- Structural support members under running boards, rear platforms, battery boxes, walkways, etc
- Inside surfaces of the pump heat enclosure (when installed)
- Suspension mounts
- Transmission cooler fittings
- Engine mounts
- Bottom and outside of framerails behind the forward edge of the water pump.

Exclusions will be:

- Engine
- Transmission
- Drive lines
- PTO's

- Schroeder valves and tank drains
- Intake valves
- Air Horns, sirens and back-up alarms
- Framerails forward of the forward edge of the water pump

FIRE APPARATUS PARTS MANUAL

There will be one (1) custom parts manual(s) in USB flash drive format for the complete fire apparatus provided.

The manual(s) will contain the following:

- Job number
- Part numbers with full descriptions
- Table of contents
- Parts section sorted in functional groups reflecting a major system, component, or assembly
- Parts section sorted in alphabetical order
- Instructions on how to locate parts

Each manual will be specifically written for the chassis and body model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.

Service Parts Internet Site

The service parts information included in these manuals are also available on the Pierce website. The website offers additional functions and features not contained in this manual, such as digital photographs and line drawings of select items. The website also features electronic search tools to assist in locating parts quickly.

CHASSIS SERVICE MANUALS

There will be one (1) chassis service manuals on USB flash drives containing parts and service information on major components provided with the completed unit.

The manual will contain the following sections:

- Job number
- Table of contents
- Troubleshooting
- Front Axle/Suspension
- Brakes
- Engine
- Tires

- Wheels
- Cab
- Electrical, DC
- Air Systems
- Plumbing
- Appendix

The manual will be specifically written for the chassis model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.

CHASSIS OPERATION MANUAL

The chassis operation manual will be provided on two (2) USB flash drives. Manuals will be in the English language.

ONE (1) YEAR MATERIAL AND WORKMANSHIP

A Pierce basic apparatus limited warranty certificate, WA0008, is included with this proposal.

ENGINE WARRANTY

A Paccar five (5) year limited engine warranty will be provided. A limited warranty certificate is included with this proposal.

STEERING GEAR WARRANTY

A Sheppard **three (3) year** limited steering gear warranty will be provided. A copy of the warranty certificate will be submitted with this proposal.

FIFTY (50) YEAR STRUCTURAL INTEGRITY

The Pierce custom chassis frame only (does not include crossmembers) limited warranty certificate, WA0013, is included with this proposal.

FRONT AXLE THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY

The Pierce TAK-4 suspension limited warranty certificate, WA0050, is included with this proposal.

SINGLE REAR AXLE FIVE (5) YEAR MATERIAL AND WORKMANSHIP WARRANTY

A Meritor™ Axle 5 year limited warranty will be provided.

ABS BRAKE SYSTEM THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY

A Meritor Wabco™ ABS brake system limited warranty certificate, WA0232, is included with this proposal.

TEN (10) YEAR STRUCTURAL INTEGRITY

The Pierce custom cab limited warranty certificate, WA0012, is included with this proposal.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION

A Pierce cab limited pro-rated paint warranty certificate, WA0055, is included with this proposal.

FIVE (5) YEAR MATERIAL AND WORKMANSHIP

The Pierce Command Zone electronics limited warranty certificate, WA0014, is included with this proposal.

CAMERA SYSTEM WARRANTY

A Pierce fifty four (54) month warranty will be provided for the camera system**.**

COMPARTMENT LIGHT WARRANTY

The Pierce 12 volt DC LED strip lights limited warranty certificate, WA0203, is included with this proposal.

TRANSMISSION WARRANTY

The transmission will have a **five (5) year/unlimited mileage** warranty covering 100 percent parts and labor. The warranty will be provided by Allison Transmission.

Note: The transmission cooler is not covered under any extended warranty you may be getting on your Allison Transmission. Please review your Allison Transmission warranty for coverage limitations.

TRANSMISSION COOLER WARRANTY

The transmission cooler will carry a five (5) year parts and labor warranty (exclusive to the transmission cooler). In addition, a collateral damage warranty will also be in effect for the first three (3) years of the warranty coverage and will not exceed $10,000 per occurrence. A copy of the warranty certificate will be included with this proposal.

WATER TANK WARRANTY

A UPF poly water tank limited warranty certificate, WA0195, is included with this proposal.

TEN (10) YEAR STRUCTURAL INTEGRITY

The Pierce apparatus body limited warranty certificate, WA0009, is included with this proposal.

ROLL UP DOOR MATERIAL AND WORKMANSHIP WARRANTY

A Gortite roll-up door limited warranty will be provided. The mechanical components of the roll-up door will be warranted against defects in material and workmanship for the lifetime of the vehicle. A **six (6) year** limited warranty will be provided on painted and satin roll up doors.

The limited warranty certificate, WA0190, is included with this proposal.

SEVEN (7) YEAR PARTS, ONE (1) YEAR LABOR

The pump and its components will be provided with a seven (7) year parts and one (1) year labor limited warranty. The manufacturer's warranty will provide that the pump and its

components will be free from failures caused by defects in material and workmanship that would arise under normal use and service.

A copy of the warranty certificate will be submitted with the bid package.

TEN (10) YEAR PUMP PLUMBING WARRANTY

The Pierce apparatus plumbing limited warranty certificate, WA0035, is included with this proposal.

FOAM SYSTEM WARRANTY

The Husky 3 foam system limited warranty certificate, WA0231, is included with this proposal.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION

A Pierce body limited pro-rated paint warranty certificate, WA0057, is included with this proposal.

THREE (3) YEAR EXTENDED

The Pierce PUC pump body limited warranty certificate, WA0151, is included with this proposal.

THREE (3) YEAR EXTENDED

The Pierce custom chassis warranty certificate, WA0061, is included with this proposal.

VEHICLE STABILITY CERTIFICATION

The fire apparatus manufacturer will provide a certification stating the apparatus complies with NFPA 1900, current edition, section 7.14, Vehicle Stability. The certification is included with this proposal.

ENGINE INSTALLATION CERTIFICATION

The fire apparatus manufacturer will provide a certification, along with a letter from the engine manufacturer stating they approve of the engine installation in the bidder's chassis. The certification will be provided at the time of delivery.

POWER STEERING CERTIFICATION

The fire apparatus manufacturer will provide a certification stating the power steering system as installed meets the requirements of the component supplier. The certification is included with this proposal.

CAB INTEGRITY CERTIFICATION

The fire apparatus manufacturer will provide a cab crash test certification with this proposal. The certification will state that a specimen representing the substantial structural configuration of the cab has been tested and certified by an independent third party test facility. Testing events will be documented with photographs, real-time and high-speed video, vehicle accelerometers, cart accelerometers, and a laser speed trap. The fire apparatus manufacturer

will provide a state licensed professional engineer to witness and certify all testing events. Testing will meet or exceed the requirements below:

- SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks.
- European Occupant Protection Standard ECE Regulation No.29.
- SAE J2420 COE Frontal Strength Evaluation - Dynamic Loading Heavy Trucks.

Side Impact
The cab will be subjected to dynamic preload where a 14,320-lb moving barrier is slammed into the side of the cab at 5.50 mph, striking with an impact of 13,000 ft-lb of force. This test is part of the SAE J2422 test procedure and more closely represents the forces a cab will see in a rollover incident.

Frontal Impact
The same cab will withstand a frontal impact of 32,600 ft-lb of force using a moving barrier in accordance with SAE J2420.

Additional Frontal Impact
The same cab will withstand a frontal impact of 65,098 ft-lb of force using a moving barrier. (Twice the force required by SAE J2420)

Roof Crush
The cab will be subjected to a roof crush force of 22,500 lb. This value meets the ECE 29 criteria, and is equivalent to the front axle rating up to a maximum of ten (10) metric tons.

Additional Roof Crush
The same cab will be subjected to a roof crush force of 110,000 lbs. (Four and a half times the load criteria of ECE 29)

The same cab will withstand all tests without any measurable intrusion into the survival space of the occupant area.

CAB DOOR DURABILITY CERTIFICATION
Robust cab doors help protect occupants. Cab doors will survive a 200,000 cycle door slam test where the slamming force exceeds 20 G's of deceleration. The bidder will certify that the sample doors similar to those provided on the apparatus have been tested and have met these criteria without structural damage, latch malfunction, or significant component wear.

WINDSHIELD WIPER DURABILITY CERTIFICATION
Visibility during inclement weather is essential to safe apparatus performance. Windshield wipers will survive a 3 million cycle durability test in accordance with section 6.2 of SAE J198 *Windshield Wiper Systems - Trucks, Buses and Multipurpose Vehicles.* The bidder will certify that the wiper system design has been tested and that the wiper system has met these criteria.

ELECTRIC WINDOW DURABILITY CERTIFICATION

Cab window roll-up systems can cause maintenance problems if not designed for long service life. The window regulator design will complete 30,000 complete up-down cycles and still function normally when finished. The bidder will certify that sample doors and windows similar to those provided on the apparatus have been tested and have met these criteria without malfunction or significant component wear.

SEAT BELT ANCHOR STRENGTH

Seat belt attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat belt anchor design will withstand 3000 lb of pull on both the lap and shoulder belt in accordance with FMVSS 571.210 Seat Belt Assembly Anchorages. The bidder will certify that each anchor design was pull tested to the required force and met the appropriate criteria.

SEAT MOUNTING STRENGTH

Seat attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat mounting design will be tested to withstand 20 G's of force in accordance with FMVSS 571.207 Seating Systems. The bidder will certify, at time of delivery, that each seat mount and cab structure design was pull tested to the required force and met the appropriate criteria.

PERFORMANCE CERTIFICATIONS

Cab Air Conditioning

Good cab air conditioning temperature and air flow performance keeps occupants comfortable, reduces humidity, and provides a climate for recuperation while at the scene. The cab air conditioning system will cool the cab from a heat-soaked condition at 100 degrees Fahrenheit to an average of 78 degrees Fahrenheit in 30 minutes. The bidder will certify that a substantially similar cab has been tested and has met these criteria.

Cab Defroster

Visibility during inclement weather is essential to safe apparatus performance. The defroster system will clear the required windshield zones in accordance with SAE J381 Windshield Defrosting Systems Test Procedure And Performance Requirements - Trucks, Buses, And Multipurpose Vehicles. The bidder will certify that the defrost system design has been tested in a cold chamber and passes the SAE J381 criteria.

Cab Auxiliary Heater

Good cab heat performance and regulation provides a more effective working environment for personnel, whether in-transit, or at a scene. An auxiliary cab heater will warm the cab 77 degrees Fahrenheit from a cold-soak, within 30 minutes when tested using the coolant supply methods found in SAE J381. The bidder will certify, at time of delivery, that a substantially similar cab has been tested and has met these criteria.

AMP DRAW REPORT

The bidder will provide, at the time of bid and delivery, an itemized print out of the expected amp draw of the entire vehicle's electrical system.

The manufacturer of the apparatus will provide the following:

- Documentation of the electrical system performance tests.
- A written load analysis, which will include the following:
    - The nameplate rating of the alternator.
    - The alternator rating under the conditions specified per:
        - Current edition of applicable NFPA standards.
    - The minimum continuous load of each component that is specified per:
        - Current edition of applicable NFPA standards.
    - Additional loads that, when added to the minimum continuous load, determine the total connected load.
    - Each individual intermittent load.

All of the above listed items will be provided by the bidder per the current edition of applicable NFPA standards.

CONTRACT

THIS AGREEMENT, made by Firematic Supply Co., Inc., East Yaphank, NY, first party and Albany International Airport located at, Albany, NY by its authorized representative, second party.

WITNESSETH:

First. The said first party hereby agrees to furnish the apparatus and equipment according to the specifications referenced in Bid #1057 Enforcer Pumper and to deliver the same as hereinafter provided.

Second. The first party agrees that all material and workmanship in and about said apparatus and equipment shall comply with said specifications. In the event there is any conflict between Customer Specifications and the Firematic Proposal, the Firematic Proposal will prevail. The standard Pierce Manufacturing Warranty will apply.

Third. This contract for fire apparatus conforms with all Federal Department of Transportation (DOT) rules and regulations in effect at the time of contract signing, and with all National Fire Protection Association (NFPA) guidelines for Automotive Fire Apparatus as published at the time of contract signing, except as modified by customer specifications. Any increased cost incurred by first party because of future changes in or additions to said DOT or NFPA standards will be passed along to the customer as an addition to the price set forth below, upon written approval of the second party.

Fourth. The said apparatus and equipment shall be ready for delivery from utilizing best know practces within about 28-30 months after receipt and acceptance of this contract at the first party's office at East Yaphank, New York. Delays due to strikes, failures to obtain chassis, materials or other causes beyond its control not preventing, and shall deliver to said party of the second part at Albany NY.

Due to global supply chain constraints, any delivery date contained herein is a good faith estimate as of the date of this order/contract, and merely an approximation based on current information. Delivery updates will be made available, and a final firm delivery date will be provided as soon as possible.

Fifth. A competent serviceman shall upon request, be furnished by first party to demonstrate said apparatus for second party and to give its employees the necessary instructions in the operation and handling of said apparatus.

Sixth. The second party hereby purchases and agrees to pay for said apparatus and equipment, the sum of:

One Million One Hundred Eighty five Thousand Dollars $ $ 1,185.000.00

Payment shall be made directly to first party at its, East Yaphank, New York, office. Under no circumstances shall payment be made to any other party except Firematic Supply Co, Inc.

Any representation that payment is authorized to be made to another party is in violation of this agreement. Net payment is due upon acceptance at the Fire House of the second party.

Payment is due upon delivery and acceptance.

Seventh. In case the second party desires to test the apparatus, such test shall be made within ten (10) days after arrival at destination and a written report of such test forthwith delivered to the first party at its principal office at East Yaphank, New York. If no such test is to be made, or if no such report be made by the second party within ten (10) days after arrival, then said apparatus and equipment shall be considered as fully complying with customers specifications.

Eighth. It is agreed that the apparatus and equipment covered by this contract shall remain the property of the first party, until the entire contract price has been paid.

Ninth. This contract to be binding must be signed and approved by an officer of Firematic Supply Co, Inc., or someone authorized by it to do so. This contract and specifications take precedence over all previous negotiations and no representations are considered as entering into this contract except as are contained herein or in the specifications attached hereto. This contract cannot be altered or modified except by mutual written agreement signed by the parties.

Tenth. If the Producer Price Index of Components for Manufacturing [www.bls.gov Series ID: WPUID6112] ("PPI") has increased at a compounded annual growth rate of 5.0% or more between the month Pierce accepts our order ("Order Month") and a month 14 months prior to the then predicted Ready For Pickup date ("Evaluation Month"), then pricing may be updated in an amount equal to the increase in PPI over 5.0% for each year or fractional year between the Order Month and the Evaluation Month.
The seller will document any such updated price for the customer's approval before proceeding and provide an option to cancel the order without charge if the updated price isn't accepted.

IN WITNESS WHEREOF, the said parties have caused these presents to be executed and the second party has caused its seal to be affixed and attested by its authorized representatives dated on this day of / /2026.

FIREMATIC SUPPLY CO, INC.

By _____

Date of Acceptance _____

Albany International Airport

By _____

_____

_____

_____

CONTRACT PRICING WORKSHEET

		Contract No.	Date Prepared
		#082025-PMI	September 25,2026
Buying Agency:		Dealer:	Firematic Supply Company
Contact Person:		Sales Rep:	Ray Muller
Member Number:		Phone:	516-790-2781
Phone:		Email:	raym@firematic.com
Email:		Pierce Bid #:	1057

Base Spec.

Sourcewell ID #	Description:	Sourcewell Price List Date	Published Contract Price
P107	Pumper, 189" PUC	8/7/2026	$ 955,691.68

Removed Options from Base Spec.

Notes: (do not list options removed)	Before Discount Price
If audited by Sourcewell be prepared to show detail.	$ -
With Pierce Discount (5.5%)	$ -

Added Options to Base Spec.

Notes: (do not list options added)	Before Discount Price
If audited by Sourcewell be prepared to show detail.	$ 170,162.62
With Pierce Discount (5.5%)	$ 160,803.68

Qty	*1*	***Subtotal (Base Spec+Added/Removed Options)***	$ 1,116,495.35

Other Expenses

Description	Price
Photo Insepction Reports	$ 1,250.00
Tool Mounting & Graphics	$ 23,000.00
Material Surcharge	$ 39,754.65
Delivery	$ 4,500.00
Total Other Expenses	$ 68,504.65

Discounts

Description	*Price*
100% Pre-Payment Discount	$ -
Chassis Pre-Payment Discount	$ -
Aerial Pre-Payment Discount	$ -
Trade-In Value / Other Customer Adjustments	$ -
Total Discount	$ -

Total Purchase Price (matches customer PO) **$ 1,185,000.00**

AGENDA ITEM NO. 10.6

Purchase Orders; Issue Annual Purchase Orders for Deicer Products for runways, taxiways and ramps. Authorize four (4) one (1) year option year extensions subject to approval of the Chief Executive Officer.

Contract # 1284
Vendor: Nachurs Alpine Solutions Industrial. (NASI)

AGENDA ITEM NO: 10.6
MEETING DATE: October 13, 2026

ALBANY COUNTY AIRPORT AUTHORITY
REQUEST FOR AUTHORIZATION

DEPARTMENT: *Finance*

Contact Person: *Margaret Herrmann, Acting Chief Financial Officer*

PURPOSE OF REQUEST:

Purchase Orders; ***Issue Annual Purchase Orders for Deicer Products for runways, taxiways and ramps. Authorize four (4) one (1) year option year extensions subject to approval of the Chief Executive Officer.***

Contract # 1284
Vendor: **Nachurs Alpine Solutions Industrial.** ***(NASI)***

CONTRACT AMOUNT:

Total Estimated Annual Contract Amounts: $250,000 for Solid and Liquid Deicer

BUDGET INFORMATION:

Anticipated in Current Budget: Yes √ No
Funding Account Number: 51019.10.0000

FISCAL IMPACT - FUNDING (Dollars or Percentages)

Federal ____ State____ Airport ***100%***
Funding Source: Airport Operating Budget

JUSTIFICATION:

Request is made to approve Deicing Products that were bid under Contract # 1284. The only bid was received from Nachurs Alpine Solutions, LLC. The Liquid Deicing fluid must meet FAA SAE-AMS 1435 Generic Fluid Specifications. Solid Deicer materials must meet FAA SAE-AMS 1431 specifications. There were no bids received for Item #1; Sodium Acetate Solid Pellets and Items #3; Sodium Formate / Acetate Blend Solid Pellets. The Airport Airfield Maintenance department has evaluated products that were bid and has approved these products for application to the runways, taxiways and ramps. The Purchasing Department will work with our Airfield Maintenance Supervisor and Airport Manager to seek other procurement options for the items that no bids were received for.

This contract is for one (1) year with four (4) one year extensions subject to annual price redetermination requests based upon changes in material costs. A Purchase Order will be issued for an annual estimated quantity of each product.

CHIEF EXECUTIVE OFFICER'S RECOMMENDATION:

Recommend approval.

AGENDA ITEM NO: 10.6
MEETING DATE: October 13, 2026

PROCUREMENT DEPARTMENT APPROVAL:

Procurement complies with Authority Procurement Guidelines and Chief Financial Officer has approved. Yes √ NA

FINAL AGREEMENT SUBJECT TO APPROVAL BY COUNSEL: Yes NA √

BACK-UP MATERIAL:

Please refer to the attached bid summary spreadsheet.

CONTRACT #1284

Deicing Product for Runways, Taxiways and Ramps

Company Name	Nachurs Alpine Solutions
Meet or Exceed Specifications	YES
Item #1 Sodium Acetate / Price for Super Sacks (2,000 lb.)	NO BID
Item #1 Sodium Acetate / Price for Half Sack (1,000 lb.)	
Item #1 Sodium Acetate / Price per 55 lb. Bags	
Item #1 / Brand Bid	
Item #2 Sodium Formate / Price per Super Sacks (2,000 lb.)	$1,851.86
Item #2 Sodium Formate / Price for Half Sack (1,000 lb.)	N/A
Item #2 Sodium Formate / Price per 55 lb. Bags	$1,848.00
Item #2 / Brand Bid	NASI sf, Ice Care, Ecoway
Item #3 Sodium Formate / Acetate Blend / Price per Super Sacks (2,000 lb.)	NO BID
Item #3 Sodium Formate / Acetate Blend / Price per Half Sacks (1,000 lb.)	
Item #3 Sodium Formate / Acetate Blend / Price per 55 lb. Bags	
Item #3 / Brand Bid	
Item #4 Potassium Acetate Base Fluid / Price per Gallon	$6.54
Item #4 / Brand Bid	Alpine RF-11
Item #4 Sack Sizes Available	N/A
Acknowledgement	X
Offerer Disclosure	X
Non-Collusion	X
Bid Bond	X
References	X

I, Bobbi Matthews, certify that this bid tabulation is a true copy of the prices submitted by each bidder for the contract shown above.

Albany Airport Authority Purchasing Department

Bobbi Matthews

Bobbi Matthews
Purchasing Agent

Sworn to before me this 17th day of Sept. 2026

Jennifer A. Munger
Notary Public

JENNIFER A. MUNGER
Notary Public, State of New York
No. 01MU6246332
Qualified in Schenectady County
Commission Expires Aug. 08, 2027

IFB #1284

DEICING PRODUCTS FOR RUNWAYS, TAXIWAYS, & RAMPS

NACHURS ALPINE SOLUTIONS INDUSTRIAL

ORIGINAL

NASi®
TRANSPORTATION & MINING
The Science of De-Icing®

421 Leader Street • Marion, Ohio 43302
[P] 800.622.4877 x300 [F] 740.223.3874
nasi_cs@nasindustrial.com
www.nasi-tm.com twitter.com/NASindustrial

09/11/2026

ALBANY COUNTY AIRPORT AUTHORITY
Albany International Airport
22 Jetway Drive
Albany, NY 12211-1057

RE: INVITATION FOR BIDS, CONTRACT # 1284
DEICING PRODUCT FOR RUNWAYS, TAXIWAYS, & RAMPS

Due date: September 17, 2026

Dear Purchasing Agent,

Thank you for this opportunity to present our bid package for above subject IFB. Nachurs Alpine Solutions LLC has a long history and great reputation for supplying high-quality deicing products to several airports in the US and Canada.
We will be bidding on Items #2 (sodium formate) and Item #4 (potassium acetate liquid) only. We agree to supply within 48 hours from time of order as we have ample warehousing within a 2-to-4-hour window from the airport.

We can supply the chemical samples under separate cover as it requires special postage and handling, upon request.

We look forward to knowing how the bid results turn out and hope to do business with you in the future.

Sincerely,

Becky Worley
US Account Manager - Deicer
Transportation Division
Nachurs Alpine Solutions LLC
Phone 740-244-9545
Email: bworley@nachurs-alpine.com

NASi
TRANSPORTATION & MINING

6620 Mooney St.,
Suite 220
Dublin, OH 43017
800-662-4877 x300

AMS 1435E — Runway Deicing Fluid Testing

Alpine RF-11 · Potassium Acetate Runway Deicing Fluid

Solicitation Albany International Airport

Product Alpine RF-11 — Nachurs Alpine Solutions, Dublin, OH

Date September 2026

CONTENTS OF THIS FILE

1. Current AMS 1435E Periodic Testing Report — SMI Reference 2602-518, dated April 24, 2026

2. Supporting AMS 1435 test history — periodic, environmental (aquatic toxicity and BOD), and performance testing

AMIL

UQAC
Université du Québec
à Chicoutimi

2023-07-24

Carla Potts, MBA
Business Manager – Airport Deicing
Nachurs Alpine Solutions
421 Leader St.
Marion, OH 43302

Subject: Confirmation of No Technical Changes to Standards AS6170, AS6172, and AS6211

Dear Carla,

I hope this letter finds you well. I am writing, as Co-chair of the SAE G12 RDP, sponsor of SAE document, to address the technical specifications of the following three standards: AS6170 (published on November 16, 2021), AS6172 (published on October 28, 2021), and AS6211 (published on October 28, 2021).

After careful examination and thorough evaluation, we have determined that there have been no technical changes made to these aforementioned standards since their initial publication dates. As such, we hereby confirm that the products tested following the requirements outlined in these standards do not require re-testing.

Our comprehensive analysis involved a meticulous comparison of the original versions of AS6170, AS6172, and AS6211 against any potential revisions or updates that might have been introduced. We also consulted with subject matter experts within our organization and reached out to relevant external authorities for verification. Based on these evaluations, we can confidently assert that the technical specifications and criteria remain unchanged.

As a result, we assure you that products that have been previously tested in accordance with the original versions of AS6170, AS6172, and AS6211 can continue to be considered compliant without the need for re-testing.

We understand the importance of adherence to industry standards in maintaining the highest level of quality and safety for products and end-users. Our commitment to upholding these standards remains steadfast, and we will continue to monitor any future updates to ensure compliance.

If you have any questions or require further clarification regarding this matter, please do not hesitate to reach out to us. We are more than happy to assist you in any way possible.

Thank you for your attention to this matter, and we look forward to continuing our collaboration in promoting excellence in product quality and safety.

Sincerely,

Jean-Denis Brassard ing. Ph.D.
Co-Chair of SAE-G12 Runway Deicing Product Committee
Research Professor
Université du Québec à Chicoutimi
555 Boul. Université
Chicoutimi Qc, Canada G7H 2B1
(418) 820-7416

SMI, Inc.
12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Franklin Kroth
Nachurs Alpine Solutions
6620 Mooney Street
Dublin, OH 43017

Date: 24-Apr-2026

SMI/REF: 2602-518

Product: **ALPINE RF-11** *(received 24-Feb-2026)*

Dilution: As received

Periodic testing in accordance with
AMS 1435E (Revised 2024-03)
LIQUID RUNWAY DEICING/ANTI-ICING PRODUCT

4.2.2 Periodic Tests

3.2.4	Freezing Point	Conforms
3.2.5	Effect on Aircraft Metals	
3.2.5.1	Sandwich Corrosion	Conforms
3.2.5.2	Total Immersion Corrosion	Conforms
3.2.5.3	Low Embrittling Cadmium Plate	Conforms
3.2.5.3.1	Cyclic Immersion Corrosion of Cadmium Plate	Informational
3.2.5.4	Hydrogen Embrittlement	Conforms
3.2.5.5	Stress-Corrosion Resistance	
	AMS 4911	Conforms
3.2.6	Effect on Transparent Plastics	
	MIL-P-25690 (Type C)	Conforms
	MIL-P-83310 (Polycarbonate)	Conforms
3.2.7	Effect on Painted Surfaces	Conforms
3.2.8	Effect on Unpainted Surfaces	Conforms
3.2.9	Rinsibility	Conforms
3.2.10	Effect on Runway Pavements	
3.2.10.1	Runway Concrete Scaling Resistance	Conforms
3.2.10.2	Asphalt Concrete Degradation Resistance	*Not performed by SMI

Testing required for deicer /anti-icer products used in Europe. This test is not performed by SMI.

Respectfully submitted,

Jeff Nottebaum, SMI Inc.
Director

Rae-anne Nottebaum, SMI Inc.
Senior Analyst

4.2.2 Periodic Tests: Freezing point (3.2.4), effect on aircraft metals (3.2.5), effect on transparent plastic (3.2.6), effect on painted surfaces (3.2.7), effect on unpainted surfaces (3.2.8), rinsibility (3.2.9), runway concrete scaling resistance (3.2.10.1) and asphalt concrete degradation resistance (3.2.10.2 Appendix A, valid for deicing/anti-icing products used in Europe) are periodic tests and shall be performed on or just prior to the second anniversary of initial testing and thereafter every four calendar years.

3.2.4 Freezing Point:

3.2.4.1 Freezing point of product diluted 1:1 by weight with ASTM D1193, Type IV, water shall be reported and shall be lower than +6°F (-14.5°C) determined in accordance with ASTM D1177.

Freezing point (1:1 dilution): -16 °C

Result Conforms

3.2.4.2 Shall be reported and shall be within 7°F (4°C) of the preproduction value established in 4.2.3, determined in accordance with ASTM D1177.

Freezing point (1:1 dilution): -16 °C

Result Informational

3.2.5 Effect on Aircraft Metals:

3.2.5.1 Sandwich Corrosion: Specimens, after testing in accordance with ASTM F 1110, shall show a rating not greater (worse) than one.

	2024-T3 Bare Anodized	2024-T3 Alclad	7075-T6 Bare Anodized	7075-T6 Alclad
PRODUCT (AS RECEIVED)	**1**	**1**	**1**	**1**
CONTROL	1	1	1	1

Result Conforms

3.2.5.2 Total Immersion Corrosion: The product, tested in accordance with ASTM F483 (except that panels of AMS4376 shall be tested for 24 hours), shall neither show evidence of corrosion of panels, nor cause a weight change of any test panel greater than shown in Table 1.

TEST PANEL	WEIGHT CHANGE (mg/cm²/24hrs)	
	ALLOWABLE	RESULTS
AMS 4037 aluminum alloy, anodized as in AMS 2470	0.3	**0.01**
AMS 4041 aluminum alloy	0.3	**0.04**
AMS 4049 aluminum alloy	0.3	**< 0.01**
AMS 4376 magnesium alloy, dichromate treated as in AMS 2475 *(tested for 24 hours only)*	0.2	**0.17**
AMS 4911 titanium alloy	0.1	**0.02**
AMS 5045 Carbon Steel	0.8	**0.02**

Result Conforms

3.2.5.3 Low-Embrittling Cadmium Plate: Test panels, coated with low-embrittling cadmium plate, shall not show a weight change greater than 0.3 mg/cm² per 24hrs, determined in accordance with ASTM F1111.

As received: < 0.01 mg/cm²/24hrs

Result Conforms

3.2.5.3.1 The product shall be tested for cyclic immersion corrosion of cadmium plate in accordance with AIR6130 and the results reported as specified in Section 6 of AIR6130B.

Initial pH of solution: 10.3 **Final pH of solution**: 10.3

	REPLICATE #	Weight (g)		
		Initial	Final	**Weight change**
PANEL WEIGHTS	1	8.0478	8.0503	**+ 0.0025**
	2	8.0615	8.0632	**+ 0.0017**
	3	7.9894	7.9912	**+ 0.0018**
	Average weight change = +0.0020 g (+ 0.07 mg/cm²) Note: "+" indicates weight gain			

AIR6130B: A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm² may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Result: ***Informational**

See separate report for complete data tables

3.2.5.4 Hydrogen Embrittlement: The product shall be non-embrittling, determined in accordance with ASTM F519, utilizing Type 1a, 1c or 2a specimens cadmium plated in accordance with MIL-STD-870 Class 1 Type I. Type 1a and Type 1c, specimens shall be loaded to 45% of the predetermined notch fracture strength, and Type 2a specimens loaded to 80% of the yield strength. The entire 2a stressed specimen, or just the notched area of the 1a and 1c stressed specimen, shall be immersed continuously in the solution under test for 150 hours at a temperature of 77°F ± 9°F (25°C ± 5°C).

Specimens: Type 1c:
As received: #1: No failures occurred within 150 hours.
#2: No failures occurred within 150 hours.
#3: No failures occurred within 150 hours.
#4: No failures occurred within 150 hours.

Result Conforms

3.2.5.5 Stress-Corrosion Resistance: The product shall not cause cracks in AMS 4911 titanium alloy specimens, determined in accordance with ASTM F945, Method A.
As received: No cracking evident.

Result Conforms

3.2.5.5.1 Repealed

3.2.6 Effect on Transparent Plastics:
3.2.6.1 The product, at 77°F ± 4°F (25°C ± 2°C), shall not craze, stain, or discolor MIL-PRF-25690 stretched acrylic plastic, determined in accordance with ASTM F484.

Result Conforms

3.2.6.2 The product, at 77°F ± 4°F (25°C ± 2°C), shall not craze, stain, or discolor AMS-P-83310 polycarbonate plastic, determined in accordance with ASTM F484, except that the specimens shall be stressed for 30 minutes ± 2 minutes to an outer fiber stress of 2000 psi (13.8 MPa).

Result Conforms

3.2.7 Effect on Painted Surfaces: The product, at 77°F ± 4°F (25°C ± 2°C), shall neither decrease the paint film hardness by more than two pencil hardness levels nor shall it produce any streaking, discoloration, or blistering of the paint film, determined in accordance with ASTM F502.

Result Conforms

3.2.8 Effect on Unpainted Surfaces: The product, tested in accordance with ASTM F485, shall neither produce streaking nor leave any stains requiring polishing to remove.

Result Conforms

3.2.9 Rinsibility: The product shall be completely rinsible in tap water, determined in accordance with 3.2.9.1

3.2.9.1 A 3 x 8 inch (75 x 200 mm) panel of clear glass shall be cleaned to provide a surface free of waterbreak, dried, and coated with the deicer/anti-icer product by pouring the product over the panel while it is held in a horizontal position. The coated panel shall be inclined at an angle of approximately 45 degrees for 10 minutes ± 0.5 minute, then placed in a horizontal position for 24 hours ± 0.25 hour at room temperature. After the 24 exposure, the panel shall be rinsed in tap water for 5 to 6 minutes, followed by a rinse with ASTM D1193, Type IV, water, allowed to air dry at ambient temperature, and examined for visible traces of deicer/anti-icer product.

Result Conforms

3.2.10 Effect on Runway Pavements

3.2.10.1 Runway Concrete Surface Scaling Resistance: The condition of the runway concrete surface shall have a rating not greater than one for 50 freeze-thaw cycles, determined in accordance with ASTM C672 except that concrete shall:

a. Be air-entrained with an air content as specified in ASTM C 672
b. Have a minimum cement content of 510 lb/yd^3 ± 10 lb/yd^3 (302 kg/m^3 ± 6 kg/m^3)
c. Have a slump, 1.5 inches ± 0.5 inch (38 mm ± 13 mm).

A 25 % by volume solution of the deicer/anti-icing product, as supplied by the manufacturer in commercial concentration, in tap water shall be substituted for calcium chloride. Performing more than one freeze-thaw cycle per day is acceptable.

Rating: 1 Result Conforms

3.2.10.2 Asphalt Concrete Degradation Resistance (Appendix A, valid for deicer/anti-icer products used in Europe)

Result *Not performed by SMI

Testing required for deicer /anti-icer products used in Europe. This test is not performed by SMI.

SMI, Inc.
12219 SW 131 Avenue
Miami, Florida 33186-6401 USA
Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Franklin Kroth
Nachurs Alpine Solutions
6620 Mooney Street
Dublin, OH 43017

Date: 24-Apr-2026

SMI/REF: 2602-518

Product: **ALPINE RF-11** *(received 24-Feb-2026)*

Dilution: As received

Testing in accordance with
SAE AIR6130B
CADMIUM PLATE CYCLIC CORROSION TEST

Cadmium Plate Cyclic Corrosion Test

Initial pH of solution: 10.3 Final pH of solution: 10.3

Replicate	Initial (g)	Final (g)	**Weight change (grams)**
1	8.0478	8.0503	**+ 0.0025**
2	8.0615	8.0632	**+ 0.0017**
3	7.9894	7.9912	**+ 0.0018**
Average weight change = + 0.0020 g (+ 0.07 mg/cm^2) Note: "+" indicates weight gain			

AIR6130B states: A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm^2 may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Result Informational

SAE AIR6130B, Cadmium Plate Cyclic Corrosion Test

Cadmium Plate Cyclic Corrosion Test

AMS 1431 Compound, Solid Runway and Taxiway Deicing/Anti-Icing
AMS 1435 Fluid, Generic, Deicing/Anti-Icing Runways and Taxiways

3 Test Specimen Preparation

Substrate: 4130 Steel
Size: 1" x 2" x 0.04" x 0.048" (25.40 mm x 50.80 mm x 1.22 mm)
Finish: Cadmium plating: 0.0005"- 0.0008" inch per side; do not exceed 0.0008 inch maximum plating. (Method: specification ASTM F1111, Section 7, quality specification AMS QQ-P-416 governs.

There shall be no supplementary chromate treatment.

a. Three cadmium plated test specimens shall be used for each fluid to be tested

b. Sample of AMS1435 shall be tested as received from the supplier.

c. Sample of AMS1431 shall be tested in a diluted form – diluted with ASTM D 1193, Type IV, water to 15% by weight solids.

d. Procure soft flexible brushes for test (paintbrush type, 1.5 inches (3.8 cm) wide, with synthetic bristles approx 1.5 inches (3.8 cm) long

4 Environmental Exposure Preparation

Preset humidity chamber to 90° ± 5°F (32°C ± 3°C and 30 ± 5% humidity. Affix plastic ties or other inert material as hangers (hangers shall be made from an inert material that will not react with the sample; plastic, plastic coated metals, monofilament fishing line or stainless steels are acceptable) in the chamber to hold specimens during the environmental exposure period.

5 Test Procedure

a. Measure and record pH of solution to be tested. Record to one decimal place (e.g., pH = 7.3). This value is to be included in the final test report

b. Solvent clean cadmium plated specimens with acetone; wipe gently with an acetone-soaked wiper. Without allowing the acetone to evaporate, gently remove excess acetone with a dry wiper. Allow samples to dry for 10 minutes in a desiccator. Do not accelerate drying of samples with oven drying.

Note: Care should be taken not to touch the cleaned specimens with bare hands; use tweezers, clean gloves or equivalent tool.

c. Weigh and record initial specimen weight in grams. Record all weights throughout the test to the nearest 0.0001 gram. Return specimens to desiccator until Day 3.

Test Schedule by Weekday				
Monday	Tuesday	Wednesday	Thursday	Friday
				Friday Start – Day 0
Day 3	Day 4	Day 5	Day 6	Day 7
Day 10	Day 11	Day 12	Day 13	Day 14

SAE AIR6130B, Cadmium Plate Cyclic Corrosion Test

d. FRIDAY START - Fill glass containers with solution to be tested, one container for each coupon. See section 3b or 3c for solution being used (consider filling one extra container to have extra conditioned fluid available). Container shall be large enough so the solution completely covers the specimens. Cover the container with loose fitting cover and place filled container into the humidity chamber to environmentally condition the solution for a minimum of 24 hours ± 1 hour before the start of test, up to 72 hours ± 1 hour.

Note: Containers should be covered with loose fitting covers at all times, with or without coupons in solution. If evaporation occurs such that coupons cannot be completely covered in solution, container should be topped off with solution conditioned per section 5.d.

e. Day 3 : Remove the solution container from the humidity chamber and the specimens from the desiccator. Place specimens in container oriented such that the specimens are not resting flush against the bottom or side of the container. Place the container with cover back into the humidity chamber for 24 hours ± 1 hour.

f. Day 4 : After the 24 hour immersion in the solution, remove the specimens, but do not rinse them. Place them into the humidity chamber by hanging for 22.5 hours ± 0.5 hour. Hangers shall be made from an inert material that will not react with the sample (such as plastic, plastic coated metals and stainless steels are acceptable).

g. Day 5 /Day 10 /Day 12 : Remove the specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimen surface with the soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

Immediately after weighing the specimens, return them to their test solution container to soak for 90 minutes ± 5 minutes in the humidity chamber. Specimens shall be oriented such that they not resting flush against the bottom or side of the container. After 90 minutes, remove the specimens but do not rinse them. Place them in the humidity chamber by hanging for 22.5 hours ± 0.5 hour, maintaining the specimen in the initial orientation throughout the cycle.

h. Day 6 /Day 11 /Day 13 ; Return the specimen to the test solution container to soak for 90 minutes ± 5 minutes in the humidity chamber. Specimens shall be oriented such that it is not resting flush against the bottom or side of the container. After 90 minutes, remove the specimen but do not rinse it. Replace it in the humidity chamber by hanging for 22.5 hours ± 0.5 hours, maintaining the specimen in the initial orientation throughout the cycle.

i. Day 7 – Remove specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimen surface with a soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

Immediately after weighing the specimens, return them to their test solution container in the humidity chamber. Specimens shall be oriented such that they are not resting flush against the bottom or side of the container. Specimens shall be left in the test solution container in the humidity chamber from DAY 7 to DAY 10.

j. Day 14 – Remove specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimen surface with a soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

k. Measure and record final pH of solution record to one decimal place (e.g., pH = 7.3). This value is to be included in the final test report

l. Report the initial weight of the specimen, the weight after each periodic weighing, and the final weight. Calculate and report the value of the cumulative weight lost from each specimen after each periodic weighing procedure.

Test Data:

pH at start of test: **10.3**
pH at end of test: **10.3**

	REPLICATE #	Weight (g)
INITIAL PANEL WEIGHTS	1	8.0478
	2	8.0615
	3	7.9894

	REPLICATE #	Weight (g)		
		Monday	Wednesday	Friday
WEEK #1 PANEL WEIGHTS	1	----	8.0539	8.0507
	2	----	8.0663	8.0630
	3	----	7.9944	7.9913

	REPLICATE #	Weight (g)		
		Monday	Wednesday	Friday
WEEK #2 PANEL WEIGHTS	1	8.0508	8.0505	8.0503
	2	8.0634	8.0632	8.0632
	3	7.9916	9.9912	7.9912

SAE AIR6130B, Cadmium Plate Cyclic Corrosion Test

TEST DATA (continued)

REPLICATE #1	INITIAL WEIGHT (grams)	WEEK 1 WED (grams)	WEEK 1 FRI (grams)	WEEK 2 MON (grams)	WEEK 2 WED (grams)	WEEK 2 FRI (grams)
	8.0478	8.0539	8.0507	8.0508	8.0505	8.0503
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	+ 0.0061	+ 0.0029	+ 0.0030	+ 0.0027	**+ 0.0025 (FINAL)**

REPLICATE #2	INITIAL WEIGHT	WEEK 1 WED	WEEK 1 FRI	WEEK 2 MON	WEEK 2 WED	WEEK 2 FRI (FINAL WEIGHT)
	8.0615	8.0663	8.0630	8.0634	8.0632	8.0632
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	+ 0.0048	+ 0.0015	+ 0.0019	+ 0.0017	**+ 0.0017 (FINAL)**

REPLICATE #3	INITIAL WEIGHT	WEEK 1 WED	WEEK 1 FRI	WEEK 2 MON	WEEK 2 WED	WEEK 2 FRI (FINAL WEIGHT)
	7.9894	7.9944	7.9913	7.9916	7.9912	7.9912
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	+ 0.0050	+ 0.0019	+ 0.0022	+ 0.0018	**+ 0.0018 (FINAL)**

SUMMARY:

	REPLICATE #	Weight Change (g)	Average Weight Change	
WEIGHT CHANGE	1	**+ 0.0025**	**+ 0.07 mg/cm^2 (+ 0.0020 g)**	**Informational**
	2	**+ 0.0017**		
	3	**+ 0.0018**		

Note: "+" indicates a weight gain.

AIR6130B: A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm^2 may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Respectfully submitted;

Jeff Nottebaum, SMI Inc.
Director

Rae-anne Nottebaum, SMI Inc.
Senior Analyst

SMI, Inc.

12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Facsimile: (305) 971-7048

Date: July 31, 2023

Jessica Cremer
NaChurs Alpine Solutions
421 Leader Street
Marion, OH 43302

Re: AIR6130B Cadmium Plate Cyclic Corrosion Test

To whom it may concern;

We are confirming receipt of 1 liter of "ALPINE RF-11", SMI/REF# 2306-360 for AIR6130B Cadmium Plate Cyclic Corrosion Testing on 31-Jul-2023. There is no pass or fail criteria for this testing, results are for informational purposes only. Completion time for this testing is 60 days from date of receipt of sample.

Respectfully submitted,

R. aA

Rae-anne Nottebaum
Chemist

SMI, Inc.

12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Jessica Cremer
Nachurs Alpine Solutions
421 Leader Street
Marion, OH 43302

Date: 30-Nov-2022

SMI/REF: 2209-735

Product: **ALPINE RF-11 (M09222022-467) MFG SITE MARION, OH**
(received 23-Sep-2022)

Dilution: As received

Periodic testing in accordance with
AMS 1435D (Revised 2018-11)
LIQUID RUNWAY DEICING/ANTI-ICING PRODUCT

4.2.2 Periodic Tests

3.2.4	Freezing Point	Conforms
3.2.5	Effect on Aircraft Metals	
3.2.5.1	Sandwich Corrosion	Conforms
3.2.5.2	Total Immersion Corrosion	Conforms
3.2.5.3	Low Embrittling Cadmium Plate	Conforms
3.2.5.3.1	Cyclic Immersion Corrosion of Cadmium Plate	Informational
3.2.5.4	Hydrogen Embrittlement	Conforms
3.2.5.5	Stress-Corrosion Resistance	
	AMS 4911	Conforms
	AMS 4916	Informational
3.2.6	Effect on Transparent Plastics	
	MIL-P-25690 (Type C)	Conforms
	MIL-P-83310 (Polycarbonate)	Conforms
3.2.7	Effect on Painted Surfaces	Conforms
3.2.8	Effect on Unpainted Surfaces	Conforms
3.2.9	Rinsibility	Conforms
3.2.10	Effect on Runway Pavements	
3.2.10.1	Runway Concrete Scaling Resistance	Conforms
3.2.10.2	Asphalt Concrete Degradation Resistance	*Not performed by SMI

Testing required for deicer /anti-icer products used in Europe. This test is not performed by SMI.

Respectfully submitted,

Jeff Nottebaum, SMI Inc.
Director

Rae-anne Nottebaum, SMI Inc.
Chemist

4.2.2 Periodic Tests: Freezing point (3.2.4), effect on aircraft metals (3.2.5), effect on transparent plastic (3.2.6), effect on painted surfaces (3.2.7), effect on unpainted surfaces (3.2.8), rinsibility (3.2.9), runway concrete scaling resistance (3.2.10.1) and asphalt concrete degradation resistance (3.2.10.2 Appendix A, valid for deicing/anti-icing products used in Europe) are periodic tests and shall be performed on or just prior to the second anniversary of initial testing and thereafter every four calendar years.

3.2.4 Freezing Point:

3.2.4.1 Freezing point of product diluted 1:1 by weight with ASTM D1193, Type IV, water shall be reported and shall be lower than +6°F (-14.5°C) determined in accordance with ASTM D1177.

Freezing point (1:1 dilution): -15 °C

Result Conforms

3.2.4.2 Shall be reported and shall be within 7°F (4°C) of the preproduction value established in 4.2.3, determined in accordance with ASTM D1177.

Freezing point (1:1 dilution): -15 °C

Result Informational

3.2.5 Effect on Aircraft Metals:

3.2.5.1 Sandwich Corrosion: Specimens, after testing in accordance with ASTM F 1110, shall show a rating not greater (worse) than one.

	2024-T3 Bare Anodized	2024-T3 Alclad	7075-T6 Bare Anodized	7075-T6 Alclad
PRODUCT (AS RECEIVED)	1	1	1	1
CONTROL	1	1	1	1

Result Conforms

3.2.5.2 Total Immersion Corrosion: The product, tested in accordance with ASTM F483 (except that panels of AMS4376 shall be tested for 24 hours), shall neither show evidence of corrosion of panels, nor cause a weight change of any test panel greater than shown in Table 1.

TEST PANEL	WEIGHT CHANGE (mg/cm²/24hrs)	
	ALLOWABLE	RESULTS
AMS 4037 aluminum alloy, anodized as in AMS 2470	0.3	< 0.01
AMS 4041 aluminum alloy	0.3	< 0.01
AMS 4049 aluminum alloy	0.3	+ 0.01
AMS 4376 magnesium alloy, dichromate treated as in AMS 2475 *(tested for 24 hours only)*	0.2	+ 0.01
AMS 4911 titanium alloy	0.1	+ 0.01
AMS 5045 Carbon Steel	0.8	0.01

"+" indicates weight gain

Result Conforms

3.2.5.3 Low-Embrittling Cadmium Plate: Test panels, coated with low-embrittling cadmium plate, shall not show a weight change greater than 0.3 mg/cm² per 24hrs, determined in accordance with ASTM F1111.

As received: 0.01 mg/cm²/24hrs

Result Conforms

3.2.5.3.1 The product shall be tested for cyclic immersion corrosion of cadmium plate in accordance with AIR6130 and the results reported as specified in Section 6 of AIR6130A.

Initial pH of solution: 10.3 **Final pH of solution:** 10.1

	REPLICATE #	Weight (g)		
		Initial	Final	Weight change
PANEL WEIGHTS	1	16.2401	16.2408	+ 0.0007
	2	16.3413	16.3422	+ 0.0009
	3	16.3125	16.3139	+ 0.0014
	Average weight change = + 0.0010 g (+ 0.04 mg/cm²) Note: "+" indicates weight gain			

AIR6130A: A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm² may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Result: ***Informational**

See separate report for complete data tables

3.2.5.4 Hydrogen Embrittlement: The product shall be non-embrittling, determined in accordance with ASTM F519, utilizing Type 1a, 1c or 2a specimens cadmium plated in accordance with MIL-STD-870 Class 1 Type I. Type 1a and Type 1c, specimens shall be loaded to 45% of the predetermined notch fracture strength, and Type 2a specimens loaded to 80% of the yield strength. The entire 2a stressed specimen, or just the notched area of the 1a and 1c stressed specimen, shall be immersed continuously in the solution under test for 150 hours at a temperature of 77°F ± 9°F (25°C ± 5°C).

Specimens: Type 1c:
As received: #1: No failures occurred within 150 hours.
#2: No failures occurred within 150 hours.
#3: No failures occurred within 150 hours.
#4: No failures occurred within 150 hours.

Result Conforms

3.2.5.5 Stress-Corrosion Resistance: The product shall not cause cracks in AMS 4911 titanium alloy specimens, determined in accordance with ASTM F945, Method A.
As received: No cracking evident.

Result Conforms

3.2.5.5.1 The product shall be tested in accordance with ASTM F945, Method A using AMS4916 specimens. Report shall detail the effect of the product and the effect of control solution. The results shall be reported for informational purposes only.
As received: Cracking evident.

Result Informational

3.2.6 Effect on Transparent Plastics:
3.2.6.1 The product, at 77°F ± 4°F (25°C ± 2°C), shall not craze, stain, or discolor MIL-PRF-25690 stretched acrylic plastic, determined in accordance with ASTM F484.

Result Conforms

3.2.6.2 The product, at 77°F ± 4°F (25°C ± 2°C), shall not craze, stain, or discolor AMS-P-83310 polycarbonate plastic, determined in accordance with ASTM F484, except that the specimens shall be stressed for 30 minutes ± 2 minutes to an outer fiber stress of 2000 psi (13.8 MPa).

Result Conforms

3.2.7 Effect on Painted Surfaces: The product, at 77°F ± 4°F (25°C ± 2°C), shall neither decrease the paint film hardness by more than two pencil hardness levels nor shall it produce any streaking, discoloration, or blistering of the paint film, determined in accordance with ASTM F502.

Result Conforms

3.2.8 Effect on Unpainted Surfaces: The product, tested in accordance with ASTM F485, shall neither produce streaking nor leave any stains requiring polishing to remove.

Result Conforms

3.2.9 Rinsibility: The product shall be completely rinsible in tap water, determined in accordance with 3.2.9.1

3.2.9.1 A 3 x 8 inch (75 x 200 mm) panel of clear glass shall be cleaned to provide a surface free of waterbreak, dried, and coated with the deicer/anti-icer product by pouring the product over the panel while it is held in a horizontal position. The coated panel shall be inclined at an angle of approximately 45 degrees for 1 0minutes ± 0.5 minute, then placed in a horizontal position for 24 hours ± 0.25 hour at room temperature. After the 24 exposure, the panel shall be rinsed in tap water for 5 to 6 minutes, followed by a rinse with ASTM D1193, Type IV, water, allowed to air dry at ambient temperature, and examined for visible traces of deicer/anti-icer product.

Result Conforms

3.2.10 Effect on Runway Pavements

3.2.10.1 Runway Concrete Surface Scaling Resistance: The condition of the runway concrete surface shall have a rating not greater than one for 50 freeze-thaw cycles, determined in accordance with ASTM C672 except that concrete shall:

a. Be air-entrained with an air content as specified in ASTM C 672
b. Have a minimum cement content of 510 lb/yd^3 ± 10 lb/yd^3 (302 kg/m^3 ± 6 kg/m^3)
c. Have a slump, 1.5 inches ± 0.5 inch (38 mm ± 13 mm).

A 25 % by volume solution of the deicer/anti-icing product, as supplied by the manufacturer in commercial concentration, in tap water shall be substituted for calcium chloride. Performing more than one freeze-thaw cycle per day is acceptable.

Rating: 1 Result Conforms

3.2.10.2 Asphalt Concrete Degradation Resistance (Appendix A, valid for deicer/anti-icer products used in Europe)

Result *Not performed by SMI

Testing required for deicer /anti-icer products used in Europe. This test is not performed by SMI.SMI.

SMI, Inc.

12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Jessica Cremer
Nachurs Alpine Solutions
421 Leader Street
Marion, OH 43302

Date: 30-Nov-2022

SMI/REF: 2209-735

Product: **ALPINE RF-11 (M09222022-467) MFG SITE MARION, OH**
(received 23-Sep-2022)

Dilution: As received

Testing in accordance with
SAE AIR6130A
CADMIUM PLATE CYCLIC CORROSION TEST (2017-05)

Cadmium Plate Cyclic Corrosion Test

Initial pH of solution: 10.3 Final pH of solution: 10.1

Replicate	Initial (g)	Final (g)	**Weight change (grams)**
1	16.2401	16.2408	**+ 0.0007**
2	16.3413	16.3422	**+ 0.0009**
3	16.3125	16.3139	**+ 0.0014**
Average weight change = + 0.0010 g (+ 0.04 mg/cm²) Note: "+" indicates weight gain			

AIR6130A states: A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm² may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Result Informational

Cadmium Plate Cyclic Corrosion Test

AMS 1431 Compound, Solid Runway and Taxiway Deicing/Anti-Icing

AMS 1435 Fluid, Generic, Deicing/Anti-Icing Runways and Taxiways

3 Test Specimen Preparation

Substrate: 4130 Steel

Size: 1" x 2" x 0.04" x 0.048" (25.40 mm x 50.80 mm x 1.22mm)

Finish: Cadmium plating in accordance with AMS QQ-P-416., Type I Class I, (0.0005"- 0.0008" inch plating per side).

There shall be no supplementary chromate treatment.

a. Three cadmium plated test specimens shall be used for each fluid to be tested

b. Sample of AMS1435 Runway Deicing Fluid shall be tested as received from the supplier.

c. Sample of AMS1431 Runway Deicing Solid Compound shall be tested in a diluted form – diluted with ASTM D 1193, Type IV, water to 15% by weight solids.

d. Procure soft flexible brushes for test (paintbrush type, 1.5 inches (3.8 cm) wide, with synthetic bristles approx 1.5 inches (3.8 cm) long

4 Environmental Exposure Preparation

Preset humidity chamber to 90 ± 5°F and 30 ± 5% humidity. Affix plastic ties or other inert material as hangers (hangers shall be made from an inert material that will not react with the sample; plastic, plastic coated metals, monofilament fishing line or stainless steels are acceptable) in the chamber to hold specimens during the environmental exposure period.

5 Test Procedure

a. Measure and record pH of solution(s) to be tested (record to one decimal place).

b. Solvent clean cadmium plated specimens with acetone; wipe gently with an acetone-soaked wiper. Without allowing the acetone to evaporate, gently remove excess acetone with a dry wiper. Allow samples to dry for 10 minutes in a desiccator. Do not accelerate drying of samples with oven drying.

Note: Care should be taken not to touch the cleaned specimens with bare hands; use tweezers, clean gloves or equivalent tool.

c. Weigh and record initial specimen weight in grams. Record all weights throughout the test to the nearest 0.0001 gram. Return specimens to desiccator until Day 3.

Monday	Tuesday	Wednesday	Thursday	Friday
				Friday Start – Day 0
Day 3	Day 4	Day 5	Day 6	Day 7
Day 10	Day 11	Day 12	Day 13	Day 14

d. FRIDAY START - Fill glass containers with solution to be tested, one container for each coupon. Refer to 3b or 3c for solution being used (consider filling one extra container to have extra conditioned fluid available). Container shall be large enough so the solution completely covers the specimens. Cover the container with loose fitting cover and place filled container into the humidity chamber to environmentally condition the solution for a minimum of 24 ± 1 hours before the start of test, up to 72 ± 1 hours.

e. Day 3 – Remove the solution container from the humidity chamber and the specimens from the desiccator. Place specimens in container oriented such that the specimens are not resting flush against the bottom or side of the container. Place the container with cover back into the humidity chamber for 24 ± 1 hours.

f. Day 4 - After the 24 hour immersion in the solution, remove the specimens, but do not rinse them. Place them into the humidity chamber by hanging for 22.5 ± 0.5 hours. Hangers shall be made from an inert material that will not react with the sample (such as plastic, plastic coated metals and stainless steels are acceptable).

g. Day 5 /Day 10 /Day 12 – Remove the specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimen surface with the soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

Immediately after weighing the specimens, return them to their test solution container to soak for 90 ± 5 minutes in the humidity chamber. Specimens shall be oriented such that they not resting flush against the bottom or side of the container. After 90 minutes, remove the specimens but do not rinse them. Place them in the humidity chamber by hanging for 22.5 ± 0.5 hours, maintaining the specimen in the initial orientation throughout the cycle.

h. Day 6 /Day 11 /Day 13 - Return the specimen to the test solution container to soak for 90 ± 5 minutes in the humidity chamber. Specimens shall be oriented such that it is not resting flush against the bottom or side of the container. After 90 minutes, remove the specimen but do not rinse it. Replace it in the humidity chamber by hanging for 22.5 ± 0.5 hours, maintaining the specimen in the initial orientation throughout the cycle.

i. Day 7 – Remove specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimens surface with a soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

Immediately after weighing the specimens, return them to their test solution container in the humidity chamber. Specimens shall be oriented such that they are not resting flush against the bottom or side of the container. Specimens shall be left in the test solution container in the humidity chamber from DAY 7 to DAY 10.

j. Day 14 – Remove specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimen surface with a soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

k. Measure and record final pH of solution (record to one decimal place).

l. Report the initial weight of the specimen, the weight after each periodic weighing, and the final weight. Calculate and report the value of the cumulative weight lost from each specimen after each periodic weighing procedure.

Test Data:

pH at start of test: 10.3
pH at end of test: 10.1

	REPLICATE #	Weight (g)
INITIAL PANEL WEIGHTS	1	16.2401
	2	16.3413
	3	16.3125

	REPLICATE #	Weight (g)		
		Monday	Wednesday	Friday
WEEK #1 PANEL WEIGHTS	1	---	16.2428	16.2439
	2	---	16.3421	16.3441
	3	---	16.3121	16.3145

	REPLICATE #	Weight (g)		
		Monday	Wednesday	Friday
WEEK #2 PANEL WEIGHTS	1	16.2397	16.2402	16.2408
	2	16.3398	16.3399	16.3422
	3	16.3106	16.3095	16.3139

Client: Nachurs Alpine Solutions Date: 30-Nov-2022
Product: **ALPINE RF-11 (M09222022-467) MFG SITE MARION, OH**
Dilution: As received SMI/REF: 2209-735
SAE AIR6130A, Cadmium Plate Cyclic Corrosion Test

TEST DATA (continued)

REPLICATE #1	INITIAL WEIGHT (grams)	WEEK 1 WED (grams)	WEEK 1 FRI (grams)	WEEK 2 MON (grams)	WEEK 2 WED (grams)	WEEK 2 FRI (grams)
	16.2401	16.2428	16.2439	16.2397	16.2402	16.2408
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	+ 0.0027	+ 0.0038	0.0004	+ 0.0001	**+ 0.0007 (FINAL)**

REPLICATE #2	INITIAL WEIGHT	WEEK 1 WED	WEEK 1 FRI	WEEK 2 MON	WEEK 2 WED	WEEK 2 FRI (FINAL WEIGHT)
	16.3413	16.3421	16.3441	16.3398	16.3399	16.3422
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	+ 0.0008	+ 0.0028	0.0015	0.0014	**+ 0.0009 (FINAL)**

REPLICATE #3	INITIAL WEIGHT	WEEK 1 WED	WEEK 1 FRI	WEEK 2 MON	WEEK 2 WED	WEEK 2 FRI (FINAL WEIGHT)
	16.3125	16.3121	16.3145	16.3106	16.3095	16.3139
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	0.0004	+ 0.0020	0.0019	0.0030	**+ 0.0014 (FINAL)**

SUMMARY

	REPLICATE #	Weight Change (g)	Average Weight Change	
WEIGHT CHANGE	1	**+ 0.0007**	**+ 0.04mg/cm²** (+	**Informational**
	2	**+ 0.0009**		
	3	**+ 0.0014**		

Note: "+" indicates a weight gain.

AIR6130A: A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm² may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Respectfully submitted,

Jeff Nottebaum, SMI Inc.
Director

Rae-anne Nottebaum, SMI Inc.
Chemist

SMI, Inc.
12219 SW 131 Avenue
Miami, Florida 33186-6401 USA
Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Jessica Cremer
Nachurs Alpine Solutions
421 Leader Street
Marion, OH 43302

Date: 28-Oct-2020

SMI/REF: 1910-127$_{SS}$

Product: ALPINE RF-11® Lot M09162019-JC02-1 (Marion, OH)
(received 22-Oct-2019)

Dilution: As received

Storage Stability testing per **AMS 1435D** (Revised 2018-11)
LIQUID RUNWAY DEICING/ANTI-ICING PRODUCT

3.2.11 Storage Stability: The fluid, after storage in accordance with ASTM F 1104, shall not exhibit separation or increase in turbidity compared to unaged fluid. Any increase in turbidity shall be reported, but shall be acceptable if removed by mild agitation.

No evidence of separation or increase in turbidity.

Result Conforms

Respectfully submitted,

Patricia D. Viani, SMI Inc.

SMI, Inc.
12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Jessica Cremer
Nachurs Alpine Solutions
421 Leader Street
Marion, OH 43302

Date: 17-Jan-2019

SMI/REF: 1810-189

Product: **ALPINE RF-11 (Lot# M07182018-445) Production Site/Facility: Marion, OH**
(received 16-Oct-2018)

Dilution: As received

Periodic testing in accordance with
AMS 1435D (Revised 2018-11)
LIQUID RUNWAY DEICING/ANTI-ICING PRODUCT

4.2.2 Periodic Tests

3.2.4	Freezing Point	Conforms
3.2.5	Effect on Aircraft Metals	
3.2.5.1	Sandwich Corrosion	Conforms
3.2.5.2	Total Immersion Corrosion	Conforms
3.2.5.3	Low Embrittling Cadmium Plate	Conforms
3.2.5.3.1	Cyclic Immersion Corrosion of Cadmium Plate	Informational
3.2.5.4	Hydrogen Embrittlement	Conforms
3.2.5.5	Stress-Corrosion Resistance	
	AMS 4911	Conforms
	AMS 4916	Informational
3.2.6	Effect on Transparent Plastics	
	MIL-P-25690 (Type C)	Conforms
	MIL-P-83310 (Polycarbonate)	Conforms
3.2.7	Effect on Painted Surfaces	Conforms
3.2.8	Effect on Unpainted Surfaces	Conforms
3.2.9	Rinsibility	Conforms
3.2.10	Effect on Runway Pavements	
3.2.10.1	Runway Concrete Scaling Resistance	Conforms
3.2.10.2	Asphalt Concrete Degradation Resistance	*Not performed by SMI

Testing required for deicer /anti-icer products used in Europe. This test is not performed by SMI.

Respectfully submitted,

Patricia D. Viani, SMI Inc.

4.2.2 Periodic Tests: Freezing point (3.2.4), effect on aircraft metals (3.2.5), effect on transparent plastic (3.2.6), effect on painted surfaces (3.2.7), effect on unpainted surfaces (3.2.8), rinsibility (3.2.9), runway concrete scaling resistance (3.2.10.1) and asphalt concrete degradation resistance (3.2.10.2 Appendix A, valid for deicing/anti-icing products used in Europe) are periodic tests and shall be performed on or just prior to the second anniversary of initial testing and thereafter every four calendar years.

3.2.4 Freezing Point:

3.2.4.1 Freeze point of product diluted 1:1 by weight with ASTM D1193, Type IV, water shall be reported and shall be lower than +6°F (-14.5°C) determined in accordance with ASTM D1177.

Freezing point (1:1 dilution): -15 °C

Result Conforms

3.2.4.2 Shall be reported and shall be within 7°F (4°C) of the preproduction value established in 4.2.3, determined in accordance with ASTM D1177.

Freezing point (1:1 dilution): -15 °C

Result Informational

3.2.5 Effect on Aircraft Metals:

3.2.5.1 Sandwich Corrosion: Specimens, after testing in accordance with ASTM F 1110, shall show a rating not greater (worse) than one.

	2024-T3 Bare Anodized	2024-T3 Alclad	7075-T6 Bare Anodized	7075-T6 Alclad
PRODUCT	**1**	**1**	**1**	**1**
CONTROL	1	1	1	1

Result Conforms

3.2.5.2 Total Immersion Corrosion: The product, tested in accordance with ASTM F483 (except the panels of AMS4376 that shall be tested for 24 hours), shall neither show evidence of corrosion of panels, nor cause a weight change of any test panel greater than shown in Table 1.

TEST PANEL	WEIGHT CHANGE (mg/cm²/24hrs)	
	ALLOWABLE	RESULTS
AMS 4037 aluminum alloy, anodized as in AMS 2470	0.3	**< 0.01**
AMS 4041 aluminum alloy	0.3	**+ 0.02**
AMS 4049 aluminum alloy	0.3	**0.02**
AMS 4376 magnesium alloy, dichromate treated per AMS 2475	0.2	**+ 0.04**
AMS 4911 titanium alloy	0.1	**< 0.01**
AMS 5045 carbon steel	0.8	**0.02**

"+" indicates weight gain

Result Conforms

3.2.5.3 Low-Embrittling Cadmium Plate: Test panels, coated with low-embrittling cadmium plate, shall not show a weight change greater than 0.3 mg/cm² per 24hrs, determined in accordance with ASTM F1111.

As received: < 0.01 mg/cm²/24hrs

Result Conforms

3.2.5.3.1 The product shall be tested for cyclic immersion corrosion of cadmium plate in accordance with AIR6130 and the results reported as specified in Section 6 of AIR6130A.

Initial pH of solution: 10.7 **Final pH of solution:** 10.1

	REPLICATE #	Weight (g)		
		Initial	Final	**Weight change**
PANEL WEIGHTS	1	8.5001	8.4962	**0.0039**
	2	8.4991	8.4915	**0.0076**
	3	8.5600	8.5548	**0.0052**
	Average weight change = 0.0056			

AIR6130A: A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm² may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Average weight change = 0.20 mg/cm²

Result: **Informational**

see separate report for complete data tables

3.2.5.4 Hydrogen Embrittlement: The product shall be non-embrittling, determined in accordance with ASTM F519, utilizing Type 1a, 1c or 2a specimens cadmium plated in accordance with MIL-STD-870 Class 1 Type I. Type 1a and Type 1c, specimens shall be loaded to 45% of the predetermined notch fracture strength, and Type 2a specimens loaded to 80% of the yield strength. The entire 2a stressed specimen, or just the notched area of the 1a and 1c stressed specimen, shall be immersed continuously in the solution under test for 150 hours at a temperature of 77°F ± 9°F (25°C ± 5°C).

No failures within 150 hours.

Result Conforms

3.2.5.5 Stress-Corrosion Resistance: The product shall not cause cracks in AMS 4911 titanium alloy specimens, determined in accordance with ASTM F945, Method A.

As received: No cracking evident.

Result Conforms

3.2.5.5.1 The product shall be tested in accordance with ASTM F945, Method A using AMS4916 specimens. Report shall detail the effect of the product and the effect of control solution. The results shall be reported for informational purposes only.

As received: Cracking evident.

Result Informational

3.2.6 Effect on Transparent Plastics:

3.2.6.1 The product, at 77°F ± 4°F (25°C ± 2°C), shall not craze, stain, or discolor MIL-PRF-25690 stretched acrylic plastic, determined in accordance with ASTM F484.

Result Conforms

3.2.6.2 The product, at 77°F ± 4°F (25°C ± 2°C), shall not craze, stain, or discolor AMS-P-83310 polycarbonate plastic, determined in accordance with ASTM F484, except that the specimens shall be stressed for 30 minutes ± 2 minutes to an outer fiber stress of 2000 psi (13.8 MPa).

Result Conforms

3.2.7 Effect on Painted Surfaces: The product, at 77°F ± 4°F (25°C ± 2°C), shall neither decrease the paint film hardness by more than two pencil hardness levels nor shall it produce any streaking, discoloration, or blistering of the paint film, determined in accordance with ASTM F502.

Result Conforms

3.2.8 Effect on Unpainted Surfaces: The product, tested in accordance with ASTM F485, shall neither produce streaking nor leave any stains requiring polishing to remove.

Result Conforms

3.2.9 Rinsibility: The product shall be completely rinsible in tap water, determined in accordance with 3.2.9.1

3.2.9.1 A 3 x 8 inch (75 x 200 mm) panel of clear glass shall be cleaned to provide a surface free of waterbreak, dried, and coated with the deicer/anti-icer product by pouring the product over the panel while it is held in a horizontal position. The coated panel shall be inclined at an angle of approximately 45 degrees for 10 minutes ± 0.5 minute, then placed in a horizontal position for 24 hours ± 0.25 hour at room temperature. After the 24 exposure, the panel shall be rinsed in tap water for 5 to 6 minutes, followed by a rinse with ASTM D1193, Type IV, water, allowed to air dry at ambient temperature, and examined for visible traces of deicer/anti-icer product.

Result Conforms

3.2.10 Effect on Runway Pavements

3.2.10.1 Runway Concrete Surface Scaling Resistance: The condition of the runway concrete surface shall have a rating not greater than one for 50 freeze-thaw cycles, determined in accordance with ASTM C672 except that concrete shall:

a. Be air-entrained with an air content as specified in ASTM C 672
b. Have a minimum cement content of 510 lb/yd^3 ± 10 lb/yd^3 (302 kg/m^3 ± 6 kg/m^3)
c. Have a slump, 1.5 inches ± 0.5 inch (38 mm ± 13 mm).

A 25 % by volume solution of the deicer/anti-icing product, as supplied by the manufacturer in commercial concentration, in tap water shall be substituted for calcium chloride. Performing more than one freeze-thaw cycle per day is acceptable.

Rating: 1 Result Conforms

3.2.10.2 Asphalt Concrete Degradation Resistance (Appendix A, valid for deicer/anti-icer products used in Europe)

Result *Not performed by SMI

Testing required for deicer/anti-icer products used in Europe. This test is not performed by SMI.SMI.

SMI, Inc.
12219 SW 131 Avenue
Miami, Florida 33186-6401 USA
Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Jessica Cremer
Nachurs Alpine Solutions
421 Leader Street
Marion, OH 43302

Date: 17-Jan-2019
SMI/REF: 1810-189

Product: **ALPINE RF-11 (Lot# M07182018-445) Production Site/Facility: Marion, OH**
(received 16-Oct-2018)

Dilution: As received

Testing in accordance with
SAE AIR6130A
CADMIUM PLATE CYCLIC CORROSION TEST (2017-05)

Cadmium Plate Cyclic Corrosion Test

Initial pH of solution: 10.7 Final pH of solution: 10.1

Replicate	Initial (g)	Final (g)	**Weight change (grams)**
1	8.5001	8.4962	**0.0039**
2	8.4991	8.4915	**0.0076**
3	8.5600	8.5548	**0.0052**
Average weight change = 0.0056 g (0.20 mg/cm²) Note: "+" indicates weight gain			

AIR6130A states: A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm² may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

See separate report for complete data tables

Result Informational

Cadmium Plate Cyclic Corrosion Test

AMS 1431 Compound, Solid Runway and Taxiway Deicing/Anti-Icing

AMS 1435 Fluid, Generic, Deicing/Anti-Icing Runways and Taxiways

3 Test Specimen Preparation

Substrate: 4130 Steel

Size: 1" x 2" x 0.04" x 0.048" (25.40 mm x 50.80 mm x 1.22 mm)

Finish: Cadmium plating in accordance with AMS QQ-P-416., Type I Class I, (0.0005"- 0.0008" inch plating per side).

There shall be no supplementary chromate treatment.

a. Three cadmium plated test specimens shall be used for each fluid to be tested

b. Sample of AMS1435 Runway Deicing Fluid shall be tested as received from the supplier.

c. Sample of AMS1431 Runway Deicing Solid Compound shall be tested in a diluted form – diluted with ASTM D 1193, Type IV, water to 15% by weight solids.

d. Procure soft flexible brushes for test (paintbrush type, 1.5 inches (3.8 cm) wide, with synthetic bristles approx 1.5 inches (3.8 cm) long

4 Environmental Exposure Preparation

Preset humidity chamber to 90 $\pm$ 5°F and 30 $\pm$ 5% humidity. Affix plastic ties or other inert material as hangers (hangers shall be made from an inert material that will not react with the sample; plastic, plastic coated metals, monofilament fishing line or stainless steels are acceptable) in the chamber to hold specimens during the environmental exposure period.

5 Test Procedure

a. Measure and record pH of solution(s) to be tested (record to one decimal place).

b. Solvent clean cadmium plated specimens with acetone; wipe gently with an acetone-soaked wiper. Without allowing the acetone to evaporate, gently remove excess acetone with a dry wiper. Allow samples to dry for 10 minutes in a desiccator. Do not accelerate drying of samples with oven drying.

Note: Care should be taken not to touch the cleaned specimens with bare hands; use tweezers, clean gloves or equivalent tool.

c. Weigh and record initial specimen weight in grams. Record all weights throughout the test to the nearest 0.0001 gram. Return specimens to desiccator until Day 3.

Monday	Tuesday	Wednesday	Thursday	Friday
				Friday Start – Day 0
Day 3	Day 4	Day 5	Day 6	Day 7
Day 10	Day 11	Day 12	Day 13	Day 14

d. FRIDAY START - Fill glass containers with solution to be tested, one container for each coupon. Refer to 3b or 3c for solution being used (consider filling one extra container to have extra conditioned fluid available). Container shall be large enough so the solution completely covers the specimens. Cover the container with loose fitting cover and place filled container into the humidity chamber to environmentally condition the solution for a minimum of 24 ± 1 hours before the start of test, up to 72 ± 1 hours.

e. Day 3 – Remove the solution container from the humidity chamber and the specimens from the desiccator. Place specimens in container oriented such that the specimens are not resting flush against the bottom or side of the container. Place the container with cover back into the humidity chamber for 24 ± 1 hours.

f. Day 4 - After the 24 hour immersion in the solution, remove the specimens, but do not rinse them. Place them into the humidity chamber by hanging for 22.5 ± 0.5 hours. Hangers shall be made from an inert material that will not react with the sample (such as plastic, plastic coated metals and stainless steels are acceptable).

g. Day 5 /Day 10 /Day 12 – Remove the specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimen surface with the soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

Immediately after weighing the specimens, return them to their test solution container to soak for 90 ± 5 minutes in the humidity chamber. Specimens shall be oriented such that they not resting flush against the bottom or side of the container. After 90 minutes, remove the specimens but do not rinse them. Place them in the humidity chamber by hanging for 22.5 ± 0.5 hours, maintaining the specimen in the initial orientation throughout the cycle.

h. Day 6 /Day 11 /Day 13 - Return the specimen to the test solution container to soak for 90 ± 5 minutes in the humidity chamber. Specimens shall be oriented such that it is not resting flush against the bottom or side of the container. After 90 minutes, remove the specimen but do not rinse it. Replace it in the humidity chamber by hanging for 22.5 ± 0.5 hours, maintaining the specimen in the initial orientation throughout the cycle.

i. Day 7 – Remove specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimens surface with a soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

Immediately after weighing the specimens, return them to their test solution container in the humidity chamber. Specimens shall be oriented such that they are not resting flush against the bottom or side of the container. Specimens shall be left in the test solution container in the humidity chamber from DAY 7 to DAY 10.

j. Day 14 – Remove specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimen surface with a soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

k. Measure and record final pH of solution (record to one decimal place).

l. Report the initial weight of the specimen, the weight after each periodic weighing, and the final weight. Calculate and report the value of the cumulative weight lost from each specimen after each periodic weighing procedure.

Test Data:

pH at start of test: 10.7
pH at end of test: 10.1

	REPLICATE #	Weight (g)
INITIAL PANEL WEIGHTS	1	8.5001
	2	8.4991
	3	8.5600

	REPLICATE #	Weight (g)		
		Monday	Wednesday	Friday
WEEK #1 PANEL WEIGHTS	1	----	8.4940	8.4988
	2	----	8.4907	8.4963
	3	----	8.5521	8.5579

	REPLICATE #	Weight (g)		
		Monday	Wednesday	Friday
WEEK #2 PANEL WEIGHTS	1	8.4999	8.4977	8.4962
	2	8.4975	8.4951	8.4915
	3	8.5589	8.5565	8.5548

Client: Nachurs Alpine Solutions Date: 17-Jan-2019
Product: **ALPINE RF-11 (Lot# M07182018-445) Production Site/Facility: Marion, OH**
Dilution: As received SMI/REF: 1810-189
SAE AIR6130A, Cadmium Plate Cyclic Corrosion Test

TEST DATA (continued)

REPLICATE #1	INITIAL WEIGHT (grams)	WEEK 1 WED (grams)	WEEK 1 FRI (grams)	WEEK 2 MON (grams)	WEEK 2 WED (grams)	WEEK 2 FRI (grams)
	8.5001	8.4940	8.4988	8.4999	8.4977	8.4962
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	0.0061	0.0013	0.0002	0.0024	**0.0039 (FINAL)**

REPLICATE #2	INITIAL WEIGHT	WEEK 1 WED	WEEK 1 FRI	WEEK 2 MON	WEEK 2 WED	WEEK 2 FRI (FINAL WEIGHT)
	8.4991	8.4907	8.4963	8.4975	8.4951	8.4915
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	0.0084	0.0028	0.0016	0.0040	**0.0076 (FINAL)**

REPLICATE #3	INITIAL WEIGHT	WEEK 1 WED	WEEK 1 FRI	WEEK 2 MON	WEEK 2 WED	WEEK 2 FRI (FINAL WEIGHT)
	8.5600	8.5521	8.5579	8.5589	8.5565	8.5548
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	0.0079	0.0021	0.0011	0.0035	**0.0052 (FINAL)**

SUMMARY:

	REPLICATE #	Weight Change (g)	Average Weight Change	
WEIGHT CHANGE	1	**0.0039**	**0.56 mg/cm² (0.0020 g)**	**Informational**
	2	**0.0076**		
	3	**0.0052**		

Note: "+" indicates a weight gain.

AIR6130A: A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm² may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Respectfully Submitted,

Patricia D. Viani, SMI Inc.

SMI, Inc.
12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Jessica Cremer
Nachurs Alpine Solutions
421 Leader Street
Marion, OH 43302

Date: 17-Jan-2019

SMI/REF: 1810-189

Product: **ALPINE RF-11 (Lot# M07182018-445) Production Site/Facility: Marion, OH**
(received 16-Oct-2018)

Dilution: As received

Testing in accordance with
SAE AIR6170A
Ice Melting Test Method for Runways and Taxiways
Deicing/Anti-icing Chemicals (2017-02)

3.0 SUMMARY OF TEST METHOD:

3.1 Introduction

The test utilizes a sheet of ice of uniform thickness frozen in a flat circular polystyrene petri dish. After equilibration to the desired temperature, a weighed quantity of the runway deicing/anti-icing chemical is distributed over the surface of the ice sheet. At specified time intervals, generated brines are removed and the mass difference is calculated in order to obtain the mass of melted ice. Test temperatures shall be within 0.5°C (1°F) of the stated values and tests shall be performed within a freezer or cold chamber.

3.2 Significance and Use

This test method provides a means to evaluate and compare the ice melting capabilities of ready-to-use runway deicing/anti-icing chemicals in liquid or solid form over limited, defined time intervals at specified temperatures.

3.5.2 Solid Runway Deicing/Anti-icing Chemical

The solid runway deicing/anti-icing chemical shall be tested in both "as is" solid and diluted forms, as described in 3.5.2.1 and 3.5.2.2.

3.8 Data Recording and Reporting

The amount of ice melted for the test solutions (or solids) and for the reference control solution shall be recorded for each temperature for the time intervals of 5, 10, and 30 minutes and reported, for example see Table 1 (additional time intervals can be gathered upon request). The test temperature shall be recorded within 0.5°C and reported. The recorded value for each temperature/time observation shall be the average of the three tests. All data are measured in grams (g) and rounded to the nearest hundredth of a gram (0.01 g). The data of the reference control solution shall be presented.

The ice melting capacity is calculated and recorded. The unit is expressed in terms of "grams of ice melted per gram of runway deicing/anti-icing chemical applied". Present the graph of the amount of ice melted as a function of time

Table 1 – ICE MELTING TEST RESULTS

As received:

Runway Deicing/Anti-icing Chemical Identification:
ALPINE RF-11 (Lot# M07182018-445) Production Site/Facility: Marion, OH

Test Temperature: **-10°C (+14°F)**

Time (minutes)	Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mass of Ice Melted M_{lm} (g)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{lm} (g)	Ice Melting Capacity (m_{lm}/m_d)
5	5.00	4.52	5.00	4.84	0.97
	5.00	5.10			
	5.00	4.89			
10	5.00	5.56	5.00	5.47	1.09
	5.00	5.25			
	5.00	5.61			
30	5.00	7.10	5.00	7.15	1.43
	5.00	7.22			
	5.00	7.13			

As received:

Runway Deicing/Anti-icing Chemical Identification:
ALPINE RF-11 (Lot# M07182018-445) Production Site/Facility: Marion, OH

Test Temperature: **-2°C (+28°F)**

Time (minutes)	Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mass of Ice Melted M_{lm} (g)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{lm} (g)	Ice Melting Capacity (m_{lm}/m_d)
5	5.00	7.75	5.00	7.77	1.55
	5.00	7.55			
	5.00	8.02			
10	5.00	9.22	5.00	8.98	1.80
	5.00	8.56			
	5.00	9.15			
30	5.00	9.89	5.00	10.10	2.02
	5.00	10.01			
	5.00	10.40			

(Reference results are included here for comparison purposes)

Table 1 – ICE MELTING TEST RESULTS

Runway Deicing/Anti-icing Chemical Identification:
REFERENCE: POTASSIUM ACETATE, 50% w/w solution

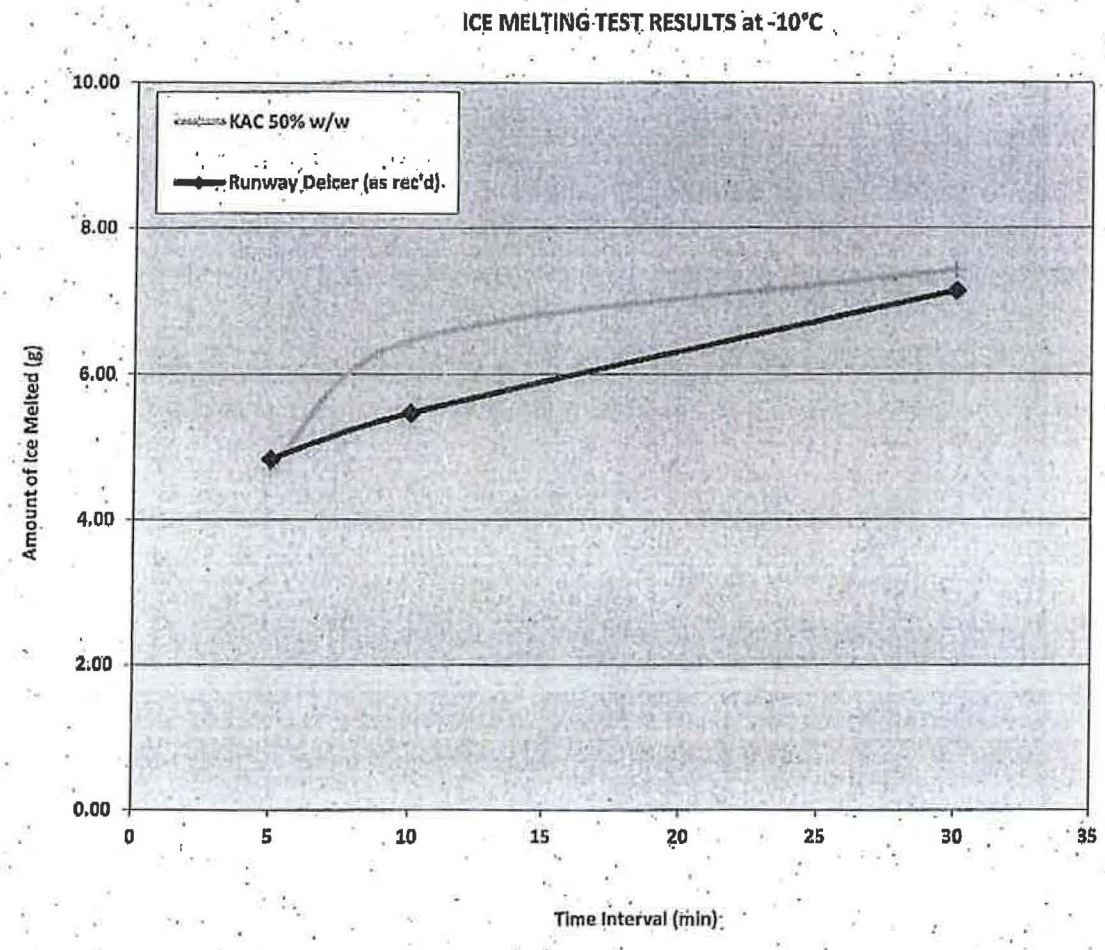
Test Temperature: **-10°C (+14°F)**

Time (minutes)	Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mass of Ice Melted M_{im} (g)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity* (m_{im}/m_d)
5	5.00	4.00	5.00	4.71	0.94
	5.00	4.81			
	5.00	5.31			
10	5.00	6.62	5.00	6.47	1.29
	5.00	6.75			
	5.00	6.05			
30	5.00	7.43	5.00	7.44	1.49
	5.00	6.90			
	5.00	7.99			

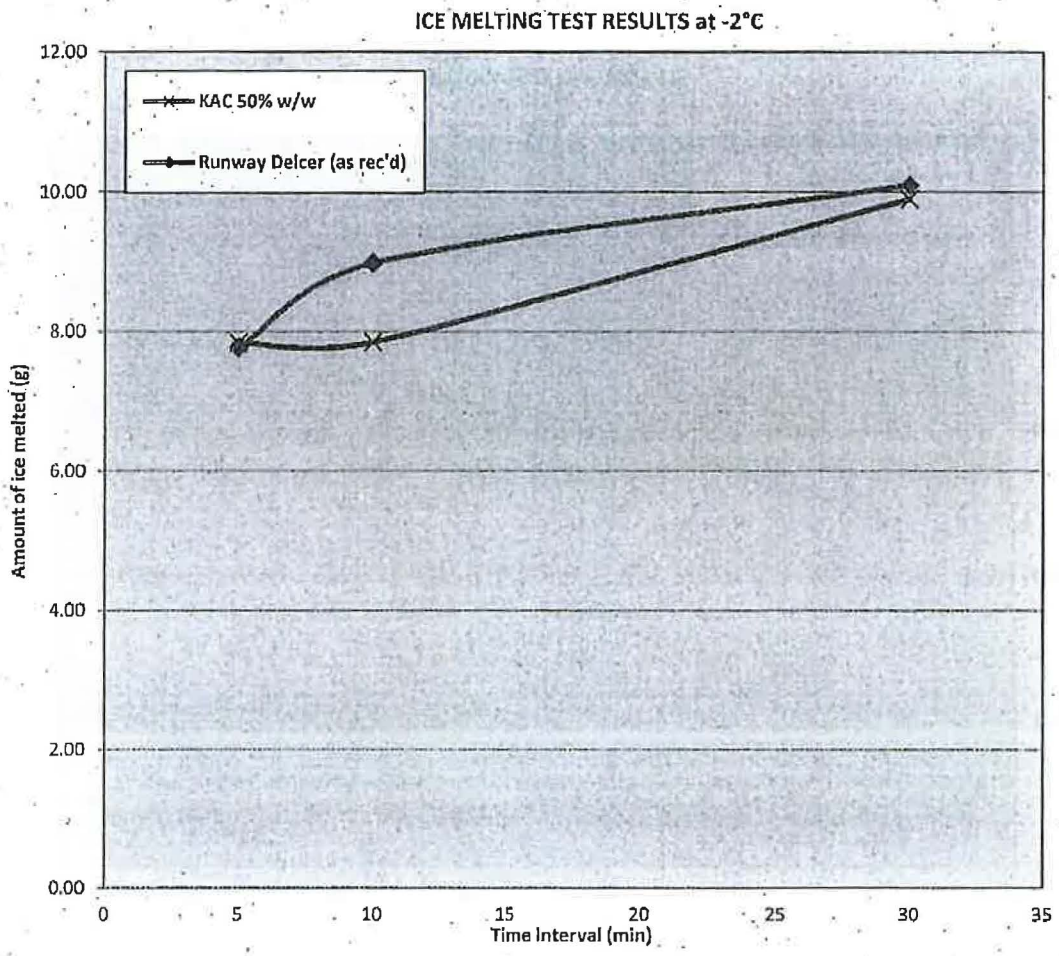
Runway Deicing/Anti-icing Chemical Identification:
REFERENCE: POTASSIUM ACETATE, 50% w/w solution

Test Temperature: **-2°C (+28°F)**

Time (minutes)	Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mass of Ice Melted M_{im} (g)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity* (m_{im}/m_d)
5	5.00	8.11	5.00	7.84	1.57
	5.00	7.49			
	5.00	7.92			
10	5.00	7.57	5.00	7.85	1.57
	5.00	7.59			
	5.00	8.38			
30	5.00	10.41	5.00	9.90	1.98
	5.00	10.53			
	5.00	8.76			


ICE MELTING TEST RESULTS at -10°C
KAC 50% w/w
Runway Deicer (as rec'd).
Amount of Ice Melted (g)
10.00
8.00
6.00
4.00
2.00
0.00
0
5
10
15
20
25
30
35
Time Interval (min)

Client:	Nachurs Alpine Solutions	Date:	17-Jan-2019
Product:	**ALPINE RF-11 (Lot# M07182018-445) Production Site/Facility: Marion, OH**		
Dilution:	As received	SMI/REF:	1810-189
SAE AIR6170A, Ice Melting Test Method.		Page 5 of 5	



Respectfully Submitted,

Patricia D. Viani, SMI Inc.

SMI, Inc.
12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Jessica Cremer
Nachurs Alpine Solutions
421 Leader Street
Marion, OH 43302

Date: 17-Jan-2019

SMI/REF: 1810-189

Product: **ALPINE RF-11 (Lot# M07182018-445) Production Site/Facility: Marion, OH**
(received 16-Oct-2018)

Dilution: As received

Testing in accordance with
SAE AIR6172A
Ice Undercutting Test Method for Runways and Taxiways Deicing/Anti-icing Chemicals (2017-03)

3. SUMMARY OF TEST METHOD

3.1 Introduction
The test utilizes small cylindrical cavities in a sheet of ice of uniform thickness frozen in a flat circular modified polystyrene Petri dish having an average standardized surface roughness of 120 grit (see Figure 1). The bottoms of the cavities are essentially free of ice. After equilibration to the desired temperature, a known volume of dyed runway deicing/anti-icing chemical is placed in the cavities, and undercutting commences (see Figure 1). Undercutting is evidenced by the formation of essentially circular undercut patterns. At specified time intervals, the dimensions of the observed undercut patterns are measured. The undercut pattern reflects the net result of melting on the walls of the ice cavity and melting at the ice/substrate interface. The undercut is relatively thick near the center and relatively thin at the extremities. The undercut area is defined as the total area of the circular undercut pattern minus the area of the original cavity. Testing temperatures shall be within 0.5°C (1°F) of the stated values and tests shall be performed within a freezer or cold chamber.

3.2 Significance and Use
This test method provides a means to evaluate and compare the rate of ice undercutting capabilities of runway deicing/anti-icing chemicals in liquid or solid form at the ice/substrate interface over limited, defined time intervals at specified temperatures.

3.7 Data Recording and Reporting
Circular-shaped ice undercuttings, in millimeters, for the test solutions and for the reference control solution shall be recorded for each temperature for the time intervals of 5, 10, and 30 minutes and reported, for example see Table 1 (data for additional time intervals can be gathered upon request). The data of the reference control solution shall be presented. All data is measured in millimeters (mm) within 0.1 mm. The test temperature shall be recorded within 0.5°C and reported. The recorded value for each temperature/time observation shall be the average of the five cavities where the measurement of each cavity is the two longest perpendicular axial dimensions (vertical and horizontal). The undercut area is defined as the total area of the circular undercut pattern minus the area of the original cavity. The ice undercutting is calculated according to Equations (3,) (4,) and (5). Present the graph of the ice undercutting area (mm^2) as a function of time.

The ice undercutting area for a given deicer is defined as: $IU=IU_e-A_s$ (Eq.3)
Where:
IU: Ice undercutting area for a given deicer (mm^2)
IU_e: Total area of circular undercut pattern at specified time interval (mm^2)
A_s: Initial area of original cavity (mm^2)

Table 1 – ICE UNDERCUTTING TEST RESULTS

Runway Deicing/Anti-icing Chemical Identification: **ALPINE RF-11 (Lot# M07182018-445) Production Site/Facility: Marion, OH**				Test Temperature: **-10°C (+14°F)**		
Time (minutes)	Cavity #	Undercut Cavity Diameter (mm)	Mean Undercut Cavity Diameter (mm)	Total Area IU_e (mm^2)	Area Original Cavity A_s (mm^2)	Ice Undercutting IU (mm^2)
5	1	7.1	7.22	40.92	7.07	33.85
	2	7.3				
	3	7.1				
	4	7.2				
	5	7.5				
10	1	7.9	8.27	53.82	7.07	46.75
	2	8.5				
	3	8.3				
	4	8.6				
	5	8.2				
30	1	8.8	8.88	61.90	7.07	54.83
	2	9.1				
	3	8.4				
	4	9.2				
	5	8.9				

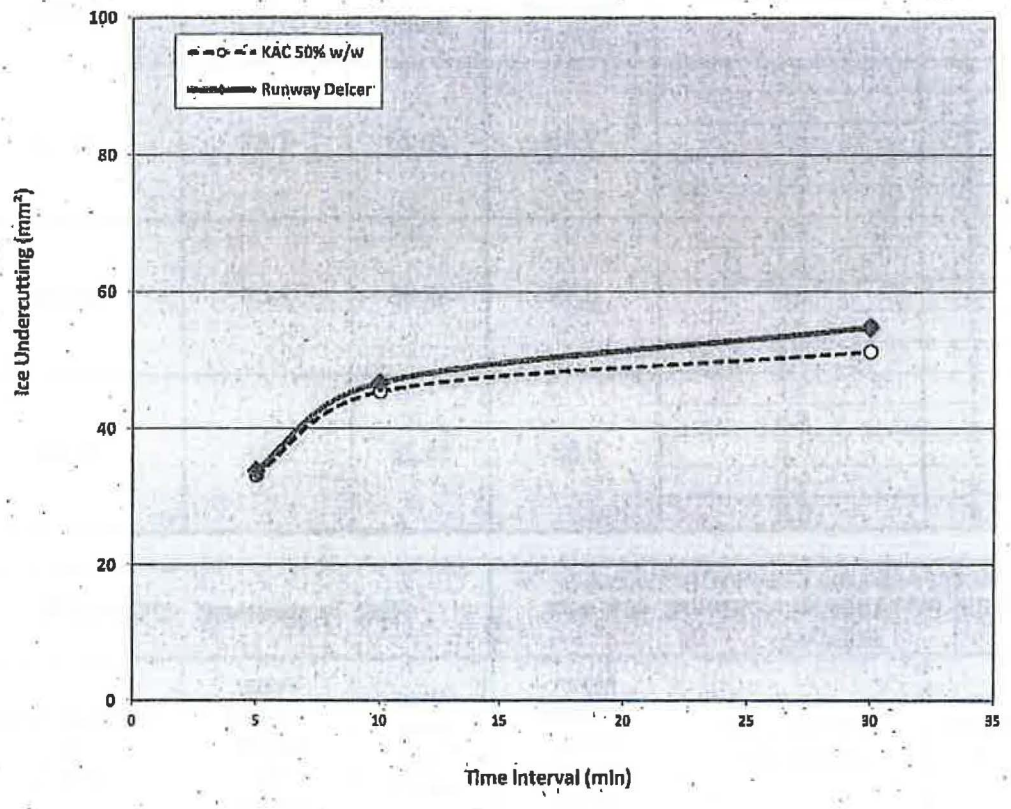
Runway Deicing/Anti-icing Chemical Identification: **ALPINE RF-11 (Lot# M07182018-445) Production Site/Facility: Marion, OH**				Test Temperature: **-2°C (+28°F)**		
Time (minutes)	Cavity #	Undercut Cavity Diameter (mm)	Mean Undercut Cavity Diameter (mm)	Total Area IU_e (mm^2)	Area Original Cavity A_s (mm^2)	Ice Undercutting IU (mm^2)
5	1	10.1	10.19	81.67	7.07	74.60
	2	10.1				
	3	10.2				
	4	10.4				
	5	10.2				
10	1	12.1	12.16	116.07	7.07	109.00
	2	12.1				
	3	12.0				
	4	12.4				
	5	12.2				
30	1	13.0	13.22	137.19	7.07	130.12
	2	13.1				
	3	13.2				
	4	13.4				
	5	13.3				

Table 1 – ICE UNDERCUTTING TEST RESULTS

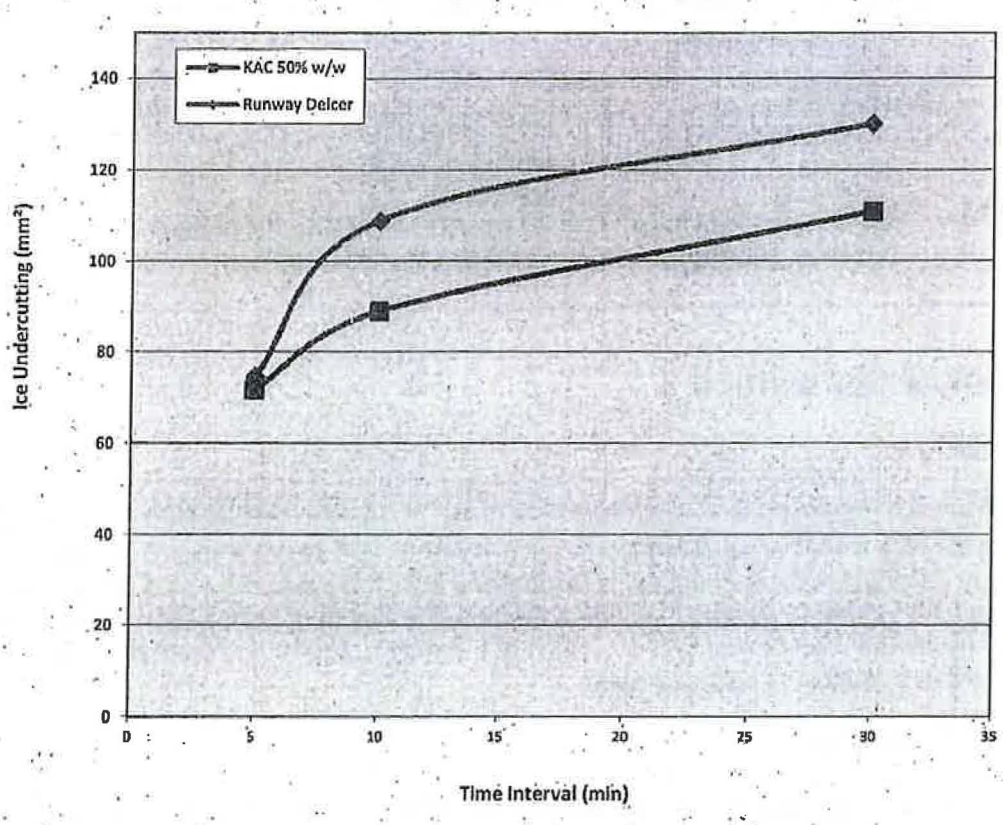
Runway Deicing/Anti-icing Chemical Identification: **REFERENCE: POTASSIUM ACETATE, 50% w/w solution**					Test Temperature: **-10°C (+14°F)**	
Time (minutes)	Cavity #	Undercut Cavity Diameter (mm)	Mean Undercut Cavity Diameter (mm)	Total Area IU_e (mm^2)	Area Original Cavity A_s (mm^2)	Ice Undercutting IU (mm^2)
5	1	7.2	7.16	40.26	7.07	33.19
	2	7.2				
	3	6.4				
	4	8.0				
	5	7.0				
10	1	8.5	8.18	52.55	7.07	45.48
	2	8.1				
	3	8.0				
	4	8.5				
	5	7.8				
30	1	8.7	8.62	58.36	7.07	51.29
	2	8.3				
	3	8.5				
	4	9.0				
	5	8.6				

Runway Deicing/Anti-icing Chemical Identification: **REFERENCE: POTASSIUM ACETATE, 50% w/w solution**					Test Temperature: **-2°C (+28°F)**	
Time (minutes)	Cavity #	Undercut Cavity Diameter (mm)	Mean Undercut Cavity Diameter (mm)	Total Area IU_e (mm^2)	Area Original Cavity A_s (mm^2)	Ice Undercutting IU (mm^2)
5	1	9.8	10.02	78.85	7.07	71.78
	2	9.7				
	3	10.5				
	4	10.0				
	5	10.1				
10	1	10.7	11.06	96.07	7.07	89.00
	2	10.8				
	3	11.6				
	4	11.2				
	5	11.0				
30	1	12.2	12.26	118.05	7.07	110.98
	2	12.1				
	3	12.7				
	4	12.2				
	5	12.1				

ICE UNDERCUTTING TEST RESULTS at -10°C



ICE UNDERCUTTING TEST RESULTS at -2°C



Respectfully Submitted,

Patricia D. Viani, SMI Inc.

SMI, Inc.
12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Jessica Cremer
Nachurs Alpine Solutions
421 Leader Street
Marion, OH 43302

Date: 17-Jan-2019

SMI/REF: 1810-189

Product: **ALPINE RF-11 (Lot# M07182018-445) Production Site/Facility: Marion, OH**
(received 16-Oct-2018)

Dilution: As received

Testing in accordance with
SAE AIR6211A
Ice Penetration Test Method for Runways and Taxiways Deicing/Anti-icing Chemicals (2017-05)

3. SUMMARY OF TEST METHOD

3.1 Introduction

The test utilizes an adapted test support having 4.0 mm (0.16 inch) inside diameter small glass test tubes filled with ice. After equilibration to the desired temperature, a known volume of dyed-liquid runway deicing/anti-icing chemical is discharged onto the ice surface and penetration commences (see Figure 1). At specified time intervals, the length of penetration is measured. Testing temperatures shall be within 0.5°C (1°F) of the stated values and tests shall be performed within a freezer or cold chamber.

3.2 Significance and Use

This test method can be used to evaluate and compare the ice penetrating capabilities of runway deicing/anti-icing chemicals in liquid or solid form over a limited, defined time interval at specified temperatures.

3.7 Data Recording and Reporting

Ice penetration depths, in millimeters, for the test solution and for the reference control shall be recorded and reported. The data at each temperature for the time intervals of 5, 10, and 30 min shall be presented, for example see Table 2 (data for additional time intervals can be gathered upon request). The test temperature shall be recorded within 0.5°C and reported. All data is measured in millimeter (mm) and rounded to the nearest 0.5 mm. The time intervals shall be measured within ±10 seconds. The recorded value for each temperature/time observation shall be the average of the four ice penetration depth values. Present the graph of the ice penetration as a function of time (for example see Figure 5). The data of the reference control solution shall be presented.

Table 1 – ICE PENETRATION TEST RESULTS

Runway Deicing/Anti-icing Chemical Identification:
ALPINE RF-11 (Lot# M07182018-445) Production Site/Facility: Marion, OH

Test Temperature **-10°C (+14°F)**:

Time (min)	Ice Penetration Depth M2-M1 (±1.0 mm)					
	Test Tube #1	Test Tube #2	Test Tube #3	Test Tube #4	Average	Standard Deviation
5	2.0 mm	2.0 mm	2.0 mm	2.0 mm	**2.0 mm**	**< 0.5 mm**
10	2.0 mm	2.0 mm	2.5 mm	2.5 mm	**2.5 mm**	**< 0.5 mm**
30	3.0 mm	3.5 mm	3.5 mm	3.5 mm	**3.5 mm**	**< 0.5 mm**

Runway Deicing/Anti-icing Chemical Identification:
ALPINE RF-11 (Lot# M07182018-445) Production Site/Facility: Marion, OH

Test Temperature **-2°C (+28°F)**:

Time (min)	Ice Penetration Depth M2-M1 (±1.0 mm)					
	Test Tube #1	Test Tube #2	Test Tube #3	Test Tube #4	Average	Standard Deviation
5	4.0 mm	4.0 mm	4.0 mm	4.0 mm	**4.0 mm**	**< 0.5 mm**
10	6.0 mm	6.0 mm	6.0 mm	6.0 mm	**6.0 mm**	**< 0.5 mm**
30	8.0 mm	8.0 mm	8.0 mm	8.0 mm	**8.0 mm**	**< 0.5 mm**

REFERENCE RESULTS

Runway Deicing/Anti-icing Chemical Identification:
REFERENCE: POTASSIUM ACETATE, 50% w/w solution

Test Temperature : **-10°C (+14°F)**

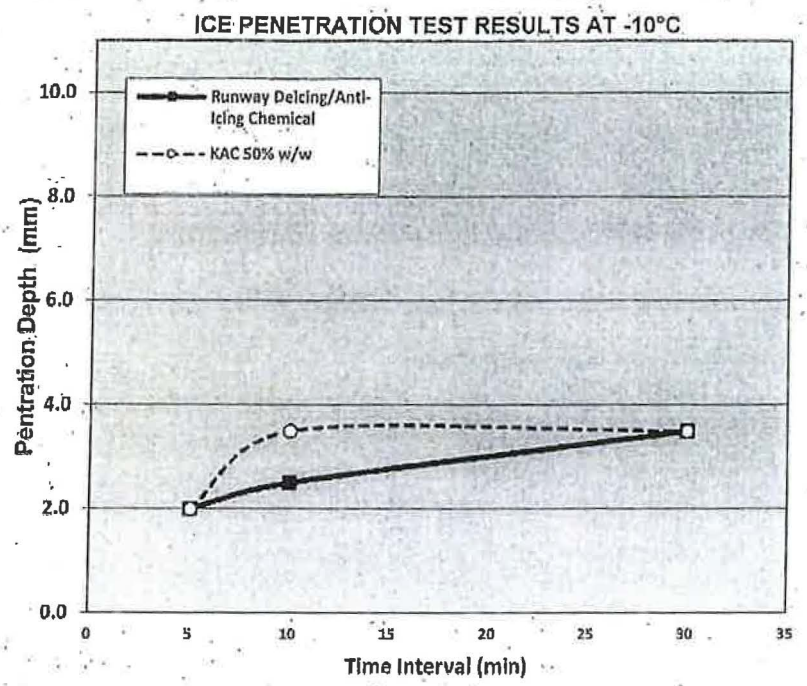
Time (min)	Ice Penetration Depth M2 – M1 (±1.0 mm)					
	Test Tube #1	Test Tube #2	Test Tube #3	Test Tube #4	Average	Standard Deviation
5	2.0 mm	2.0 mm	2.0 mm	2.0 mm	**2.0 mm**	**< 0.5 mm**
10	3.0 mm	3.5 mm	3.5 mm	3.5 mm	**3.5 mm**	**< 0.5 mm**
30	3.5 mm	4.0 mm	3.5 mm	3.5 mm	**3.5 mm**	**< 0.5 mm**

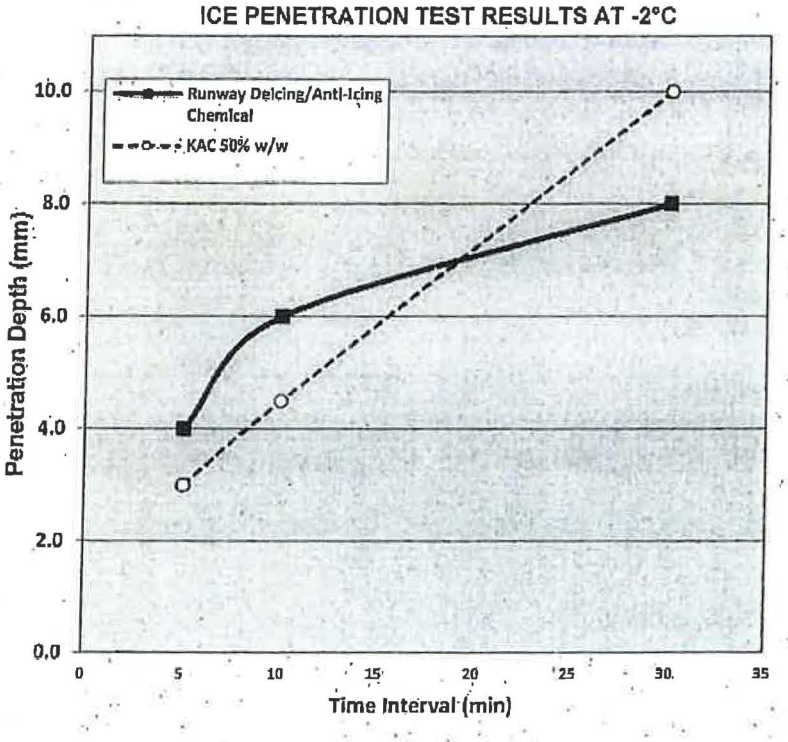
Runway Deicing/Anti-icing Chemical Identification:
REFERENCE: POTASSIUM ACETATE, 50% w/w solution

Test Temperature : **-2°C (+28°F)**

Time (min)	Ice Penetration Depth M2 – M1 (±1.0 mm)					
	Test Tube #1	Test Tube #2	Test Tube #3	Test Tube #4	Average	Standard Deviation
5	3.0 mm	3.0 mm	3.0 mm	3.0 mm	**3.0 mm**	**< 0.5 mm**
10	4.5 mm	4.5 mm	4.5 mm	4.5 mm	**4.5 mm**	**< 0.5 mm**
30	10.0 mm	10.0 mm	10.0 mm	10.0 mm	**10.0 mm**	**< 0.5 mm**

(all data rounded to the nearest 0.5mm)





Respectfully Submitted,

Patricia D. Viani, SMI Inc.

SMI, Inc.

12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Charlotte Danals
NaChurs Alpine Solutions Corp.
421 Leader Street
Marion, OH 43302

Date: 05-Jan-2015

SMI/REF: 1411-301

Product: **ALPINE RF-11 (Marion, OH) (Lot M11132014-JC03-20-1)** *(received 17-Nov-2014)*

Dilution: As received

Periodic testing in accordance with
AMS 1435C
FLUID, GENERIC, DEICING/ANTI-ICING
Runways and Taxiways

4.2.2 Periodic Tests

3.2.4	Freezing Point	Conforms
3.2.5	Effect on Aircraft Metals	
3.2.5.1	Sandwich Corrosion	Conforms
3.2.5.2	Total Immersion Corrosion	Conforms
3.2.5.3	Low Embrittling Cadmium Plate	Conforms
3.2.5.3.1	Cyclic Immersion Corrosion of Cadmium Plate	Informational
3.2.5.4	Hydrogen Embrittlement	Conforms
3.2.5.5	Stress-Corrosion Resistance	
	AMS 4911	Conforms
	AMS 4916	Informational
3.2.6	Effect on Transparent Plastics	
	MIL-P-25690 (Type C)	Conforms
	MIL-P-83310 (Polycarbonate)	Conforms
3.2.7	Effect on Painted Surfaces	Conforms
3.2.8	Effect on Unpainted Surfaces	Conforms
3.2.9	Rinsibility	Conforms
3.2.10	Effect on Runway Pavements	
3.2.10.1	Runway Concrete Scaling Resistance	Conforms
3.2.10.2	Asphalt Concrete Degradation Resistance	*Not performed by SMI

Testing required for deicer /anti-icer products used in Europe. This test is not performed by SMI.

Respectfully submitted,

Patricia D. Viani, SMI Inc.

4.2.2 Periodic Tests: Freezing point (3.2.4), effect on aircraft metals (3.2.5), effect on transparent plastic (3.2.6), effect on painted surfaces (3.2.7), effect on unpainted surfaces (3.2.8), rinsibility (3.2.9), and runway concrete scaling resistance (3.2.10) are periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser, but in no case less than once every two years.

3.2.4 Freezing Point:

3.2.4.1 Freeze point of fluid diluted 1:1 by weight with ASTM D 1193 Type IV water shall be reported and shall be lower than -14.5°C (+6°F) determined in accordance with ASTM D 1177.

Freezing point (fluid diluted 1:1): -15 °C

Result Conforms

3.2.4.2 Shall be reported and shall be within 4°C (7°F) of the preproduction value established in 4.2.3, determined in accordance with ASTM D 1177.

Freezing point (fluid diluted 1:1): -15 °C

Result Informational

3.2.5 Effect on Aircraft Metals:

3.2.5.1 Sandwich Corrosion: Specimens, after testing in accordance with ASTM F 1110, shall not show corrosion worse than control panels run using ASTM D 1193, type IV, water.

	2024-T3 Bare Anodized	2024-T3 Alclad	7075-T6 Bare Anodized	7075-T6 Alclad
DEICER FLUID	**1**	**1**	**1**	**1**
CONTROL	1	1	1	1

Result Conforms

3.2.5.2 Total Immersion Corrosion: The fluid, tested in accordance with ASTM F 483 except that panels of AMS 4376 shall be tested for 24 hours, shall neither show evidence of corrosion of panels nor cause a weight change of any test panel greater than shown in Table 1:

TEST PANEL	WEIGHT CHANGE (mg/cm²/24hrs)	
	ALLOWABLE	RESULTS
AMS 4037 Aluminum Alloy, anodized as in AMS 2470	0.3	**+ 0.02**
AMS 4041 Aluminum Alloy	0.3	**< 0.01**
AMS 4049 Aluminum Alloy	0.3	**< 0.01**
AMS 4376 Mg Alloy, dichromate treated as in AMS 2475	0.2	**0.10**
AMS 4911 or MAM 4911 Titanium Alloy	0.1	**< 0.01**
AMS 5045 Carbon Steel	0.8	**< 0.01**

Result Conforms

3.2.5.3 Low-Embrittling Cadmium Plate: Test panels, coated with low-embrittling cadmium plate, shall not show a weight change greater than 0.3 mg/cm^2/24hrs, determined in accordance with ASTM F 1111.

As received: 0.02 mg/cm^2/24hrs

Result Conforms

3.2.5.3.1 The fluid shall be tested for cyclic immersion corrosion of cadmium plate in accordance with AIR6130 and the results reported as specified in Section 4 of AIR6130.

Initial pH of solution: 10.4 **Final pH of solution**: 10.3

	REPLICATE #	Weight (g)		
		Initial	Final	**Weight change**
PANEL WEIGHTS	1	8.4373	8.4301	**0.0072**
	2	8.4759	8.4687	**0.0072**
	3	8.4471	8.4394	**0.0077**

A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm^2 (total weight loss more than 0.0077 g for the standard 1 x 2 inch cadmium plated specimen) may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Average weight change = 0.0074 g per panel (0.26 mg/cm^2)

Result: **Informational**

see separate report for complete data tables

3.2.5.4 Hydrogen Embrittlement: The fluid shall be nonembrittling, determined in accordance with ASTM F 519, Type 1a, 1c, or 2a.

Specimens: Type 1c, cadmium-plated per MIL-STD-870.
Parameters: 45% load, notch immersed in fluid for duration (150 hours)

As received: No failures occurred within 150 hours.

Result Conforms

3.2.5.5 Stress-Corrosion Resistance: The fluid shall not cause cracks in AMS 4911 or MAM 4911 titanium alloy specimens, determined in accordance with ASTM F 945, Method A. *(3% salt control: cracking evident)*

As received: No cracking evident.

Result Conforms

3.2.5.5.1 The fluid shall be tested in accordance with ASTM F 945, Method A using AMS 4916 specimens. Report shall detail the effect of the fluid and the effect of control solution. The results shall be reported for informational purposes only. *(100 ppm salt control: cracking evident)*

As received: Cracking evident.

Result Informational

3.2.6 Effect on Transparent Plastics:

3.2.6.1 The fluid, at 25°C ± 2 (77°F ± 4), shall not craze, stain, or discolor MIL-P-25690 stretched acrylic plastic, determined in accordance with ASTM F 484.

MIL-P-25690: No craze, stain, or discolor

Result Conforms

3.2.6.2 The fluid, at 25°C ± 2 (77°F ± 4), shall not craze, stain, or discolor MIL-P-83310 polycarbonate plastic, determined in accordance with ASTM F 484, except that the specimens shall be stressed for 30 minutes ± 2 to an outer fiber stress of 13.8 MPa (2000 psi).

MIL-P-83310: No craze, stain, or discolor

Result Conforms

3.2.7 Effect on Painted Surfaces: The fluid, at 25°C ± 2 (77°F ± 4), shall neither decrease the paint film hardness by more than two pencil hardness levels nor shall it produce any streaking, discoloration, or blistering of the paint film, determined in accordance with ASTM F 502.

ASTM F502: No decrease in film hardness; no detrimental effect

Result Conforms

3.2.8 Effect on Unpainted Surfaces: The fluid, tested in accordance with ASTM F 485, shall neither produce streaking nor leave any stains requiring polishing to remove.

AMS 4049: No streaking or stains
AMS 4911: No streaking or stains

Result Conforms

3.2.9 Rinsibility: The fluid shall be completely rinsible in tap water, determined in accordance with 3.2.9.1

3.2.9.1 A 75 x 200 mm panel of clear glass shall be cleaned to provide a surface free of waterbreak, dried, and coated with the deicer/anti-icer fluid by pouring the fluid over the panel while it is held in a horizontal position. The coated panel shall be inclined at an angle of approximately 45 degrees for 10 minutes ± 0.5, then placed in a horizontal position for 24 hours ± 0.25 at room temperature. After the 24 exposure, the panel shall be rinsed in tap water for 5 to 6 minutes, followed by a rinse with ASTM D 1193, Type IV, water, allowed to air dry at ambient temperature, and examined for visible traces of deicer/anti-icer fluid.

Fluid was completely rinsible.

Result Conforms

3.2.10 Effect on Runway Pavements

3.2.10.1 Runway Concrete Scaling Resistance: The condition of the runway concrete surface shall have a rating not greater than 1 for 50 freeze-thaw cycles, determined in accordance with ASTM C 672 except that concrete shall:

- ☐ Be air-entrained with an air content as specified in ASTM C 672
- ☐ Have a minimum cement content of 510 pound per cubic yard ± 10 (302 kg/m^3 ± 6)
- ☐ Have a slump, 1.5 inches ± 0.5 (38 mm ± 13)

A 25 % by volume solution of the deicer/anti-icer fluid, as supplied by the manufacturer in commercial concentration, in tap water shall be substituted for calcium chloride. Performing more than one freeze-thaw cycle per day is acceptable.

Rating after 50 cycles: 1

Result Conforms

2.10.2 Asphalt Concrete Degradation Resistance (Appendix A, valid for deicer/anti-icer products used in Europe)

Result *Not performed by SMI

****Testing required for deicer /anti-icer products used in Europe. This test is not performed by SMI.***

SMI, Inc.

12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Charlotte Danals
NaChurs Alpine Solutions Corp.
421 Leader Street
Marion, OH 43302

Date: 05-Jan-2015

SMI/REF: 1411-301

Product: **ALPINE RF-11 (Marion, OH) (Lot M11132014-JC03-20-1)** *(received 17-Nov-2014)*

Dilution: As received

Testing in accordance with
SAE AIR6130
CADMIUM PLATE CYCLIC CORROSION TEST (2012-01)

Cadmium Plate Cyclic Corrosion Test

Initial pH of solution: 10.4 **Final pH of solution:** 10.3

	REPLICATE #	Weight (g)		
		Initial	Final	**Weight change**
PANEL WEIGHTS	1	8.4373	8.4301	**0.0072**
	2	8.4759	8.4687	**0.0072**
	3	8.4471	8.4394	**0.0077**

A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm² (total weight loss more than 0.0077 g for the standard 1 x 2 inch cadmium plated specimen) may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Average weight change = 0.0074 g per panel (0.26 mg/cm²)

Result: **Informational**

see page 5 for complete data tables

Cadmium Plate Cyclic Corrosion Test

AMS 1431 Compound, Solid Runway and Taxiway Deicing/Anti-Icing

AMS 1435 Fluid, Generic, Deicing/Anti-Icing Runways and Taxiways

3 Test Specimen Preparation

Substrate: 4130 Steel

Size: 1" x 2" x 0.04" x 0.040" (25.40 mm x 50.80 mm x 1.02 mm)

Finish: Cadmium plating in accordance with AMS QQ-P-416., Type I Class I, (0.0005"- 0.0008" inch plating per side).

There shall be no supplementary chromate treatment.

a. Three cadmium plated test specimens shall be used for each fluid to be tested

b. Sample of AMS1435 Runway Deicing Fluid shall be tested as received from the supplier.

c. Sample of AMS1431 Runway Deicing Solid Compound shall be tested in a diluted form – diluted with ASTM D 1193, Type IV, water to 15% by weight solids.

d. Procure soft flexible brushes for test (paintbrush type, 1.5 inches (3.8 cm) wide, with synthetic bristles approx 1.5 inches (3.8 cm) long

4 Environmental Exposure Preparation

Preset humidity chamber to 90 ± 5°F and 30 ± 5% humidity. Affix plastic ties or other inert material as hangers (hangers shall be made from an inert material that will not react with the sample; plastic, plastic coated metals, monofilament fishing line or stainless steels are acceptable) in the chamber to hold specimens during the environmental exposure period.

5 Test Procedure

a. Measure and record pH of solution(s) to be tested (record to one decimal place).

b. Solvent clean cadmium plated specimens with acetone; wipe gently with an acetone-soaked wiper. Without allowing the acetone to evaporate, gently remove excess acetone with a dry wiper. Allow samples to dry for 10 minutes in a desiccator. Do not accelerate drying of samples with oven drying.

Note: Care should be taken not to touch the cleaned specimens with bare hands; use tweezers, clean gloves or equivalent tool.

c. Weigh and record initial specimen weight in grams. Record all weights throughout the test to the nearest 0.0001 gram. Return specimens to desiccator until Day 3.

Monday	Tuesday	Wednesday	Thursday	Friday
				Friday Start – Day 0
Day 3	Day 4	Day 5	Day 6	Day 7
Day 10	Day 11	Day 12	Day 13	Day 14

d. FRIDAY START - Fill glass containers with solution to be tested, one container for each coupon. Refer to 3b or 3c for solution being used (consider filling one extra container to have extra conditioned fluid available). Container shall be large enough so the solution completely covers the specimens. Cover the container with loose fitting cover and place filled container into the humidity chamber to environmentally condition the solution for a minimum of 24 ± 1 hours before the start of test, up to 72 ± 1 hours.

e. Day 3 – Remove the solution container from the humidity chamber and the specimens from the desiccator. Place specimens in container oriented such that the specimens are not resting flush against the bottom or side of the container. Place the container with cover back into the humidity chamber for 24 ± 1 hours.

f. Day 4 - After the 24 hour immersion in the solution, remove the specimens, but do not rinse them. Place them into the humidity chamber by hanging for 22.5 ± 0.5 hours. Hangers shall be made from an inert material that will not react with the sample (such as plastic, plastic coated metals and stainless steels are acceptable).

g. Day 5 /Day 10 /Day 12 – Remove the specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimen surface with the soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

Immediately after weighing the specimens, return them to their test solution container to soak for 90 ± 5 minutes in the humidity chamber. Specimens shall be oriented such that they not resting flush against the bottom or side of the container. After 90 minutes, remove the specimens but do not rinse them. Place them in the humidity chamber by hanging for 22.5 ± 0.5 hours, maintaining the specimen in the initial orientation throughout the cycle.

h. Day 6 /Day 11 /Day 13 - Return the specimen to the test solution container to soak for 90 ± 5 minutes in the humidity chamber. Specimens shall be oriented such that it is not resting flush against the bottom or side of the container. After 90 minutes, remove the specimen but do not rinse it. Replace it in the humidity chamber by hanging for 22.5 ± 0.5 hours, maintaining the specimen in the initial orientation throughout the cycle.

i. Day 7 – Remove specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimens surface with a soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

Immediately after weighing the specimens, return them to their test solution container in the humidity chamber. Specimens shall be oriented such that they are not resting flush against the bottom or side of the container. Specimens shall be left in the test solution container in the humidity chamber from DAY 7 to DAY 10.

j. Day 14 – Remove specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimen surface with a soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

k. Measure and record final pH of solution (record to one decimal place).

l. Report the initial weight of the specimen, the weight after each periodic weighing, and the final weight. Calculate and report the value of the cumulative weight lost from each specimen after each periodic weighing procedure.

Test Data:

pH at start of test: 10.4
pH at end of test: 10.3

	REPLICATE #	Weight (g)
INITIAL PANEL WEIGHTS	1	8.4373
	2	8.4759
	3	8.4471

	REPLICATE #	Weight (g)		
		Monday	Wednesday	Friday
WEEK #1 PANEL WEIGHTS	1	----	8.4373	8.4356
	2	----	8.4756	8.4742
	3	----	8.4469	8.4445

	REPLICATE #	Weight (g)		
		Monday	Wednesday	Friday
WEEK #2 PANEL WEIGHTS	1	8.4342	8.4333	8.4301
	2	8.4719	8.4709	8.4687
	3	8.4427	8.4404	8.4394

Client: NaChurs Alpine Solutions Corp. Date: 05-Jan-2015
Product: **ALPINE RF-11 (Marion, OH) (Lot M11132014-JC03-20-1)**
Dilution: As received SMI/REF: 1411-301
SAE AIR6130, Cadmium Plate Cyclic Corrosion Test

TEST DATA (continued)

REPLICATE #1	INITIAL WEIGHT (grams)	WEEK 1 WED (grams)	WEEK 1 FRI (grams)	WEEK 2 MON (grams)	WEEK 2 WED (grams)	WEEK 2 FRI (grams)
	8.4373	8.4373	8.4356	8.4342	8.4333	8.4301
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	0	0.0017	0.0031	0.0040	**0.0072 (FINAL)**

REPLICATE #2	INITIAL WEIGHT	WEEK 1 WED	WEEK 1 FRI	WEEK 2 MON	WEEK 2 WED	WEEK 2 FRI (FINAL WEIGHT)
	8.4759	8.4756	8.4742	8.4719	8.4709	8.4687
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	0.0003	0.0017	0.0040	0.0050	**0.0072 (FINAL)**

REPLICATE #3	INITIAL WEIGHT	WEEK 1 WED	WEEK 1 FRI	WEEK 2 MON	WEEK 2 WED	WEEK 2 FRI (FINAL WEIGHT)
	8.4471	8.4469	8.4445	8.4427	8.4404	8.4394
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	0.0002	0.0026	0.0044	0.0067	**0.0077 (FINAL)**

SUMMARY:

	REPLICATE #	Weight Change (g)	Average Weight Change	
WEIGHT CHANGE	1	**0.0072**	**0.0074 g (0.26mg/cm^2)**	**Informational**
	2	**0.0072**		
	3	**0.0077**		

Note: "+" indicates a weight gain.

"A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm^2 (total weight loss more than 0.0077 g for the standard 1 x 2 inch cadmium plated specimen) may cause undesirable corrosion effects to airplane equipment and/or airport equipment."

Respectfully Submitted,

Patricia D. Viani, SMI Inc.

SMI, Inc.

12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Greg Bame
Na-Churs Alpine Solutions
421 Leader Street
Marion, OH 43302

Date: 15-Jan-2013

SMI/REF: 1209-987

Product: **ALPINE RF-11 (from Marion, OH)** *(received 01-Nov-2012)*

Dilution: As received

AMS 1435C (Revised June, 2012)
FLUID, GENERIC, DEICING/ANTI-ICING
Runways and Taxiways

3.1	MATERIAL	
3.1.1	Environmental Information	
3.1.1.1	Biodegradability	Informational
3.1.1.2	Ecological Behavior (LC_{50})	Informational
3.1.1.3	Trace Contaminants	Informational
3.1.2	Appearance	Conforms
3.2	PROPERTIES	
3.2.1	Flash Point	Conforms
3.2.2	Specific Gravity	Informational
3.2.3	pH	Conforms
3.2.4	Freezing Point	Conforms
3.2.5	Effect on Aircraft Metals	
3.2.5.1	Sandwich Corrosion	Conforms
3.2.5.2	Total Immersion Corrosion	Conforms
3.2.5.3	Low Embrittling Cadmium Plate	Conforms
3.2.5.3.1	Cyclic Immersion Corrosion of Cadmium Plate	Informational
3.2.5.4	Hydrogen Embrittlement	Conforms
3.2.5.5	Stress-Corrosion Resistance	
	AMS 4911	Conforms
	AMS 4916	Informational
3.2.6	Effect on Transparent Plastics	
	MIL-P-25690 (Type C)	Conforms
	MIL-P-83310 (Polycarbonate)	Conforms
3.2.7	Effect on Painted Surfaces	Conforms
3.2.8	Effect on Unpainted Surfaces	Conforms
3.2.9	Rinsibility	Conforms
3.2.10	Effect on Runway Pavements	
3.2.10.1	Runway Concrete Scaling Resistance	Conforms
3.2.10.2	Asphalt Concrete Degradation Resistance	[1]Not performed by SMI
3.2.11	Storage Stability	Not performed
3.2.12	Performance	
	Ice Melting Effectiveness	Informational
	Ice Undercutting Effectiveness	Informational
	Ice Penetration Effectiveness	Informational
3.2.13	Effect on Carbon-Brake Systems	[2]Not performed by SMI

[1] *Testing required for deicer /anti-icer products used in Europe. This test is not performed by SMI.*

[2] *This test is not performed by SMI.*

Respectfully submitted,

Patricia D. Viani, SMI Inc.

3.1 Material: The composition of the fluid shall be optional with the manufacturer. The fluid may contain additives, such as corrosion inhibitors, urea, formamide, etc, as required to produce a product meeting the requirements of this specification.

3.1.1 Environmental information: The manufacturer of the fluid shall provide not less than the following information:

3.1.1.1 Biodegradability: Fluid shall be tested in accordance with APHA Standard Methods for Examination of Water and Waste Water. The manufacturer shall provide results of bioassays, which shall contain not less than the following information:

3.1.1.1.1 The percent of fluid biodegraded in five days at 20°C (68°F).

BOD: 0.23 kg O_2/kg fluid

Result Informational

3.1.1.1.2 The five day theoretical total oxygen demand (TOD) of the fluid, expressed in kilograms of oxygen per kilograms of fluid.

COD: 0.33 kg O_2/kg fluid

Result Informational

3.1.1.2 Ecological Behavior: A statement of the ecological behavior of the fluid, which shall include aquatic toxicity for the total formulation. The aquatic toxicity data shall be determined in accordance with EPA Methods 40 Code of Federal Regulations (CFR) Part 797.1300 and 797.1400 or OECD Guidelines for Testing of Chemicals (Organization for Economic Cooperation and Development, Methods 202 and 203, updated 1989) using test species required by regulatory agencies for permitted discharges. The LC_{50} concentration, the highest concentration at which 50 % of the test species survive, shall be given in milligrams per liter.

EPA 40 CFR 797.1300 DAPHNID ACUTE TOXICITY TEST

Daphnia magna, static system
48 hour LC_{50}: 2,175 mg/L

EPA 40 CFR 797.1400 FISH ACUTE TOXICITY TEST

Pimephales promelas, static system
96 hour LC_{50}: 2,125 mg/L

Result Informational

3.1.1.3 Trace Contaminants: Report the presence, percentage by weight, of sulfur, halogens, phosphate, nitrate, and heavy metals (lead, chromium, cadmium, and mercury).

Sulfur:	***9 ppm***	***(0.0009%)***
Halogens:	***< 10 ppm***	***(<0.0010%)***
Phosphate (P as P_2O_5):	***2040 ppm***	***(0.2040%)***
Nitrate (as NO_3):	***< 2 ppm***	***(<0.0002%)***
Heavy Metals:		
Lead (Pb):	***< 1 ppm***	***(<0.0001%)***
Chromium (Cr):	***< 1 ppm***	***(<0.0001%)***
Cadmium (Cd):	***< 1 ppm***	***(<0.0001%)***
Mercury (Hg):	***< 1 ppm***	***(<0.0001%)***

Result Informational

3.1.2 Appearance: Fluid, as received by purchaser, shall be homogeneous, uniform in color, and free from skins, lumps, and foreign materials detrimental to usage of the product. If fluid is colored, it shall be blue.

Product is blue in color, uniform and homogeneous; exhibits no precipitate.

Result Conforms

3.2. Physical Properties: The fluid, as supplied by vendor, shall conform to the following requirements: tests shall be performed in accordance with specified tests on the product in concentrated form as delivered by vendor, unless otherwise specified herein.

3.2.1 Flash Point: Shall be reported and shall be not lower than 100°C (212°F), determined in accordance with ASTM D 56 or ASTM D 93. In case of dispute, flash point determined in accordance with ASTM D 56 shall apply.

No flash to 100 °C

Result Conforms

3.2.2 Specific Gravity: Shall be reported and shall be within ± 0.015 of the preproduction value established in 4.2.3 determined in accordance with ASTM D 891.

Specific gravity: 1.282 @ 60/60°F

Result Informational

3.2.3 pH: Shall be 7.0 to 11.5 and within ± 0.5 of the preproduction value established in 4.2.3, determined in accordance with ASTM E 70.

pH: 9.9

Result Conforms

3.2.4 Freezing Point:

3.2.4.1 Freeze point of fluid diluted 1:1 by weight with ASTM D 1193 Type IV water shall be reported and shall be lower than -14.5°C (+6°F) determined in accordance with ASTM D 1177.

Freezing point (1:1 dilution): -15 °C

Result Conforms

3.2.4.2 Shall be reported and shall be within 4°C (7°F) of the preproduction value established in 4.2.3, determined in accordance with ASTM D 1177.

Freezing point (1:1 dilution): -15 °C

Result Informational

3.2.5 Effect on Aircraft Metals:

3.2.5.1 Sandwich Corrosion: Specimens, after testing in accordance with ASTM F 1110, shall not show corrosion worse than control panels run using ASTM D 1193, type IV, water.

	2024-T3 Bare Anodized	2024-T3 Alclad	7075-T6 Bare Anodized	7075-T6 Alclad
PRODUCT	**1**	**1**	**1**	**1**
CONTROL	1	1	1	1

Result Conforms

3.2.5.2 Total Immersion Corrosion: The fluid, tested in accordance with ASTM F 483 except that panels of AMS 4376 shall be tested for 24 hours, shall neither show evidence of corrosion of panels nor cause a weight change of any test panel greater than shown in Table 1:

TEST PANEL	WEIGHT CHANGE (mg/cm²/24hrs)	
	ALLOWABLE	RESULTS
AMS 4037 aluminum alloy, anodized as in AMS 2470	0.3	**< 0.01**
AMS 4041 aluminum alloy	0.3	**0.04**
AMS 4049 aluminum alloy	0.3	**0.02**
AMS 4376 magnesium alloy, dichromate treated per AMS 2475	0.2	**0.05**
AMS 4911 titanium alloy	0.1	**0.02**
AMS 5045 carbon steel	0.8	**0.05**

Result Conforms

3.2.5.3 Low-Embrittling Cadmium Plate: Test panels, coated with low-embrittling cadmium plate, shall not show a weight change greater than 0.3 mg/cm^2/24hrs, determined in accordance with ASTM F 1111.

As received: 0.07 mg/cm^2/24hrs (panels were discolored; blue)

Result Conforms

3.2.5.3.1 Cyclic Immersion Corrosion of Cadmium Plate: The fluid shall be tested for cyclic immersion corrosion of cadmium plate in accordance with AIR6130 and the results reports as specified in Section 4 of AIR6130.

Initial pH of solution: 9.9 **Final pH of solution:** 9.8

	REPLICATE #	Weight (g)		
		Initial	Final	Weight change
PANEL WEIGHTS	1	16.3985	16.3961	0.0024
	2	16.4276	16.4273	0.0003
	3	16.5649	16.5647	0.0002

A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm^2 (total weight loss more than 0.0077 g for the standard 1 x 2 inch cadmium plated specimen) may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Average weight change = 0.0009 g per panel (0.03 mg/cm^2)

Result: **Informational**

see separate report for complete data tables

3.2.5.4 Hydrogen Embrittlement: The fluid shall be nonembrittling, determined in accordance with ASTM F 519, Type 1a, 1c, or 2a.

Specimens: Type 1c, cadmium plated per MIL-STD-870.
Test temperature: 20°C (68°F); Load: 45%, immersed for 150 hr duration.
No failures within 150 hours.

Result Conforms

3.2.5.5 Stress-Corrosion Resistance: The fluid shall not cause cracks in AMS 4911 or MAM 4911 titanium alloy specimens, determined in accordance with ASTM F 945, Method A. *(3% salt control: cracking evident)*

As received: No cracking evident.

Result Conforms

3.2.5.5.1 The fluid shall be tested in accordance with ASTM F 945, Method A using AMS 4916 specimens. Report shall detail the effect of the fluid and the effect of control solution. The results shall be reported for informational purposes only. *(100 ppm salt control: cracking evident)*

As received: Cracking evident.

Result Informational

3.2.6 Effect on Transparent Plastics:

3.2.6.1 The fluid, at 25°C ± 2 (77°F ± 4), shall not craze, stain, or discolor MIL-P-25690 stretched acrylic plastic, determined in accordance with ASTM F 484.

Result Conforms

3.2.6.2 The fluid, at 25°C ± 2 (77°F ± 4), shall not craze, stain, or discolor MIL-P-83310 polycarbonate plastic, determined in accordance with ASTM F 484, except that the specimens shall be stressed for 30 minutes ± 2 to an outer fiber stress of 13.8 MPa (2000 psi).

Result Conforms

3.2.7 Effect on Painted Surfaces: The fluid, at 25°C ± 2 (77°F ± 4), shall neither decrease the paint film hardness by more than two pencil hardness levels nor shall it produce any streaking, discoloration, or blistering of the paint film, determined in accordance with ASTM F 502.

Result Conforms

3.2.8 Effect on Unpainted Surfaces: The fluid, tested in accordance with ASTM F 485, shall neither produce streaking nor leave any stains requiring polishing to remove.

Result Conforms

3.2.9 Rinsibility: The fluid shall be completely rinsible in tap water, determined in accordance with 3.2.9.1

3.2.9.1 A 75 x 200 mm panel of clear glass shall be cleaned to provide a surface free of waterbreak, dried, and coated with the deicer/anti-icer fluid by pouring the fluid over the panel while it is held in a horizontal position. The coated panel shall be inclined at an angle of approximately 45 degrees for 10 minutes ± 0.5, then placed in a horizontal position for 24 hours ± 0.25 at room temperature. After the 24 exposure, the panel shall be rinsed in tap water for 5 to 6 minutes, followed by a rinse with ASTM D 1193, Type IV, water, allowed to air dry at ambient temperature, and examined for visible traces of deicer/anti-icer fluid.

Result Conforms

3.2.10 Effect on Runway Pavements

3.2.10.1 Runway Concrete Scaling Resistance: The condition of the runway concrete surface shall have a rating not greater than 1 for 50 freeze-thaw cycles, determined in accordance with ASTM C 672 except that concrete shall:

- ☐ Be air-entrained with an air content as specified in ASTM C 672
- ☐ Have a minimum cement content of 510 pound per cubic yard ± 10 (302 kg/m^3 ± 6)
- ☐ Have a slump, 1.5 inches ± 0.5 (38 mm ± 13)

A 25 % by volume solution of the deicer/anti-icer fluid, as supplied by the manufacturer in commercial concentration, in tap water shall be substituted for calcium chloride. Performing more than one freeze-thaw cycle per day is acceptable.

Rating = 1

Result Conforms

3.2.10.2 Asphalt Concrete Degradation Resistance (Appendix A, valid for deicer/anti-icer products used in Europe)

Result [1]Not performed by SMI

[1]Testing required for deicer /anti-icer products used in Europe. This test is not performed by SMI.

3.2.11 Storage Stability: The fluid, after storage in accordance with ASTM F 1105, shall not exhibit separation or an increase in turbidity compared to unaged fluid. Any increase in turbidity shall be reported, but shall be acceptable if removed by mild agitation.

Result Not performed

3.2.12 Performance: The fluid, used in accordance with manufacturer's recommendation, shall remove accumulated frozen deposits of frost and ice from airport aprons (ramps), taxiways and runways. The fluid shall be tested in accordance with AIR6170 for ice melting effectiveness, with AIR6172 for ice undercutting effectiveness, and with AIR6211 for ice penetration effectiveness. Acceptance criteria shall be agreed upon by purchaser and vendor.

SAE AIR6170 (2012-01)
Ice Melting Test Method for Runways and Taxiways Deicing / Anti-icing Chemicals
See separate report for complete data results

ICE MELTING TEST RESULTS

Runway Deicing/Anti-icing Chemical Identification: **ALPINE RF-11 (from Marion, OH)**			
Test Temperature: **-10°C (+14°F)**			
Time (minute)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity* (m_{im}/m_d)
5	5.0	3.4	0.7
10	5.0	4.3	0.9
30	5.0	5.4	1.1

Runway Deicing/Anti-icing Chemical Identification: **ALPINE RF-11 (from Marion, OH)**			
Test Temperature: **-2°C (+28°F)**			
Time (minute)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity* (m_{im}/m_d)
5	5.0	3.8	0.8
10	5.0	5.6	1.1
30	5.0	8.2	1.6

3.2.12 Performance (continued):

SAE AIR6172
Ice Undercutting Test Method for Runways and Taxiways Deicing/Anti-icing Chemicals
See separate report for complete data results

ICE UNDERCUTTING TEST RESULTS

Runway Deicing/Anti-icing Chemical Identification: **ALPINE RF-11 (from Marion, OH)**		Test Temperature: **-10°C (+14°F)**		
Time (minute)	Mean Undercut Cavity Diameter (mm)	Total Area IU_{e_2} (mm^2)	Area Original Cavity A_s (mm^2)	Ice Undercutting IU (mm^2)
5	5.8	26.4	7.1	19.3
10	8.2	53.3	7.1	46.2
30	9.1	65.0	7.1	57.9

Runway Deicing/Anti-icing Chemical Identification: **ALPINE RF-11 (from Marion, OH)**		Test Temperature: **-2°C (+28°F)**		
Time (minute)	Mean Undercut Cavity Diameter (mm)	Total Area IU_{e_2} (mm^2)	Area Original Cavity A_s (mm^2)	Ice Undercutting IU (mm^2)
5	11.0	95.0	7.1	87.9
10	12.5	122.7	7.1	115.6
30	13.7	147.3	7.1	140.2

3.2.1 Performance (continued):

SAE AIR6211
Ice Penetration test Method for Runways and Taxiways Deicing/Anti-icing Chemicals
See separate report for complete data results

ICE PENETRATION TEST RESULTS

Runway Deicing/Anti-icing Chemical Identification: **ALPINE RF-11 (from Marion, OH)**	
Test Temperature **-10°C (+14°F)**:	
Time (minutes)	Penetration Depth (mm) Average
5	**3.5 mm**
10	**3.8 mm**
30	**4.0 mm**

3.2.13 Effect on Carbon-Brake Systems: The fluid shall be tested for catalytic oxidation of carbon in accordance with AIR5567 and the results shall be reported as shown in 4.2 of AIR5567. The results shall be reported for informational purposes only.

Result [2]Not performed by SMI

[2] *This test is not performed by SMI.*

SMI, Inc.
12219 SW 131 Avenue
Miami, Florida 33186-6401 USA
Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Greg Bame
Na-Churs Alpine Solutions
421 Leader Street
Marion, OH 43302

Date: 15-Jan-2013

SMI/REF: 1209-987

Product: **ALPINE RF-11 (from Marion OH)** *(received 01-Nov-2012)*

Dilution: As received

Testing in accordance with
SAE AIR6130
CADMIUM PLATE CYCLIC CORROSION TEST (2012-01)

Cadmium Plate Cyclic Corrosion Test

Initial pH of solution: 9.9 **Final pH of solution:** 9.8

	REPLICATE #	Weight (g)		
		Initial	Final	Weight change
PANEL WEIGHTS	1	16.3985	16.3961	**0.0024**
	2	16.4276	16.4273	**0.0003**
	3	16.5649	16.5647	**0.0002**

A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm² (total weight loss more than 0.0077 g for the standard 1 x 2 inch cadmium plated specimen) may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Average weight change = 0.0009 g per panel (0.03 mg/cm²)

Result: **Informational**

Note: panels exhibited a bluish stain/discoloration after exposure to fluid.

see page 5 for complete data tables

Cadmium Plate Cyclic Corrosion Test

AMS 1431 Compound, Solid Runway and Taxiway Deicing/Anti-Icing

AMS 1435 Fluid, Generic, Deicing/Anti-Icing Runways and Taxiways

3 Test Specimen Preparation

Substrate: 4130 Steel

Size: 1" x 2" x 0.04" x 0.040" (25.40 mm x 50.80 mm x 1.02 mm)

Finish: Cadmium plating in accordance with AMS QQ-P-416., Type I Class I, (0.0005"- 0.0008" inch plating per side).

There shall be no supplementary chromate treatment.

a. Three cadmium plated test specimens shall be used for each fluid to be tested

b. Sample of AMS1435 Runway Deicing Fluid shall be tested as received from the supplier.

c. Sample of AMS1431 Runway Deicing Solid Compound shall be tested in a diluted form – diluted with ASTM D 1193, Type IV, water to 15% by weight solids.

d. Procure soft flexible brushes for test (paintbrush type, 1.5 inches (3.8 cm) wide, with synthetic bristles approx 1.5 inches (3.8 cm) long

4 Environmental Exposure Preparation

Preset humidity chamber to 90 $\pm$ 5°F and 30 $\pm$ 5% humidity. Affix plastic ties or other inert material as hangers (hangers shall be made from an inert material that will not react with the sample; plastic, plastic coated metals, monofilament fishing line or stainless steels are acceptable) in the chamber to hold specimens during the environmental exposure period.

5 Test Procedure

a. Measure and record pH of solution(s) to be tested (record to one decimal place).

b. Solvent clean cadmium plated specimens with acetone; wipe gently with an acetone-soaked wiper. Without allowing the acetone to evaporate, gently remove excess acetone with a dry wiper. Allow samples to dry for 10 minutes in a desiccator. Do not accelerate drying of samples with oven drying.

Note: Care should be taken not to touch the cleaned specimens with bare hands; use tweezers, clean gloves or equivalent tool.

c. Weigh and record initial specimen weight in grams. Record all weights throughout the test to the nearest 0.0001 gram. Return specimens to desiccator until Day 3.

Monday	Tuesday	Wednesday	Thursday	Friday
				Friday Start – Day 0
Day 3	Day 4	Day 5	Day 6	Day 7
Day 10	Day 11	Day 12	Day 13	Day 14

SAE AIR6130, Cadmium Plate Cyclic Corrosion Test

d. FRIDAY START - Fill glass containers with solution to be tested, one container for each coupon. Refer to 3b or 3c for solution being used (consider filling one extra container to have extra conditioned fluid available). Container shall be large enough so the solution completely covers the specimens. Cover the container with loose fitting cover and place filled container into the humidity chamber to environmentally condition the solution for a minimum of 24 ± 1 hours before the start of test, up to 72 ± 1 hours.

e. Day 3 – Remove the solution container from the humidity chamber and the specimens from the desiccator. Place specimens in container oriented such that the specimens are not resting flush against the bottom or side of the container. Place the container with cover back into the humidity chamber for 24 ± 1 hours.

f. Day 4 - After the 24 hour immersion in the solution, remove the specimens, but do not rinse them. Place them into the humidity chamber by hanging for 22.5 ± 0.5 hours. Hangers shall be made from an inert material that will not react with the sample (such as plastic, plastic coated metals and stainless steels are acceptable).

g. Day 5 /Day 10 /Day 12 – Remove the specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimen surface with the soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

Immediately after weighing the specimens, return them to their test solution container to soak for 90 ± 5 minutes in the humidity chamber. Specimens shall be oriented such that they not resting flush against the bottom or side of the container. After 90 minutes, remove the specimens but do not rinse them. Place them in the humidity chamber by hanging for 22.5 ± 0.5 hours, maintaining the specimen in the initial orientation throughout the cycle.

h. Day 6 /Day 11 /Day 13 - Return the specimen to the test solution container to soak for 90 ± 5 minutes in the humidity chamber. Specimens shall be oriented such that it is not resting flush against the bottom or side of the container. After 90 minutes, remove the specimen but do not rinse it. Replace it in the humidity chamber by hanging for 22.5 ± 0.5 hours, maintaining the specimen in the initial orientation throughout the cycle.

i. Day 7 – Remove specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimens surface with a soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

Immediately after weighing the specimens, return them to their test solution container in the humidity chamber. Specimens shall be oriented such that they are not resting flush against the bottom or side of the container. Specimens shall be left in the test solution container in the humidity chamber from DAY 7 to DAY 10.

j. Day 14 – Remove specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimen surface with a soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

k. Measure and record final pH of solution (record to one decimal place).

l. Report the initial weight of the specimen, the weight after each periodic weighing, and the final weight. Calculate and report the value of the cumulative weight lost from each specimen after each periodic weighing procedure.

Test Data:

pH at start of test: **9.9**
pH at end of test: **9.8**

	REPLICATE #	Weight (g)
INITIAL PANEL WEIGHTS	1	16.3985
	2	16.4276
	3	16.5649

	REPLICATE #	Weight (g)		
		Monday	Wednesday	Friday
WEEK #1 PANEL WEIGHTS	1	----	16.4021	16.3988
	2	----	16.4341	16.4303
	3	----	16.5715	16.5675

	REPLICATE #	Weight (g)		
		Monday	Wednesday	Friday
WEEK #2 PANEL WEIGHTS	1	16.3977	16.3975	16.3961
	2	16.4289	16.4294	16.4273
	3	16.5663	16.5666	16.5647

Client: Na-Churs Alpine Solutions
Product: **ALPINE RF-11 (from Marion, OH)**
Dilution: As received

Date: 15-Jan-2013
SMI/REF: 1209-987

SAE AIR6130, Cadmium Plate Cyclic Corrosion Test

TEST DATA (continued)

REPLICATE #1	INITIAL WEIGHT (grams)	WEEK 1 WED (grams)	WEEK 1 FRI (grams)	WEEK 2 MON (grams)	WEEK 2 WED (grams)	WEEK 2 FRI (grams)
	16.3985	16.4021	16.3988	16.3977	16.3975	16.3961
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	+ 0.0036	+0.0003	0.0008	0.0010	**0.0024 (FINAL)**

REPLICATE #2	INITIAL WEIGHT	WEEK 1 WED	WEEK 1 FRI	WEEK 2 MON	WEEK 2 WED	WEEK 2 FRI (FINAL WEIGHT)
	16.4276	16.4341	16.4303	16.4289	16.4294	16.4273
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	+0.0065	+0.0027	+0.0013	+0.0018	**0.0003 (FINAL)**

REPLICATE #3	INITIAL WEIGHT	WEEK 1 WED	WEEK 1 FRI	WEEK 2 MON	WEEK 2 WED	WEEK 2 FRI (FINAL WEIGHT)
	16.5649	16.5715	16.5675	16.5663	16.5666	16.5647
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	+ 0.0066	+ 0.0026	+ 0.0014	+ 0.0017	**0.0002 (FINAL)**

SUMMARY:

	REPLICATE #	Weight Change (g)	Average Weight Change	
WEIGHT CHANGE	1	**0.0024**	**0.0009 g ($0.03 mg/cm^2$)**	**Informational**
	2	**0.0003**		
	3	**0.0002**		

Note: "+" indicates a weight gain.

"A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm^2 (total weight loss more than 0.0077 g for the standard 1 x 2 inch cadmium plated specimen) may cause undesirable corrosion effects to airplane equipment and/or airport equipment."

Respectfully Submitted,

Patricia D. Viani, SMI Inc.

SMI, Inc.
12219 SW 131 Avenue
Miami, Florida 33186-6401 USA
Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Greg Bame
Na-Churs Alpine Solutions
421 Leader Street
Marion, OH 43302

Date: 15-Jan-2013

SMI/REF: 1209-987

Product: **ALPINE RF-11 (from Marion, OH)** *(received 01-Nov-2012)*

Dilution: As received

Testing in accordance with
SAE AIR6170
Ice Melting Test Method for Runways and Taxiways Deicing/Anti-icing Chemicals (2012-01)

3.0 SUMMARY OF TEST METHOD:

3.1 The test utilizes a sheet of ice of uniform thickness frozen in a flat circular polystyrene petri dish. After equilibration to the desired temperature, a weighed quantity of the deicing chemical is distributed over the surface of the ice. At specified time intervals, generated brines are removed and the mass difference is calculated in order to obtain the mass of melted ice. Test temperatures shall be within 1°C (2°F) of the stated values and tests shall be performed within a freezer or cold chamber.

3.2 This test method provides a means to evaluate and compare the ice melting capabilities of ready-to-use runway deicing/anti-icing chemicals in liquid or solid form over limited, defined time intervals at specified temperatures.

...

3.8 Data Recording and Reporting
The amount of ice melted shall be recorded for each temperature for the time intervals of 5, 10 and 30 minutes and reported, for example see Table 1 (additional time intervals can be gathered upon request). The recorded value for each temperature/time observation shall be the average of the three tests. All data is measured in gram (g) and rounded to the nearest tenth of a gram (0.1 g).

The ice melting capacity is calculated and recorded. The unit is expressed in terms of "grams of ice melted per gram of deicing/anti-icing chemical applied". Present the graph of the amount of ice melted as a function of time.

Table 1 – ICE MELTING TEST RESULTS

Runway Deicing/Anti-icing Chemical Identification:
ALPINE RF-11 (from Marion, OH)

Test Temperature: **-10°C (+14°F)**

Time (minute)	Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mass of Ice Melted M_{im} (g)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity* (m_{im}/m_d)
5	5.0	3.3	5.0	3.4	0.7
	5.0	3.5			
	5.0	3.5			
10	5.0	4.2	5.0	4.3	0.9
	5.0	4.2			
	5.0	4.4			
30	5.0	5.5	5.0	5.4	1.1
	5.0	5.8			
	5.0	5.0			

Runway Deicing/Anti-icing Chemical Identification:
ALPINE RF-11 (from Marion, OH)

Test Temperature: **-2°C (+28°F)**

Time (minute)	Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mass of Ice Melted M_{im} (g)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity* (m_{im}/m_d)
5	5.0	4.1	5.0	3.8	0.8
	5.0	2.7			
	5.0	4.5			
10	5.0	6.1	5.0	5.6	1.1
	5.0	5.3			
	5.0	5.4			
30	5.0	8.7	5.0	8.2	1.6
	5.0	7.4			
	5.0	8.5			

(Reference results are included here for comparison purposes)

Table 1 – ICE MELTING TEST RESULTS

Runway Deicing/Anti-icing Chemical Identification:
REFERENCE: POTASSIUM ACETATE, 50% w/w solution

Test Temperature: **-10°C (+14°F)**

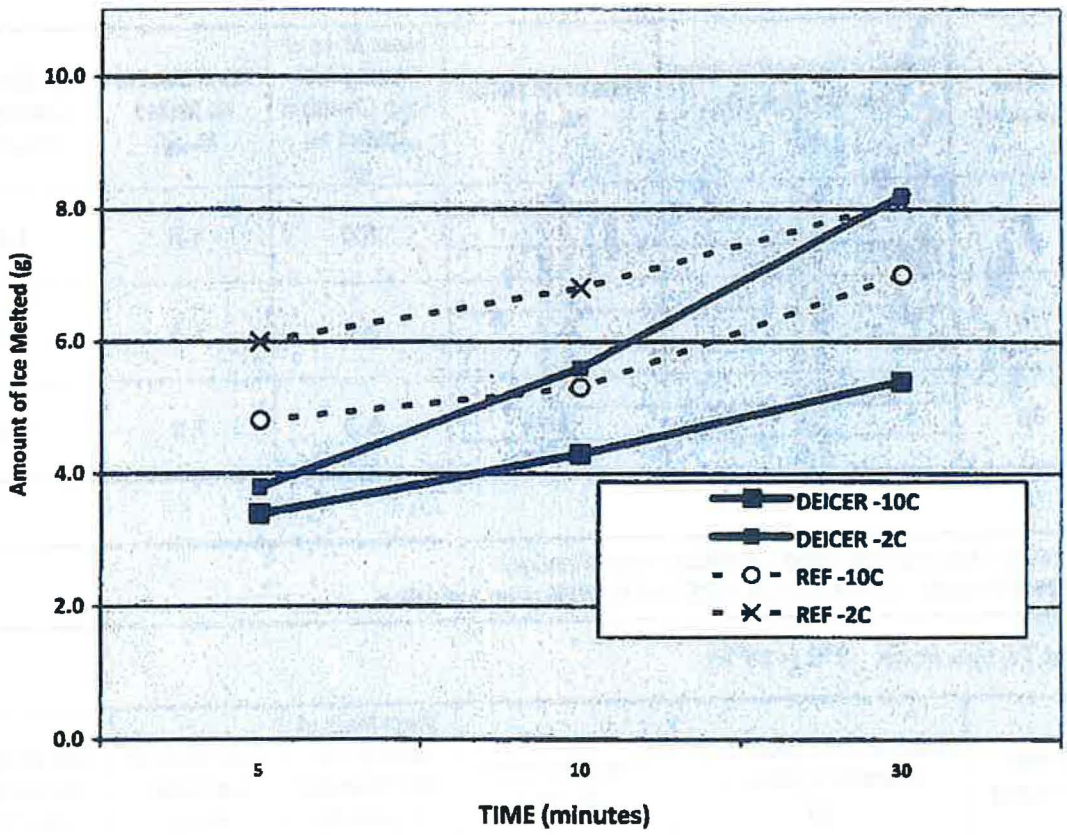
Time (minute)	Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mass of Ice Melted M_{im} (g)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity* (m_{im}/m_d)
5	5.0	4.9	5.0	4.8	1.0
	5.0	4.7			
	5.0	4.8			
10	5.0	5.2	5.0	5.3	1.1
	5.0	5.3			
	5.0	5.3			
30	5.0	7.3	5.0	7.0	1.4
	5.0	6.8			
	5.0	7.0			

Runway Deicing/Anti-icing Chemical Identification:
REFERENCE: POTASSIUM ACETATE, 50% w/w solution

Test Temperature: **-2°C (+28°F)**

Time (minute)	Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mass of Ice Melted M_{im} (g)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity* (m_{im}/m_d)
5	5.0	5.8	5.0	6.0	1.2
	5.0	6.1			
	5.0	6.1			
10	5.0	7.7	5.0	6.8	1.4
	5.0	6.1			
	5.0	6.7			
30	5.0	9.2	5.0	8.1	1.6
	5.0	7.8			
	5.0	7.4			

ICE MELTING RESULTS



Respectfully Submitted,

Patricia D. Viani, SMI Inc.

SMI, Inc.
12219 SW 131 Avenue
Miami, Florida 33186-6401 USA
Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Greg Bame
Na-Churs Alpine Solutions
421 Leader Street
Marion, OH 43302

Date: 15-Jan-2013

SMI/REF: 1209-987

Product: **ALPINE RF-11 (from Marion, OH)** *(received 01-Nov-2012)*

Dilution: As received

Testing in accordance with
SAE AIR6172
Ice Undercutting Test Method for Runways and Taxiways
Deicing/Anti-icing Chemicals (2012-02)

3. SUMMARY OF TEST METHOD

3.1 Introduction
The test utilizes small cylindrical cavities in a sheet of ice of uniform thickness frozen in a flat circular modified polystyrene Petri dish having an average standardized surface roughness of 120 grit (see Figure 1). The bottoms of the cavities are essentially free of ice. After equilibration to the desired temperature, a known volume of dyed deicing chemical is placed in the cavities, and undercutting commences (see figure 1). Undercutting is evidenced by the formation of essentially circular undercut patterns. At specified time intervals, the dimensions of the observed undercut patterns are measured. The undercut pattern reflects the net result of melting on the walls of the ice cavity and melting at the ice/substrate interface. The undercut is relatively thick near the center and relatively thin at the extremities. The undercut area is defined as the total area of the circular undercut pattern minus the area of the original cavity. Testing temperatures shall be within 1°C (2°F) of the stated values and tests shall be performed within a freezer or cold chamber.

3.2 Significance and Use
This test method provides a means to evaluate and compare the rate of ice undercutting capabilities of runway deicing/anti-icing chemicals in liquid or solid form at the ice/substrate interface over limited, defined time intervals at specified temperatures.

3.7 Data Recording and Reporting

Circular-shaped ice undercuttings, in millimeters, shall be recorded for each temperature for the time intervals of 5, 10 and 30 minutes and reported, for example see Table 1 (data for additional time intervals can be gathered upon request). All data is measured in millimeters (mm) within 0.1 mm. The recorded value for each temperature/time observation shall be the average of the five cavities where the measurement of each cavity is the two longest perpendicular axial dimensions (vertical and horizontal). The undercut area is defined as the total area of the circular undercut pattern minus the area of the original cavity. The ice undercutting is calculated according to equations (2)(3) and (4). Present the graph of the ice undercutting area $(mm)^2$ as a function of time.

The ice undercutting area for a given deicer is defined as: $IU=IU_e-A_s$

Where:
IU : Ice undercutting area for a given deicer (mm^2)
IU_e : Total area of circular undercut pattern at specified time interval (mm^2)
A_s : Initial area of original cavity (mm^2)

Table 1 – ICE UNDERCUTTING TEST RESULTS

Runway Deicing/Anti-icing Chemical Identification: **ALPINE RF-11 (from Marion, OH)**				Test Temperature: **-10°C (+14°F)**		
Time (minute)	Cavity #	Undercut Cavity Diameter (mm)	Mean Undercut Cavity Diameter (mm)	Total Area IU_e (mm^2)	Area Original Cavity A_s (mm^2)	Ice Undercutting IU (mm^2)
5	1	5.5	5.8	26.4	7.1	19.3
	2	5.6				
	3	5.7				
	4	6.0				
	5	6.0				
10	1	7.9	8.2	53.3	7.1	46.2
	2	8.2				
	3	8.2				
	4	8.4				
	5	8.5				
30	1	9.1	9.1	65.0	7.1	57.9
	2	9.3				
	3	9.0				
	4	8.9				
	5	9.2				

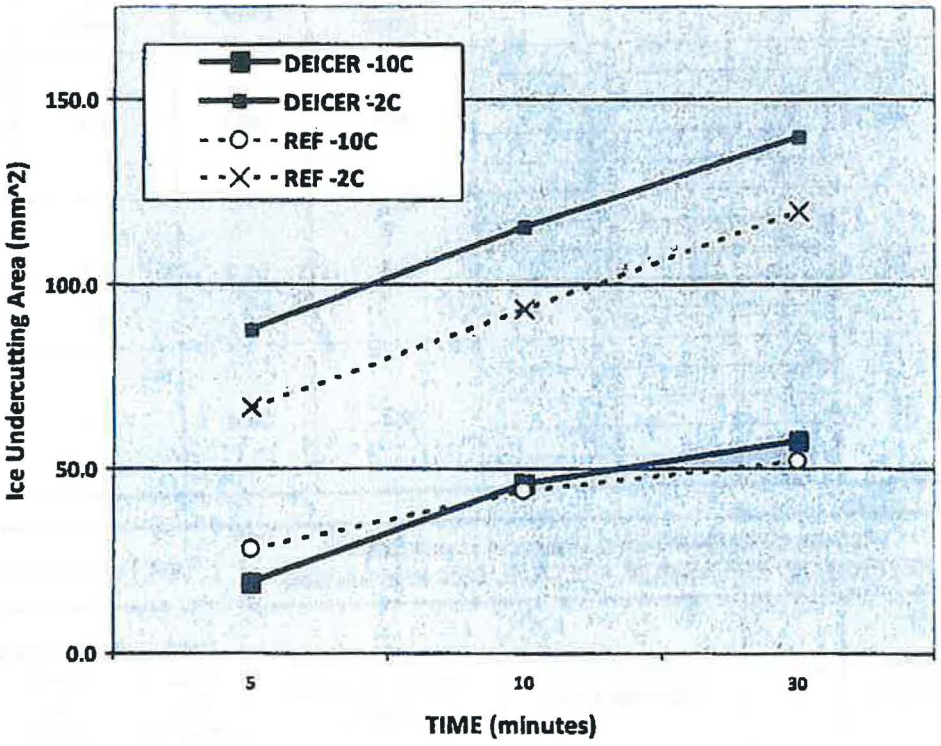
Runway Deicing/Anti-icing Chemical Identification: **ALPINE RF-11 (from Marion, OH)**				Test Temperature: **-2°C (+28°F)**		
Time (minute)	Cavity #	Undercut Cavity Diameter (mm)	Mean Undercut Cavity Diameter (mm)	Total Area IU_e (mm^2)	Area Original Cavity A_s (mm^2)	Ice Undercutting IU (mm^2)
5	1	10.9	11.0	95.0	7.1	87.9
	2	11.0				
	3	10.9				
	4	11.1				
	5	11.3				
10	1	12.3	12.5	122.7	7.1	115.6
	2	12.6				
	3	12.5				
	4	12.3				
	5	12.7				
30	1	13.8	13.7	147.3	7.1	140.2
	2	13.8				
	3	13.5				
	4	13.6				
	5	13.9				

Table 1 – ICE UNDERCUTTING TEST RESULTS

Runway Deicing/Anti-icing Chemical Identification: **REFERENCE: POTASSIUM ACETATE, 50% w/w solution**				Test Temperature: **-10°C (+14°F)**		
Time (minute)	Cavity #	Undercut Cavity Diameter (mm)	Mean Undercut Cavity Diameter (mm)	Total Area IU_e (mm^2)	Area Original Cavity A_s (mm^2)	Ice Undercutting IU (mm^2)
5	1	6.7	6.7	35.2	7.1	28.1
	2	7.1				
	3	6.7				
	4	6.4				
	5	6.6				
10	1	7.9	8.1	51.2	7.1	44.1
	2	8.5				
	3	8.6				
	4	8.0				
	5	7.4				
30	1	8.7	8.7	59.4	7.1	52.3
	2	9.0				
	3	9.0				
	4	8.5				
	5	8.3				

Runway Deicing/Anti-icing Chemical Identification: **REFERENCE: POTASSIUM ACETATE, 50% w/w solution**				Test Temperature: **-2°C (+28°F)**		
Time (minute)	Cavity #	Undercut Cavity Diameter (mm)	Mean Undercut Cavity Diameter (mm)	Total Area IU_e (mm^2)	Area Original Cavity A_s (mm^2)	Ice Undercutting IU (mm^2)
5	1	9.3	9.7	73.9	7.1	66.8
	2	9.5				
	3	10.4				
	4	9.0				
	5	10.1				
10	1	10.2	11.3	100.3	7.1	93.2
	2	10.1				
	3	11.3				
	4	12.9				
	5	12.0				
30	1	13.5	12.7	126.7	7.1	119.6
	2	12.4				
	3	12.6				
	4	13.0				
	5	12.6				

ICE UNDERCUTTING RESULTS



Respectfully Submitted,

Patricia D. Viani, SMI Inc.

SMI, Inc.
12219 SW 131 Avenue
Miami, Florida 33186-6401 USA
Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Greg Bame
Na-Churs Alpine Solutions
421 Leader Street
Marion, OH 43302

Date: 15-Jan-2013

SMI/REF: 1209-987

Product: **ALPINE RF-11 (from Marion, OH)** *(received 01-Nov-2012)*

Dilution: As received

Testing in accordance with
SAE AIR6211
Ice Penetration Test Method for Runways and Taxiways Deicing/Anti-icing Chemicals (2012-04)

3. SUMMARY OF TEST METHOD

3.1 The test utilizes a Plexiglas® test plate having 5 mm (0.20 in) diameter cavities filled with ice. After equilibration to the desired temperature, a known volume of dyed-liquid runway deicing/anti-icing chemical is discharged onto the surface of ice cones and penetration commences (see Figure 1). Penetration is evidenced by an embedded scale in millimeters behind the Plexiglas® test plate. At specified time intervals, the length of penetration is measured. Testing temperatures shall be within 1°C (2°F) of the stated values and tests shall be performed within a freezer or cold chamber.

3.2 Significance and Use

This test method can be used to evaluate and compare the ice penetrating capabilities of runway deicing/anti-icing chemicals in liquid or solid form over a limited, defined time interval at specified temperatures.

...

3.7 Data Recording and Reporting

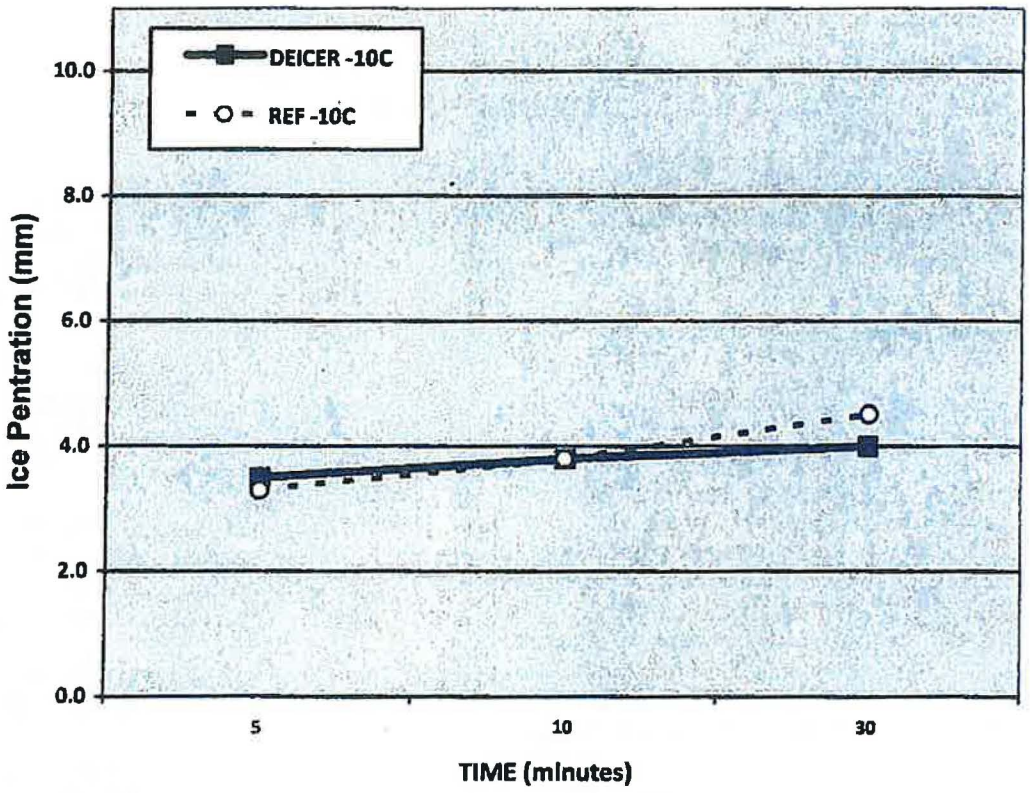
Penetration depths, in millimeters, shall be recorded at the test temperature for the time intervals of 5, 10 and 30 min and reported, for example see Table 1. All data is measured in millimeter (mm) and rounded to the nearest 0.5 mm. The recorded value for each temperature/time observation shall be the average of the four cavity depths. Present the graph of the ice penetration as a function of time.

Table 1 – ICE PENETRATION TEST RESULTS

Runway Deicing/Anti-icing Chemical Identification: **ALPINE RF-11 (from Marion, OH)**					
Test Temperature **-10°C (+14°F)**:					
Time (minutes)	Penetration Depth (mm)				
	Cavity #1	Cavity #2	Cavity #3	Cavity #4	Average
5	4.0 mm	4.0 mm	4.0 mm	2.0 mm	**3.5 mm**
10	4.0 mm	4.0 mm	5.0 mm	2.0 mm	**3.8 mm**
30	4.0 mm	4.0 mm	5.0 mm	3.0 mm	**4.0 mm**

Runway Deicing/Anti-icing Chemical Identification: **REFERENCE: POTASSIUM ACETATE, 50% w/w solution**					
Test Temperature : **-10°C (+14°F)**					
Time (minutes)	Penetration Depth (mm)				
	Cavity #1	Cavity #2	Cavity #3	Cavity #4	Average
5	4.0 mm	4.0 mm	2.0 mm	3.0 mm	**3.3 mm**
10	4.0 mm	3.0 mm	4.0 mm	4.0 mm	**3.8 mm**
30	4.0 mm	5.0 mm	5.0 mm	4.0 mm	**4.5 mm**

ICE PENETRATION TEST RESULTS AT -10C



Respectfully Submitted,

Patricia D. Viani, SMI Inc.

SMI, Inc.

12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Greg Bame
Na-Churs Alpine Solutions
421 Leader Street
Marion, OH 43302

Original Report Date: 03-Jan-2011
*Revised Report Date: 23-Nov-2011
SMI/REF: 1011-990
*Revised report to include Storage Stability results

Product: **ALPINE RF-11 (NASI 421 Leader St., Marion, OH)**
(received 22-Nov-2010)

Dilution: As received

AMS 1435B (Revised Sep, 2010)
FLUID, GENERIC, DEICING/ANTI-ICING
Runways and Taxiways

3.1	MATERIAL	
3.1.1	Environmental Information	
3.1.1.1	Biodegradability	Informational
3.1.1.2	Ecological Behavior (LC_{50})	Informational
3.1.1.3	Trace Contaminants	Informational
3.1.2	Appearance	Conforms
3.2	PROPERTIES	
3.2.1	Flash Point	Conforms
3.2.2	Specific Gravity	Informational
3.2.3	pH	Conforms
3.2.4	Freezing Point	Conforms
3.2.5	Effect on Aircraft Metals	
3.2.5.1	Sandwich Corrosion	Conforms
3.2.5.2	Total Immersion Corrosion	Conforms
3.2.5.3	Low Embrittling Cadmium Plate	Conforms
3.2.5.4	Hydrogen Embrittlement	Conforms
3.2.5.5	Stress-Corrosion Resistance	
	AMS 4911	Conforms
	AMS 4916	Informational
3.2.6	Effect on Transparent Plastics	
	MIL-P-25690 (Type C)	Conforms
	MIL-P-83310 (Polycarbonate)	Conforms
3.2.7	Effect on Painted Surfaces	Conforms
3.2.8	Effect on Unpainted Surfaces	Conforms
3.2.9	Rinsibility	Conforms
3.2.10	Effect on Runway Pavements	
3.2.10.1	Runway Concrete Scaling Resistance	Conforms
3.2.10.2	Asphalt Concrete Degradation Resistance	[1]Not performed by SMI
3.2.11	Storage Stability	Conforms (Nov-2011)
3.2.12	Performance	To be certified by Mfr.
3.2.13	Effect on Carbon-Brake Systems	[2]Not performed by SMI

[1]Testing required for deicer /anti-icer products used in Europe. This test is not performed by SMI.
[2] This test is not performed by SMI.

Respectfully submitted,
Patricia D. Viani, SMI Inc.

Client: Na-Churs Alpine Solutions Original Report Date: 03-Jan-2011
*Revised Report Date: 23-Nov-2011
Product: **ALPINE RF-11** (NASi 421 Leader St., Marion, OH) SMI/REF: 1011-990
Dilution: As received *Revised report to include Storage Stability results
AMS 1435B Page 2 of 7

3.1 Material: The composition of the fluid shall be optional with the manufacturer. The fluid may contain additives, such as corrosion inhibitors, urea, formamide, etc, as required to produce a product meeting the requirements of this specification.

3.1.1 Environmental information: The manufacturer of the fluid shall provide not less than the following information:

3.1.1.1 Biodegradability: Fluid shall be tested in accordance with APHA Standard Methods for Examination of Water and Waste Water. The manufacturer shall provide results of bioassays, which shall contain not less than the following information:

3.1.1.1.1 The percent of fluid biodegraded in five days at 20°C (68°F).

BOD: 0.21 kg O_2/kg fluid

Result Informational

3.1.1.1.2 The five day theoretical total oxygen demand (TOD) of the fluid, expressed in kilograms of oxygen per kilograms of fluid.

COD: 0.35 kg O_2/kg fluid

Result Informational

3.1.1.2 Ecological Behavior: A statement of the ecological behavior of the fluid, which shall include aquatic toxicity for the total formulation. The aquatic toxicity data shall be determined in accordance with EPA Methods 40 Code of Federal Regulations (CFR) Part 797.1300 and 797.1400 or OECD Guidelines for Testing of Chemicals (Organization for Economic Cooperation and Development, Methods 202 and 203, updated 1989) using test species required by regulatory agencies for permitted discharges. The LC_{50} concentration, the highest concentration at which 50 % of the test species survive, shall be given in milligrams per liter.

EPA 40 CFR 797.1300 DAPHNID ACUTE TOXICITY TEST

Daphnia magna, static system
48 hour LC_{50}: 2,825 mg/L

EPA 40 CFR 797.1400 FISH ACUTE TOXICITY TEST

Pimephales promelas, static system
96 hour LC_{50}: 2,925 mg/L

Result Informational

Client: Na-Churs Alpine Solutions Original Report Date: 03-Jan-2011
*Revised Report Date: 23-Nov-2011

Product: **ALPINE RF-11** (NASI 421 Leader St., Marion, OH) SMI/REF: 1011-990
Dilution: As received *Revised report to include Storage Stability results

3.1.1.3 Trace Contaminants: Report the presence, percentage by weight, of sulfur, halogens, phosphate, nitrate, and heavy metals (lead, chromium, cadmium, and mercury).

Sulfur:	***6 ppm***	***(0.0006 %)***
Halogens:	***14 ppm***	***(0.0014 %)***
Phosphate (P as P_2O_5):	***1137 ppm***	***(0.1137 %)***
Nitrate (as NO_3):	***<2 ppm***	***(<0.0002 %)***
Heavy Metals:		
Lead (Pb):	***<1 ppm***	***(<0.0001 %)***
Chromium (Cr):	***<1 ppm***	***(<0.0001 %)***
Cadmium (Cd):	***<1 ppm***	***(<0.0001 %)***
Mercury (Hg):	***<1 ppm***	***(<0.0001 %)***

Result Informational

3.1.2 Appearance: Fluid, as received by purchaser, shall be homogeneous, uniform in color, and free from skins, lumps, and foreign materials detrimental to usage of the product. If fluid is colored, it shall be blue.

Product is blue in color, uniform and homogeneous; exhibits no precipitate.

Result Conforms

3.2. Physical Properties: The fluid, as supplied by vendor, shall conform to the following requirements: tests shall be performed in accordance with specified tests on the product in concentrated form as delivered by vendor, unless otherwise specified herein.

3.2.1 Flash Point: Shall be reported and shall be not lower than 100°C (212°F), determined in accordance with ASTM D 56 or ASTM D 93. In case of dispute, flash point determined in accordance with ASTM D 56 shall apply.

No flash to 100 °C

Result Conforms

3.2.2 Specific Gravity: Shall be reported and shall be within ± 0.015 of the preproduction value established in 4.2.3 determined in accordance with ASTM D 891.

Specific gravity: 1.282 @ 60/60°F

Result Informational

3.2.3 pH: Shall be 7.0 to 11.5 and within ± 0.5 of the preproduction value established in 4.2.3, determined in accordance with ASTM E 70.

pH: 9.9

Result Conforms

Client: Na-Churs Alpine Solutions Original Report Date: 03-Jan-2011
*Revised Report Date: 23-Nov-2011

Product: **ALPINE RF-11 (NAS) 421 Leader St., Marion, OH)** SMI/REF: 1011-990
Dilution: As received *Revised report to include Storage Stability results

3.2.4 Freezing Point:

3.2.4.1 Freeze point of fluid diluted 1:1 by weight with ASTM D 1193 Type IV water shall be reported and shall be lower than -14.5°C (+6°F) determined in accordance with ASTM D 1177.

Freezing point (1:1 dilution): -16 °C

Result Conforms

3.2.4.2 Shall be reported and shall be within 4°C (7°F) of the preproduction value established in 4.2.3, determined in accordance with ASTM D 1177.

Freezing point (1:1 dilution): -16 °C

Result Informational

3.2.5 Effect on Aircraft Metals:

3.2.5.1 Sandwich Corrosion: Specimens, after testing in accordance with ASTM F 1110, shall not show corrosion worse than control panels run using ASTM D 1193, type IV, water.

	2024-T3 Bare Anodized	2024-T3 Alclad	7075-T6 Bare Anodized	7075-T6 Alclad
PRODUCT	**1**	**1**	**1**	**1**
CONTROL	1	1	1	1

Result Conforms

3.2.5.2 Total Immersion Corrosion: The fluid, tested in accordance with ASTM F 483 except that panels of AMS 4376 shall be tested for 24 hours, shall neither show evidence of corrosion of panels nor cause a weight change of any test panel greater than shown in Table 1:

TEST PANEL	WEIGHT CHANGE (mg/cm²/24hrs)	
	ALLOWABLE	RESULTS
AMS 4037 aluminum alloy, anodized as in AMS 2470	0.3	**0.01**
AMS 4041 aluminum alloy	0.3	**0.01**
AMS 4049 aluminum alloy	0.3	**0.01**
AMS 4376 magnesium alloy, dichromate treated per AMS 2475	0.2	**0.05**
AMS 4911 titanium alloy	0.1	**0.01**
AMS 5045 carbon steel	0.8	**0.01**

Result Conforms

Client: Na-Churs Alpine Solutions Original Report Date: 03-Jan-2011
*Revised Report Date: 23-Nov-2011

Product: **ALPINE RF-11 (NASI 421 Leader St., Marion, OH)** SMI/REF: 1011-990
Dilution: As received *Revised report to include Storage Stability results
AMS 1435B Page 5 of 7

3.2.5.3 Low-Embrittling Cadmium Plate: Test panels, coated with low-embrittling cadmium plate, shall not show a weight change greater than 0.3 mg/cm^2/24hrs, determined in accordance with ASTM F 1111.

As received: 0.05 mg/cm^2/24hrs

Result Conforms

3.2.5.4 Hydrogen Embrittlement: The fluid shall be nonembrittling, determined in accordance with ASTM F 519, Type 1a, 1c, or 2a.

Specimens: Type 1c, cadmium plated per MIL-STD-870.
Test temperature: 20°C (68°F); Load: 45%, immersed for 150 hr duration.

No failures within 150 hours.

Result Conforms

3.2.5.5 Stress-Corrosion Resistance: The fluid shall not cause cracks in AMS 4911 or MAM 4911 titanium alloy specimens, determined in accordance with ASTM F 945, Method A. *(3% salt control: cracking evident)*

As received: No cracking evident.

Result Conforms

3.2.5.5.1 The fluid shall be tested in accordance with ASTM F 945, Method A using AMS 4916 specimens. Report shall detail the effect of the fluid and the effect of control solution. The results shall be reported for informational purposes only. *(100 ppm salt control: cracking evident)*

As received: Cracking evident.

Result Informational

3.2.6 Effect on Transparent Plastics:

3.2.6.1 The fluid, at 25°C ± 2 (77°F ± 4), shall not craze, stain, or discolor MIL-P-25690 stretched acrylic plastic, determined in accordance with ASTM F 484.

Result Conforms

3.2.6.2 The fluid, at 25°C ± 2 (77°F ± 4), shall not craze, stain, or discolor MIL-P-83310 polycarbonate plastic, determined in accordance with ASTM F 484, except that the specimens shall be stressed for 30 minutes ± 2 to an outer fiber stress of 13.8 MPa (2000 psi).

Result Conforms

3.2.7 Effect on Painted Surfaces: The fluid, at 25°C ± 2 (77°F ± 4), shall neither decrease the paint film hardness by more than two pencil hardness levels nor shall it produce any streaking, discoloration, or blistering of the paint film, determined in accordance with ASTM F 502.

Result Conforms

3.2.8 Effect on Unpainted Surfaces: The fluid, tested in accordance with ASTM F 485, shall neither produce streaking nor leave any stains requiring polishing to remove.

Result Conforms

Client: Na-Churs Alpine Solutions Original Report Date: 03-Jan-2011
*Revised Report Date: 23-Nov-2011

Product: **ALPINE RF-11** (NASI 421 Leader St., Marion, OH) SMI/REF: 1011-990
Dilution: As received *Revised report to include Storage Stability results
AMS 1435B Page 6 of 7

3.2.9 Rinsibility: The fluid shall be completely rinsible in tap water, determined in accordance with 3.2.9.1

3.2.9.1 A 75 x 200 mm panel of clear glass shall be cleaned to provide a surface free of waterbreak, dried, and coated with the deicer/anti-icer fluid by pouring the fluid over the panel while it is held in a horizontal position. The coated panel shall be inclined at an angle of approximately 45 degrees for 10 minutes ± 0.5, then placed in a horizontal position for 24 hours ± 0.25 at room temperature. After the 24 exposure, the panel shall be rinsed in tap water for 5 to 6 minutes, followed by a rinse with ASTM D 1193, Type IV, water, allowed to air dry at ambient temperature, and examined for visible traces of deicer/anti-icer fluid.

Result Conforms

3.2.10 Effect on Runway Pavements

3.2.10.1 Runway Concrete Scaling Resistance: The condition of the runway concrete surface shall have a rating not greater than 1 for 50 freeze-thaw cycles, determined in accordance with ASTM C 672 except that concrete shall:

- ☐ Be air-entrained with an air content as specified in ASTM C 672
- ☐ Have a minimum cement content of 510 pound per cubic yard ± 10 (302 kg/m^3 ± 6)
- ☐ Have a slump, 1.5 inches ± 0.5 (38 mm ± 13)

A 25 % by volume solution of the deicer/anti-icer fluid, as supplied by the manufacturer in commercial concentration, in tap water shall be substituted for calcium chloride. Performing more than one freeze-thaw cycle per day is acceptable.

Rating = 1

Result Conforms

3.2.10.2 Asphalt Concrete Degradation Resistance (Appendix A, valid for deicer/anti-icer products used in Europe)

Result [1]Not performed by SMI

3.2.11 Storage Stability: The fluid, after storage in accordance with ASTM F 1105, shall not exhibit separation or an increase in turbidity compared to unaged fluid. Any increase in turbidity shall be reported, but shall be acceptable if removed by mild agitation.

After 12 months storage in accordance with ASTM F 1105, product did not exhibit separation or turbidity when compared to un-aged fluid. (Completed Nov. 2011)

Result Conforms

3.2.12 Performance: The fluid, used in accordance with manufacturer's recommendation, shall remove accumulated frozen deposits of frost and ice from airport taxiways and runways. Acceptance criteria and method of test shall be agreed upon by purchaser and vendor.

Result To be certified by Mfr.

[1]*Testing required for deicer /anti-icer products used in Europe. This test is not performed by SMI.*

Client: Na-Churs Alpine Solutions Original Report Date: 03-Jan-2011
*Revised Report Date: 23-Nov-2011
Product: **ALPINE RF-11 (NASI 421 Leader St., Marion, OH)** SMI/REF: 1011-990
*Revised report to include Storage Stability results
Dilution: As received
AMS 1435B Page 7 of 7

3.2.13 Effect on Carbon-Brake Systems: The fluid shall be tested for catalytic oxidation of carbon in accordance with AIR5567 and the results shall be reported as shown in 4.2 of AIR5567. The results shall be reported for informational purposes only.

Result [2]Not performed by SMI

[2] *This test is not performed by SMI.*

Laboratoire international des matériaux antigivre LIMA AMIL Anti-icing Materials International Laboratory

CATALYTIC CARBON BRAKE DISK OXIDATION TEST
SAE AIR5567

Deicer Name: Alpine RF-11 Deicer supplier/manufacturer: NASI	Marion	Belle Plaine	Corydon	New Hamburg	Red Oak	Mean	Untreated Control	Urea
Mfg lot #:	B11-40A	B11-40B	B11-40C	B11-40D	B11-40E	N/A	N/A	N/A
Initial deicer active ingredient concentration, wt/wt%:	50	50	50	50	50	50	N/A	25
Deicer active ingredient concentration, wt/wt%: (test solution)	25	25	25	25	25	25	N/A	25
Mean pickup of deicer by coupon (wt%):	0.77	0.89	0.79	0.93	0.87	0.85	N/A	0.38
Mean pickup of antioxidant by coupon (wt%):	1.62	1.60	1.41	1.67	1.72	1.60	1.48	1.56
Mean ratio of: deicer pickup wt% / antioxidant pickup wt%:	0.48	0.56	0.56	0.56	0.51	0.53	N/A	0.24
Min test temperature, °C / °F:	551.5/1025	550.4/1023	550.3/1023	549.8/1022	549.8/1022	550.4/1023	550.4/1023	550.4/1023
Max test temperature, °C / °F:	550.4/1023	551.8/1025	551.8/1025	551.5/1025	551.5/1025	551.4/1025	551.4/1025	551.4/1025
Mean test temperature, °C / °F:	550.6/1023	550.6/1023	550.6/1023	550.6/1023	550.6/1023	550.6/1023	550.6/1023	550.6/1023
Test duration, minutes	1440	1440	1440	1440	1440	1440	1440	1440
Mean oxidation weight loss of deicer treated* coupons (wt%):	12.7	16.5	14.5	15.4	14.5	14.7	0.32*	0.33
Standard deviation:	4.2	2.7	3.0	3.1	4.5	3.5	0.075*	0.086
Mean normalized weight loss of deicer treated coupons (wt%):	25.4	29.1	25.8	27.5	28.6	27.3	N/A	1.35
Standard deviation:	5.9	5.9	6.7	7.2	8.1	6.8	N/A	0.41
Mean weight loss for control coupons (wt%)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Standard deviation:	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

*untreated control coupon

Test Laboratory: LIMA/AMIL, Chicoutimi Quebec
Report ID#: 2010-MT-20-1-5
Report Date: 2011-01-02



Marc Mario Tremblay, Chimiste / Chemist
Gestionnaire des procédés, Fluides / Fluid Testing Manager
LIMA / AMIL
Université du Québec à Chicoutimi,
Chicoutimi (Qc) Canada
mmtrembl@uqac.ca
Tel : 418-545-5011 (2155)
Fax: 418-696-2908
http://www.uqac.ca/amil

Laboratoire international des matériaux antigivre **LIMA AMIL** Anti-icing Materials International Laboratory

RUNWAY AND TAXIWAY DEICING CHEMICALS
SAE AIR6170, AIR6172 and AIR6211

Deicer Name: Alpine RF-11 Manufacturer: NASI	Location						Reference		
	Marion	Belle Plaine	Corydon	New Hamburg	Red Oak	NASI deicer Average	REF control REF001	REF control REF002	Comments
Mfg lot #:	B11-40A	B11-40B	B11-40C	B11-40D	B11-40E		n/a	n/a	
Initial conc. (% w/w):	50	50	50	50	50		50	50	
Refractive index at 20°C:	1.3953	1.3949	1.3949	1.3948	1.3953		1.3932	1.3937	
Ice melting -2°C	AIR6170 - Amount of Ice Melted (average of three tests) (g)								
5 minute time interval	6.48 ± 0.17	6.72 ± 0.11	6.12 ± 0.23	6.35 ± 0.37	6.26 ± 0.31	6.38 ± 0.23	6.10 ± 0.95	n/a	Based on Std. Dev. results, the NASI deicer shows similar ice Melting capacity to the REF001 control solution
10 minute time interval	7.93 ± 0.09	8.82 ± 0.42	8.23 ± 0.15	7.82 ± 0.37	8.28 ± 0.34	8.22 ± 0.39	7.58 ± 0.18		
30 minute time interval	12.03 ± 1.20	13.20 ± 0.28	12.88 ± 0.51	12.66 ± 0.32	13.32 ± 0.89	12.82 ± 0.51	13.42 ± 1.12		
Ice melting -10°C	AIR6170 - Amount of Ice Melted (average of three tests) (g)								
5 minute time interval	3.63 ± 0.14	3.51 ± 0.08	3.56 ± 0.21	3.70 ± 0.03	3.94 ± 0.20	3.67 ± 0.17	3.77 ± 0.17	n/a	Based on Std. Dev. results, the NASI deicer shows similar ice Melting capacity to the REF001 control solution
10 minute time interval	4.33 ± 0.09	4.50 ± 0.26	4.45 ± 0.12	4.74 ± 0.03	4.88 ± 0.10	4.58 ± 0.22	4.48 ± 0.27		
30 minute time interval	6.01 ± 0.16	6.07 ± 0.12	5.94 ± 0.29	6.03 ± 0.39	6.25 ± 0.08	6.06 ± 0.12	6.06 ± 0.12		
Ice undercutting -2°C	AIR6172 - Ice Undercutting (average of five tests) (mm^2)								
5 minute time interval	49.5 ± 5.5	44.1 ± 3.0	49.4 ± 4.8	47.2 13.9	36.9 ± 14.6	45.4 ± 6.2	50.2 ± 5.7	n/a	Based on Std. Dev. results, the NASI deicer shows similar ice Undercutting capacity to the REF001 control solution
10 minute time interval	71.7 ± 6.5	66.8 ± 9.5	77.3 ± 10.6	73.0 ± 13.1	72.2 ± 9.5	72.2 ± 3.7	90.9 ± 16.4		
30 minute time interval	133.0 ± 27.1	115.2 ± 30.1	145.1 ± 28.4	130.9 ± 7.8	140.9 ± 11.2	133.0 ± 11.5	136.0 ± 9.9		
Ice undercutting -10°C	AIR6172 - Ice Undercutting (average of five tests) (mm^2)								
5 minute time interval	9.1 ± 7.5	11.9 ± 4.2	3.8 ± 5.3	3.0 ± 1.7	5.7 ± 2.9	6.7 ± 3.7	13.4 ± 2.1	n/a	Based on Std. Dev. results, the NASI deicer shows less ice Undercutting capacity compared to the REF001 control solution [1]
10 minute time interval	24.2 ± 6.5	20.1 ± 5.5	15.0 ± 8.1	13.4 ± 3.7	16.9 ± 6.1	17.9 ± 4.3	28.0 ± 3.5		
30 minute time interval	30.1 ± 5.7	25.7 ± 3.6	23.0 ± 7.0	23.1 ± 6.3	25.9 ± 5.1	25.6 ± 2.9	36.6 ± 5.9		
Ice penetration -5°C	AIR6211 - Ice Penetration (average of four tests) (mm)								
5 minute time interval	1.0 ± 0.0	1.4 ± 0.3	1.4 ± 0.3	1.4 ± 0.3	1.4 ± 0.3	1.3 ± 0.2		1.0 ± 0.0	Based on Std. Dev. results, the NASI deicer shows better ice Penetration capacity compared to the REF002 control solution
10 minute time interval	1.9 ± 0.3	2.3 ± 0.3	2.0 ± 0.0	2.1 ± 0.3	2.3 ± 0.3	2.1 ± 0.2	n/a	1.9 ± 0.3	
30 minute time interval	2.8 ± 0.3	3.1 ± 0.3	3.3 ± 0.3	3.4 ± 0.3	3.4 ± 0.3	3.2 ± 0.3		2.9 ± 0.3	
Ice penetration -10°C	AIR6211 - Ice Penetration (average of four tests) (mm)								
5 minute time interval	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0		0.6 ± 0.3	Based on Std. Dev. results, the NASI deicer shows better ice Penetration capacity compared to the REF002 control solution
10 minute time interval	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	1.0 ± 0.0	n/a	1.0 ± 0.0	
30 minute time interval	1.6 ± 0.3	1.8 ± 0.3	1.6 ± 0.3	1.8 ± 0.3	1.6 ± 0.3	1.7 ± 0.3		1.4 ± 0.3	

[1] Potassium Acetate (Reagent Grade ACS > 99%) Solution. *Tests performed at AMIL demonstrated that the average relative Std. Dev. of the REF control solution corresponds to ± 22%*

Test Laboratory: LIMA/AMIL, Chicoutimi Quebec
Report ID#: 2011-MT-27 series

LIMA AMIL Diane Paradis Approved by / Approuvé par 2012/05/23 Date

Diane Paradis, B. Sc., Chemistry
Research Assistant
diane_paradis@uqac.ca
Tel : 418-545-5011 (2576)

Marc Mario Tremblay, B.Sc., Chemist
Fluid Testing Manager
mmtrembl@uqac.ca
Tel : 418-545-5011 (2155)

SMI, Inc.
12219 SW 131 Avenue
Miami, Florida 33186-6401 USA
Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Franklin Kroth
Nachurs Alpine Solutions
6620 Mooney Street
Dublin, OH 43017

Date: 24-Apr-2026

SMI/REF: 2602-518

Product: **ALPINE RF-11** *(received 24-Feb-2026)*

Dilution: As received

Periodic testing in accordance with
AMS 1435E (Revised 2024-03)
LIQUID RUNWAY DEICING/ANTI-ICING PRODUCT

4.2.2 Periodic Tests

3.2.4	Freezing Point	Conforms
3.2.5	Effect on Aircraft Metals	
3.2.5.1	Sandwich Corrosion	Conforms
3.2.5.2	Total Immersion Corrosion	Conforms
3.2.5.3	Low Embrittling Cadmium Plate	Conforms
3.2.5.3.1	Cyclic Immersion Corrosion of Cadmium Plate	Informational
3.2.5.4	Hydrogen Embrittlement	Conforms
3.2.5.5	Stress-Corrosion Resistance	
	AMS 4911	Conforms
3.2.6	Effect on Transparent Plastics	
	MIL-P-25690 (Type C)	Conforms
	MIL-P-83310 (Polycarbonate)	Conforms
3.2.7	Effect on Painted Surfaces	Conforms
3.2.8	Effect on Unpainted Surfaces	Conforms
3.2.9	Rinsibility	Conforms
3.2.10	Effect on Runway Pavements	
3.2.10.1	Runway Concrete Scaling Resistance	Conforms
3.2.10.2	Asphalt Concrete Degradation Resistance	*Not performed by SMI

Testing required for deicer /anti-icer products used in Europe. This test is not performed by SMI.

Respectfully submitted,

Jeff Nottebaum, SMI Inc.
Director

Rae-anne Nottebaum, SMI Inc.
Senior Analyst

4.2.2 Periodic Tests: Freezing point (3.2.4), effect on aircraft metals (3.2.5), effect on transparent plastic (3.2.6), effect on painted surfaces (3.2.7), effect on unpainted surfaces (3.2.8), rinsibility (3.2.9), runway concrete scaling resistance (3.2.10.1) and asphalt concrete degradation resistance (3.2.10.2 Appendix A, valid for deicing/anti-icing products used in Europe) are periodic tests and shall be performed on or just prior to the second anniversary of initial testing and thereafter every four calendar years.

3.2.4 Freezing Point:

3.2.4.1 Freezing point of product diluted 1:1 by weight with ASTM D1193, Type IV, water shall be reported and shall be lower than +6°F (-14.5°C) determined in accordance with ASTM D1177.

Freezing point (1:1 dilution): -16 °C

Result Conforms

3.2.4.2 Shall be reported and shall be within 7°F (4°C) of the preproduction value established in 4.2.3, determined in accordance with ASTM D1177.

Freezing point (1:1 dilution): -16 °C

Result Informational

3.2.5 Effect on Aircraft Metals:

3.2.5.1 Sandwich Corrosion: Specimens, after testing in accordance with ASTM F 1110, shall show a rating not greater (worse) than one.

	2024-T3 Bare Anodized	2024-T3 Alclad	7075-T6 Bare Anodized	7075-T6 Alclad
PRODUCT (AS RECEIVED)	**1**	**1**	**1**	**1**
CONTROL	1	1	1	1

Result Conforms

3.2.5.2 Total Immersion Corrosion: The product, tested in accordance with ASTM F483 (except that panels of AMS4376 shall be tested for 24 hours), shall neither show evidence of corrosion of panels, nor cause a weight change of any test panel greater than shown in Table 1.

TEST PANEL	WEIGHT CHANGE (mg/cm²/24hrs)	
	ALLOWABLE	RESULTS
AMS 4037 aluminum alloy, anodized as in AMS 2470	0.3	**0.01**
AMS 4041 aluminum alloy	0.3	**0.04**
AMS 4049 aluminum alloy	0.3	**< 0.01**
AMS 4376 magnesium alloy, dichromate treated as in AMS 2475 *(tested for 24 hours only)*	0.2	**0.17**
AMS 4911 titanium alloy	0.1	**0.02**
AMS 5045 Carbon Steel	0.8	**0.02**

Result Conforms

3.2.5.3 Low-Embrittling Cadmium Plate: Test panels, coated with low-embrittling cadmium plate, shall not show a weight change greater than 0.3 mg/cm² per 24hrs, determined in accordance with ASTM F1111.

As received: < 0.01 mg/cm²/24hrs

Result Conforms

3.2.5.3.1 The product shall be tested for cyclic immersion corrosion of cadmium plate in accordance with AIR6130 and the results reported as specified in Section 6 of AIR6130B.

Initial pH of solution: 10.3 **Final pH of solution**: 10.3

	REPLICATE #	Weight (g)		
		Initial	Final	**Weight change**
PANEL WEIGHTS	1	8.0478	8.0503	**+ 0.0025**
	2	8.0615	8.0632	**+ 0.0017**
	3	7.9894	7.9912	**+ 0.0018**
	Average weight change = +0.0020 g (+ 0.07 mg/cm²) Note: "+" indicates weight gain			

AIR6130B: A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm² may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Result: ***Informational**

See separate report for complete data tables

3.2.5.4 Hydrogen Embrittlement: The product shall be non-embrittling, determined in accordance with ASTM F519, utilizing Type 1a, 1c or 2a specimens cadmium plated in accordance with MIL-STD-870 Class 1 Type I. Type 1a and Type 1c, specimens shall be loaded to 45% of the predetermined notch fracture strength, and Type 2a specimens loaded to 80% of the yield strength. The entire 2a stressed specimen, or just the notched area of the 1a and 1c stressed specimen, shall be immersed continuously in the solution under test for 150 hours at a temperature of 77°F ± 9°F (25°C ± 5°C).

Specimens: Type 1c:
As received: #1: No failures occurred within 150 hours.
#2: No failures occurred within 150 hours.
#3: No failures occurred within 150 hours.
#4: No failures occurred within 150 hours.

Result Conforms

3.2.5.5 Stress-Corrosion Resistance: The product shall not cause cracks in AMS 4911 titanium alloy specimens, determined in accordance with ASTM F945, Method A.
As received: No cracking evident.

Result Conforms

3.2.5.5.1 Repealed

3.2.6 Effect on Transparent Plastics:

3.2.6.1 The product, at 77°F ± 4°F (25°C ± 2°C), shall not craze, stain, or discolor MIL-PRF-25690 stretched acrylic plastic, determined in accordance with ASTM F484.

Result Conforms

3.2.6.2 The product, at 77°F ± 4°F (25°C ± 2°C), shall not craze, stain, or discolor AMS-P-83310 polycarbonate plastic, determined in accordance with ASTM F484, except that the specimens shall be stressed for 30 minutes ± 2 minutes to an outer fiber stress of 2000 psi (13.8 MPa).

Result Conforms

3.2.7 Effect on Painted Surfaces: The product, at 77°F ± 4°F (25°C ± 2°C), shall neither decrease the paint film hardness by more than two pencil hardness levels nor shall it produce any streaking, discoloration, or blistering of the paint film, determined in accordance with ASTM F502.

Result Conforms

3.2.8 Effect on Unpainted Surfaces: The product, tested in accordance with ASTM F485, shall neither produce streaking nor leave any stains requiring polishing to remove.

Result Conforms

3.2.9 Rinsibility: The product shall be completely rinsible in tap water, determined in accordance with 3.2.9.1

3.2.9.1 A 3 x 8 inch (75 x 200 mm) panel of clear glass shall be cleaned to provide a surface free of waterbreak, dried, and coated with the deicer/anti-icer product by pouring the product over the panel while it is held in a horizontal position. The coated panel shall be inclined at an angle of approximately 45 degrees for 10 minutes ± 0.5 minute, then placed in a horizontal position for 24 hours ± 0.25 hour at room temperature. After the 24 exposure, the panel shall be rinsed in tap water for 5 to 6 minutes, followed by a rinse with ASTM D1193, Type IV, water, allowed to air dry at ambient temperature, and examined for visible traces of deicer/anti-icer product.

Result Conforms

3.2.10 Effect on Runway Pavements

3.2.10.1 Runway Concrete Surface Scaling Resistance: The condition of the runway concrete surface shall have a rating not greater than one for 50 freeze-thaw cycles, determined in accordance with ASTM C672 except that concrete shall:

a. Be air-entrained with an air content as specified in ASTM C 672
b. Have a minimum cement content of 510 lb/yd^3 ± 10 lb/yd^3 (302 kg/m^3 ± 6 kg/m^3)
c. Have a slump, 1.5 inches ± 0.5 inch (38 mm ± 13 mm).

A 25 % by volume solution of the deicer/anti-icing product, as supplied by the manufacturer in commercial concentration, in tap water shall be substituted for calcium chloride. Performing more than one freeze-thaw cycle per day is acceptable.

Rating: 1 Result Conforms

3.2.10.2 Asphalt Concrete Degradation Resistance (Appendix A, valid for deicer/anti-icer products used in Europe)

Result *Not performed by SMI

Testing required for deicer /anti-icer products used in Europe. This test is not performed by SMI.

SMI, Inc.
12219 SW 131 Avenue
Miami, Florida 33186-6401 USA
Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Franklin Kroth
Nachurs Alpine Solutions
6620 Mooney Street
Dublin, OH 43017

Date: 24-Apr-2026

SMI/REF: 2602-518

Product: **ALPINE RF-11** *(received 24-Feb-2026)*

Dilution: As received

Testing in accordance with
SAE AIR6130B
CADMIUM PLATE CYCLIC CORROSION TEST

Cadmium Plate Cyclic Corrosion Test

Initial pH of solution: 10.3 Final pH of solution: 10.3

Replicate	Initial (g)	Final (g)	**Weight change (grams)**
1	8.0478	8.0503	**+ 0.0025**
2	8.0615	8.0632	**+ 0.0017**
3	7.9894	7.9912	**+ 0.0018**
Average weight change = + 0.0020 g (+ 0.07 mg/cm²) Note: "+" indicates weight gain			

AIR6130B states: A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm² may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Result Informational

Cadmium Plate Cyclic Corrosion Test

AMS 1431 Compound, Solid Runway and Taxiway Deicing/Anti-Icing
AMS 1435 Fluid, Generic, Deicing/Anti-Icing Runways and Taxiways

3 Test Specimen Preparation

Substrate: 4130 Steel
Size: 1" x 2" x 0.04" x 0.048" (25.40 mm x 50.80 mm x 1.22 mm)
Finish: Cadmium plating: 0.0005"- 0.0008" inch per side; do not exceed 0.0008 inch maximum plating. (Method: specification ASTM F1111, Section 7, quality specification AMS QQ-P-416 governs.

There shall be no supplementary chromate treatment.

a. Three cadmium plated test specimens shall be used for each fluid to be tested

b. Sample of AMS1435 shall be tested as received from the supplier.

c. Sample of AMS1431 shall be tested in a diluted form – diluted with ASTM D 1193, Type IV, water to 15% by weight solids.

d. Procure soft flexible brushes for test (paintbrush type, 1.5 inches (3.8 cm) wide, with synthetic bristles approx 1.5 inches (3.8 cm) long

4 Environmental Exposure Preparation

Preset humidity chamber to 90° ± 5°F (32°C ± 3°C and 30 ± 5% humidity. Affix plastic ties or other inert material as hangers (hangers shall be made from an inert material that will not react with the sample; plastic, plastic coated metals, monofilament fishing line or stainless steels are acceptable) in the chamber to hold specimens during the environmental exposure period.

5 Test Procedure

a. Measure and record pH of solution to be tested. Record to one decimal place (e.g., pH = 7.3). This value is to be included in the final test report

b. Solvent clean cadmium plated specimens with acetone; wipe gently with an acetone-soaked wiper. Without allowing the acetone to evaporate, gently remove excess acetone with a dry wiper. Allow samples to dry for 10 minutes in a desiccator. Do not accelerate drying of samples with oven drying.

Note: Care should be taken not to touch the cleaned specimens with bare hands; use tweezers, clean gloves or equivalent tool.

c. Weigh and record initial specimen weight in grams. Record all weights throughout the test to the nearest 0.0001 gram. Return specimens to desiccator until Day 3.

Test Schedule by Weekday				
Monday	Tuesday	Wednesday	Thursday	Friday
				Friday Start – Day 0
Day 3	Day 4	Day 5	Day 6	Day 7
Day 10	Day 11	Day 12	Day 13	Day 14

d. FRIDAY START - Fill glass containers with solution to be tested, one container for each coupon. See section 3b or 3c for solution being used (consider filling one extra container to have extra conditioned fluid available). Container shall be large enough so the solution completely covers the specimens. Cover the container with loose fitting cover and place filled container into the humidity chamber to environmentally condition the solution for a minimum of 24 hours ± 1 hour before the start of test, up to 72 hours ± 1 hour.

Note: Containers should be covered with loose fitting covers at all times, with or without coupons in solution. If evaporation occurs such that coupons cannot be completely covered in solution, container should be topped off with solution conditioned per section 5.d.

e. Day 3 : Remove the solution container from the humidity chamber and the specimens from the desiccator. Place specimens in container oriented such that the specimens are not resting flush against the bottom or side of the container. Place the container with cover back into the humidity chamber for 24 hours ± 1 hour.

f. Day 4 : After the 24 hour immersion in the solution, remove the specimens, but do not rinse them. Place them into the humidity chamber by hanging for 22.5 hours ± 0.5 hour. Hangers shall be made from an inert material that will not react with the sample (such as plastic, plastic coated metals and stainless steels are acceptable).

g. Day 5 /Day 10 /Day 12 : Remove the specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimen surface with the soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

Immediately after weighing the specimens, return them to their test solution container to soak for 90 minutes ± 5 minutes in the humidity chamber. Specimens shall be oriented such that they not resting flush against the bottom or side of the container. After 90 minutes, remove the specimens but do not rinse them. Place them in the humidity chamber by hanging for 22.5 hours ± 0.5 hour, maintaining the specimen in the initial orientation throughout the cycle.

h. Day 6 /Day 11 /Day 13 : Return the specimen to the test solution container to soak for 90 minutes ± 5 minutes in the humidity chamber. Specimens shall be oriented such that it is not resting flush against the bottom or side of the container. After 90 minutes, remove the specimen but do not rinse it. Replace it in the humidity chamber by hanging for 22.5 hours ± 0.5 hours, maintaining the specimen in the initial orientation throughout the cycle.

i. Day 7 – Remove specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimen surface with a soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

Immediately after weighing the specimens, return them to their test solution container in the humidity chamber. Specimens shall be oriented such that they are not resting flush against the bottom or side of the container. Specimens shall be left in the test solution container in the humidity chamber from DAY 7 to DAY 10.

j. Day 14 – Remove specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimen surface with a soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

k. Measure and record final pH of solution record to one decimal place (e.g., pH = 7.3). This value is to be included in the final test report

l. Report the initial weight of the specimen, the weight after each periodic weighing, and the final weight. Calculate and report the value of the cumulative weight lost from each specimen after each periodic weighing procedure.

Test Data:

pH at start of test: **10.3**
pH at end of test: **10.3**

	REPLICATE #	Weight (g)
INITIAL PANEL WEIGHTS	1	8.0478
	2	8.0615
	3	7.9894

	REPLICATE #	Weight (g)		
		Monday	Wednesday	Friday
WEEK #1 PANEL WEIGHTS	1	----	8.0539	8.0507
	2	----	8.0663	8.0630
	3	----	7.9944	7.9913

	REPLICATE #	Weight (g)		
		Monday	Wednesday	Friday
WEEK #2 PANEL WEIGHTS	1	8.0508	8.0505	8.0503
	2	8.0634	8.0632	8.0632
	3	7.9916	9.9912	7.9912

SAE AIR6130B, Cadmium Plate Cyclic Corrosion Test

TEST DATA (continued)

REPLICATE #1	INITIAL WEIGHT (grams)	WEEK 1 WED (grams)	WEEK 1 FRI (grams)	WEEK 2 MON (grams)	WEEK 2 WED (grams)	WEEK 2 FRI (grams)
	8.0478	8.0539	8.0507	8.0508	8.0505	8.0503
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	+ 0.0061	+ 0.0029	+ 0.0030	+ 0.0027	**+ 0.0025 (FINAL)**

REPLICATE #2	INITIAL WEIGHT	WEEK 1 WED	WEEK 1 FRI	WEEK 2 MON	WEEK 2 WED	WEEK 2 FRI (FINAL WEIGHT)
	8.0615	8.0663	8.0630	8.0634	8.0632	8.0632
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	+ 0.0048	+ 0.0015	+ 0.0019	+ 0.0017	**+ 0.0017 (FINAL)**

REPLICATE #3	INITIAL WEIGHT	WEEK 1 WED	WEEK 1 FRI	WEEK 2 MON	WEEK 2 WED	WEEK 2 FRI (FINAL WEIGHT)
	7.9894	7.9944	7.9913	7.9916	7.9912	7.9912
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	+ 0.0050	+ 0.0019	+ 0.0022	+ 0.0018	**+ 0.0018 (FINAL)**

SUMMARY:

	REPLICATE #	Weight Change (g)	Average Weight Change	
WEIGHT CHANGE	1	**+ 0.0025**	**+ 0.07 mg/cm^2 (+ 0.0020 g)**	**Informational**
	2	**+ 0.0017**		
	3	**+ 0.0018**		

Note: "+" indicates a weight gain.

AIR6130B: A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm^2 may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Respectfully submitted,

Jeff Nottebaum, SMI Inc.
Director

Rae-anne Nottebaum, SMI Inc.
Senior Analyst

ALPiNE® RF-11

Alpine RF-11®, a 50% w/w **potassium acetate** solution, is an environmentally safe and effective alternative to chlorides. This is the most advanced formula using only virgin raw materials and meets the latest edition of the **SAE AMS1435E**.

TYPICAL PROPERTIES

Active Ingredients	50% Aqueous potassium acetate solution, by weight, plus corrosion inhibitors
pH, as is	9.5–10.5
Specific Gravity @ 68°F (20°C)	1.27–1.30
Density, lbs/gal @ 68°F (20°C)	10.58–10.83
Appearance	Clear or blue liquid
Odor	Mild, characteristic
Water Miscibility	Complete
Freezing Point	-72°F (-58°C)
Effective to	-25°F (-32°C)
BOD (5 day), g O_2/g of fluid @ 68°F (20°C)	0.25
COD g O_2/g of fluid @ 68°F (20°C)	0.35
Flash Point	Non-flammable, no flash at 212°F (100°C)

Temperature °C	Viscosity cPs (centipoise)
20	6.0
10	7.0
0	12.5
-10	21.1
-20	39.1



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6620 Mooney St. Suite 220
Dublin, OH 43017
P 800.622.4877
F 740.223.3874
www.nasindustrial.com
nasi_cs@nasindustrial.com
twitter.com/NASi_TM

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Alpine RF-11

Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations And According To The Hazardous Products Regulation (February 11, 2015).

Date of Issue: 12/06/2021 Version: 1.0

SECTION 1: IDENTIFICATION

1.1. Product Identifier

Product Form: Mixture

Product Name: Alpine RF-11

Product Number: I000093, I000115, I000119

1.2. Intended Use of the Product

Deicer

1.3. Name, Address, and Telephone of the Responsible Party

Company

Nachurs Alpine Solutions
421 Leader St.
Marion, OH 43302
740-382-5701

Company

Nachurs Alpine Solutions
30 Neville Street
New Hamburg, ON N3A 4G7 CANADA
1-519-662-2352

1.4. Emergency Telephone Number

Emergency Number : CHEMTREC: 1-800-424-9300
CANUTEC: 1-613-996-6666 (CANADA)
QM: 1-887-387-7745 (CANADA)

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

GHS-US/CA Classification

Not classified

2.2. Label Elements

GHS-US/CA Labeling

No labeling applicable according to 29 CFR 1910.1200 and the Hazardous Products Regulations (HPR) SOR/2015-17.

2.3. Other Hazards

Exposure may aggravate pre-existing eye, skin, or respiratory conditions.

2.4. Unknown Acute Toxicity (GHS-US/CA)

No additional information available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance

Not applicable

3.2. Mixture

Within the meaning of the OSHA Hazard Communication Standard [29 CFR 1910.1200] and Canada's Hazardous Products Regulations [SOR/2015-17]: the ingredients of this mixture are not required to be disclosed.

SECTION 4: FIRST AID MEASURES

4.1. Description of First-aid Measures

General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

Inhalation: When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

Skin Contact: Remove contaminated clothing. Drench affected area with water for at least 5 minutes. Obtain medical attention if irritation develops or persists.

Eye Contact: Rinse cautiously with water for at least 5 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if irritation develops or persists.

Ingestion: Rinse mouth. Do NOT induce vomiting. Obtain medical attention.

4.2. Most Important Symptoms and Effects Both Acute and Delayed

General: Not expected to present a significant hazard under anticipated conditions of normal use.

Inhalation: Prolonged exposure may cause irritation.

Skin Contact: Prolonged exposure may cause skin irritation.
Eye Contact: May cause slight irritation to eyes.
Ingestion: Ingestion may cause adverse effects.
Chronic Symptoms: None expected under normal conditions of use.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention. If medical advice is needed, have product container or label at hand.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: Water spray, fog, carbon dioxide (CO_2), alcohol-resistant foam, or dry chemical.
Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: Not considered flammable but may burn at high temperatures.
Explosion Hazard: Product is not explosive.
Reactivity: Hazardous reactions will not occur under normal conditions.

5.3. Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.
Firefighting Instructions: Use water spray or fog for cooling exposed containers.
Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.
Hazardous Combustion Products: Carbon oxides (CO, CO_2). Potassium oxides. Sodium oxides.

5.4. Reference to Other Sections

Refer to Section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Avoid prolonged contact with eyes, skin and clothing. Avoid breathing (vapor, mist, spray).

6.1.1. For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protective equipment (PPE).
Emergency Procedures: Evacuate unnecessary personnel.

6.1.2. For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection.
Emergency Procedures: Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit. Ventilate area.

6.2. Environmental Precautions

Prevent entry to sewers and public waters.

6.3. Methods and Materials for Containment and Cleaning Up

For Containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.
Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. Transfer spilled material to a suitable container for disposal. Contact competent authorities after a spill.

6.4. Reference to Other Sections

See Section 8 for exposure controls and personal protection and Section 13 for disposal considerations.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Precautions for Safe Handling: Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Avoid prolonged contact with eyes, skin and clothing. Avoid breathing vapors, mist, spray.
Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Comply with applicable regulations.
Storage Conditions: Keep container closed when not in use. Store in a dry, cool place. Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials.
Incompatible Materials: Strong acids, strong bases, strong oxidizers.

7.3. Specific End Use(s)

Deicer

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

For substances listed in section 3 that are not listed here, there are no established exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), AIHA (WEEL), NIOSH (REL), OSHA (PEL), or Canadian provincial governments.

8.2. Exposure Controls

Appropriate Engineering Controls: Suitable eye/body wash equipment should be available in the vicinity of any potential exposure. Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed.

Personal Protective Equipment: Gloves. Protective clothing. Protective goggles.



Materials for Protective Clothing: Chemically resistant materials and fabrics.

Hand Protection: Wear protective gloves.

Eye and Face Protection: Chemical safety goggles.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn. In case of inadequate ventilation, oxygen deficient atmosphere, or where exposure levels are not known wear approved respiratory protection.

Other Information: When using, do not eat, drink or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

Physical State	:	Liquid
Appearance	:	Blue
Odor	:	Characteristic slight acetic
Odor Threshold	:	No data available
pH	:	9.5 – 10.5
Evaporation Rate	:	No data available
Melting Point	:	No data available
Freezing Point	:	No data available
Boiling Point	:	No data available
Flash Point	:	> 100 °C (>212 °F)
Auto-ignition Temperature	:	No data available
Decomposition Temperature	:	No data available
Flammability (solid, gas)	:	Not applicable
Lower Flammable Limit	:	No data available
Upper Flammable Limit	:	No data available
Vapor Pressure	:	No data available
Relative Vapor Density at 20°C	:	No data available
Relative Density	:	No data available
Density	:	10.58 – 10.83 lb/gal
Specific Gravity	:	1.27 - 1.3
Solubility	:	Complete.
Partition Coefficient: N-Octanol/Water	:	No data available
Viscosity	:	Similar to water

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity:

Hazardous reactions will not occur under normal conditions.

10.2. Chemical Stability:

Stable under recommended handling and storage conditions (see section 7).

10.3. Possibility of Hazardous Reactions:

Hazardous polymerization will not occur.

10.4. Conditions to Avoid:
Direct sunlight, extremely high or low temperatures, and incompatible materials.

10.5. Incompatible Materials:
Strong acids, strong bases, strong oxidizers.

10.6. Hazardous Decomposition Products:
Not expected to decompose under ambient conditions.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on Toxicological Effects - Product
Acute Toxicity (Oral): Not classified
Acute Toxicity (Dermal): Not classified
Acute Toxicity (Inhalation): Not classified
LD50 and LC50 Data:
No additional information available
Skin Corrosion/Irritation: Not classified
pH: 9.5 – 10.5
Eye Damage/Irritation: Not classified
pH: 9.5 – 10.5
Respiratory or Skin Sensitization: Not classified
Germ Cell Mutagenicity: Not classified
Carcinogenicity: Not classified
Specific Target Organ Toxicity (Repeated Exposure): Not classified
Reproductive Toxicity: Not classified
Specific Target Organ Toxicity (Single Exposure): Not classified
Aspiration Hazard: Not classified
Symptoms/Injuries After Inhalation: Prolonged exposure may cause irritation.
Symptoms/Injuries After Skin Contact: Prolonged exposure may cause skin irritation.
Symptoms/Injuries After Eye Contact: May cause slight irritation to eyes.
Symptoms/Injuries After Ingestion: Ingestion may cause adverse effects.
Chronic Symptoms: None expected under normal conditions of use.

11.2. Information on Toxicological Effects - Ingredient(s)
LD50 and LC50 Data:

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity
Ecology - General: Not classified.

12.2. Persistence and Degradability

Alpine RF-11	
Persistence and Degradability	Not established.

12.3. Bioaccumulative Potential

Alpine RF-11	
Bioaccumulative Potential	Not established.

12.4. Mobility in Soil
No additional information available

12.5. Other Adverse Effects
Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods
Waste Disposal Recommendations: Dispose of contents/container in accordance with local, regional, national, territorial, provincial, and international regulations.
Ecology - Waste Materials: Avoid release to the environment.

SECTION 14: TRANSPORT INFORMATION

The shipping description(s) stated herein were prepared in accordance with certain assumptions at the time the SDS was authored, and can vary based on a number of variables that may or may not have been known at the time the SDS was issued.

14.1. In Accordance with DOT

Not regulated for transport

14.2. In Accordance with IMDG

Not regulated for transport

14.3. In Accordance with IATA

Not regulated for transport

14.4. In Accordance with TDG

Not regulated for transport

SECTION 15: REGULATORY INFORMATION

15.1. US Federal Regulations

Neither this product nor its chemical components appear on any US federal lists, or its chemical components are not required to be disclosed.

15.2. US State Regulations

Neither this product nor its chemical components appear on any US State lists, or its chemical components are not required to be disclosed.

15.3. Canadian Regulations

This product or its components are not listed on the Canadian Domestic Substances List (DSL) or the Non-Domestic Substances List (NDSL), or are not required to be disclosed.

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Date of Preparation or Latest Revision : 12/06/2021

Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200 and Canada's Hazardous Products Regulations (HPR) SOR/2015-17.

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

NA GHS SDS 2015 (Can, US)

NASi™ SF

NASi SF™ (IceCare & Ecoway SF) is an advanced, environmentally friendly, granulated solid sodium formate deicing product that is certified to the latest edition of **SAE AMS1431E**. It is specifically engineered to allow for efficient removal of snow and ice from airport runways, aprons, parking lots, and access roads and is designed to maintain adequate friction between aircraft tires and the runway. **NASi SF** is also effective in landside areas that are sensitive to corrosion such as parking decks, stadiums, institution grounds, parks, bridges, and roadways. In these applications, **NASi SF** helps avoid/reduce the chloride load in waterways when compared to traditional salt.

TYPICAL PROPERTIES

Active Ingredients	Min. 98%
pH, (15% Solution)	8–12
Density, kg/L @ 68°F (20°C)	0.9–1.0 kg/L
Appearance	White, irregular granulat
Odor	Very slight
Water Miscibility (20°C)	81 g / 100 ml
Eutectic Temperature	-8°F (-22°C)
Effective to	0°F (-18°C)
BOD (5 DAY), g O_2/g of fluid @ 68° F (20°C)	0.01–0.20
COD, g O_2/g of fluid @ 68° F (20°C)	0.25–0.35
Chloride	0–250 ppm*
Flash Point	Non-flammable, no flash 200°F (93°C)

* According to the EPA drinking water standards for nuisance chemicals, the Secondary Maximum (SMCL) for chlorides, the limit is considered not a present risk to human health at <250 ppm.
Reference:
https://www.epa.gov/dwstandardsregulations/secondary-drinking-water-standards-guidance-nu

NASi®
TRANSPORTATION & MINING

*INFORMATIONAL ONLY

SAFETY DATA SHEET

Product #: See Section 1

Name of Product:
NASi SF

New Issue: May 27, 2016

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	***NASi SF***		
SYNONYMS:	Formic acid sodium salt		
PRODUCT CODES:			
COMPANY IDENTIFICATION:	NACHURS ALPINE SOLUTIONS		
CORPORATE ADDRESS:	421 Leader Street, Marion, OH43302, United States		
PHONE:	800-622-4877 (USA) 800-265-2268 (CANADA)		
EMERGENCY PHONE:	United States:	Chemtrec: 800-424-9300	(CCN 15189)
	Canada:	CANUTEC: 1-613-996-6666 I TECH: 1-877-324-4402	
CHEMICAL NAME:	Sodium Formate		
CHEMICAL FAMILY:	Formic Acid, Sodium Salt		
CHEMICAL FORMULA:	HCOONa		
PRODUCT USE:	Solid Deicer		

SECTION 2: HAZARDS IDENTIFICATION

GHS ELEMENTS:

Hazard Classification:	Skin Irritation (Category 3). Eye Irritation (Category 2B). Acute Toxicity – Inhalation (Category 5).
Pictogram:	None Required.
Signal Word:	Warning
Hazard Statements:	Causes mild skin irritation. Causes eye irritation. May be harmful if inhaled.
Precautionary Statements:	Use only outdoors or in a well ventilated area. Avoid breathing dust. Wash skin throughly after handling. Wear protective gloves, clothing, eye and face protection. If swallowed, rinse mouth. Do NOT induce vomiting. If on hair or skin, remove all contaminated clothing and rinse skin with water. If inhaled, remove victim to fresh air and keep at rest in a position comfortable for breathing. If in eyes, rinse carefully with water for several minutes. Remove contactlenses, if able and continue rinsing. Immediately call a poison center or doctor/physician. See First Aid instruction for specific treatment. If skin irritation occurs, get medical attention. If eye irritation persists, get medical attention. If you feel unwell, call a poison center or doctor/physician. Wash contaminated clothing before reuse. Absorb spillage to prevent material damage.

POTENTIAL HEALTH EFFECTS

EYES:	May cause irritation.
SKIN:	May cause irritation.
INGESTION:	May cause irritation.
INHALATION:	May cause irritation. Do not inhale dust.
ACUTE HEALTH HAZARDS:	N/A
CHRONIC HEALTH HAZARDS:	N/A

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: N/A

CARCINOGENICITY:

OSHA:	N/A
ACGIH:	N/A
NTP:	N/A
IARC:	N/A
OTHER:	N/A

SECTION 2 NOTES: Human health effects of overexposure may cause skin or eye irritation or skin rash, tearing, or blurring of vision.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT:	Sodium Formate	>98%	CAS# 141-53-7
	Corrosion Inhibitor	<2.0%	Proprietary

SARA 313 REPORTABLE: N/A

OSHA PEL-TWA:	N/A
OSHA PEL STEL:	N/A
OSHA PEL CEILING:	N/A
ACGIH TLV-TWA:	N/A
ACGIH TLV STEL:	N/A
ACGIH TLV CEILING:	N/A

SECTION 4: FIRST AID MEASURES

EYES: Flush with water immediately and thoroughly for 15 minutes. If irritation persists, seek medical attention.

SKIN: May be harmful if absorbed through skin. May cause skin irritation. Wash thoroughly with soap and water. If irritation persists, seek medical attention.

INGESTION: No specific intervention is indicated as compound is not likely to be hazardous by ingestion. Consult a physician if necessary.

INHALATION: May be harmful if inhaled. May cause respiratory tract irritation. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

NOTES TO PHYSICIANS OR FIRST AID PROVIDERS: N/A

SECTION 5: FIRE-FIGHTING MEASURES

FLAMMABILITY: Not flammable.

FLAMMABLE LIMITS IN AIR: (% BY VOLUME) UPPER: N/A LOWER: N/A

FLASH POINT: >200°F (93°C)

METHOD USED: Tagged closed cup.

AUTOIGNITION TEMPERATURE: N/A

NFPA HAZARD CLASSIFICATION:

HEALTH:	1
FLAMMABILITY:	0
REACTIVITY:	0

OTHER: 0

HMIS HAZARD CLASSIFICATION
HEALTH: 1
FLAMMABILITY: 0
REACTIVITY: 0
PROTECTION: B

EXTINGUISHING MEDIA: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

SPECIAL FIRE FIGHTING PROCEDURES: Use self-contained breathing apparatus and full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None.

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon oxides, Sodium/sodium oxides

SECTION 6: ACCIDENTAL RELEASE MEASURES

ACCIDENTAL RELEASE MEASURES: Before handling any spills, always observe the safety precautions described in Section 8. Spills can be removed in the dry form with suitable equipment or flushed away with large quantities of water.

SECTION 7: HANDLING AND STORAGE

HANDLING AND STORAGE: Hygroscopic. Store in a cool dry, well-ventilated area in tightly closed containers. Keep away from acids.

OTHER PRECAUTIONS: N/A

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Keep container tightly closed and protect from moisture. Use ventilation that is adequate to keep employee exposure to airborne dust limited.

VENTILATION: Use ventilation that is adequate to keep employee exposure to airborne dust limited. A dust mask is recommended when handling large quantities in small confined non-ventilated area.

RESPIRATORY PROTECTION: Respiratory protection is not required under normal circumstances. If material is misted, use appropriate NIOSH approved respirator of self-contained breathing apparatus.

EYE PROTECTION: Coverall Chemical splash goggles and full face shield.

SKIN PROTECTION: Rubber or plastic gloves.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: N/A

WORK HYGIENIC PRACTICES: Always follow good safety and industrial hygienic practices.

EXPOSURE GUIDELINES: See section 2.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: white granules

ODOR: slight specific odor.

ODOR THRESHOLD: No data available.

PHYSICAL STATE: Solid/crystalline granular

pH : 10.0-12.0 (10% solution)

BOILING POINT:		
	F°:	Unknown
	C°:	Unknown
MELTING POINT:		
	F°:	>608
	C°:	>320
FREEZING POINT:		
	F°:	N/A
	C°:	N/A
FLASH POINT:		
	F°:	>200
	C°:	>93
METHOD USED:	Tagged Closed Cup	
EVAPORATION RATE:	N/A	
FLAMABILITY:	Not flammable.	
FLAMMABLE LIMITS IN AIR: (% BY VOLUME)	UPPER: N/A LOWER: N/A	
VAPOR PRESSURE (mmHg):	N/A	
SPECIFIC GRAVITY (kg/m³):	900-950	
VAPOR DENSITY (AIR = 1):	N/A	
DENSITY @ 20°C	0.9-1.0 kg/l	
SOLUBILITY IN WATER:	soluble (>3.75 lbs./gal.)	
PARTITION COEFFICIENT:	n-octanol/water – N/A	
PERCENT SOLIDS BY WEIGHT:	>98	
PERCENT VOLATILE:	N/A	
VOLATILE ORGANIC COMPOUNDS (VOC):	N/A	
AUTOIGNITION TEMPERATURE:	N/A	
THERMON DECOMPOSITIONS:	N/A	
MOLECULAR WEIGHT:	174.2	

SECTION 10: STABILITY AND REACTIVITY

	STABLE	UNSTABLE
STABILITY:	x	
CONDITIONS TO AVOID (STABILITY):	Prevent contamination with other chemicals	
INCOMPATIBILITY (MATERIAL TO AVOID):	Contact with acids	
HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:	Thermal decomposition may generate	

carbon monoxide and carbon dioxide.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID (POLYMERIZATION): N/A

SECTION 11: TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION: Acute oral toxicity LD50: >2000 mg/kg (rats).IE
Acute inhalation toxicity LC50: >680 mg/m³ (dust, rats, 4 hrs.).
LC0: >680 mg/m³ (dust, rats, 4 hrs). No mortality during 14 day observation.
Skin irritation: nonirritant (Rabbits).
Eye irritation: nonirritant (Rabbits).

SECTION 12: ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: Biological elimination: >90% (Static test, 7 days) DIN 38 412-L25) Toxicity to bacteria ECo:> 10000 (OECD 209, after 3 hours)
Chemical oxygen demand COD: - 211 mg oxygen/g. (DIN 38409-H41) Daphnia acute toxicity ECo: 3.3 g/l (24h); 3.2 g/l (48h)
EC50: 4.8 g/l (24h); 4.4 g/l (48h)
Fish Toxicity LC50:.1000 mg/l (96 h, Zebra fish, OECD 203)

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Reclaim and reuse as much as possible. Dispose in accordance with all federal, state, and local regulations.

RCRA HAZARD CLASS: N/A

SECTION 14: TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION:

PROPER SHIPPING NAME:	NASi SF (Sodium Formate)
HAZARD CLASS:	N/A
ID NUMBER:	N/A
PACKING GROUP:	N/A
LABEL STATEMENT:	N/A

WATER TRANSPORTATION:

PROPER SHIPPING NAME:	NASi SF (Sodium Formate)
HAZARD CLASS:	N/A
ID NUMBER:	N/A
PACKING GROUP:	N/A
LABEL STATEMENTS:	N/A

AIR TRANSPORTATION:

PROPER SHIPPING NAME:	NASi SF (Sodium Formate)
HAZARD CLASS:	N/A
ID NUMBER:	N/A
PACKING GROUP:	N/A
LABEL STATEMENTS:	N/A

SECTION 15: REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:

TSCA (TOXIC SUBSTANCE CONTROL ACT): Yes

CERCLA (COMPREHENSIVE RESPONSE COMPENSATION, AND LIABILITY ACT): No

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT):	N/A
311/312 HAZARD CATEGORIES:	N/A
313 REPORTABLE INGREDIENTS:	N/A

SECTION 16: OTHER INFORMATION

PREPARATION INFORMATION: ***Technical Services***

DISCLAIMER: The information contained herein is offered only as a guide to the handling of this specific material and has been prepared in good faith by technically knowledgeable personnel. It is not intended to be all-inclusive and the manner and conditions of use and handling may involve other and additional considerations. No warranty of any kind is given or implied and NACHURS ALPINE SOLUTIONS will not be liable for any damages, losses, injuries or consequential damages which may result from the use or reliance on any information contained herein.

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SAE INTERNATIONAL

AEROSPACE MATERIAL SPECIFICATION

AMS1431™ REV. E

Issued 1992-01
Revised 2018-10

Superseding AMS1431D

(R) Solid Runway Deicing/Anti-Icing Product

RATIONALE

This specification covers a runway deicing and anti-icing product in the form of a solid. This specification has been revised to include the following revisions: clarification of several test methods including sandwich corrosion (3.2.9.1), cyclic immersion corrosion of cadmium plate (3.2.9.3.1), and effect on carbon-brake systems (3.2.11); a change to the requirements for periodic testing (4.2.2); and addition of requirements for multiple locations.

1. SCOPE

1.1 Form

This specification covers a runway deicing and anti-icing product in the form of a solid. Unless otherwise stated, all specifications referenced herein are latest (current) revision.

1.2 Application

These products have been used typically at airports on aircraft maneuvering areas, such as aprons, runways, and taxiways, for the prevention and removal of frozen deposits of snow, frost, and ice, but usage is not limited to such applications.

1.3 Precautions

1.3.1 Material Compatibilities

While this specification covers technical requirements for solid runway deicing/anti-icing products, it does not address the compatibility issue of combining runway deicing products during the operational phase. Products meeting this specification are unique to each manufacturer and may be adversely affected by combining with other deicing/anti-icing products. It is the user's responsibility to become familiar with the safe and proper use of applying multiple deicing/anti-icing products.

1.3.1.1 Liquefied Solid Deicing Product

When the solid deicing/anti-icing product is liquefied and used as a liquid runway deicing/anti-icing product, the resulting liquid at the highest recommended dilution shall meet the requirements of AMS1435.

1.3.2 Pavement Friction Evaluation

Airport authorities should ascertain the friction coefficient of the runway after the application of a deicing/anti-icing product prior to aircraft landing operations.

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http://standards.sae.org/AMS1431E

1.4 Safety - Hazardous Materials

While the materials, methods, applications, and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards which may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.

2. APPLICABLE DOCUMENTS

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS1435	Fluid, Generic, Deicing/Anti-Icing Runways and Taxiways
AMS2470	Anodic Treatment of Aluminum Alloys, Chromic Acid Process
AMS2475	Protective Treatments, Magnesium Alloys
AMS4037	Aluminum Alloy, Sheet and Plate, 4.4Cu - 1.5Mg - 0.60Mn (2024; -T3 Flat Sheet, -T351 Plate), Solution Heat Treated
AMS4041	Aluminum Alloy, Sheet and Plate, Alcad 4.4Cu - 1.5Mg - 0.60Mn (2024, -T3 Sheet/-T351 Plate with 1-1/2% Alclad) Solution Heat Treated, Cold Worked and Naturally Aged
AMS4049	Aluminum Alloy, Sheet and Plate, Alclad, 5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr (Alclad 7075; -T6 Sheet -T651 Plate), Solution and Precipitation Heat Treated
AMS4376	Plate, Magnesium Alloy, 3.0Al - 1.0Zn - 0.20Mn (AZ31B-H26), Cold Rolled and Partially Annealed
AMS4911	Titanium Alloy, Sheet, Strip, and Plate, 6Al - 4V, Annealed
AMS4916	Titanium Alloy Sheet, Strip and Plate, 8Al - 1Mo - 1V, Duplex Annealed
AMS5045	Steel, Sheet and Strip, 0.25 Carbon, Maximum, Hard Temper
AMS-P-83310	Plastic Sheet, Polycarbonate, Transparent
AIR5567	Test Method for Catalytic Carbon Brake Disk Oxidation
AIR6130	Cadmium Plate Cyclic Corrosion Test
AIR6172	Ice Undercutting Test Method for Runways and Taxiways Deicing/Anti-Icing Chemicals
AIR6211	Ice Penetration Test Method for Runways and Taxiways Deicing/Anti-Icing Chemicals
ARP1917	Clarification of Terms Used in Aerospace Metals Specifications

2.2 ANSI Accredited Publications

Copies of these documents are available online at http://webstore.ansi.org/.

ANSI Z400.1/Z129.1-2010 Hazardous Workplace Chemicals - Hazard Evaluation and Safety Data Sheet and Precautionary Labeling Preparation

2.3 APHA Publications

Available from American Public Health Association, 800 I Street, NW, Washington, DC 2001-3710, Tel: 888-320-2742, www.apha.org.

Standard Methods for the Examination of Water and Waste Water, Method 4500-Cl

2.4 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM C672	Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals
ASTM D56	Standard Test Method for Flash Point by Tag Closed Tester
ASTM D1193	Reagent Water
ASTM D1568	Sampling and Chemical Analysis of Alkylbenzene Sulfonates
ASTM E70	pH of Aqueous Solutions with the Glass Electrode
ASTM E203	Water Using Karl Fischer Reagent
ASTM F483	Total Immersion Corrosion Test for Aircraft Maintenance Chemicals
ASTM F484	Stress Crazing of Acrylic Plastics in Contact with Liquid or Semi-Liquid Compounds
ASTM F485	Effects of Cleaners on Unpainted Aircraft Surfaces
ASTM F502	Effects of Cleaning and Chemical Maintenance Materials on Painted Aircraft Surfaces
ASTM F519	Mechanical Hydrogen Embrittlement Testing of Plating Processes and Aircraft Maintenance Chemicals
ASTM F945	Stress Corrosion of Titanium Alloys by Aircraft Engine Cleaning Materials
ASTM F1104	Preparing Aircraft Cleaning Compounds, Liquid Type, Water Base, for Storage Stability Testing
ASTM F1110	Sandwich Corrosion Test
ASTM F1111	Corrosion of Low-Embrittling Cadmium Plate by Aircraft Maintenance Chemicals

2.5 ISO Publications

Copies of these documents are available online at http://webstore.ansi.org/.

ISO 5725 Accuracy (trueness and precision) of measurement methods and results

2.6 LFV Test Method 2-98 Publications

Available from Swedish Civil Aviation Administration, LFV Teknik, Box 53, SE-190 45 Stockholm-Arlanda, Sweden.

2.7 Organization for Economic Cooperation and Development Publications

Available from Organization for Economic Co-operation and Development, 2 Rue Andre Pascal, 75775 Paris Cedex 16, France, Tel: +33 1 45 24 82 00, www.oecd.org.

OECD Guidelines for Testing of Chemicals, Methods 202 and 203

2.8 U.S Government Publications

Available from U.S. Government Printing Office, Superintendent of Documents, Mail Stop: SSOP, Washington, DC 20402-932. www.epa.gov.

EPA 40CFR 797.1300 Daphnid Acute Toxicity Test

EPA 40CFR 797.1400 Fish Acute Toxicity Test

Copies of these documents are available at http://quicksearch.dla.mil.

MIL-PRF-25690 Plastic, Sheet and Formed Parts, Modified Acrylic Base, Monolithic, Crack Propagation Resistant

MIL-STD-870 Cadmium Plating, Low Embrittlement, Electrodeposition

MIL-STD-2073-1 DoD Material Procedures for Development and Packaging Requirements

3. TECHNICAL REQUIREMENTS

3.1 Material

The composition of the product may contain additives, such as corrosion inhibitors, coating agents, etc., as required to produce a product meeting the requirements of this specification.

3.1.1 Environmental Information

Product shall be tested in accordance with APHA "Standard Methods for Examination of Water and Waste Water." The manufacturer shall provide not less than the following information:

3.1.1.1 Biochemical Oxygen Demand (BOD) of the product for 5-, 15-, and 20-day incubation periods. The test solutions shall be incubated at 68 °F (20 °C).

3.1.1.2 Total Oxygen Demand (TOD) or Chemical Oxygen Demand (COD) of the product, expressed in kilograms of oxygen per kilograms of product.

3.1.1.3 Percent biodegradation of product for 5-, 15-, and 20-day incubation periods. Percent biodegradation can be approximated by dividing BODx100 by either TOD or COD.

3.1.1.4 Aquatic Toxicity

Product shall be tested in accordance with EPA (40 Code of Federal Regulations (CFR) Parts 797.1300 and 797.1400) or OECD (Organization for Economic Cooperation and Development Guidelines for Testing of Chemicals, Methods 202 and 203) procedures using test species required by regulatory agencies for permitted discharges. Examples include: fathead minnows, daphnia magna, and rainbow trout. The LC50 concentration, the highest concentration at which 50% of the test species survive, shall be given in milligrams per liter.

3.1.2 Trace Contaminants

Report the presence, in percentage by weight, of sulfur, halogens, phosphate, nitrate, and heavy metals (lead, chromium, cadmium, and mercury).

3.1.3 Vendor shall report the product chemical analysis, determined in accordance with a recognized method acceptable to purchaser; and total water content shall be determined in accordance with ASTM E203.

3.1.4 Vendor shall provide a phase diagram relating product dilution to freezing point. Delivered product shall be within +7 °F (+4 °C) of the preproduction value.

3.1.5 Appearance

The product, as received by purchaser, shall be uniform, free-flowing, and free from foreign material detrimental to usage of the product.

3.2 Physical Properties

The product, as supplied by vendor, shall conform to the following requirements: tests shall be performed in accordance with specified test on the product as delivered by vendor, unless otherwise specified herein.

3.2.1 pH

The product, diluted with ASTM D1193, Type IV water, to 15% by weight of solids taking into account water contained in the product, shall be within ±0.5 of the preproduction value established in 4.2.3, determined in accordance with ASTM E70.

3.2.2 Flash Point

The product on a dry basis shall be not lower than 200 °F (93 °C), determined in accordance with ASTM D56.

3.2.3 Chloride Content

The level of soluble chloride on a dry basis shall not exceed 250 ppm, determined in accordance with APHA Standard Methods for the Examination of Water and Waste Water, Method 4500-Cl or equivalent..

3.2.4 Storage Stability

The product, when stored in a closed container for at least 1 year in accordance with ASTM F1104 shall not deliquesce or otherwise deteriorate.

3.2.5 Effect on Transparent Plastics

3.2.5.1 The product, diluted with ASTM D1193, Type IV, water to 15% by weight of solids taking into account water contained in the product, shall not craze, stain, or discolor Type C stretched acrylic plastic conforming to MIL-PRF-25690, determined in accordance with ASTM F484.

3.2.5.2 The product, diluted with ASTM D1193, Type IV, water to 15% by weight of solids taking into account water contained in the product, shall not craze, stain, or discolor AMS-P-83310 polycarbonate plastic, determined in accordance with ASTM F484, except that the specimens shall be stressed for 30 minutes ± 2 minutes to an outer fiber stress of 2000 psi (13.8 MPa).

3.2.6 Effect on Painted Surfaces

Product, diluted with ASTM D1193, Type IV, water to 15% by weight of solids taking into account water contained in the product, shall neither decrease the paint film hardness by more than two pencil hardness levels nor shall it produce any streaking, discoloration, or blistering of the paint film, determined in accordance with ASTM F502.

3.2.7 Effect on Unpainted Surfaces

Product, diluted with ASTM D1193, Type IV, water to 15% by weight of solids taking into account water contained in the product, shall neither produce streaking nor leave stains which require polishing to remove, determined in accordance with ASTM F485.

3.2.8 Effect on Runway Pavements

3.2.8.1 Runway Concrete Surface Scaling Resistance

The condition of the runway concrete surface shall have a rating not greater than 1 for 50 freeze-thaw cycles, determined in accordance with ASTM C672 except that concrete shall:

a. Be air-entrained with an air content as specified in ASTM C672.

b. Have a minimum cement content of 510 lb/yd^3 ± 10 lb/yd^3 (302 kg/m^3 ± 6 kg/m^3).

c. Have a slump, 1.5 inches ± 0.5 inch (38 mm ± 13 mm).

A 25% by volume solution of the deicing/anti-icing product as supplied by the manufacturer in commercial concentration in tap water shall be substituted for calcium chloride. Performing more than one freeze-thaw cycle per day is acceptable.

3.2.8.2 Asphalt Concrete Degradation Resistance (Appendix A, valid for runway deicing/anti-icing products used in Europe)

Product, diluted with tap water to 50% or regular highest concentration by weight of solid, shall be tested in accordance with LFV Method 2-98 (see Appendix A). The reduction in adhesion value of the runway asphalt concrete surface shall not be more than 50% of the adhesion value of the specimens not stored in deicing diluted product. Adhesion values shall be determined and documented. The following test parameters shall be used:

1. Marshall test specimens with paving grade bitumen 160/220 [penetration value at 77 °F (25 °C) of 180 mm^{-1} ± 10 mm^{-1} and softening point 102 °F ± 1 °F (39 °C ± 1 °C)] shall be used,

2. Binder content 5.7% by mass,

3. Maximum aggregate size 0.625 inch (16 mm), and distribution as shown in Figure 1:

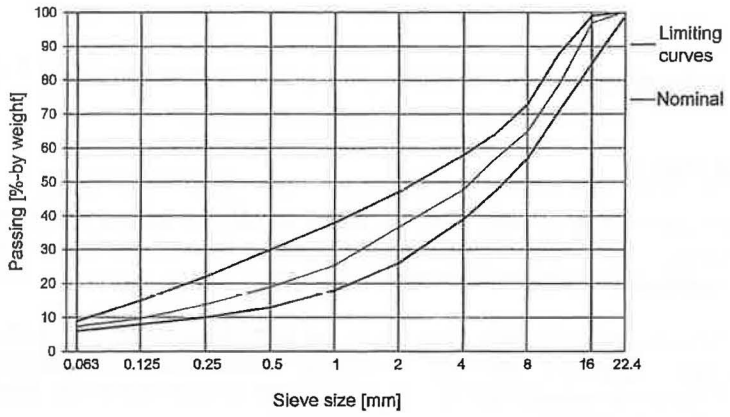


Figure 1 - Aggregate size distribution

4. The aggregate used shall be characterized regarding variety of stone, origin and petrographical analysis. The aggregate shall be of good mechanical stability,

5. Air voids 7% ± 1% by volume,

6. Specimens are sawed to approximately 1.125 inch (30 mm) thickness.

3.2.9 Effect on Aircraft Metals

Product, diluted with ASTM D1193, Type IV, water to 5% and 15% by weight solids taking into account water contained in the product, shall meet the following requirements:

3.2.9.1 Sandwich Corrosion

Specimens, after testing in accordance with ASTM F1110, shall not have a rating greater (worse) than 1.

3.2.9.2 Total Immersion Corrosion

The product, tested in accordance with ASTM F483, except that panels shall be AMS4376 tested for 24 hours, shall neither cause corrosion of test panels nor a weight change of any test panel greater than shown in Table 1.

Table 1 - Total immersion corrosion

Test Panel	Weight Change mg/cm² per 24 hours
AMS4037 Aluminum Alloy, anodized as in AMS2470	0.3
AMS4041 Aluminum Alloy	0.3
AMS4049 Aluminum Alloy	0.3
AMS4376 Magnesium Alloy, dichromate treated as in AMS2475	0.2
AMS4911 Titanium Alloy	0.1
AMS5045 Carbon Steel	0.8

3.2.9.3 Low-Embrittling Cadmium Plate

Test panels, coated with low-embrittling cadmium plate, shall not show a weight change greater than 0.3 mg/cm² per 24 hours, determined in accordance with ASTM F1111.

3.2.9.3.1 The product shall be tested for cyclic immersion corrosion of cadmium plate in accordance with AIR6130 and the results reported as specified in Section 6 of AIR6130.

3.2.9.4 Hydrogen Embrittlement

The diluted product shall be non-embrittling, determined in accordance with ASTM F519, utilizing Type 1a, 1c, or 2a specimens, cadmuim plated in accordance with MIL-STD -870, Class 1 Type I. Type Ia and Type 1c speciments shall be loaded to 45% of the predetermined notch fracture strength and Type 2a specimens loaded to 80% of the yield strength. The entire 2a stressed specimen or just the notched area of the 1a and 1c stressed specimen shall be immersed continuously in the solution under test for 150 hours at a temperature of 77 °F ± 9 °F (25 °C ± 5 °C)

3.2.9.5 Stress Corrosion Resistance

The diluted product shall not cause cracks in AMS4911 titanium alloy specimens, determined in accordance with ASTM F945, Method A.

3.2.9.5.1 Stress Corrosion Resistance

The diluted product shall be tested in accordance with ASTM F945, Method A using AMS4916 specimens. The results obtained from AMS4916 shall be reported for informational purposes only.

3.2.10 Performance

The product, used in accordance with manufacturer's recommendation, shall remove accumulated frozen deposits of frost and ice from aircraft maneuvering areas, such as airport aprons, runways, and taxiways. The product shall be tested in accordance with AIR6170 for ice melting effectiveness, with AIR6172 for ice undercutting effectiveness, and with AIR6211 for ice penetration effectiveness. Acceptance criteria shall be agreed upon by purchaser and vendor.

3.2.11 Effect on Carbon-Brake Systems

The product shall be tested for catalytic oxidation of carbon in accordance with AIR5567 and the results shall be reported as shown in 4.2 of AIR5567. The results shall be reported for informational purposes only. Per AIR5567 the lower the percentage weight loss, the lower the risk of the carbon-carbon heat sink being damaged through catalytic oxidation.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The vendor of the product shall supply all samples for conformance testing and shall be responsible for obtaining independent laboratory confirmation of conformance to the requirements of this specification. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conform to specified requirements.

4.2 Classification of Tests

4.2.1 Acceptance Tests

Total water content (3.1.3), pH (3.2.1), flash point (3.2.2), and chloride content (3.2.3) are acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests

Effect on transparent plastics (3.2.5), effect on painted surfaces (3.2.6), effect on unpainted surfaces (3.2.7), runway concrete scaling resistance (3.2.8.1), asphalt concrete degradation resistance (3.2.8.2, Appendix A, valid for runway deicing/anti-icing products used in Europe) and effect on aircraft metals (3.2.9) are periodic tests and shall be performed on or just prior to the second anniversary of initial testing and thereafter every four calendar years.

4.2.3 Preproduction Tests

All technical requirements are preproduction tests and shall be performed prior to or on the initial shipment of the product to a purchaser, when a change in ingredients and/or manufacturing procedures requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.3 Sampling and Testing

Shall be in accordance with applicable requirements of ASTM D1568; a lot shall be all product produced in one continuous manufacturing operation from the same batches of raw materials and presented for vendor's inspection at one time.

4.3.1 When a statistical sampling plan has been agreed upon by purchaser and vendor, sampling shall be in accordance with such plan in lieu of sampling as in 4.3 and the report of 4.5 shall state that such plan was used.

4.4 Approval

4.4.1 Sample product shall be approved by purchaser before product for production use is supplied, unless such approval be waived by purchaser. Results of tests on production product shall be essentially equivalent to those on the approved sample.

4.4.2 Vendor shall use ingredients, manufacturing procedures, and methods of inspection on production product which are essentially the same as those used on the approved sample product. If necessary to make any change in ingredients or in manufacturing procedures, vendor shall submit for reapproval a statement of the proposed changes in ingredients and/or manufacturing procedures and, when requested, sample product. Production product made by the revised procedure shall not be shipped prior to receipt of approval.

4.4.3 Whenever a product is to be produced by a licensee or subcontractor, all testing shall be required on a product produced at the site, prior to initial shipment as if the product were being initially qualified.

4.5 Reports

The vendor of product shall furnish with each shipment a report showing the results of tests to determine conformance to all technical requirements. These tests shall be carried out by an independent facility. This report shall include the manufacturer's product identification, lot number, AMS1431E, purchase order number, and quantity.

4.5.1 A material safety data sheet conforming to ANSI Z400, or equivalent, shall be supplied to each purchaser prior to, or concurrent with, the report of preproduction test results or, if preproduction testing be waived by purchaser, concurrent with the first shipment of product for production use. Each request for modification of product formulation shall be accompanied by a revised material safety data sheet.

4.6 Resampling and Retesting

If any sample used in the above tests fails to meet the specified requirements, disposition of the product may be based on the results of testing three additional samples for each original nonconforming sample. Failure of any retest sample to meet the specified requirements shall be cause for rejection of the product represented. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY

5.1 Packaging and Identification

5.1.1 Product shall be packaged in clean containers of a type and size acceptable to purchaser and vendor.

5.1.2 Each container of product shall be legibly marked with not less than AMS1431E, the phrase "FOR AIRFIELD USE," manufacturer's product identification, purchase order number, lot number, and quantity.

5.1.3 Labeling requirements shall meet all federal, state, and local laws. In the United States of America there are states whose Right to Know Regulations relate to labeling. Product manufactured, stored, or used in those states is subject to those regulations.

5.1.4 Containers of product shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the product to ensure carrier acceptance and safe delivery.

6. ACKNOWLEDGMENT

A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

7. REJECTIONS

Product not conforming to this specification, or to modifications authorized by purchaser, will be subject to rejection.

8. NOTES

8.1 Revision Indicator

A change bar (l) located in the left margin is for the convenience of the user in locating areas where technical revisions, not editorial changes, have been made to the previous issue of this document. An (R) symbol to the left of the document title indicates a complete revision of the document, including technical revisions. Change bars and (R) are not used in original publications, nor in documents that contain editorial changes only.

8.2 Terms used in AMS are clarified in ARP1917.

8.3 Dimensions and properties in inch/pound units and the Fahrenheit temperatures are primary; dimensions and properties in SI units and the Celsius temperatures are shown as the approximate equivalents of the primary units and are presented only for information.

8.4 Purchase documents should contain the following:

AMS1431E
Type of solid required or limitations (if applicable)
Size and type of containers desired (see 5.1.4)
Quantity desired
Packaging requirements (see 5.1.5)

PREPARED BY AMS COMMITTEE "G-12"

APPENDIX A

This Appendix is valid for runway deicing/anti-icing products used in Europe. LFV Method 2-98 is a European standard method within CEN (European Committee for Standardization) named EN 12697-41.

LFV METHOD 2-98
EFFECT OF DE-ICING FLUID ON THE SURFACE TENSILE STRENGTH
OF ASPHALT CONCRETE FOR AIRFIELDS - ADHESION TEST

A.1 INTRODUCTION

The purpose of the test is to determine the effect of storage in de-icing fluid on the surface tensile strength of asphalt concrete. The surface strength is the force in N/mm² required for failure to occur in the upper surface of the asphalt concrete under perpendicular "pull off" tension with an increase in tensile force of 200 N/s.

The test is performed largely in the same way as the method used for testing the adhesion of road markings to a road pavement and/or the adhesion of bridge deck waterproofing to an underlying concrete or steel surface.

A.2 TEST METHODS

A.2.1 Principle

Testing shall be performed on a sawn cylindrical test specimen on which a well-defined test surface has been carefully drilled out in the asphalt concrete to a depth of about 5 mm. A steel plate shall be bonded to the test surface. The specimen with test plate shall then be stored in de-icing fluid. During testing, the plate is pulled off with an increase in tensile force of 200 N/s, the force being applied perpendicularly to the test surface. The surface strength upon failure and the type of failure shall be recorded.

The results are compared with those for specimens which have not been stored in de-icing fluid.

A.2.2 Apparatus and Materials

a. Vessel with tight-fitting lid for storing specimens in de-icing fluid.

b. Vacuum desiccator.

c. Vacuum pump for evacuation of the desiccator. The pump shall be capable of achieving a pressure of 6.7 kPa within 10 minutes and maintaining this pressure (within ±0.3 kPa) throughout the vacuum treatment.

d. Manometer for measuring absolute pressure in the desiccator.

e. Approved equipment for laboratory mixing of bituminous asphalt mixture.

f. Approved equipment for compaction of Marshall specimens or other approved laboratory compaction equipment such as gyratory compaction machine, roller or vibrating hammer.

g. Circular steel plates with a diameter of 50 mm and a tolerance of 0.5 mm. The steel plate shall be attached by suitable means (e.g., screwed) to the tensile test machine. Minimum thickness of steel plate shall be 10 mm from bottom of steel plate to bottom of screw hole.

h. Suitable adhesive (e.g., two part epoxy resin) for bonding the steel plates to the test specimen.

i. Base and holder for fixing the specimen prior to testing (see Figure A1).

j. Tensile test machine, with force increasing rate control and automatic load recording, fitted with suitable clampings and base to ensure that the tensile force can be applied without momentum perpendicular to the test specimen.

k. Equipment for drilling out a test surface.

l. Conditioning device giving a temperature of 23 °C ± 1 °C.

m. Circular saw capable of cutting asphalt with finish that has no imperfections discernible by touch.

n. Heating cabinet giving a temperature of 40 °C ± 2 °C for heated storage of specimens.

o. Desiccator grease.

A.2.3 Preparation of Test Specimens

Produce a number of specimens by compaction according to Marshall or other laboratory compaction method. The specimens should have a diameter of 100 mm ± 5 mm and a height of 60 mm ± 10 mm. The asphalt mix may be produced in an asphalt mixing plant or in the laboratory.

A.2.4 Determination of Dry Weight and Bulk Volume

Allow the specimens to reach room temperature. Mark them with a waterproof marking. Store the specimens overnight in room temperature on a flat surface. The next day, determine the bulk density for each specimen according to EN 12697-6. Divide the specimens into two equal groups (a wet and a dry group) with regard to bulk density. The mean bulk density must not differ by more than 30 kg/m^3 between the groups.

A.2.5 Preparation of Test Surface

Saw the specimens in half and carefully drill a test surface with a diameter of 50 mm and a depth of about 5 mm approximately in the centre of the sawn surface of the specimen. Allow the specimens to dry on a flat surface at room temperature for at least three days. Bond the test plate to the test surface by carefully applying a thin layer of epoxy adhesive. Allow the specimen to cure at room temperature until the following day. Prepare the test surfaces of specimens from both groups.

A.2.6 Storage in De-icing Fluid

Store the specimens with bonded test plate from the wet group in de-icing liquid at 40 °C ± 2 °C and perform the test at 23 °C ± 1 °C.

Store the specimens in de-icing fluid, first for 3 hours ± 5 minutes under vacuum and room temperature, and then for a further 70 days ± 1 hour at normal pressure and specified storage temperature. Four specimens are normally stored for testing.

Place the specimens with the test plate upwards in the desiccator. Pour de-icing fluid at room temperature into the desiccator to a level 2 to 3 cm above the top of the asphalt concrete surface.

Evacuate to an absolute pressure of 6.7 kPa ± 0.3 kPa within 10 minutes ± 1 minute. Adjust the evacuation rate and pressure with a valve or rubber hose with clamp.

Keep the absolute pressure at 6.7 kPa ± 0.3 kPa for 3 hours. Turn off the pump and carefully admit air into the desiccator until atmospheric pressure is reached.

Continue storage in a vessel at 40 °C ± 2 °C for a further 70 days ± 1 hour. Here again, the specimens must be placed with the test plate upwards immersed in de-icing fluid to a level 2 to 3 cm above the top of the asphalt concrete specimen surface. During storage, the vessel shall be covered with a tight-fitting lid. At the same time, the group of dry specimens is stored on a flat surface at room temperature.

After storage, condition the specimens to test temperature in the de-icing fluid not longer than until the next day.

A.2.7 Procedure

Take the specimen out of the de-icing fluid. Directly fix the specimen in the tensile test machine and the test plate attached to the machine. Apply the tensile force perpendicularly to the test surface and perform the test with an increase in tensile force of 200 N/s until failure occurs.

Record the tensile force together with the mode of failure. The following general modes of failure may occur:

a. in the asphalt concrete, 5 mm or deeper;

b. superficially in the asphalt concrete surface;

c. adhesive failure.

The test is carried out at 23 °C ± 1 °C.

At least three valid tests shall be carried out. The mean surface strength shall be calculated from a minimum of three accepted test results. Test results for specimens stored in de-icing fluid are compared to test results for not stored specimens.

A.2.8 Expression of Results

A.2.8.1 Method of Calculation

The surface strength shall be calculated, to the nearest 0.1 N/mm², as the stress at maximum force by the following equation:

$$\sigma_{max} = \frac{F_{max}}{A} \quad \text{(Eq. A1)}$$

where:

σ_{max} = surface strength at failure, in N/mm²

F_{max} = recorded maximum force, in N

A = test area, in mm²

The mean value of the three test results shall be calculated.

A.2.8.2 Precision of the Test Method

Reproducibility and repeatability of the test method have been determined in accordance with ISO 5725 for seven laboratories using different equipment. The experiment was done on gyratory compacted test specimens with maximum particle size 16 mm and void content 7%. The origin of the aggregate was Skärlunda in Östergötland, the binder was a Laguna 160/220 and the nominal binder content was 5.7% by weight. Five different storage agents were used.

Results relating to σ_{max} (6 laboratories, 1 excluded by statistical tests):

repeatability, standard deviation: s_r = 130 N

repeatability, critical range at 95% confidence level when testing three specimens: CR_r = 430 N

reproducibility, standard deviation: s_R = 220 N

A.2.9 Test Report

The test report shall include at least the following information:

a. all details necessary to identify the de-icing product tested (such as type, product name, density, pH value, and concentration);

b. a reference to this method and any deviation from it;

c. information on preparation of test specimens in accordance with A.2.3, type of asphalt, including aggregate and bitumen designation;

d. bulk density of all specimens and mean and SD for each group according to A.2.4;

e. information on storage according to A.2.6;

f. the test results and failure mode according to A.2.7 for each individual test, mean values;

g. the dates of delivery and preparation of specimens;

h. the date of tests.

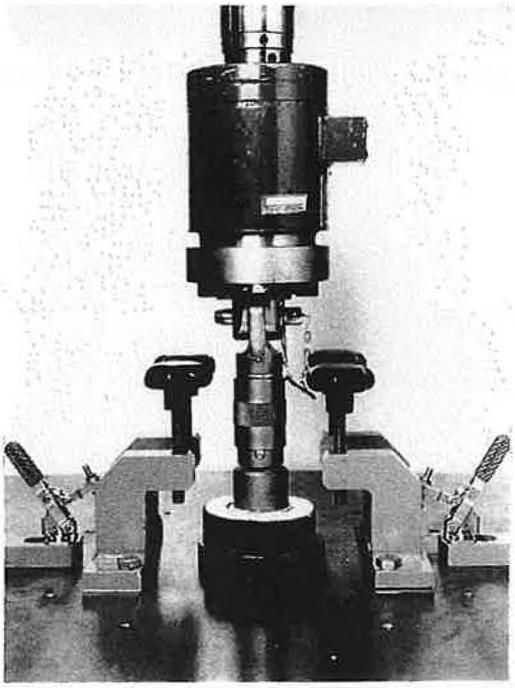


Figure A1 - Example of base, test specimen and equipment for adhesion testing (road markings)

SMI, Inc.

12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Inga Rusu
Eiffel Group SAS France
TOUR CIT
3 rue de l'arrivee
Paris 75015 France

Date: 03-May-2023

SMI/REF: 2302-030

Product: **ECOWAY SF (FY-01)** *(received 06-Feb-2023)*
MANUFACTURER – HUBEI LITAI ECO – TECHNOLOGIES CO., LTD
Chemical parks, Economic development zone
Luotian county, Hubei, 438600 China
TEL: 86 713 5101319 FAX: 86 713 5101319

Dilution: Per specification

AMS 1431E
SOLID RUNWAY DEICING/ANTI-ICING PRODUCT
Periodic Tests

4.2.2 Periodic Tests

3.2.5	Effect on Transparent Plastics	Conforms
3.2.6	Effect on Painted Surfaces	Conforms
3.2.7	Effect on Unpainted Surfaces	Conforms
3.2.8	Effect on Runway Pavements	
3.2.8.1	Runway Concrete Surface Scaling Resistance	Conforms
3.2.8.2	Asphalt Concrete Degradation Resistance	[1]Not performed by SMI
3.2.9	Effect on Aircraft Metals:	
	3.2.9.1 Sandwich Corrosion	Conforms
	3.2.9.2 Total Immersion Corrosion	Conforms
	3.2.9.3 Low Embrittling Cadmium Plate	Conforms
	3.2.9.3.1 Cyclic Immersion Corrosion of Cadmium Plate	Informational
	3.2.9.4 Hydrogen Embrittlement	Conforms
	3.2.9.5 Stress Corrosion Resistance	
	AMS 4911	Conforms
	AMS 4916	Informational

[1]*Testing required for deicer /anti-icer products used in Europe. This test is not performed by SMI.*

Respectfully submitted,

Jeff Nottebaum, SMI Inc.
Director

Rae-anne Nottebaum, SMI Inc.
Chemist

4.2.2 Periodic Tests: Effect on transparent plastics (3.2.5), effect on painted surface (3.2.6), effect on unpainted surfaces (3.2.7), runway concrete scaling resistance (3.2.8.1), asphalt concrete degradation resistance (3.2.8.2, Appendix A, valid for runway deicing/anti-icing products used in Europe) and effect on aircraft metals (3.2.9) are periodic tests and shall be performed on or just prior to the second anniversary of initial testing and thereafter every four calendar years.

3.2.5 Effect on Transparent Plastics:

3.2.5.1 The product, diluted with ASTM D1193, Type IV, water to 15% by weight of solids taking into account water contained in the product, shall not craze, stain or discolor Type C stretched acrylic plastic conforming to MIL-P-25690, determined in accordance with ASTM F484

Result Conforms

3.2.5.1 The product, diluted with ASTM D1193, Type IV, water to 15% by weight of solids taking into account water contained in the product, shall not craze, stain, or discolor AMS-P-83310 polycarbonate plastic, determined in accordance with ASTM F484, except that the specimens shall be stressed for 30 minutes ± 2 minutes to an outer fiber stress of 2000 psi (13.8 MPa).

Result Conforms

3.2.6 Effect on Painted Surfaces: Product, diluted with ASTM D1193, Type IV, water to 15% by weight of solids taking into account water contained in the product, shall neither decrease the paint film hardness by more than two pencil hardness levels nor shall it produce any streaking, discoloration, or blistering of the paint film, determined in accordance with ASTM F502.

Result Conforms

3.2.7 Effect on Unpainted Surfaces: Product, diluted with ASTM D1193, Type IV, water to 15% by weight of solids taking into account water contained in the product, shall neither produce streaking nor leave any stains which require polishing to remove, determined in accordance with ASTM F485.

Result Conforms

3.2.8 Effect on Runway Pavements

3.2.8.1 Runway Concrete Surface Scaling Resistance The condition of the runway concrete surface shall have a rating not greater than 1 for 50 freeze-thaw cycles, determined in accordance with ASTM C672, except that concrete shall

a. Be air-entrained with an air content as specified in ASTM C 672.

b. Have a minimum cement content of 510 lb/yd^3 ± 10 lb/yd^3 (302 kg/m^3 ± 6 kg/m^3).

c. Have a slump, 1.5 inches ± 0.5 inches (38 mm ± 13 mm).

A 25% by volume solution of the deicing/anti-icing product as supplied by the manufacturer in commercial concentration in tap water shall be substituted for calcium chloride. Performing more than one freeze-thaw cycle per day is acceptable.

Rating: 1

Result Conforms

3.2.8.2 Asphalt Concrete Degradation Resistance (Appendix A, valid for deicer/anti-icer products used in Europe)

Result [1]Not performed by SMI

[1]Testing required for deicer /anti-icer products used in Europe. This test is not performed by SMI.

3.2.9 Effect on Aircraft Metals: Product, diluted with ASTM D1193, Type IV, water to 5% and 15% by weight solids taking into account water contained in the product, shall meet the following requirements:

3.2.9.1 Sandwich Corrosion: Specimens, after testing in accordance with ASTM F1110, shall not have a rating greater (worse) than 1.

	2024-T3 Bare Anodized	2024-T3 Alclad	7075-T6 Bare Anodized	7075-T6 Alclad
5 percent	**1**	**1**	**1**	**1**
15 percent	**1**	**1**	**1**	**1**
Control	1	1	1	1

Result Conforms

3.2.9.2 Total Immersion Corrosion: The product, tested in accordance with ASTM F483, except that panels shall be AMS4376 tested for 24 hours, shall neither cause corrosion of test panels nor a weight change of any test panel greater than shown in Table I.

Table I

ALLOY	WEIGHT LOSS mg/cm²/24hrs		
	Allowed	5%	15 %
AMS 4037 Aluminum anodized per AMS 2470	0.3	**0.02**	**+ 0.02**
AMS 4041 Aluminum	0.3	**< 0.01**	**< 0.01**
AMS 4049 Aluminum	0.3	**0.01**	**< 0.01**
AMS 4376 Magnesium, dichromate (AMS 2475)	0.2	**0.20**	**+ 0.01**
AMS 4911 Titanium	0.1	**0.01**	**0.01**
AMS 5045 Carbon Steel	0.8	**0.12**	**0.05**

"+" indicates a weight gain

Result Conforms

3.2.9.3 Low-Embrittling Cadmium Plate: Test panels, coated with low-embrittling cadmium plate, shall not show a weight change greater than 0.3 mg/cm² 24 hours, determined in accordance with ASTM F1111.

5%: 0.01 mg/cm²/24hrs
15%: 0.02 mg/cm²/24hrs

Result Conforms

3.2.9.3.1 The product shall be tested for cyclic immersion corrosion of cadmium plate in accordance with AIR6130 and the results reported as specified in Section 6 of AIR6130.

Cadmium Plate Cyclic Corrosion Test

Initial pH of solution: 9.7 **Final pH of solution**: 9.6

Note: Solution tested = 15% w/w

The weight loss shall be no more than 0.3 mg/cm^2.

	REPLICATE #	Weight (g)		
		Initial	Final	**Weight change**
PANEL WEIGHTS	1	16.4095	16.4087	**0.0008**
	2	16.3813	16.3808	**0.0005**
	3	16.3604	16.3593	**0.0011**
	Average weight change = 0.0008 g (0.03 mg/cm^2) Note: "+" indicates weight gain			

AIR6130A: A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm^2 may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Result: **Informational**

See separate report for complete data tables

3.2.9.4 Hydrogen Embrittlement: The diluted product shall be non-embrittling, determined in accordance with ASTM F 519, Type 1a, 1c, or 2a specimens, cadmium plated in accordance with MIL-STD-870, Class 1 Type I. Type 1a and Type 1c specimens shall be loaded to 45% of the predetermined notch fracture strength and the 2a specimens loaded to 80% of the yield strength. The entire 2a stressed specimen or just the notched area of the 1a and 1c stressed specimen shall be immersed continuously in the solution under test for 150 hours at a temperature of 77°F ± 9°F (25°C ± 5°C)

Specimens: Four Type 1c, cadmium plated per MIL-STD-870 Class 1 Type I.
Load: 45%, immersed for duration, 150 hours, temperature 25°C ± 5°C.

Type 1c @ 5%: ***No failures occurred within 150 hours.***
Type 1c @ 15%: ***No failures occurred within 150 hours.***

Result Conforms

3.2.9.5 Stress-Corrosion Resistance: The diluted product shall not cause cracks in AMS 4911 titanium alloy specimens, determined in accordance with ASTM F945, Method A.

AMS 4911: 5%: No cracking evident.
15%: No cracking evident.

Result Conforms

3.2.9.5.1 Stress Corrosion Resistance: The diluted product shall be tested in accordance with ASTM F945, Method A using AMS 4916 specimens. The results obtained from AMS 4916 shall be reported for informational purposes only.

AMS 4916: 5 %: Cracking evident.
15%: Cracking evident.

Result Informational

SMI, Inc.

12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Inga Rusu
Eiffel Group SAS France
TOUR CIT
3 rue de l'arrivee
Paris 75015 France

Date: 03-May-2023

SMI/REF: 2302-030

Product: **ECOWAY SF (FY-01)** *(received 06-Feb-2023)*
MANUFACTURER – HUBEI LITAI ECO – TECHNOLOGIES CO., LTD
Chemical parks, Economic development zone
Luotian county, Hubei, 438600 China
TEL: 86 713 5101319 FAX: 86 713 5101319

Dilution: 15% w/w

Testing in accordance with
SAE AIR6130A
CADMIUM PLATE CYCLIC CORROSION TEST (2017-05)

Cadmium Plate Cyclic Corrosion Test

Initial pH of solution: 9.7 Final pH of solution: 9.6

Replicate	Initial (g)	Final (g)	**Weight change (grams)**
1	16.4095	16.4087	**0.0008**
2	16.3813	16.3808	**0.0005**
3	16.3604	16.3593	**0.0011**
Average weight change = 0.0008 g (0.03 mg/cm²) Note: "+" indicates weight gain			

AIR6130A states: A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm² may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Result Informational

Cadmium Plate Cyclic Corrosion Test

AMS 1431 Compound, Solid Runway and Taxiway Deicing/Anti-Icing

AMS 1435 Fluid, Generic, Deicing/Anti-Icing Runways and Taxiways

3 Test Specimen Preparation

Substrate: 4130 Steel

Size: 1" x 2" x 0.04" x 0.048" (25.40 mm x 50.80 mm x 1.22 mm)

Finish: Cadmium plating in accordance with AMS QQ-P-416., Type I Class I, (0.0005"- 0.0008" inch plating per side).

There shall be no supplementary chromate treatment.

a. Three cadmium plated test specimens shall be used for each fluid to be tested

b. Sample of AMS1435 Runway Deicing Fluid shall be tested as received from the supplier.

c. Sample of AMS1431 Runway Deicing Solid Compound shall be tested in a diluted form – diluted with ASTM D 1193, Type IV, water to 15% by weight solids.

d. Procure soft flexible brushes for test (paintbrush type, 1.5 inches (3.8 cm) wide, with synthetic bristles approx 1.5 inches (3.8 cm) long

4 Environmental Exposure Preparation

Preset humidity chamber to 90 $\pm$ 5^{0}F and 30 $\pm$ 5% humidity. Affix plastic ties or other inert material as hangers (hangers shall be made from an inert material that will not react with the sample; plastic, plastic coated metals, monofilament fishing line or stainless steels are acceptable) in the chamber to hold specimens during the environmental exposure period.

5 Test Procedure

a. Measure and record pH of solution(s) to be tested (record to one decimal place).

b. Solvent clean cadmium plated specimens with acetone; wipe gently with an acetone-soaked wiper. Without allowing the acetone to evaporate, gently remove excess acetone with a dry wiper. Allow samples to dry for 10 minutes in a desiccator. Do not accelerate drying of samples with oven drying.

Note: Care should be taken not to touch the cleaned specimens with bare hands; use tweezers, clean gloves or equivalent tool.

c. Weigh and record initial specimen welght in grams. Record all weights throughout the test to the nearest 0.0001 gram. Return specimens to desiccator until Day 3.

Monday	Tuesday	Wednesday	Thursday	Friday
				Friday Start – Day 0
Day 3	Day 4	Day 5	Day 6	Day 7
Day 10	Day 11	Day 12	Day 13	Day 14

d. FRIDAY START - Fill glass containers with solution to be tested, one container for each coupon. Refer to 3b or 3c for solution being used (consider filling one extra container to have extra conditioned fluid available). Container shall be large enough so the solution completely covers the specimens. Cover the container with loose fitting cover and place filled container into the humidity chamber to environmentally condition the solution for a minimum of 24 ± 1 hours before the start of test, up to 72 ± 1 hours.

e. Day 3 – Remove the solution container from the humidity chamber and the specimens from the desiccator. Place specimens in container oriented such that the specimens are not resting flush against the bottom or side of the container. Place the container with cover back into the humidity chamber for 24 ± 1 hours.

f. Day 4 - After the 24 hour immersion in the solution, remove the specimens, but do not rinse them. Place them into the humidity chamber by hanging for 22.5 ± 0.5 hours. Hangers shall be made from an inert material that will not react with the sample (such as plastic, plastic coated metals and stainless steels are acceptable).

g. Day 5 /Day 10 /Day 12 – Remove the specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimen surface with the soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

Immediately after weighing the specimens, return them to their test solution container to soak for 90 ± 5 minutes in the humidity chamber. Specimens shall be oriented such that they not resting flush against the bottom or side of the container. After 90 minutes, remove the specimens but do not rinse them. Place them in the humidity chamber by hanging for 22.5 ± 0.5 hours, maintaining the specimen in the initial orientation throughout the cycle.

h. Day 6 /Day 11 /Day 13 - Return the specimen to the test solution container to soak for 90 ± 5 minutes in the humidity chamber. Specimens shall be oriented such that it is not resting flush against the bottom or side of the container. After 90 minutes, remove the specimen but do not rinse it. Replace it in the humidity chamber by hanging for 22.5 ± 0.5 hours, maintaining the specimen in the initial orientation throughout the cycle.

i. Day 7 – Remove specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimens surface with a soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

Immediately after weighing the specimens, return them to their test solution container in the humidity chamber. Specimens shall be oriented such that they are not resting flush against the bottom or side of the container. Specimens shall be left in the test solution container in the humidity chamber from DAY 7 to DAY 10.

j. Day 14 – Remove specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimen surface with a soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

k. Measure and record final pH of solution (record to one decimal place).

l. Report the initial weight of the specimen, the weight after each periodic weighing, and the final weight. Calculate and report the value of the cumulative weight lost from each specimen after each periodic weighing procedure.

Test Data:

pH at start of test: **9.7**
pH at end of test: **9.6**

	REPLICATE #	Weight (g)
INITIAL PANEL WEIGHTS	1	16.4095
	2	16.3813
	3	16.3604

	REPLICATE #	Weight (g)		
		Monday	Wednesday	Friday
WEEK #1 PANEL WEIGHTS	1	----	16.4091	16.4100
	2	----	16.3811	16.3820
	3	----	16.3600	16.3609

	REPLICATE #	Weight (g)		
		Monday	Wednesday	Friday
WEEK #2 PANEL WEIGHTS	1	16.4097	16.4080	16.4087
	2	16.3817	16.3805	16.3808
	3	16.3605	16.3589	16.3593

Client: Eiffel Group SAS France Date: 03-May-2023
Product: **ECOWAY SF (FY-01)** *(received 06-Feb-2023)*
MANUFACTURER – HUBEI LITAI ECO – TECHNOLOGIES CO., LTD
Dilution: 15% w/w SMI/REF: 2302-030
SAE AIR6130A, Cadmium Plate Cyclic Corrosion Test

TEST DATA (continued)

REPLICATE #1	INITIAL WEIGHT (grams)	WEEK 1 WED (grams)	WEEK 1 FRI (grams)	WEEK 2 MON (grams)	WEEK 2 WED (grams)	WEEK 2 FRI (grams)
	16.4095	16.4091	16.4100	16.4097	16.4080	16.4087
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	0.0004	+ 0.0005	+ 0.0002	0.0015	**0.0008 (FINAL)**

REPLICATE #2	INITIAL WEIGHT	WEEK 1 WED	WEEK 1 FRI	WEEK 2 MON	WEEK 2 WED	WEEK 2 FRI (FINAL WEIGHT)
	16.3813	16.3811	16.3820	16.3817	16.3805	16.3808
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	0.0002	+ 0.0007	+ 0.0004	0.0008	**0.0005 (FINAL)**

REPLICATE #3	INITIAL WEIGHT	WEEK 1 WED	WEEK 1 FRI	WEEK 2 MON	WEEK 2 WED	WEEK 2 FRI (FINAL WEIGHT)
	16.3604	16.3600	16.3609	16.3605	16.3589	16.3593
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	0.0004	+ 0.0005	+ 0.0001	+ 0.0015	**0.0011 (FINAL)**

SUMMARY:

	REPLICATE #	Weight Change (g)	Average Weight Change	
WEIGHT CHANGE	1	**0.0008**	**0.03mg/cm^2 (0.0008 g)**	**Informational**
	2	**0.0005**		
	3	**0.0011**		

AIR6130A: A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm^2 may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Respectfully submitted,

Jeff Nottebaum, SMI Inc.
Director

Rae-anne Nottebaum, SMI Inc.
Chemist

SMI, Inc.

12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Elffel Group SAS France

Date: 09-May-2019

SMI/REF: 1902-482$_{R4}$

Product: **ECOWAY SF** *(received 07-Feb-2019)*

MANUFACTURER – HUBEI LITAI ECO-TECHNOLOGIES CO., LTD
Chemical parks, Economic development zone
Luotian county, Hubei, 438600 China
TEL: 86 713 5101319 FAX: 86 713 5101319

Distributed on North America Market by: Nachurs Alpine Solutions, LLC.
421 Leader Street
Marion, OH USA, 43302

Dilution: Per specification

Partial testing in accordance with:
AMS 1431E
SOLID RUNWAY DEICING/ANTI-ICING PRODUCT

3.1	Material	
3.1.1	Environmental Information	
3.1.1.1	Biochemical Oxygen Demand	Informational
3.1.1.2	Chemical Oxygen Demand	Informational
3.1.1.3	Percent Biodegradation	Informational
3.1.1.4	Aquatic Toxicity	Informational
3.1.2	Trace Contaminants	Informational
3.1.3	Water Content	Informational
3.1.4	Freezing Point	Informational
3.1.5	Appearance	Conforms
3.2	PHYSICAL PROPERTIES	
3.2.1	pH	Informational
3.2.2	Flash Point	Conforms
3.2.3	Chloride Content	Conforms
3.2.4	Storage Stability	Not performed
3.2.5	Effect on Transparent Plastics	Conforms
3.2.6	Effect on Painted Surfaces	Conforms
3.2.7	Effect on Unpainted Surfaces	Conforms
3.2.8	Effect on Runway Pavements	
3.2.8.1	Runway Concrete Surface Scaling Resistance	Conforms
3.2.8.2	Asphalt Concrete Degradation Resistance	[1]Not performed
3.2.9	Effect on Aircraft Metals:	
3.2.9.1	Sandwich Corrosion	Conforms
3.2.9.2	Total Immersion Corrosion	Conforms
3.2.9.3	Low Embrittling Cadmium Plate	Conforms
3.2.9.3.1	Cyclic Immersion Corrosion of Cadmium Plate	Informational
3.2.9.4	Hydrogen Embrittlement	Conforms
3.2.9.5	Stress Corrosion Resistance	
	AMS 4911	Conforms
	AMS 4916	Informational

[1]*Testing required for deicer /anti-icer products used in Europe. This test is not performed by SMI.*

3.2 PROPERTIES *(continued)*

3.2.10 Performance

Ice Melting Effectiveness	Informational
Ice Undercutting Effectiveness	Informational
Ice Penetration Effectiveness	Informational

3.2.11 Effect on Carbon-Brake Systems — [2]Not performed

[2] *This test is not performed by SMI.*

Respectfully submitted,

Patricia D. Viani, SMI Inc.

3.1 Material: The composition of the product may contain additives, such as corrosion inhibitors, coating agents, etc., as required to produce a product meeting the requirements of this specification.

3.1.1 Environmental Information: Product shall be tested in accordance with APHA "Standard Methods for Examination of Water and Waste Water". The manufacturer shall provide not less than the following information:

3.1.1.1 Biochemical Oxygen Demand (BOD) of the product for 5-, 15-, and 20-day incubation periods. The test solutions shall be incubated at 68°F (20°C).

5 day BOD: < 0.01 kg O_2/kg solid
15 day BOD: < 0.01 kg O_2/kg solid
20 day BOD: < 0.01 kg O_2/kg solid

Result Informational

3.1.1.2 Total Oxygen Demand (TOD) or Chemical Oxygen Demand (COD) of the product, expressed in kilograms of oxygen per kilograms of product.

COD: 0.28 kg O_2/kg solid

Result Informational

3.1.1.3 Percent biodegradation of product for 5-, 15-, and 20 day incubation periods. Percent biodegradation can be approximated by dividing BODx100 by either TOD or COD.

5 day = ([< 0.01 x 100] / 0.28) = 3%
15 day = ([< 0.01 x 100] / 0.28) = 3%
20 day = ([< 0.01 x 100] / 0.28) = 3%

Result Informational

3.1.1.4 Aquatic Toxicity: Product shall be tested in accordance with EPA (40 Code of Federal Regulations (CFR) Parts 797.1300 and 797.1400) or OECD (Organization for Economic Cooperation and Development Guidelines for Testing of Chemicals, Methods 202 and 203) procedures using test species required by regulatory agencies for permitted discharges. Examples include: fathead minnows, daphnia magna and rainbow trout. The LC50 concentration, the highest concentration at which 50% of the test species survive, shall be given in milligrams per liter.

EPA 40 CFR 797.1300 DAPHNID ACUTE TOXICITY TEST
Daphnia magna, static system
48 hour LC_{50}: 2,025 mg/L

EPA 40 CFR 797.1400 FISH ACUTE TOXICITY TEST
Pimephales promelas, static system
96 hour LC_{50}: 4,250 mg/L

Result Informational

3.1.2 Trace Contaminants: Report the presence, in percentage by weight, of sulfur, halogens, phosphate, nitrate, and heavy metals (lead, chromium, cadmium, and mercury).

	ppm	%
Sulfur	***72***	***0.0072***
Halogens	***354***	***0.0354***
Phosphorus (as P_2O_5)	***598***	***0.0598***
Nitrate (as NO_3)		
Heavy Metals:		
Lead (Pb)	***< 1***	***< 0.0001***
Chromium (Cr)	***< 1***	***< 0.0001***
Cadmium (Cd)	***< 1***	***< 0.0001***
Mercury (Hg)	***< 1***	***< 0.0001***

Result Informational

3.1.3 Vendor shall report the product chemical analysis, determined in accordance with a recognized method acceptable to purchaser; and total water content shall be determined in accordance with ASTM E203.

Water Content: 0.5%

Result Informational

3.1.4 Vendor shall provide a phase diagram relating product dilution to freezing point. Delivered product shall be within +7°F (+4°C) of the preproduction value.

Freezing point (5% solution): - 2°C
Freezing point (10% solution): - 4°C
Freezing point (15% solution): - 7°C

Result Informational

3.1.5 Appearance: The product, as received by purchaser, shall be uniform, free-flowing, and free from foreign material detrimental to usage of the product.

Compound is uniform and free from foreign material.

Result Conforms

3.2 Physical Properties: The product, as supplied by vendor, shall conform to the following requirements: tests shall be performed in accordance with specified test on the product as delivered by vendor, unless otherwise specified herein.

3.2.1 pH: The product, diluted with ASTM D1193, Type IV water; to 15% by weight of solids taking into account water contained in the product, shall be within ±0.5 of the preproduction value established in 4.2.3, determined in accordance with ASTM E70.

15%: pH = 10.3

Result Informational

3.2.2 Flash Point: The product on a dry basis shall be not lower than 200°F (93°C), determined in accordance with ASTM D56.

As received (dry basis): No flash to 212°F

Result Conforms

3.2.3 Chloride Content: The level of soluble chloride on a dry basis shall not exceed 250 ppm, determined in accordance with APHA Standard Methods for the Examination of Water and Waste Water, Method 4500-CL or equivalent.

As received (dry basis): Chloride content = 246 ppm

Result Conforms

3.2.4 Storage Stability: The product, when stored in a closed container for at least 1 year in accordance with ASTM F1104 shall not deliquesce or otherwise deteriorate.

Result Not performed

3.2.5 Effect on Transparent Plastics:

3.2.5.1 The product, diluted with ASTM D1193, Type IV, water to 15% by weight of solids taking into account water contained in the product shall not craze, stain or discolor Type C stretched acrylic plastic conforming to MIL-PRF-25690, determined in accordance with ASTM F484.

15%: Type C – no crazing, staining or discoloration

Result Conforms

3.2.5 Effect on Transparent Plastics (continued):

3.2.5.2 The product, diluted with ASTM D1193, Type IV, water to 15% by weight of solids taking into account water contained in the product, shall not craze, stain, or discolor AMS-P-83310 polycarbonate plastic, determined in accordance with ASTM F484, except that the specimens shall be stressed for 30 minutes ±2 minutes to an outer fiber stress of 2000 psi (13.8 Mpa).

15%: MIL-P-83310 – no crazing, staining or discoloration

Result Conforms

3.2.6 Effect on Painted Surfaces: Product, diluted with ASTM D1193, Type IV, water to 15% by weight of solids taking into account water contained in the product, shall neither decrease the paint film hardness by more than two pencil hardness levels nor shall it produce any streaking, discoloration, or blistering of the paint film, determined in accordance with ASTM F502.

15%: No hardness change; no streaking, discoloration or blistering

Result Conforms

3.2.7 Effect on Unpainted Surfaces: Product, diluted with ASTM D1193, Type IV, water to 15% by weight of solids taking into account water contained in the product, shall neither produce streaking nor leave any stains which require polishing to remove, determined in accordance with ASTM F485.

15%: No streaking, no staining

Result Conforms

3.2.8 Effect on Runway Pavements

3.2.8.1 Runway Concrete Surface Scaling Resistance: The condition of the runway concrete surface shall have a rating not greater than 1 for 50 freeze-thaw cycles, determined in accordance with ASTM C672, except that concrete shall:

a. Be air-entrained with an air content as specified in ASTM C672.

b. Have a minimum cement content of 510 lb/yd^3 ±10 lb/yd^3 (302 kg/m^3 ±6 kg/m^3).

c. Have a slump, 1.5 inches ± 0.5 inch (38 mm ± 13 mm).

A 25% by volume solution of the deicing/anti-icing product as supplied by the manufacturer in commercial concentration in tap water shall be substituted for calcium chloride. Performing more than one freeze-thaw cycle per day is acceptable.

Note: a 25% by weight saturated solution was utilized for testing

Rating after 50 cycles: 1

Result Conforms

3.2.8.2 Asphalt Concrete Degradation Resistance (Appendix A, valid for runway deicing/anti-icing products used in Europe) Result [1]Not performed by SMI

[1]*Testing required for deicer/anti-icer products used in Europe. This test is not performed by SMI.*

3.2.9 Effect on Aircraft Metals: Product, diluted with ASTM D1193, Type IV, water to 5% and 15% by weight solids taking into account water contained in the product, shall meet the following requirements:

3.2.9.1 Sandwich Corrosion: Specimens, after testing in accordance with ASTM F1110, shall not have a rating greater (worse) than 1.

	2024-T3 Bare Anodized	2024-T3 Alclad	7075-T6 Bare Anodized	7075-T6 Alclad
5 PERCENT	1	1	1	1
15 PERCENT	1	1	1	1
CONTROL	1	1	1	1

Result Conforms

3.2.9.2 Total Immersion Corrosion: The product, tested in accordance with ASTM F483, except that panels shall be AMS4376 tested for 24 hours, shall neither cause corrosion of test panels nor a weight change of any test panel greater than shown in Table I.

ALLOY	WEIGHT LOSS mg/cm^2/24hrs		
	Allowed	5 %	15 %
AMS 4037 Aluminum anodized per AMS 2470	0.3	**0.01**	**0.02**
AMS 4041 Aluminum	0.3	**0.01**	**0.02**
AMS 4049 Aluminum	0.3	**0.01**	**0.02**
AMS 4376 Magnesium, dichromate (AMS 2475)	0.2	**0.11**	**0.13**
AMS 4911 Titanium	0.1	**0.04**	**0.03**
AMS 5045 Carbon Steel	0.8	**0.12***	**< 0.01**

"+" indicates weight gain
****Discoloration***

Result Conforms

3.2.9.3 Low-Embrittling Cadmium Plate: Test panels, coated with low-embrittling cadmium plate, shall not show a weight change greater than 0.3 mg/cm² per 24 hours, determined in accordance with ASTM F1111.

5%: < 0.01 mg/cm²/24 hrs
15%: < 0.01 mg/cm²/24 hrs

Result Conforms

3.2.9.3.1 The product shall be tested for cyclic immersion corrosion of cadmium plate in accordance with AIR6130 and the results reported as specified in Section 6 of AIR6130.

Cadmium Plate Cyclic Corrosion Test

Initial pH of solution: 10.3 **Final pH of solution:** 9.7

Note: Solution tested = 15% w/w

	REPLICATE #	Weight (g)		
		Initial	Final	**Weight change**
PANEL WEIGHTS	1	8.6373	8.6338	**0.0035**
	2	8.4272	8.4237	**0.0035**
	3	8.4736	8.4699	**0.0037**
	Average weight change = 0.0036			

AIR6130A: A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm² may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Average weight change = 0.13 mg/cm²

Result: ***Informational**

3.2.9.4 Hydrogen Embrittlement: The diluted product shall be non-embrittling, determined in accordance with ASTM F 519, Type 1a, 1c, or 2a specimens, cadmium plated in accordance with MIL-STD-870, Class 1 Type I. Type 1a and Type 1c specimens shall be loaded to 45% of the predetermined notch fracture strength and the 2a specimens loaded to 80% of the yield strength. The entire 2a stressed specimen or just the notched area of the 1a and 1c stressed specimen shall be immersed continuously in the solution under test for 150 hours at a temperature of 77°F ± 9°F (25°C ± 5°C)

Specimens: Four Type 1c, cadmium plated per MIL-STD-870 Class 1 Type I.
Load: 45%, immersed for duration, 150 hours, temperature 25°C ± 5°C.

Type 1c @ 5%: ***No failures occurred within 150 hours.***
Type 1c @ 15%: ***No failures occurred within 150 hours.***

Result Conforms

3.2.9.5 Stress-Corrosion Resistance: The diluted product shall not cause cracks in AMS4911 titanium alloy specimens, determined in accordance with ASTM F945, Method A.

	AMS 4911
CONTROL, BLANK:	No cracking evident
CONTROL, 3% ppm SALT:	Cracking evident
5%	**No cracking evident**
15%	**No cracking evident**

Result Conforms

3.2.9.5.1 Stress Corrosion Resistance: The diluted product shall be tested in accordance with ASTM F945, Method A using AMS4916 specimens. The results obtained from AMS 4916 shall be reported for informational purposes only.

	AMS 4916
CONTROL, BLANK:	No cracking evident
CONTROL, 100 ppm SALT:	Cracking evident
5%	**Cracking evident**
15%	**Cracking evident**

Result Informational

3.2.10 Performance: The product, used in accordance with manufacturer's recommendation, shall remove accumulated frozen deposits of frost and ice from aircraft maneuvering areas, such as airport aprons, runways and taxiways. The product shall be tested in accordance with AIR6170 for ice melting effectiveness, with AIR6172 for ice undercutting effectiveness and with AIR6211 for ice penetration effectiveness. Acceptance criteria shall be agreed upon by purchaser and vendor

SAE AIR6170 (2012-01)

Ice Melting Test Method for Runways and Taxiways Deicing / Anti-icing Chemicals

See separate report for complete data results

ICE MELTING TEST RESULTS

As received (solid):

Test Temperature: -10°C (+14°F)			
Time (minutes)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity (m_{im}/m_d)
5	5.00	4.4	0.9
10	5.00	6.2	1.2
30	5.00	8.4	1.7

Test Temperature: -2°C (+28°F)			
Time (minutes)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity (m_{im}/m_d)
5	5.00	7.8	1.6
10	5.00	9.8	2.0
30	5.00	14.1	2.8

SAE AIR6170 (2012-01)

Ice Melting Test Method for Runways and Taxiways Deicing/Anti-icing Chemicals

See separate report for complete data results

ICE MELTING TEST RESULTS

25% w/w:

Test Temperature: -10°C (+14°F)			
Time (minutes)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity* (m_{im}/m_d)
5	5.00	2.3	0.5
10	5.00	3.1	0.6
30	5.00	4.2	0.8

Test Temperature: -2°C (+28°F)			
Time (minutes)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity* (m_{im}/m_d)
5	5.00	7.0	1.4
10	5.00	8.7	1.7
30	5.00	10.0	2.0

3.2.12 Performance (continued):

SAE AIR6172

Ice Undercutting Test Method for Runways and Taxiways Deicing/Anti-icing Chemicals

See separate report for complete data results

ICE UNDERCUTTING TEST RESULTS

25% w/w:

Test Temperature: -10°C (+14°F)				
Time (minutes)	Mean Undercut Cavity Diameter (mm)	Total Area IU$_e$ (mm^2)	Area Original Cavity A$_s$ (mm^2)	Ice Undercutting IU (mm^2)
5	4.5	16.6	7.07	9.5
10	4.8	18.1	7.07	11.0
30	4.9	19.6	7.07	12.5

Test Temperature: -2°C (+28°F)				
Time (minutes)	Mean Undercut Cavity Diameter (mm)	Total Area IU$_e$ (mm^2)	Area Original Cavity A$_s$ (mm^2)	Ice Undercutting IU (mm^2)
5	8.9	62.7	7.07	55.7
10	9.8	75.4	7.07	68.3
30	10.7	89.5	7.07	82.5

3.2.1 Performance (continued): **SAE AIR6211**

Ice Penetration test Method for Runways and Taxiways Deicing/Anti-icing Chemicals

See separate report for complete data results

ICE PENETRATION TEST RESULTS

25% w/w:

Test Temperature -10°C (+14°F):		
Time (minutes)	Penetration Depth Average (mm)	Standard Deviation
5	**1.0 mm**	**< 0.5**
10	**1.0 mm**	**< 0.5**
30	**2.0 mm**	**< 0.5**

Test Temperature -2°C (+28°F):		
Time (minutes)	Penetration Depth Average (mm)	Standard Deviation
5	**1.5 mm**	**< 0.5**
10	**2.0 mm**	**< 0.5**
30	**4.0 mm**	**< 0.5**

3.2.11 Effect on Carbon-Brake Systems: The product shall be tested for catalytic oxidation of carbon in accordance with AIR5567 and the results shall be reported as shown in section 4.2 of AIR5567. The results shall be reported for informational purposes only. Per AIR5567 the lower the percentage weight loss, the lower the risk of the carbon-carbon heat sink being damaged through catalytic oxidation

Result [2]Not performed

[2] *This test is not performed by SMI.*

SMI, Inc.

12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Eiffel Group SAS
Park Nord, Les Pleiades
Metz Tessy 74340
France

Date: 30-May-2017

SMI/REF: 1704-844

Product: **ECOWAY SF (FY-01)** *(received 13-Apr-2017)*
Manufacturer: HUBEI LITAI ECO-TECHNOLOGIES CO., LTD
Chemical Parks, Economic development zone
Luotian county,
Hubei, 438600 China
Telephone: 86 713 5072336 Fax: 86 713 5072336
Distributed in North America Markey by: Nachurs Alpine Solutions, LLC 421 Leader Street
Marion, OH USA 43302
Dilution: Per specification

AMS 1431D
COMPOUND, SOLID RUNWAY AND TAXIWAY DEICING/ANTI-ICING
Periodic Tests

4.2.2	Periodic Tests	
3.2.5	Effect on Transparent Plastics	Conforms
3.2.6	Effect on Painted Surfaces	Conforms
3.2.7	Effect on Unpainted Surfaces	Conforms
3.2.8	Effect on Runway Pavements	
3.2.8.1	Runway Concrete Surface Scaling Resistance	Conforms
3.2.8.2	Asphalt Concrete Degradation Resistance	[1]Not performed by SMI
3.2.9	Effect on Aircraft Metals:	
	3.2.9.1 Sandwich Corrosion	Conforms
	3.2.9.2 Total Immersion Corrosion	Conforms
	3.2.9.3 Low Embrittling Cadmium Plate	Conforms
	3.2.9.3.1 Cyclic Immersion Corrosion of Cadmium Plate	Informational
	3.2.9.4 Hydrogen Embrittlement	Conforms
	3.2.9.5 Stress Corrosion Resistance	
	AMS 4911	Conforms
	AMS 4916	Informational

[1]*Testing required for deicer /anti-icer products used in Europe. This test is not performed by SMI.*

Respectfully submitted,

Patricia D. Viani, SMI Inc.

Client: Eiffel Group SAS Date: 30-May-2017
Product: **ECOWAY SF (FY-01)** SMI/REF: 1704-844
Manufacturer: HUBEI LITAI ECO-TECHNOLOGIES CO., LTD
Chemical Parks, Economic development zone
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Marion, OH USA 43302
Dilution: Per specification

4.2.2 Periodic Tests: Effect on transparent plastics (3.2.5), effect on painted surface (3.2.6), effect on unpainted surfaces (3.2.7), runway concrete scaling resistance (3.2.8), and effect on aircraft metals (3.2.9) are periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser, but in no case less than once every two years.

3.2.5 Effect on Transparent Plastics:

3.2.5.1 The compound, diluted with ASTM D 1193, Type IV, water to 15% by weight of solids taking into account water contained in the compound shall not craze, stain or discolor Type C stretched acrylic plastic conforming to MIL-P-23690, determined in accordance with ASTM F 484

Result Conforms

3.2.5.1 The compound, diluted with ASTM D 1193, Type IV, water to 15% by weight of solids taking into account water contained in the compound, shall not craze, stain, or discolor MIL-P-83310 polycarbonate plastic, determined in accordance with ASTM F 484, except that the specimens shall be stressed for 30 minutes ± 2 to an outer fiber stress 13.8 Mpa (2000 psi).

Result Conforms

3.2.6 Effect on Painted Surfaces: Compound, diluted with ASTM D 1193, Type IV, water to 15% by weight of solids taking into account water contained in the compound, shall neither decrease the paint film hardness by more than two pencil hardness levels nor shall it produce any streaking, discoloration, or blistering of the paint film, determined in accordance with ASTM F 502.

Result Conforms

3.2.7 Effect on Unpainted Surfaces: Compound, diluted with ASTM D 1193, Type IV, water to 15% by weight of solids taking into account water contained in the compound, shall neither produce streaking nor leave any stains which require polishing to remove, determined in accordance with ASTM F 485.

Result Conforms

3.2.8 Effect on Runway Pavements

3.2.8.1 Runway Concrete Surface Scaling Resistance The condition of the runway concrete surface shall have a rating not greater than 1 for 50 freeze-thaw cycles, determined in accordance with ASTM C 672, except that concrete shall

* Be air-entrained with an air content as specified in ASTM C 672. Have a minimum cement content of 302 kg/m^3 ± 6 (510 lb/yd^3 ± 10). Have a slump, 38 mm ± 13 (1.5 inches ± 0.5).

* A 25% by volume solution of the deicer/anti-icer fluid as supplied by the manufacturer in commercial concentration in tap water shall be substituted for calcium chloride. Performing more than one freeze-thaw cycle per day is acceptable.
Rating: 1

Result Conforms

3.2.8.2 Asphalt Concrete Degradation Resistance (Appendix A, valid for deicer/anti-icer products used in Europe)

Result [1]Not performed by SMI

[1]*Testing required for deicer /anti-icer products used in Europe. This test is not performed by SMI.*

3.2.9 Effect on Aircraft Metals: Compound, diluted with ASTM D 1193, Type IV, water to 5% and 15% by weight solids taking into account water contained in the compound, shall meet the following requirements:

3.2.9.1 Sandwich Corrosion: Specimens, after testing in accordance with ASTM F 1110, shall show corrosion not worse than control panels run using ASTM D 1193, Type IV water.

	2024-T3 Bare Anodized	2024-T3 Alclad	7075-T6 Bare Anodized	7075-T6 Alclad
5 percent	1	1	1	1
15 percent	1	1	1	1
Control	1	1	1	1

Result Conforms

3.2.9.2 Total Immersion Corrosion: The compound, tested in accordance with ASTM F 483, except that panels shall be AMS 4376 tested for 24 hours, shall neither cause corrosion of test panels nor a weight change of any test panel greater than shown in Table I.

Table I

ALLOY	WEIGHT LOSS mg/cm²/24hrs		
	Allowed	5%	15 %
AMS 4037 Aluminum anodized per AMS 2470	0.3	**0.04**	**+ 0.04**
AMS 4041 Aluminum	0.3	**< 0.01**	**< 0.01**
AMS 4049 Aluminum	0.3	**+ 0.01**	**0.03**
AMS 4376 Magnesium, dichromate (AMS 2475)	0.2	**0.16**	**0.19**
AMS 4911 Titanium	0.1	**< 0.01**	**0.02**
AMS 5045 Carbon Steel	0.8	**0.15**	**0.07**

Result Conforms

3.2.9.3 Low-Embrittling Cadmium Plate: Test panels, coated with low-embrittling cadmium plate, shall not show a weight change greater than 0.3 mg/cm² 24 hours, determined in accordance with ASTM F 1111.

5%: < 0.01 mg/cm²/24hrs
15%: < 0.01 mg/cm²/24hrs

Result Conforms

Client: Eiffel Group SAS Date: 30-May-2017
Product: **ECOWAY SF (FY-01)** SMI/REF: 1704-844
Manufacturer: HUBEI LITAI ECO-TECHNOLOGIES CO., LTD
Chemical Parks, Economic development zone
Luotian county,
Hubei, 438600 China
Telephone: 86 713 5072336 Fax: 86 713 5072336
Distributed in North America Markey by: Nachurs Alpine Solutions, LLC 421 Leader Street
Marion, OH USA 43302
Dilution: Per specification
AMS 1431D Periodic Tests Page 5 of 6

3.2.9.3.1 The compound shall be tested for cyclic immersion corrosion of cadmium plate in accordance with AIR6130 and the results reported as specified in Section 4 of AIR6130A.

Cadmium Plate Cyclic Corrosion Test

Initial pH of solution: 10.3 **Final pH of solution:** 10.0

Note: Solution tested = 15% w/w

	REPLICATE #	Weight (g)		
		Initial	Final	Weight change
PANEL WEIGHTS	1	12.7414	12.7368	**0.0046**
	2	12.7506	12.7462	**0.0044**
	3	12.8466	12.8417	**0.0049**
	Average weight change = 0.0046			

AIR6130A: A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm² may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Average weight change = 0.16 mg/cm²

Result: ***Informational**

see page 3 for complete data tables

3.2.9.4 Hydrogen Embrittlement: The diluted compound shall be non-embrittling, determined in accordance with ASTM F 519, Type 1a, 1c, or 2a.

Specimens: Type 1c, cadmium-plated per MIL-STD-870 Type I Class 1.
Parameters: 45% load, notch immersed in fluid for duration (150 hours)
Temperature: 24°C (75 °F)

5%: No failures within 150 hours.
15%: No failures within 150 hours.

Result Conforms

3.2.9.5 Stress-Corrosion Resistance: The diluted compound shall not cause cracks in AMS 4911 Titanium alloy, determined in accordance with ASTM F 945, Method A.

AMS 4911: ***5%: No cracking evident.***
15%: No cracking evident.

Result Conforms

3.2.9.5.1 Stress Corrosion Resistance: The diluted compound shall be tested in accordance with ASTM F 945, Method A using AMS 4916 specimens. The results obtained from AMS 4916 shall be reported for informational purposes only.

AMS 4916: ***5 %: Cracking evident.***
15%: Cracking evident.

Result Informational

SMI, Inc.

12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Eiffel Group SAS
Park Nord, Les Pleiades
Metz Tessy 74340
France

Date: 30-May-2017

SMI/REF: 1704-844

Product: **ECOWAY SF (FY-01)** *(received 13-Apr-2017)*
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Distributed in North America Markey by: Nachurs Alpine Solutions, LLC 421 Leader Street
Marion, OH USA 43302
Dilution: 15% w/w

Testing in accordance with
SAE AIR6130A
CADMIUM PLATE CYCLIC CORROSION TEST (2017-05)

Cadmium Plate Cyclic Corrosion Test

Initial pH of solution: 10.3 **Final pH of solution:** 10.0

	REPLICATE #	Weight (g)		
		Initial	Final	Weight change
PANEL WEIGHTS	1	12.7414	12.7368	**0.0046**
	2	12.7506	12.7462	**0.0044**
	3	12.8466	12.8417	**0.0049**
	Average weight change = 0.0046			

AIR6130A: A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm² may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Average weight change = 0.16 mg/cm²

Result: ***Informational**

see page 5 for complete data tables

SAE AIR6130A, Cadmium Plate Cyclic Corrosion Test

Cadmium Plate Cyclic Corrosion Test

AMS 1431 Compound, Solid Runway and Taxiway Deicing/Anti-Icing

AMS 1435 Fluid, Generic, Deicing/Anti-Icing Runways and Taxiways

3 Test Specimen Preparation

Substrate: 4130 Steel

Size: 1" x 2" x 0.04" x 0.048" (25.40 mm x 50.80 mm x 1.22 mm)

Finish: Cadmium plating in accordance with AMS QQ-P-416., Type I Class I, (0.0005"- 0.0008" inch plating per side).

There shall be no supplementary chromate treatment.

a. Three cadmium plated test specimens shall be used for each fluid to be tested

b. Sample of AMS1435 Runway Deicing Fluid shall be tested as received from the supplier.

c. Sample of AMS1431 Runway Deicing Solid Compound shall be tested in a diluted form – diluted with ASTM D 1193, Type IV, water to 15% by weight solids.

d. Procure soft flexible brushes for test (paintbrush type, 1.5 inches (3.8 cm) wide, with synthetic bristles approx 1.5 inches (3.8 cm) long

4 Environmental Exposure Preparation

Preset humidity chamber to 90 ± 5°F and 30 ± 5% humidity. Affix plastic ties or other inert material as hangers (hangers shall be made from an inert material that will not react with the sample; plastic, plastic coated metals, monofilament fishing line or stainless steels are acceptable) in the chamber to hold specimens during the environmental exposure period.

5 Test Procedure

a. Measure and record pH of solution(s) to be tested (record to one decimal place).

b. Solvent clean cadmium plated specimens with acetone; wipe gently with an acetone-soaked wiper. Without allowing the acetone to evaporate, gently remove excess acetone with a dry wiper. Allow samples to dry for 10 minutes in a desiccator. Do not accelerate drying of samples with oven drying.

Note: Care should be taken not to touch the cleaned specimens with bare hands; use tweezers, clean gloves or equivalent tool.

c. Weigh and record initial specimen weight in grams. Record all weights throughout the test to the nearest 0.0001 gram. Return specimens to desiccator until Day 3.

SAE AIR6130A, Cadmium Plate Cyclic Corrosion Test

Monday	Tuesday	Wednesday	Thursday	Friday
				Friday Start – Day 0
Day 3	Day 4	Day 5	Day 6	Day 7
Day 10	Day 11	Day 12	Day 13	Day 14

d. FRIDAY START - Fill glass containers with solution to be tested, one container for each coupon. Refer to 3b or 3c for solution being used (consider filling one extra container to have extra conditioned fluid available). Container shall be large enough so the solution completely covers the specimens. Cover the container with loose fitting cover and place filled container into the humidity chamber to environmentally condition the solution for a minimum of 24 ± 1 hours before the start of test, up to 72 ± 1 hours.

e. Day 3 – Remove the solution container from the humidity chamber and the specimens from the desiccator. Place specimens in container oriented such that the specimens are not resting flush against the bottom or side of the container. Place the container with cover back into the humidity chamber for 24 ± 1 hours.

f. Day 4 - After the 24 hour immersion in the solution, remove the specimens, but do not rinse them. Place them into the humidity chamber by hanging for 22.5 ± 0.5 hours. Hangers shall be made from an inert material that will not react with the sample (such as plastic, plastic coated metals and stainless steels are acceptable).

g. Day 5 /Day 10 /Day 12 – Remove the specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimen surface with the soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

Immediately after weighing the specimens, return them to their test solution container to soak for 90 ± 5 minutes in the humidity chamber. Specimens shall be oriented such that they not resting flush against the bottom or side of the container. After 90 minutes, remove the specimens but do not rinse them. Place them in the humidity chamber by hanging for 22.5 ± 0.5 hours, maintaining the specimen in the initial orientation throughout the cycle.

h. Day 6 /Day 11 /Day 13 - Return the specimen to the test solution container to soak for 90 ± 5 minutes in the humidity chamber. Specimens shall be oriented such that it is not resting flush against the bottom or side of the container. After 90 minutes, remove the specimen but do not rinse it. Replace it in the humidity chamber by hanging for 22.5 ± 0.5 hours, maintaining the specimen in the initial orientation throughout the cycle.

i. Day 7 – Remove specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimens surface with a soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

Immediately after weighing the specimens, return them to their test solution container in the humidity chamber. Specimens shall be oriented such that they are not resting flush against the bottom or side of the container. Specimens shall be left in the test solution container in the humidity chamber from DAY 7 to DAY 10.

j. Day 14 – Remove specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimen surface with a soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

k. Measure and record final pH of solution (record to one decimal place).

l. Report the initial weight of the specimen, the weight after each periodic weighing, and the final weight. Calculate and report the value of the cumulative weight lost from each specimen after each periodic weighing procedure.

Test Data:

pH at start of test: **10.3**
pH at end of test: **10.0**

	REPLICATE #	Weight (g)
INITIAL PANEL WEIGHTS	1	12.7414
	2	12.7506
	3	12.8466

	REPLICATE #	Weight (g)		
		Monday	Wednesday	Friday
WEEK #1 PANEL WEIGHTS	1	----	12.7386	12.7404
	2	----	12.7476	12.7495
	3	----	12.8433	12.8453

	REPLICATE #	Weight (g)		
		Monday	Wednesday	Friday
WEEK #2 PANEL WEIGHTS	1	12.7396	12.7360	12.7368
	2	12.7489	12.7455	12.7462
	3	12.8444	12.8409	12.8417

Client: Eiffel Group SAS
Product: **ECOWAY SF (FY-01)**
Manufacturer: HUBEI LITAI ECO-TECHNOLOGIES CO., LTD
Chemical Parks, Economic development zone
Luotian county,
Hubei, 438600 China
Telephone: 86 713 5072336 Fax: 86 713 5072336
Distributed in North America Markey by: Nachurs Alpine Solutions, LLC 421 Leader Street
Marion, OH USA 43302

Date: 30-May-2017
SMI/REF: 1704-844

Dilution: 15% w/w

SAE AIR6130A, Cadmium Plate Cyclic Corrosion Test

TEST DATA (continued)

REPLICATE #1	INITIAL WEIGHT (grams)	WEEK 1 WED (grams)	WEEK 1 FRI (grams)	WEEK 2 MON (grams)	WEEK 2 WED (grams)	WEEK 2 FRI (grams)
	12.7414	12.7386	12.7404	12.7396	12.7360	12.7368
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	0.0028	0.0010	0.0018	0.0054	**0.0046 (FINAL)**

REPLICATE #2	INITIAL WEIGHT	WEEK 1 WED	WEEK 1 FRI	WEEK 2 MON	WEEK 2 WED	WEEK 2 FRI (FINAL WEIGHT)
	12.7506	12.7476	12.7495	12.7489	12.7455	12.7462
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	0.0030	0.0011	0.0017	0.0051	**0.0044 (FINAL)**

REPLICATE #3	INITIAL WEIGHT	WEEK 1 WED	WEEK 1 FRI	WEEK 2 MON	WEEK 2 WED	WEEK 2 FRI (FINAL WEIGHT)
	12.8466	12.8433	12.8453	12.8444	12.8409	12.8417
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	0.0033	0.0013	0.0022	0.0057	**0.0049 (FINAL)**

SUMMARY:

	REPLICATE #	Weight Change (g)	Average Weight Change	
WEIGHT CHANGE	1	**0.0046**	**0.16mg/cm^2 (0.0046 g)**	***Informational**
	2	**0.0044**		
	3	**0.0049**		

AIR6130A: A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm^2 may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Respectfully Submitted,

Patricia D. Viani, SMI Inc.

SMI, Inc.

12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Eiffel Group France SAS
Park Nord, Les Pleiades
Metz Tessy 74370
France

Date: 11-Mar-2016

SMI/REF: $1511\text{-}368_R$
Report revised product name change

Product: **ECOWAY (FCY-01B)** *(received 12-Nov-2015)*
HUBEI LITAI ECO-TECHNOLOGIES CO., LTD
Chemical parks, Economic development zone
Luotian county, Hubei 438600 China

Dilution: Per specification

The Latest Edition of SAE AMS 1431D
COMPOUND, SOLID RUNWAY AND TAXIWAY DEICING/ANTI-ICING

3.1	Material	
3.1.1	Environmental Information	
3.1.1.1	Biochemical Oxygen Demand	Informational
3.1.1.2	Chemical Oxygen Demand	Informational
3.1.1.3	Percent Biodegradation	Informational
3.1.1.4	Aquatic Toxicity	Informational
3.1.2	Trace Contaminants	Informational
3.1.3	Water Content	Informational
3.1.4	Freezing Point	Informational
3.1.5	Appearance	Conforms
3.2	PROPERTIES	
3.2.1	pH	Informational
3.2.2	Flash Point	Conforms
3.2.3	Chloride Content	Conforms
3.2.4	Storage Stability	Not performed
3.2.5	Effect on Transparent Plastics	Conforms
3.2.6	Effect on Painted Surfaces	Conforms
3.2.7	Effect on Unpainted Surfaces	Conforms
3.2.8	Effect on Runway Pavements	
3.2.8.1	Runway Concrete Surface Scaling Resistance	Conforms
3.2.8.2	Asphalt Concrete Degradation Resistance	[1]Not performed by SMI
3.2.9	Effect on Aircraft Metals:	
3.2.9.1	Sandwich Corrosion	Conforms
3.2.9.2	Total Immersion Corrosion	Conforms
3.2.9.3	Low Embrittling Cadmium Plate	Conforms
3.2.9.3.1	Cyclic Immersion Corrosion of Cadmium Plate	Informational
3.2.9.4	Hydrogen Embrittlement	Conforms
3.2.9.5	Stress Corrosion Resistance	
	AMS 4911	Conforms
	AMS 4916	Informational

[1]*Testing required for deicer /anti-icer products used in Europe. This test is not performed by SMI.*

3.2 PROPERTIES *(continued)*

3.2.10 Performance

Ice Melting Effectiveness	Informational
Ice Undercutting Effectiveness	Informational
Ice Penetration Effectiveness	Informational

3.2.11 Effect on Carbon-Brake Systems — [2]Not performed by SMI

[2] *This test is not performed by SMI.*

Respectfully submitted,

Patricia D. Viani, SMI Inc.

SMI, Inc.

12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Eiffel Group SAS
Park Nord, Les Pleiades
Metz Tessy 74370
France

Date: 28-Aug-2015

SMI/REF: 1506-976$_{R2}$
Report revised for product name change

Product: **ECOWAY SF** *(received 29-Jun-2015)*
Manufacturer: HUBEI LITAI ECO- TECHNOLOGIES Co., Ltd
Chemical parks, Economic development zone, Loutian county, Hubei, 438600 China
TEL: 86 713 5072336 FAX: 86 713 5072336
Distributed on North America Market by:
Nachurs Alpine Solutions, 421 Leader Street, Marion, OH USA, 43302

Dilution: Per specification

AMS 1431D
COMPOUND, SOLID RUNWAY AND TAXIWAY DEICING/ANTI-ICING
Periodic Tests

4.2.2	Periodic Tests	
3.2.5	Effect on Transparent Plastics	Conforms
3.2.6	Effect on Painted Surfaces	Conforms
3.2.7	Effect on Unpainted Surfaces	Conforms
3.2.8	Effect on Runway Pavements	
3.2.8.1	Runway Concrete Surface Scaling Resistance	Conforms
3.2.8.2	Asphalt Concrete Degradation Resistance	[1]Not performed by SMI
3.2.9	Effect on Aircraft Metals:	
	3.2.9.1 Sandwich Corrosion	Conforms
	3.2.9.2 Total Immersion Corrosion	Conforms
	3.2.9.3 Low Embrittling Cadmium Plate	Conforms
	3.2.9.3.1 Cyclic Immersion Corrosion of Cadmium Plate	Informational
	3.2.9.4 Hydrogen Embrittlement	Conforms
	3.2.9.5 Stress Corrosion Resistance	
	AMS 4911	Conforms
	AMS 4916	Informational

[1]*Testing required for deicer /anti-icer products used in Europe. This test is not performed by SMI.*

Respectfully submitted,

Patricia D. Viani, SMI Inc.

SMI, Inc.

12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Elffel Industry SARL
Park Nord, Les Pleiades
Metz Tessy 74370
France

Date: 06-Feb-2014
SMI/REF: 1311-177$_R$
Report revised for product /Co.name change

Product: **ECOWAY SF** *(received 15-Nov-2013)*
Distributed in North America Market by: Nachurs Alpine Solutions, 421 Leader St, Marion, OH USA 43302
Dilution: Per specification

AMS 1431D
COMPOUND, SOLID RUNWAY AND TAXIWAY DEICING/ANTI-ICING

3.1	Material	
3.1.1	Environmental Information	
3.1.1.1	Biochemical Oxygen Demand	Informational
3.1.1.2	Chemical Oxygen Demand	Informational
3.1.1.3	Percent Biodegradation	Informational
3.1.1.4	Aquatic Toxicity	Informational
3.1.2	Trace Contaminants	Informational
3.1.3	Water Content	Informational
3.1.4	Freezing Point	Informational
3.1.5	Appearance	Conforms
3.2	PROPERTIES	
3.2.1	pH	Informational
3.2.2	Flash Point	Conforms
3.2.3	Chloride Content	Conforms
3.2.4	Storage Stability	Not performed
3.2.5	Effect on Transparent Plastics	Conforms
3.2.6	Effect on Painted Surfaces	Conforms
3.2.7	Effect on Unpainted Surfaces	Conforms
3.2.8	Effect on Runway Pavements	
3.2.8.1	Runway Concrete Surface Scaling Resistance	Conforms
3.2.8.2	Asphalt Concrete Degradation Resistance	[1]Not performed by SMI
3.2.9	Effect on Aircraft Metals:	
3.2.9.1	Sandwich Corrosion	Conforms
3.2.9.2	Total Immersion Corrosion	Conforms
3.2.9.3	Low Embrittling Cadmium Plate	Conforms
3.2.9.3.1	Cyclic Immersion Corrosion of Cadmium Plate	Informational
3.2.9.4	Hydrogen Embrittlement	Conforms
3.2.9.5	Stress Corrosion Resistance	
	AMS 4911	Conforms
	AMS 4916	Informational

[1]*Testing required for deicer /anti-icer products used in Europe. This test is not performed by SMI.*

3.2 PROPERTIES *(continued)*

3.2.10 Performance

Ice Melting Effectiveness	Informational
Ice Undercutting Effectiveness	Informational
Ice Penetration Effectiveness	Informational

3.2.11 Effect on Carbon-Brake Systems — [2]Not performed by SMI

[2] *This test is not performed by SMI.*

Respectfully submitted,

Patricia D. Viani, SMI Inc.

AMS 1431D

3.1 Material:

3.1.1 Environmental Information: Compound shall be tested in accordance with APHA Standard Methods for Examination of Water and Waste Water. The manufacturer shall provide not less than the following information:

3.1.1.1 Biochemical Oxygen Demand (BOD) of the compound for 5, 15, and 20-day incubation periods. The test solutions shall be incubated at 20°C (68°F).

5 day BOD: 0.02 kg O_2/kg solid
15 day BOD: < 0.01 kg O_2/kg solid
20 day BOD: < 0.01 kg O_2/kg solid

Result Informational

3.1.1.2 Total Oxygen Demand (TOD) or Chemical Oxygen Demand (COD) of the compound, expressed in kilograms of oxygen per kilograms of compound.

COD: 0.34 kg O_2/kg solid

Result Informational

3.1.1.3 Percent biodegradation of compound for 5, 15, and 20 day incubation periods. Percent biodegradation can be approximated by dividing BODx100 by either TOD or COD.

5 day = (0.02 x 100) / 0.34) = 5.8%
15 day = (< 0.01 x 100) / 0.34) = < 3%
20 day = (< 0.01 x 100) / 0.34) = < 3%

Result Informational

3.1.1.4 Aquatic Toxicity: Formulated compound shall be tested in accordance with EPA (40 Code of Federal Regulations (CFR) Parts 797.1300 and 797.1400) or OECD (Organization for Economic Cooperation and Development Guidelines for Testing of Chemicals, Methods 202 and 203) procedures using test species required by regulatory agencies for permitted discharges. Examples include: fathead minnows, daphnia magna and rainbow trout. The LC_{50} concentration, the highest concentration at which 50% of the test species survive, shall be given in milligrams per liter.

EPA 40 CFR 797.1300 DAPHNID ACUTE TOXICITY TEST
Daphnia magna, static system
48 hour LC_{50}: 1,275 mg/l

EPA 40 CFR 797.1400 FISH ACUTE TOXICITY TEST
Pimephales promelas, static system
96 hour LC_{50}: 4,525 mg/l

Result Informational

3.1.2 Trace Contaminants: Report the presence, in percentage by weight, of sulfur, halogens, phosphate, nitrate, and heavy metals (lead, chromium, cadmium, and mercury). *Tested using a 15 % solution:*

Sulfur:	***7 ppm***	***(0.0007 %)***
Halogens:	***141 ppm***	***(0.0141 %)***
Phosphate (P as P_2O_5):	***243 ppm***	***(0.0243 %)***
Nitrate (as NO_3):	***< 2 ppm***	***(<0.0002 %)***

Heavy Metals:

Lead (Pb):	***< 1 ppm***	***(< 0.0001 %)***
Chromium (Cr):	***< 1 ppm***	***(< 0.0001 %)***
Cadmium (Cd):	***< 1 ppm***	***(< 0.0001 %)***
Mercury (Hg):	***< 1 ppm***	***(< 0.0001 %)***

Result Informational

3.1.3 Vendor shall report the product chemical analysis, determined in accordance with a recognized method acceptable to purchaser; and total water content shall be determined in accordance with ASTM E 203.

Water Content: 2.3%

Result Informational

3.1.4 Vendor shall provide a phase diagram relating product dilution to freeze point. Delivered product shall be within +4°C (+7°F) of the preproduction value.

Freezing point (5% solution):	***- 2 °C***
Freezing point (10% solution):	***- 4 °C***
Freezing point (15% solution):	***- 7 °C***

Result Informational

3.1.5 Appearance: The compound, as received by purchaser, shall be uniform, free-flowing, and free from foreign material detrimental to usage of the compound.

Compound is uniform and free from foreign material.

Result Conforms

3.2 Properties: The compound, as supplied by vendor, shall conform to the following requirements: tests shall be performed in accordance with specified test on the product as delivered by vendor, unless otherwise specified herein.

3.2.1 pH: The compound, diluted with ASTM D 1193, Type IV water, to 15% by weight of solids taking into account water contained in the compound, shall be within ± 0.5 of the preproduction value established in 4.2.3, determined in accordance with ASTM E 70.

15%: pH = 10.1

Result Informational

3.2.2 Flash Point: The compound on a dry basis shall be not lower than 93°C (200°F), determined in accordance with ASTM D 56.

As received (dry basis): No flash to 212°F

Result Conforms

3.2.3 Chloride Content: The level of soluble chloride on a dry basis shall not exceed 250 ppm, determined in accordance with APHA Standard Methods for the Examination of Water and Waste Water, Method 112A.

As received (dry basis): Chloride content = 141 ppm

Result Conforms

3.2.4 Storage Stability: The compound, when stored in a closed container for at least one year in accordance with ASTM F 1104 shall not deliquesce or otherwise deteriorate.

Result Not performed

3.2.5 Effect on Transparent Plastics:

3.2.5.1 The compound, diluted with ASTM D 1193, Type IV, water to 15% by weight of solids taking into account water contained in the compound shall not craze, stain or discolor Type C stretched acrylic plastic conforming to MIL-P-23690, determined in accordance with ASTM F 484

15%: Type C – no crazing, staining or discoloration

Result Conforms

3.2.5 Effect on Transparent Plastics (continued):

3.2.5.1 The compound, diluted with ASTM D 1193, Type IV, water to 15% by weight of solids taking into account water contained in the compound, shall not craze, stain, or discolor MIL-P-83310 polycarbonate plastic, determined in accordance with ASTM F 484, except that the specimens shall be stressed for 30 minutes ± 2 to an outer fiber stress 13.8 Mpa (2000 psi).

15%: MIL-P-83310 – no crazing, staining or discoloration

Result Conforms

3.2.6 Effect on Painted Surfaces: Compound, diluted with ASTM D 1193, Type IV, water to 15% by weight of solids taking into account water contained in the compound, shall neither decrease the paint film hardness by more than two pencil hardness levels nor shall it produce any streaking, discoloration, or blistering of the paint film, determined in accordance with ASTM F 502.

15%: No hardness change; no streaking, discoloration or blistering

Result Conforms

3.2.7 Effect on Unpainted Surfaces: Compound, diluted with ASTM D 1193, Type IV, water to 15% by weight of solids taking into account water contained in the compound, shall neither produce streaking nor leave any stains which require polishing to remove, determined in accordance with ASTM F 485.

15%: No streaking, no staining

Result Conforms

3.2.8 Effect on Runway Pavements

3.2.8.1 Runway Concrete Surface Scaling Resistance: The condition of the runway concrete surface shall have a rating not greater than 1 for 50 freeze-thaw cycles, determined in accordance with ASTM C 672, except that concrete shall

* Be air-entrained with an air content as specified in ASTM C 672. Have a minimum cement content of 302 kg/m^3 ± 6 (510 lb/yd^3 ± 10). Have a slump, 38 mm ± 13 (1.5 inches ± 0.5).
* A 25% by volume solution of the deicer/anti-icer fluid as supplied by the manufacturer in commercial concentration in tap water shall be substituted for calcium chloride. Performing more than one freeze-thaw cycle per day is acceptable.
  Note: a 25% by weight saturated solution was utilized for testing

Rating after 50 cycles: 1

Result Conforms

3.2.8.2 Asphalt Concrete Degradation Resistance (Appendix A, valid for deicer/anti-icer products used in Europe)

Result [1]Not performed by SMI

[1]*Testing required for deicer /anti-icer products used in Europe. This test is not performed by SMI.*

3.2.9 Effect on Aircraft Metals: Compound, diluted with ASTM D 1193, Type IV, water to 5% and 15% by weight solids taking into account water contained in the compound, shall meet the following requirements:

3.2.9.1 Sandwich Corrosion: Specimens, after testing in accordance with ASTM F 1110, shall show corrosion not worse than control panels run using ASTM D 1193, Type IV water.

	2024-T3 Bare Anodized	2024-T3 Alclad	7075-T6 Bare Anodized	7075-T6 Alclad
5 PERCENT	**1**	**1**	**1**	**1**
15 PERCENT	**1**	**1**	**1**	**1**
CONTROL	1	1	1	1

Result Conforms

3.2.9.2 Total Immersion Corrosion: The compound, tested in accordance with ASTM F 483, except that panels shall be AMS 4376 tested for 24 hours, shall neither cause corrosion of test panels nor a weight change of any test panel greater than shown in Table I.

ALLOY	WEIGHT LOSS mg/cm^2/24hrs		
	Allowed	5 %	15 %
AMS 4037 Aluminum anodized per AMS 2470	0.3	**+ 0.01**	**+ 0.03**
AMS 4041 Aluminum	0.3	**< 0.01**	**+ 0.02**
AMS 4049 Aluminum	0.3	**+ 0.01**	**< 0.01**
AMS 4376 Magnesium, dichromate (AMS 2475)	0.2	**0.14**	**0.14**
AMS 4911 Titanium	0.1	**< 0.01**	**+ 0.01**
AMS 5045 Carbon Steel	0.8	**0.04***	**0.01**

Slight Staining

Result Conforms

3.2.9.3 Low-Embrittling Cadmium Plate: Test panels, coated with low-embrittling cadmium plate, shall not show a weight change greater than 0.3 mg/cm^2 24 hours, determined in accordance with ASTM F 1111.

5%: 0.02 mg/cm^2 / 24 hrs
15%: 0.05 mg/cm^2 / 24 hrs

Result Conforms

3.2.9.3.1 The compound shall be tested for cyclic immersion corrosion of cadmium plate in accordance with AIR6130 and the results reported as specified in Section 4 of AIR6130.

Cadmium Plate Cyclic Corrosion Test

Initial pH of solution: 10.1 **Final pH of solution:** 9.2

Note: Solution tested = 15% w/w

	REPLICATE #	Weight (g)		
		Initial	Final	**Weight change**
PANEL WEIGHTS	1	16.6043	16.6016	**0.0027**
	2	16.6309	16.6253	**0.0056**
	3	16.2176	16.2117	**0.0059**

**A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm^2 (total weight loss more than 0.0077 g for the standard 1 x 2 inch cadmium plated specimen) may cause undesirable corrosion effects to airplane equipment and/or airport equipment.*

("+" indicates weight gain)

Average weight change = 0.0047 g per panel (0.17 mg/cm^2)

Result: ***Informational**

3.2.9.4 Hydrogen Embrittlement: The diluted compound shall be non-embrittling, determined in accordance with ASTM F 519, Type 1a, 1c, or 2a.

Specimens: Four Type 1c, cadmium plated per MIL-STD-870.
Load: 45%, immersed for duration, 150 hours, temperature 23°C + 2°C.

Type 1c @ 5%: ***No failures occurred within 150 hours.***
Type 1c @ 15%: ***No failures occurred within 150 hours.***

Result Conforms

3.2.9.5 Stress-Corrosion Resistance: The diluted compound shall not cause cracks in AMS 4911 Titanium alloy, determined in accordance with ASTM F 945, Method A.

5 %: AMS 4911: ***No cracking evident***
15 %: AMS 4911: ***No cracking evident***

Result Conforms

3.2.9.5.1 Stress Corrosion Resistance: The diluted compound shall be tested in accordance with ASTM F 945, Method A using AMS 4916 specimens. The results obtained from AMS 4916 shall be reported for informational purposes only.

5 %: AMS 4916: ***No cracking evident***
15 %: AMS 4916: ***Cracking evident***

Result Informational

3.2.10 Performance: The compound, used in accordance with manufacturer's recommendation, shall remove accumulated frozen deposits of frost and ice from aircraft maneuvering areas, such as airport aprons, runways and taxiways. The compound shall be tested in accordance with AIR6170 for ice melting effectiveness, with AIR6172 for ice undercutting effectiveness and with AIR6211 for ice penetration effectiveness. Acceptance criteria and method of test shall be agreed upon by purchaser and vendor

SAE AIR6170 (2012-01)

Ice Melting Test Method for Runways and Taxiways Deicing / Anti-icing Chemicals

See separate report for complete data results

As received (solid): ***ICE MELTING TEST RESULTS***

Runway Deicing/Anti-icing Chemical Identification: **ECOWAY SF**			
Test Temperature: **-10°C (+14°F)**			
Time (minute)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity (m_{im}/m_d)
5	5.0	3.1	0.6
10	5.0	3.7	0.7
30	5.0	5.2	1.0

Runway Deicing/Anti-icing Chemical Identification: **ECOWAY SF**			
Test Temperature: **-2°C (+28°F)**			
Time (minute)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity (m_{im}/m_d)
5	5.0	4.7	0.9
10	5.0	7.1	1.4
30	5.0	9.4	1.9

SAE AIR6170 (2012-01)

Ice Melting Test Method for Runways and Taxiways Deicing / Anti-icing Chemicals

See separate report for complete data results

25% w/w: ***ICE MELTING TEST RESULTS***

Runway Deicing/Anti-icing Chemical Identification: **ECOWAY SF**			
Test Temperature: **-10°C (+14°F)**			
Time (minute)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity* (m_{im}/m_d)
5	5.0	1.3	0.3
10	5.0	1.4	0.3
30	5.0	1.4	0.3

Runway Deicing/Anti-icing Chemical Identification: **ECOWAY SF**			
Test Temperature: **-2°C (+28°F)**			
Time (minute)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity* (m_{im}/m_d)
5	5.0	3.6	0.7
10	5.0	3.7	0.7
30	5.0	4.9	1.0

3.2.12 Performance (continued):

SAE AIR6172

Ice Undercutting Test Method for Runways and Taxiways Deicing/Anti-icing Chemicals

See separate report for complete data results

ICE UNDERCUTTING TEST RESULTS

Runway Deicing/Anti-icing Chemical Identification: **ECOWAY SF**		Test Temperature: **-10°C (+14°F)**		
Time (minute)	Mean Undercut Cavity Diameter (mm)	Total Area IU_e (mm^2)	Area Original Cavity A_s (mm^2)	Ice Undercutting IU (mm^2)
5	4.4	15.2	7.1	8.1
10	4.6	16.6	7.1	9.5
30	4.7	17.3	7.1	10.2

Runway Deicing/Anti-icing Chemical Identification: **ECOWAY SF**		Test Temperature: **-2°C (+28°F)**		
Time (minute)	Mean Undercut Cavity Diameter (mm)	Total Area IU_e (mm^2)	Area Original Cavity A_s (mm^2)	Ice Undercutting IU (mm^2)
5	7.6	44.2	7.1	37.1
10	8.2	52.8	7.1	45.7
30	9.1	65.0	7.1	57.9

3.2.1 Performance (continued):

SAE AIR6211

Ice Penetration test Method for Runways and Taxiways Deicing/Anti-icing Chemicals

See separate report for complete data results

ICE PENETRATION TEST RESULTS

Runway Deicing/Anti-icing Chemical Identification: **ECOWAY SF**	
Test Temperature **-10^{0}C (+14^{0}F)**:	
Time (minutes)	Penetration Depth (mm) Average
5	**1.0 mm**
10	**1.0 mm**
30	**1.5 mm**

3.2.11 Effect on Carbon-Brake Systems: The compound shall be tested for catalytic oxidation of carbon in accordance with AIR5567 and the results shall be reported as shown in section 4.2 of AIR5567. The results shall be reported for informational purposes only

Result [2]Not performed by SMI

[2] *This test is not performed by SMI.*

SMI, Inc.
12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Eiffel Industry SARL
Park Nord, Les Pleiades
Metz Tessy 74370
France

Date: 06-Feb-2014
SMI/REF: 1311-177$_R$
Report revised for product /Co.name change

Product: ECOWAY SF ***(received 15-Nov-2013)***
Distributed in North America Market by: Nachurs Alpine Solutions, 421 Leader St, Marion, OH USA 43302

Dilution: 15% w/w

Testing in accordance with
SAE AIR6130
CADMIUM PLATE CYCLIC CORROSION TEST (2012-01)

Cadmium Plate Cyclic Corrosion Test

Initial pH of solution: 10.1 **Final pH of solution:** 9.2

	REPLICATE #	Weight (g)		
		Initial	Final	**Weight change**
PANEL WEIGHTS	1	16.6043	16.6016	**0.0027**
	2	16.6309	16.6253	**0.0056**
	3	16.2176	16.2117	**0.0059**

A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm^2 (total weight loss more than 0.0077 g for the standard 1 x 2 inch cadmium plated specimen) may cause undesirable corrosion effects to airplane equipment and/or airport equipment.

Average weight change = 0.0047 g per panel (0.17 mg/cm^2)

Result: ***Informational**

see page 5 for complete data tables

Cadmium Plate Cyclic Corrosion Test

AMS 1431 Compound, Solid Runway and Taxiway Deicing/Anti-Icing

AMS 1435 Fluid, Generic, Deicing/Anti-Icing Runways and Taxiways

3 Test Specimen Preparation

Substrate: 4130 Steel

Size: 1" x 2" x 0.04" x 0.040" (25.40 mm x 50.80 mm x 1.02 mm)

Finish: Cadmium plating in accordance with AMS QQ-P-416., Type I Class I, (0.0005"- 0.0008" inch plating per side).

There shall be no supplementary chromate treatment.

a. Three cadmium plated test specimens shall be used for each fluid to be tested

b. Sample of AMS1435 Runway Deicing Fluid shall be tested as received from the supplier.

c. Sample of AMS1431 Runway Deicing Solid Compound shall be tested in a diluted form – diluted with ASTM D 1193, Type IV, water to 15% by weight solids.

d. Procure soft flexible brushes for test (paintbrush type, 1.5 inches (3.8 cm) wide, with synthetic bristles approx 1.5 inches (3.8 cm) long

4 Environmental Exposure Preparation

Preset humidity chamber to 90 $\pm$ 5^{0}F and 30 $\pm$ 5% humidity. Affix plastic ties or other inert material as hangers (hangers shall be made from an inert material that will not react with the sample; plastic, plastic coated metals, monofilament fishing line or stainless steels are acceptable) in the chamber to hold specimens during the environmental exposure period.

5 Test Procedure

a. Measure and record pH of solution(s) to be tested (record to one decimal place).

b. Solvent clean cadmium plated specimens with acetone; wipe gently with an acetone-soaked wiper. Without allowing the acetone to evaporate, gently remove excess acetone with a dry wiper. Allow samples to dry for 10 minutes in a desiccator. Do not accelerate drying of samples with oven drying.

Note: Care should be taken not to touch the cleaned specimens with bare hands; use tweezers, clean gloves or equivalent tool.

c. Weigh and record initial specimen weight in grams. Record all weights throughout the test to the nearest 0.0001 gram. Return specimens to desiccator until Day 3.

Monday	Tuesday	Wednesday	Thursday	Friday
				Friday Start – Day 0

SAE AIR6130, Cadmium Plate Cyclic Corrosion Test

Day 3	Day 4	Day 5	Day 6	Day 7
Day 10	Day 11	Day 12	Day 13	Day 14

d. FRIDAY START - Fill glass containers with solution to be tested, one container for each coupon. Refer to 3b or 3c for solution being used (consider filling one extra container to have extra conditioned fluid available). Container shall be large enough so the solution completely covers the specimens. Cover the container with loose fitting cover and place filled container into the humidity chamber to environmentally condition the solution for a minimum of 24 ± 1 hours before the start of test, up to 72 ± 1 hours.

e. Day 3 – Remove the solution container from the humidity chamber and the specimens from the desiccator. Place specimens in container oriented such that the specimens are not resting flush against the bottom or side of the container. Place the container with cover back into the humidity chamber for 24 ± 1 hours.

f. Day 4 - After the 24 hour immersion in the solution, remove the specimens, but do not rinse them. Place them into the humidity chamber by hanging for 22.5 ± 0.5 hours. Hangers shall be made from an inert material that will not react with the sample (such as plastic, plastic coated metals and stainless steels are acceptable).

g. Day 5 /Day 10 /Day 12 – Remove the specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimen surface with the soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

Immediately after weighing the specimens, return them to their test solution container to soak for 90 ± 5 minutes in the humidity chamber. Specimens shall be oriented such that they not resting flush against the bottom or side of the container. After 90 minutes, remove the specimens but do not rinse them. Place them in the humidity chamber by hanging for 22.5 ± 0.5 hours, maintaining the specimen in the initial orientation throughout the cycle.

h. Day 6 /Day 11 /Day 13 - Return the specimen to the test solution container to soak for 90 ± 5 minutes in the humidity chamber. Specimens shall be oriented such that it is not resting flush against the bottom or side of the container. After 90 minutes, remove the specimen but do not rinse it. Replace it in the humidity chamber by hanging for 22.5 ± 0.5 hours, maintaining the specimen in the initial orientation throughout the cycle.

i. Day 7 – Remove specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimens surface with a soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

SAE AIR6130, Cadmium Plate Cyclic Corrosion Test

Immediately after weighing the specimens, return them to their test solution container in the humidity chamber. Specimens shall be oriented such that they are not resting flush against the bottom or side of the container. Specimens shall be left in the test solution container in the humidity chamber from DAY 7 to DAY 10.

j. Day 14 – Remove specimens from the humidity chamber. Rinse the specimens with deionized water. Lightly brush (12 strokes per side) the specimen surface with a soft flexible brush while rinsing to remove loose corrosion products. Immerse samples into acetone for 10 seconds while agitating specimen. Allow samples to dry for 10 minutes in a desiccator. Weigh and record the specimen weights. Do not accelerate drying of samples with oven drying.

Note: If multiple solutions are being tested, use different brushes for each solution to avoid cross contamination.

k. Measure and record final pH of solution (record to one decimal place).

l. Report the initial weight of the specimen, the weight after each periodic weighing, and the final weight. Calculate and report the value of the cumulative weight lost from each specimen after each periodic weighing procedure.

Test Data:

pH at start of test: **10.1**
pH at end of test: **9.2**

	REPLICATE #	Weight (g)
INITIAL PANEL WEIGHTS	1	16.6043
	2	16.6309
	3	16.2176

	REPLICATE #	Weight (g)		
		Monday	Wednesday	Friday
WEEK #1 PANEL WEIGHTS	1	----	16.6034	16.6033
	2	----	16.6299	16.6295
	3	----	16.2163	16.2159

	REPLICATE #	Weight (g)		
		Monday	Wednesday	Friday
WEEK #2 PANEL WEIGHTS	1	16.6013	16.6012	16.6016
	2	16.6251	16.6252	16.6253
	3	16.2114	16.2113	16.2117

Client: Eiffel Industry SARL
Product: **ECOWAY SF**

Date: 06-Feb-2014
SMI/REF: 1311-177$_R$
Report revised for product / Co. name change

Distributed in North America Market by: Nachurs Alpine Solutions, 421 Leader St, Marion, OH USA 43302

Dilution: 15% w/w

SAE AIR6130, Cadmium Plate Cyclic Corrosion Test

TEST DATA (continued)

REPLICATE #1	INITIAL WEIGHT (grams)	WEEK 1 WED (grams)	WEEK 1 FRI (grams)	WEEK 2 MON (grams)	WEEK 2 WED (grams)	WEEK 2 FRI (grams)
	16.6043	16.6034	16.6033	16.6013	16.6012	16.6016
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	0.0009	0.0010	0.0030	0.0031	**0.0027 (FINAL)**

REPLICATE #2	INITIAL WEIGHT	WEEK 1 WED	WEEK 1 FRI	WEEK 2 MON	WEEK 2 WED	WEEK 2 FRI (FINAL WEIGHT)
	16.6309	16.6299	16.6295	16.6251	16.6252	16.6253
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	0.0010	0.0014	0.0058	0.0057	**0.0056 (FINAL)**

REPLICATE #3	INITIAL WEIGHT	WEEK 1 WED	WEEK 1 FRI	WEEK 2 MON	WEEK 2 WED	WEEK 2 FRI (FINAL WEIGHT)
	16.2176	16.2163	16.2159	16.2114	16.2113	16.2117
CUMULATIVE WEIGHT CHANGE ("+" indicates weight gain)	--	0.0013	0.0017	0.0062	0.0063	**0.0059 (FINAL)**

SUMMARY:

	REPLICATE #	Weight Change (g)	Average Weight Change	
WEIGHT CHANGE	1	**0.0027**	**0.0047 g (0.17mg/cm^2)**	***Informational**
	2	**0.0056**		
	3	**0.0059**		

"A runway deicing fluid or solid compound tested in accordance with this document that exhibits a weight loss of more than 0.3 mg/cm^2 (total weight loss more than 0.0077 g for the standard 1 x 2 inch cadmium plated specimen) may cause undesirable corrosion effects to airplane equipment and/or airport equipment."

Respectfully Submitted,

Patricia D. Viani, SMI Inc.

SMI, Inc.
12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Eiffel Industry SARL
Park Nord, Les Pleiades
Metz Tessy 74370
France

Date: 06-Feb-2014
SMI/REF: 1311-177$_R$
Report revised for product /Co.name change

Product: ECOWAY SF ***(received 15-Nov-2013)***
Distributed in North America Market by: Nachurs Alpine Solutions, 421 Leader St, Marion, OH USA 43302

Dilution: As received and 25% w/w

Testing in accordance with
SAE AIR6170
Ice Melting Test Method for Runways and Taxiways
Deicing/Anti-icing Chemicals (2012-01)

3.0 SUMMARY OF TEST METHOD:

3.1 The test utilizes a sheet of ice of uniform thickness frozen in a flat circular polystyrene petri dish. After equilibration to the desired temperature, a weighed quantity of the deicing chemical is distributed over the surface of the ice. At specified time intervals, generated brines are removed and the mass difference is calculated in order to obtain the mass of melted ice. Test temperatures shall be within 1°C (2°F) of the stated values and tests shall be performed within a freezer or cold chamber.

3.2 This test method provides a means to evaluate and compare the ice melting capabilities of ready-to-use runway deicing/anti-icing chemicals in liquid or solid form over limited, defined time intervals at specified temperatures.

Solid Runway Deicing/Anti-icing Chemical
The solid deicing/anti-icing chemical shall be tested in both "as is" and diluted forms (25% w/w solution)

3.8 Data Recording and Reporting

The amount of ice melted shall be recorded for each temperature for the time intervals of 5, 10 and 30 minutes and reported, for example see Table 1 (additional time intervals can be gathered upon request). The recorded value for each temperature/time observation shall be the average of the three tests. All data is measured in gram (g) and rounded to the nearest tenth of a gram (0.1 g).

The ice melting capacity is calculated and recorded. The unit is expressed in terms of "grams of ice melted per gram of deicing/anti-icing chemical applied". Present the graph of the amount of ice melted as a function of time.

Table 1 – ICE MELTING TEST RESULTS

As received:

Runway Deicing/Anti-icing Chemical Identification: **ECOWAY SF**					
Test Temperature: **-10°C (+14°F)**					
Time (minute)	Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mass of Ice Melted M_{im} (g)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity (m_{im}/m_d)
5	5.00	3.61	5.0	3.1	0.6
	5.00	2.79			
	5.00	3.03			
10	5.00	4.46	5.0	3.7	0.7
	5.00	3.25			
	5.00	3.45			
30	5.00	5.36	5.0	5.2	1.0
	5.00	6.07			
	5.00	4.10			

As received:

Runway Deicing/Anti-icing Chemical Identification: **ECOWAY SF**					
Test Temperature: **-2°C (+28°F)**					
Time (minute)	Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mass of Ice Melted M_{im} (g)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity (m_{im}/m_d)
5	5.00	5.19	5.0	4.7	0.9
	5.00	4.34			
	5.00	4.65			
10	5.00	7.07	5.0	7.1	1.4
	5.00	7.41			
	5.00	6.69			
30	5.00	9.34	5.0	9.4	1.9
	5.00	9.42			
	5.00	9.43			

Table 1 – ICE MELTING TEST RESULTS (continued)

25% w/w

Runway Deicing/Anti-icing Chemical Identification: **ECOWAY SF**					
Test Temperature: **-10°C (+14°F)**					
Time (minute)	Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mass of Ice Melted M_{im} (g)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity (m_{im}/m_d)
5	5.00	1.00	5.0	1.3	0.3
	5.00	1.65			
	5.00	1.34			
10	5.00	1.40	5.0	1.4	0.3
	5.00	1.47			
	5.00	1.39			
30	5.00	1.36	5.0	1.4	0.3
	5.00	1.42			
	5.00	1.53			

25% w/w:

Runway Deicing/Anti-icing Chemical Identification: **ECOWAY SF**					
Test Temperature: **-2°C (+28°F)**					
Time (minute)	Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mass of Ice Melted M_{im} (g)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity (m_{im}/m_d)
5	5.00	3.61	5.0	3.6	0.7
	5.00	3.57			
	5.00	3.51			
10	5.00	3.60	5.0	3.7	0.7
	5.00	3.48			
	5.00	3.92			
30	5.00	5.09	5.0	4.9	1.0
	5.00	5.13			
	5.00	4.57			

Client: Eiffel Industry SARL
Product: **ECOWAY SF**

Date: 06-Feb-2014
SMI/REF: 1311-177$_R$
Report revised for product / Co. name change

Distributed in North America Market by: Nachurs Alpine Solutions, 421 Leader St, Marion, OH USA 43302
Dilution: As received and 25% w/w
SAE AIR6170, Ice Melting Test Method

(Reference results are included here for comparison purposes)

Table 1 – ICE MELTING TEST RESULTS

Runway Deicing/Anti-icing Chemical Identification:
REFERENCE: POTASSIUM ACETATE, 50% w/w solution

Test Temperature: **-10°C (+14°F)**

Time (minute)	Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mass of Ice Melted M_{im} (g)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity* (m_{im}/m_d)
5	5.00	4.9	5.0	4.8	1.0
	5.00	4.7			
	5.00	4.8			
10	5.00	5.2	5.0	5.2	1.0
	5.00	5.3			
	5.00	5.2			
30	5.00	7.3	5.0	7.0	1.4
	5.00	6.8			
	5.00	6.9			

Runway Deicing/Anti-icing Chemical Identification:
REFERENCE: POTASSIUM ACETATE, 50% w/w solution

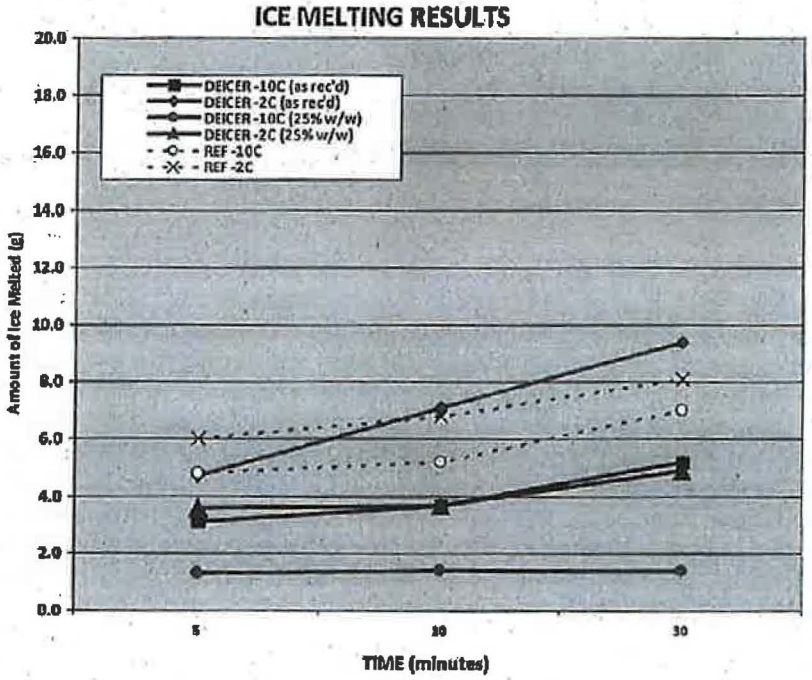
Test Temperature: **-2°C (+28°F)**

Time (minute)	Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mass of Ice Melted M_{im} (g)	Mean Mass of Deicing/Anti-icing Chemical applied m_d (g)	Mean Mass of Ice Melted M_{im} (g)	Ice Melting Capacity* (m_{im}/m_d)
5	5.00	5.8	5.0	6.0	1.2
	5.00	6.1			
	5.00	6.1			
10	5.00	7.7	5.0	6.8	1.4
	5.00	6.1			
	5.00	6.7			
30	5.00	9.2	5.0	8.1	1.6
	5.00	7.8			
	5.00	7.4			

Client: Eiffel Industry SARL
Product: **ECOWAY SF**

Date: 06-Feb-2014
SMI/REF: 1311-177$_R$
Report revised for product / Co. name change

Distributed in North America Market by: Nachurs Alpine Solutions, 421 Leader St, Marion, OH USA 43302
Dilution: As received and 25% w/w
SAE AIR6170, Ice Melting Test Method



Respectfully Submitted,

Patricia D. Viani, SMI Inc.

SMI, Inc.
12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Eiffel Industry SARL
Park Nord, Les Pleiades
Metz Tessy 74370
France

Date: 06-Feb-2014
SMI/REF: 1311-177$_R$
Report revised for product /Co.name change

Product: ECOWAY SF *(received 15-Nov-2013)*
Distributed in North America Market by: Nachurs Alpine Solutions, 421 Leader St, Marion, OH USA 43302

Dilution: 25% w/w

Testing in accordance with
SAE AIR6172
Ice Undercutting Test Method for Runways and Taxiways
Deicing/Anti-Icing Chemicals (2012-02)

3. SUMMARY OF TEST METHOD

3.1 Introduction

The test utilizes small cylindrical cavities in a sheet of ice of uniform thickness frozen in a flat circular modified polystyrene Petri dish having an average standardized surface roughness of 120 grit (see Figure 1). The bottoms of the cavities are essentially free of ice. After equilibration to the desired temperature, a known volume of dyed deicing chemical is placed in the cavities, and undercutting commences (see figure 1). Undercutting is evidenced by the formation of essentially circular undercut patterns. At specified time intervals, the dimensions of the observed undercut patterns are measured. The undercut pattern reflects the net result of melting on the walls of the ice cavity and melting at the ice/substrate interface. The undercut is relatively thick near the center and relatively thin at the extremities. The undercut area is defined as the total area of the circular undercut pattern minus the area of the original cavity. Testing temperatures shall be within 1°C (2°F) of the stated values and tests shall be performed within a freezer or cold chamber.

3.2 Significance and Use

This test method provides a means to evaluate and compare the rate of ice undercutting capabilities of runway deicing/anti-icing chemicals in liquid or solid form at the ice/substrate interface over limited, defined time intervals at specified temperatures.

3.7 Data Recording and Reporting

Circular-shaped ice undercuttings, in millimeters, shall be recorded for each temperature for the time intervals of 5, 10 and 30 minutes and reported, for example see Table 1 (data for additional time intervals can be gathered upon request). All data is measured in millimeters (mm) within 0.1 mm. The recorded value for each temperature/time observation shall be the average of the five cavities where the measurement of each cavity is the two longest perpendicular axial dimensions (vertical and horizontal). The undercut area is defined as the total area of the circular undercut pattern minus the area of the original cavity. The ice undercutting is calculated according to equations (2)(3) and (4). Present the graph of the ice undercutting area $(mm)^2$ as a function of time.

The ice undercutting area for a given deicer is defined as: $IU=IU_e-A_s$

Where:
IU : Ice undercutting area for a given deicer (mm^2)
IU_e : Total area of circular undercut pattern at specified time interval (mm^2)
A_s : Initial area of original cavity (mm^2)

Table 1 – ICE UNDERCUTTING TEST RESULTS

Runway Deicing/Anti-icing Chemical Identification: **ECOWAY SF**				Test Temperature: **-10°C (+14°F)**		
Time (minute)	Cavity #	Undercut Cavity Diameter (mm)	Mean Undercut Cavity Diameter (mm)	Total Area IU_e (mm^2)	Area Original Cavity A_s (mm^2)	Ice Undercutting IU (mm^2)
5	1	3.9	4.4	15.2	7.1	8.1
	2	4.7				
	3	4.4				
	4	4.3				
	5	4.6				
10	1	4.8	4.6	16.6	7.1	9.5
	2	4.1				
	3	4.9				
	4	4.7				
	5	4.4				
30	1	5.2	4.7	17.3	7.1	10.2
	2	4.3				
	3	5.0				
	4	4.7				
	5	4.4				

Runway Deicing/Anti-icing Chemical Identification: **ECOWAY SF**				Test Temperature: **-2°C (+28°F)**		
Time (minute)	Cavity #	Undercut Cavity Diameter (mm)	Mean Undercut Cavity Diameter (mm)	Total Area IU_e (mm^2)	Area Original Cavity A_s (mm^2)	Ice Undercutting IU (mm^2)
5	1	7.7	7.5	44.2	7.1	37.1
	2	8.4				
	3	7.1				
	4	6.7				
	5	7.4				
10	1	7.9	8.2	52.8	7.1	45.7
	2	8.6				
	3	8.2				
	4	7.9				
	5	8.4				
30	1	8.6	9.1	65.0	7.1	57.9
	2	8.8				
	3	9.3				
	4	9.6				
	5	9.2				

Client: Eiffel Industry SARL
Product: **ECOWAY SF**

Date: 06-Feb-2014
SMI/REF: 1311-177$_R$
Report revised for product / Co. name change

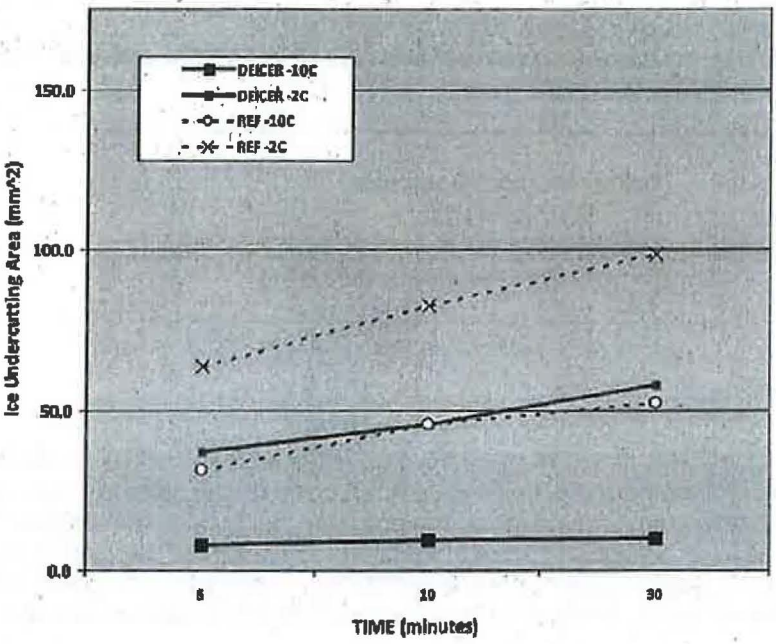
Distributed in North America Market by: Nachurs Alpine Solutions, 421 Leader St, Marion, OH USA 43302
Dilution: 25% w/w
SAE AIR6172, Ice Undercutting Test Method

Table 1 – ICE UNDERCUTTING TEST RESULTS

Runway Deicing/Anti-icing Chemical Identification: **REFERENCE: POTASSIUM ACETATE, 50% w/w solution**				Test Temperature: **-10°C (+14°F)**		
Time (minute)	Cavity #	Undercut Cavity Diameter (mm)	Mean Undercut Cavity Diameter (mm)	Total Area IU_{e_2} (mm^2)	Area Original Cavity A_s (mm^2)	Ice Undercutting IU (mm^2)
5	1	6.3	7.0	38.5	7.1	31.4
	2	6.7				
	3	7.1				
	4	7.4				
	5	7.5				
10	1	7.6	8.2	52.7	7.1	45.6
	2	7.9				
	3	8.5				
	4	8.5				
	5	8.5				
30	1	8.0	8.7	59.4	7.1	52.3
	2	8.8				
	3	8.8				
	4	8.9				
	5	9.0				

Runway Deicing/Anti-icing Chemical Identification: **REFERENCE: POTASSIUM ACETATE, 50% w/w solution**				Test Temperature: **-2°C (+28°F)**		
Time (minute)	Cavity #	Undercut Cavity Diameter (mm)	Mean Undercut Cavity Diameter (mm)	Total Area IU_{e_2} (mm^2)	Area Original Cavity A_s (mm^2)	Ice Undercutting IU (mm^2)
5	1	9.1	9.5	70.8	7.1	63.7
	2	9.2				
	3	9.9				
	4	9.7				
	5	9.6				
10	1	10.6	10.7	89.9	7.1	82.8
	2	10.3				
	3	10.9				
	4	10.8				
	5	10.9				
30	1	11.4	11.6	105.6	7.1	98.5
	2	11.5				
	3	11.3				
	4	11.9				
	5	11.9				

ICE UNDERCUTTING RESULTS



Respectfully Submitted,

Patricia D. Viani, SMI Inc.

SMI, Inc.

12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Eiffel Industry SARL
Park Nord, Les Pleiades
Metz Tessy 74370
France

Date: 06-Feb-2014
SMI/REF: 1311-177$_R$
Report revised for product /Co.name change

Product: ECOWAY SF ***(received 15-Nov-2013)***
Distributed in North America Market by: Nachurs Alpine Solutions, 421 Leader St, Marion, OH USA 43302

Dilution: 25% w/w

Testing in accordance with
SAE AIR6211
Ice Penetration Test Method for Runways and Taxiways Deicing/Anti-icing Chemicals (2012-04)

3. SUMMARY OF TEST METHOD

3.1 The test utilizes a Plexiglas® test plate having 5 mm (0.20 in) diameter cavities filled with ice. After equilibration to the desired temperature, a known volume of dyed-liquid runway deicing/anti-icing chemical is discharged onto the surface of ice cones and penetration commences (see Figure 1). Penetration is evidenced by an embedded scale in millimeters behind the Plexiglas® test plate. At specified time intervals, the length of penetration is measured. Testing temperatures shall be within 1°C (2°F) of the stated values and tests shall be performed within a freezer or cold chamber.

3.2 Significance and Use

This test method can be used to evaluate and compare the ice penetrating capabilities of runway deicing/anti-icing chemicals in liquid or solid form over a limited, defined time interval at specified temperatures.

3.7 Data Recording and Reporting

Penetration depths, in millimeters, shall be recorded at the test temperature for the time intervals of 5, 10 and 30 min and reported, for example see Table 1. All data is measured in millimeter (mm) and rounded to the nearest 0.5 mm. The recorded value for each temperature/time observation shall be the average of the four cavity depths. Present the graph of the ice penetration as a function of time.

Table 1 – ICE PENETRATION TEST RESULTS

Runway Deicing/Anti-icing Chemical Identification: **ECOWAY SF**					
Test Temperature -10°C (+14°F):					
Time (minutes)	Penetration Depth (mm)				
	Cavity #1	Cavity #2	Cavity #3	Cavity #4	Average
5	1.0 mm	1.0 mm	1.0 mm	1.0 mm	**1.0 mm**
10	1.0 mm	1.0 mm	1.0 mm	1.0 mm	**1.0 mm**
30	1.5 mm	1.5 mm	1.5 mm	1.5 mm	**1.5 mm**

Runway Deicing/Anti-icing Chemical Identification: **REFERENCE: POTASSIUM ACETATE, 50% w/w solution**					
Test Temperature : **-10°C (+14°F)**					
Time (minutes)	Penetration Depth (mm)				
	Cavity #1	Cavity #2	Cavity #3	Cavity #4	Average
5	2.5 mm	2.5 mm	2.0 mm	2.0 mm	**2.5 mm**
10	3.5 mm	3.5 mm	3.0 mm	3.0 mm	**3.5 mm**
30	4.0 mm	4.0 mm	3.5 mm	4.0 mm	**4.0 mm**

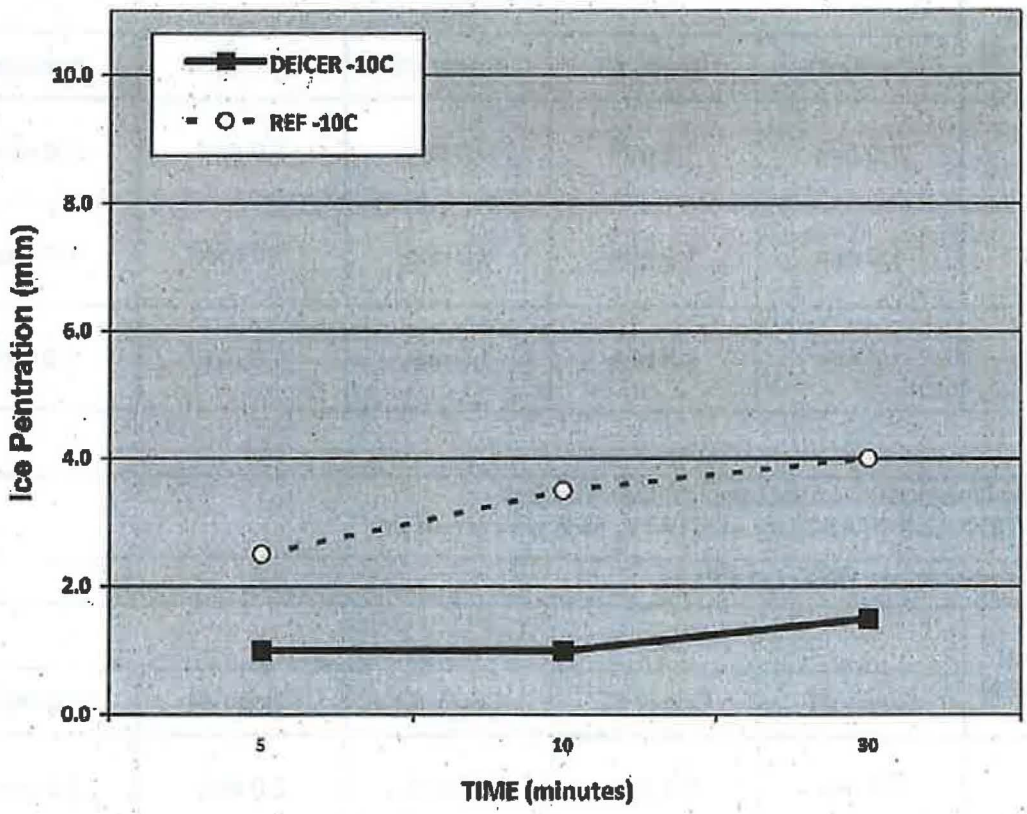
(ALL DATE ROUNDED TO THE NEAREST 0.5 mm)

Client: Eiffel Industry SARL
Product: ECOWAY SF

Date: 06-Feb-2014
SMI/REF: 1311-177$_R$
Report revised for product / Co. name change

Distributed in North America Market by: Nachurs Alpine Solutions, 421 Leader St, Marion, OH USA 43302
Dilution: 25% w/w
SAE AIR6211, Ice Penetration Test Method

ICE PENETRATION TEST RESULTS AT -10C



Respectfully Submitted,

Patricia D. Viani, SMI Inc.

SMI, Inc.
12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Eiffel Group SA
Park Nord, Les Pleiades
Metz Tessy 74370
France

Date: 18-Nov-2014

SMI/REF: 1311-177$_{SSR}$

Product: **ECOWAY SF** ***(received 15-Nov-2013)***

Distributed in North America Market by: Nachurs Alpine Solutions, 421 Leader Street, Marion, OH USA 43302

Dilution: As received (solid)

Storage Stability in Accordance with **AMS 1431D**
COMPOUND, SOLID RUNWAY AND TAXIWAY DEICING/ANTI-ICING

3.2.4 Storage Stability: The compound, when stored in a closed container for at least one year in accordance with ASTM F 1104 shall not deliquesce or otherwise deteriorate.

Result Conforms

Respectfully submitted,

Patricia D. Viani, SMI Inc.

Federal Aviation Administration
National Part 139 CertAlert

AdvisoryCautionary**Non-Directive**Advisory**Cautionary**Non-Directive**Advisory**Cautionary**Non-Directive**

No. 22-08

Date:	**November 29, 2022**
To:	**All Title 14 CFR Part 139 Airport Operators**
Subject:	**Deicing/Anti-Icing Product Awareness**
Point of Contact:	Alberto Rodriguez, AAS-300, (202) 256-1651 Email: alberto.rodriguez@faa.gov

1. **Purpose.** This CertAlert provides guidance and awareness on specifications for FAA-recommended airside pavement deicer and anti-icer products.

2. **Background.** The FAA provides specifications or, in certain instances, references the specifications of third parties, such as professional associations like the Society of Automotive Engineers (SAE) Aerospace Material Specifications (AMS) and the U.S. military (MIL-SPEC), for deicing/anti-icing products. These specifications require vendors to provide airport operators with a certification stating the product conforms to the applicable specification. Additionally, the vendor is required to provide a safety data sheet (SDS) for product acceptability.

   The FAA does not recommend the use of deicing/anti-icing products that do not meet the associated specifications for that product type.

   For additional clarity:

   - ***Liquid*** deicing/anti-icing products should meet the specifications in the current edition of SAE AMS 1435, *Liquid Runway Deicing/Anti-Icing Product.*
   - ***Solid*** deicing/anti-icing products should meet the specifications in the current edition of SAE AMS 1431, *Solid Runway Deicing/Anti-Icing Product.*
   - ***Liquefied Solid (making a liquid from a solid product)*** deicing/anti-icing products should meet the specifications in the current edition of SAE AMS 1435, *Liquid Runway Deicing/Anti-Icing Product.*

3. **Action.** When using approved chemicals, airport operators should ensure the products being used meet all standards and are in conformance with the appropriate specification. Airport operators should be particularly mindful when mixing/brining a solid product to create a liquefied solid. In its "liquefied solid" form, the resulting product must meet the ***liquid***

deicing/anti-icing specification (SAE AMS 1435, *Liquid Runway Deicing/Anti-Icing Product*) as the original solid product specification is no longer applicable.

4. Refer to Advisory Circular 150/5200-30, *Airport Field Condition Assessments and Winter Operations Safety*, paragraph 4.6, for additional information.

Birkely M. Rhodes, Manager
Airports Safety and Operations Division, AAS-300

Federal Aviation Administration
National Part 139 CertAlert

AdvisoryCautionary**Non-Directive**Advisory**Cautionary**Non-Directive**Advisory**Cautionary**Non-Directive**

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To:	**All Title 14 CFR Part 139 Airport Operators**
Subject:	**Deicing/Anti-Icing Product Awareness**
Point of Contact:	Alberto Rodriguez, AAS-300, (202) 256-1651 Email: alberto.rodriguez@faa.gov

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   The FAA does not recommend the use of deicing/anti-icing products that do not meet the associated specifications for that product type.

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Birkely M. Rhodes, Manager
Airports Safety and Operations Division, AAS-300

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AdvisoryCautionary**Non-Directive**Advisory**Cautionary**Non-Directive**Advisory**Cautionary**Non-Directive**

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deicing/anti-icing specification (SAE AMS 1435, *Liquid Runway Deicing/Anti-Icing Product*) as the original solid product specification is no longer applicable.

4. Refer to Advisory Circular 150/5200-30, *Airport Field Condition Assessments and Winter Operations Safety*, paragraph 4.6, for additional information.

Birkely M. Rhodes, Manager
Airports Safety and Operations Division, AAS-300

NASi®
TRANSPORTATION & MINING
The Science of De-Icing®

421 Leader Street • Marion, Ohio 43302
[P] 800.622.4877 x300 [F] 740.223.3874
nasi_cs@nasindustrial.com
www.nasi-tm.com twitter.com/NASindustrial

September 11, 2026

ALBANY COUNTY AIRPORT AUTHORITY
Albany International Airport
22 Jetway Drive
Albany, NY 12211-1057

RE: INVITATION FOR BIDS, CONTRACT # 1284
DEICING PRODUCT FOR RUNWAYS, TAXIWAYS, & RAMPS

Due date: October 17, 2024

EXECUTIVE SUMMARY

The history of our company, including our core values, business philosophy, and industry longevity related to the supply of runway deicing chemicals are that:

NAS (Nachurs Alpine Solutions) has been a North American specialty chemical. manufacturer since 1946. We have been in the production and supply of runway. deicers since Some of our core values and business philosophy include the 4R's. philosophy:

1. Right Products - Chose the most suitable for your prevailing climate, operating conditions and specific weather events.
2. Right Rate - Whether freezing rain, snow, black ice, etc., apply at rates that ensure optimal performance without waste; thereby minimizing cost and environmental impact.
3. Right Time - Apply anti-icing/de-icing products according to impending weather conditions. A preemptive approach ensures maximum performance and efficiency.
4. Right Place - Make sure the product is placed and stays where you need it. Current technology and practices allow precision application of liquid products. We maintain certification of our products per FAA Advisory Circular 150-5200-30D. to the standard of SAE AMS1435E (liquid deicers) and SAE AMS1431E (solid deicers). We have representation of the SAE G-12 committee with a sponsor for the AMS1435. G-12 meets twice a year and is an international entity maintaining. the specifications for all airport-related deicers.

Our team members have been in the industry for more than 20 years and have expert knowledge of applications, meeting specifications, storage & handling, etc.

We have 40% to 50% of the US market share for the liquid runway.
deicer. We have about 60% of the market share for the solid runway deicer.

Licenses and certifications that are both required to be held, and held, by NAS (including third parties and subcontractors that we use) in pursuit of the business contemplated by this IFB.

ISO 9001- We adhere to rigorous quality control measures and repeated laboratory testing throughout. the manufacturing process. Every product shipment meets strict quality assurance standards, and we provide certificates of analysis with every shipment. We adhere to responsible care needs of our customers.

Sales force.

Corporate-wide we have 6 business units. Depending on the chemical type, each business unit has a varied number of salespeople. Within our department, Industrial Sales, we have a force of 11 in General Industrial, 4 in Energy, and 4 in Transportation and Mining. The latter is the business unit that is in charge of runway deicer sales. We have 90 total sales staff across all 6 business units. More about sales support experience is in the Executive Summary.

*

Dealer network or other distribution methods.

Distribution methods are by having several production and warehouse depots throughout the US and Canada. They are as follows (broken down by product):

RF-11 stocking points	Sodium formate stocking points
Marion, OH – production facility Corydon, OH– production facility Red Oak, IA – production facility New Hamburg, Ontario – production facility Belle Plaine, Saskatchewan – production facility 3rd-party terminals: Astro Chemical – Springfield, MA Key State Ag – New Enterprise, PA Sterling Chemical – Hamtramck, MI Denver & Rock Island Railroad – Denver, CO Volusol – Salt Lake City, UT Harms Ag – Pasco, WA Alaska Railroad – Anchorage, AK Alaska Railroad – Fairbanks, AK Future Transfer – Airdrie, Alberta Future Transfer – Tillsonburg, Ontario Driving Force Decks – Abbotsford, British Columbia Treblay Warehouse – Dartmouth, Nova Scotia	Springfield, MA Kennedyville, MD Scranton, PA Tillsonburg, Ontario Dartmouth, Nova Scotia Caledonia, OH Clarksville, OH St. Louis, MO Elwood, IL Denver, CO Salt Lake City, UT Airdrie, Alberta Tacoma, Washington Anchorage, Alaska
3rd-party terminals:	
Astro Chemical – Springfield, MA Key State Ag – New Enterprise, PA Sterling Chemical – Hamtramck, MI Denver & Rock Island Railroad – Denver, CO Volusol – Salt Lake City, UT	

Harms Ag – Pasco, WA Alaska Railroad – Anchorage, AK Alaska Railroad – Fairbanks, AK Future Transfer – Airdrie, Alberta Future Transfer – Tillsonburg, Ontario Driving Force Decks – Abbotsford, British Columbia Treblay Warehouse – Dartmouth, Nova Scotia	

*

Service force.

All of our sales force is also part of the service force. We also have lab personnel to assist us at each of the 7 plants. In total, we have 165 people as service staff.

*

Describe the ordering process.

Orders will be handled directly with our customer service staff in our corporate office in Marion, Ohio.

Process is: call in to our 800 number (1-800-622-4877 x300). Tell who you are and what you want. If that customer is not in our system, they will be asked to fill-out some basic information (ship to, bill to, special shipping requirements, etc). Customer service lines up a carrier. Customer service notifies customer of ETA. If customer has questions about the product (application rate, training, storage/handling), they will be directed to me. Once the customer's information is in our system, the delivery process begins. Our response time is same-day, usually within a few minutes. Deliveries will vary depending on quantity, but customer service always follows-up with customer to keep them informed of ETA. We are committed to 24/7 service including holidays. We have had to offer incentives to some of our carriers to get them to deliver faster or, if a holiday, to make the delivery.

*

A list of references is given in this IFB and tabbed accordingly.

EXHIBIT D-1: BID ACKNOWLEDGEMENT FORM

The Bidder acknowledges that he/she has carefully read the IFB and understands the specifications requested.

The Bidder warrants that if the Bid is accepted, he/she will contract with the Albany County Airport Authority using a Purchase Order and comply with the requirements of the IFB and the Terms and Conditions attached to the Purchase Order.

Name of Bidder: Nachurs Alpine Solutions, LLC

Signature of Authorized Person: X [signature]

Print Name and Title: Bob Hopp, VP Industrial

Business Address of Bidder: 6620 Mooney Street, Ste. 220

Dublin, OH 43017

Business Phone Number: (800)622-4877

Business Fax Number: ( )

Business E-Mail Address: BHOPP@NACHURS-ALPINE.COM

Date: 09/14/2026

Subscribed and sworn to before me this 14th day of September, 2026

[signature]
Notary Public

NOTARIAL SEAL STATE OF OHIO

JENNIFER L. ADAMS
Notary Public, State of Ohio
My Commission Expires
December 6, 2030


JENNIFER L. ADAMS
Notary Public, State of Ohio
My Commission Expires
December 8, 2030

Exhibit D-2:

Offerer Disclosure of Prior Non-Responsibility Determinations

Name of Individual or Entity Seeking to Enter into the Procurement Contract:

Nachurs Alpine Solutions, LLC

Address: 6620 Mooney Street, Suite 220

Dublin, Ohio 43017

Name and Title of Person Submitting this Form: Becky Worley

US Account Manager

Contract Procurement Number: IFB CONTRACT #1284

Date: September 11, 2026

1. Has any Governmental Entity made a finding of non-responsibility regarding the individual or entity seeking to enter into the Procurement Contract in the previous four years? (Please circle):

X No Yes

If yes, please answer the next questions:

2. Was the basis for the finding of non-responsibility due to a violation of State Finance Law §139-j (Please circle):

No Yes

3. Was the basis for the finding of non-responsibility due to the intentional provision of false or incomplete information to a Governmental Entity? (Please circle):

No Yes

4. If you answered yes to any of the above questions, please provide details regarding the finding of non-responsibility below.

Governmental Entity: _____

Date of Finding of Non-responsibility: _____

Basis of Finding of Non-Responsibility: _____

(Add additional pages as necessary)

5. Has any Governmental Entity or other governmental agency terminated or withheld a Procurement Contract with the above-named individual or entity due to the intentional provision of false or incomplete information? (Please circle):

X No Yes

6. If yes, please provide details below.

Governmental Entity: _____

Date of Termination or Withholding of Contract: _____

Basis of Termination or Withholding: _____

_____

_____

_____

_____

_____

_____

_____

(Add additional pages as necessary)

Offerer certifies that all information provided to the Governmental Entity with respect to State Finance Law §139-k is complete, true and accurate.

By: X _____ Date: September 14. 2026

Signature

Name: Bob Hopp

Title: VP Industrial

EXHIBIT D-3: NON-COLLUSION AFFIDAVIT

AUTHORIZED OFFICER: Bidder's submittal containing statements, supporting documentation, letters, etc., shall be signed in the bid by a duly authorized officer of the company whose signature is binding on the bid.

The undersigned offers and agrees to furnish the product upon which specifications are stated in the enclosed bid. The period of acceptance of this bid will be 45 calendar days from the date of the acknowledgment. (Period of acceptance will be forty-five (45) calendar days unless otherwise indicated by Bidder).

STATE OF Ohio COUNTY OF Marion
BEFORE ME, the undersigned authority, a Notary Public in and for the State of Ohio on this day personally appeared Bob Hipp who after being by me duly sworn did depose and say: I, Bob Hipp am a duly authorized officer of/agent for Nachurs Alpine Solutions and have been duly authorized to execute the foregoing on behalf of the said.

I hereby certify that the foregoing offer has not been prepared in collusion with any other proponent or other person or persons engaged in the same line of business prior to the official opening of this Bid. Further, I certify that the proponent is not now, nor has been for the past six (6) months, directly or indirectly concerned in any pool or agreement or combination, to control the type of product offered, or to influence any person or persons to offer or not to offer thereon.

By submission of this bid, the Bidder and each person signing on behalf of the Bidder certifies and in the case of a joint Bid each party thereto certifies as to its own organization, under penalty of perjury that to the best of his knowledge and belief:

A. The prices in this Bid have been arrived at independently without collusion, consultation, communication or agreement for the purpose of restricting competition as to any matter relating to such prices with any other Bidder or with any competitor;

B. Unless otherwise required by law, the prices which have been quoted in this Bid have not been knowingly disclosed by the Bidder and will not knowingly be disclosed by the Bidder prior to the opening, directly or indirectly to any other Bidder or to any competitor; and,

C. No attempt has been made or will be made by the proponent to induce any other person, partnership or corporation to submit or not to submit a proposal for the purpose of restricting competition.

Name and Address of Bidder: Nachurs Alpine Solutions, LLC

6620 Mooney St., Suite 220.

Dublin, Ohio 43017

Telephone and Fax Numbers: 800-622-4877

E-Mail Address: BHOPP@NACHURS-ALPINE.COM

By: X _____ Name and Title: Bob, Hopp, VP, Industrial

Signature Name & Title

SUBSCRIBED AND SWORN to before me by the above-named on this 14 day of September, 2020

_____

Notary Public in and for the State of Ohio

NOTARIAL SEAL STATE OF OHIO

JENNIFER L. ADAMS
Notary Public, State of Ohio
My Commission Expires
December 6, 2030

EXHIBIT D-4 BID BOND

KNOW ALL MEN BY THESE PRESENT, that we, the undersigned, Nachurs Alpine Solutions, LLC as Principal, and Swiss Re Corporate Solutions America Insurance Corporation, as Surety, a corporation chartered and existing under the laws of the State of Missouri, and fully authorized to the business in the State of New York, and hereby held and firmly bound unto Albany County Airport Authority, as Owner in the sum of $ 2,000.00 dollars and no cents in good and lawful money of the United States of America, to be paid upon demand to the Albany County Airport Authority, to which payment well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

The condition of the above obligation is such that whereas the Principal has submitted to Albany County Airport Authority, certain Bid attached hereto and hereby made a part hereof to enter into a contract in writing, for the delivery of the certain product to the Albany International Airport.

NOW, THEREFORE,

A. If said Bid shall be rejected, or in the alternate;

B. If said Bid shall be accepted and the Principal shall, within the time committed provide the specified product in faithful performance of said Purchase Order, and for the payment of all amounts in connection therewith, and shall in all other respects meet the conditions created by the acceptance of said Bid, then this obligation shall be void; otherwise the same shall remain in force and effect, it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulated and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the Authority accepts such Bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have cause their corporate seals to be hereto affixed and these presents to be signed by their proper officers.
Signed, this 8th day of September, 2026.

SWISS RE CORPORATE SOLUTIONS

SWISS RE CORPORATE SOLUTIONS AMERICA INSURANCE CORPORATION ("SRCSAIC")
SWISS RE CORPORATE SOLUTIONS PREMIER INSURANCE CORPORATION ("SRCSPIC")
WESTPORT INSURANCE CORPORATION ("WIC")

GENERALPOWEROF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS. THAT SRCSAIC, a corporation duly organized and existing under laws of the State of Missouri, and having its principal office in the City of Kansas City, Missouri, and SRCSPIC, a corporation organized and existing under the laws of the State of Missouri and having its principal office in the City of Kansas City, Missouri, and WIC, organized under the laws of the State of Missouri, and having its principal office in the City of Kansas City, Missouri, each does hereby make, constitute and appoint:

TIMOTHY BOWEN, BRIAN DREHER and WILLIAM SUNDWALL

JOINTLY OR SEVERALLY

its true and lawful Attorney(s)-in-Fact, to make, execute, seal and deliver, for and on its behalf and as its act and deed, bonds or other writings obligatory in the nature of a bond on behalf of each of said Companies, as surety, on contracts of suretyship as are or may be required or permitted by law, regulation, contract or otherwise, provided that no bond or undertaking or contract or suretyship executed under this authority shall exceed the amount of:

TWO HUNDRED MILLION ($200,000,000.00) DOLLARS

This Power of Attorney is granted and is signed by facsimile under and by the authority of the following Resolutions adopted by the Boards of Directors of both SRCSAIC and SRCSPIC at meetings duly called and held on the 18th of November 2021 and WIC by written consent of its Executive Committee dated July 18, 2011.

"RESOLVED, that any two of the President, any Managing Director, any Senior Vice President, any Vice President, the Secretary or any Assistant Secretary be, and each or any of them hereby is, authorized to execute a Power of Attorney qualifying the attorney named in the given Power of Attorney to execute on behalf of the Corporation bonds, undertakings and all contracts of surety, and that each or any of them hereby is authorized to attest to the execution of any such Power of Attorney and to attach therein the seal of the Corporation: and it is

FURTHER RESOLVED, that the signature of such officers and the seal of the Corporation may be affixed to any such Power of Attorney or to any certificate relating thereto by facsimile, and any such Power of Attorney or certificate bearing such facsimile signatures or facsimile seal shall be binding upon the Corporation when so affixed and in the future with regard to any bond, undertaking or contract of surety to which it is attached."

SWISS RE CORPORATE SOLUTIONS AMERICA INSURANCE CORPORATION CORPORATE SEAL 1973 MISSOURI

SWISS RE CORPORATE SOLUTIONS PREMIER INSURANCE CORPORATION CORPORATE SEAL MISSOURI

By _____
David Satory, Senior Vice President of SRCSAIC & Senior Vice President of SRCSPIC & Senior Vice President of WIC

By _____
Gabriel Jacquez, Senior Vice President of SRCSAIC & Senior Vice President of SRCSPIC & Senior Vice President of WIC

WESTPORT INSURANCE CORPORATION CORPORATE SEAL MISSOURI

IN WITNESS WHEREOF, SRCSAIC, SRCSPIC, and WIC have caused their official seals to be hereunto affixed, and these presents to be signed by their authorized officers

this 4th day of June, 20 25

Swiss Re Corporate Solutions America Insurance Corporation
Swiss Re Corporate Solutions Premier Insurance Corporation
Westport Insurance Corporation

State of Illinois
County of Cook ss

On this 4th day of June, 20 25 before me, a Notary Public personally appeared David Satory, Senior Vice President of SRCSAIC and Senior Vice President of SRCSPIC and Senior Vice President of WIC and Gabriel Jacquez, Senior Vice President of SRCSAIC and Senior Vice President of SPCSPIC and Senior Vice President of WIC, personally known to me, who being by me duly sworn, acknowledged that they signed the above Power of Attorney as officers of and acknowledged said instrument to be the voluntary act and deed of their respective companies

Karen M. Szweda, Notary

I, Jeffrey Goldberg, the duly elected Senior Vice President and Assistant Secretary of SRCSAIC and SRCSPIC and WIC, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney given by said SRCSAIC and SRCSPIC and WIC, which is still in full force and effect.
IN WITNESS WHEREOF, I have set my hand and affixed the seals of the Companies this 8 day of September, 20 26

OFFICIAL SEAL
KAREN M SZWEDA
Notary Public, State of Illinois
Commission No. 978628
My Commission Expires September 26, 2027

Jeffrey Goldberg, Senior Vice President & Assistant Secretary of SRCSAIC and SRCSPIC and WIC

Nachurs Alpine Solutions, LLC
Principal

By Jeff Barnes

Swiss Re Corporate Solutions
America Insurance Corporation
Surety

By Timothy Bowen
Timothy Bowen, Attorney-in-Fact

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, Alan Drosdick, certify that I am the Secretary of the Corporation named as Principal in the within bond; that Jeff Barnes, who signed the said bond of said Corporation is the President of said Corporation; that I know his signature, and his signature hereto is genuine; and that said bond was duly signed, sealed, and attested for in behalf of said Corporation by authority of its governing body.

Alan Drosdick
Alan Drosdick

(Corporate Seal)

Bob Hopp is Vice President Industrial for Nachurs Alpine Solutions and a duly sworn officer of Nachurs Alpine Solutions

NOTARIAL SEAL STATE OF OHIO

JENNIFER L. ADAMS
Notary Public, State of Ohio
My Commission Expires
December 6, 2030

Bob Hopp

Sworn and subscribed to before me by the above named this 14th day of September 2026



JENNIFER L. ADAMS
Notary Public, State of Ohio
My Commission Expires
December 6, 2020

EXHIBIT D-5 **REFERENCES**

List three (3) businesses where like or similar product(s) has been provided within the last two (2) years:

1. **Company Name:** References attached to this page.

   Address: _____

   Contact Person and Title: _____

   Phone / Fax/ E-Mail _____

2. **Company Name:** _____

   Address: _____

   Contact Person and Title: _____

   Phone / Fax/ E-Mail _____

3. **Company Name:** _____

   Address: _____

   Contact Person and Title: _____

   Phone / Fax/ E-Mail _____

EXHIBIT D-6: BID SHEET(S)

1. COMPLIANCY

Listed in EXHIBIT C are the minimum specifications and standards intended to govern, in general, the deicers desired. Please check "Yes: or "No" if you can meet these specifications and standards. Variations offered as "or equal" should include a justification for each to be used in the evaluation of the product offered. The Authority reserves the right to make the final determination if the "as equal" variation is acceptable to the Authority.

All requirements of the Minimum Specifications and Standards will be met for each deicer:

YES ✓ NO _____

2. PRODUCT PRICING

ITEM # 1: SODIUM ACETATE NO BID

Price for Super Sacks(2,000lb) $_____

Price per Half Sack (1,000lb) $_____

Price Per 55lb bags: $_____

Maximum Amount Available For Delivery Per Week: _____

Brand Bid (for information only): _____

As stated in specifications, delivery must be made within 48 hours of placing order.

Hours Available for Placement of Orders by Airport:

Monday–Friday _____ **Saturday** _____ **Sunday**_____

Phone Number _____

Contact Person _____

3. PROMPT PAYMENT DISCOUNTS

Percent discount available for prompt payment: _____**%**

Terms: _____

Nachurs Alpine Solutions LLC
References List **U.S. Airports**
winters 2025 thru 2026

NASi®

Sourcewell
Awarded Contract
Contract # 110122-NCH

Customer	Location	Contact	Position	Phone Number	E-mail	NASi-SF	Alpine RF-11
Atlanta Hartsfield Airport	Atlanta, GA	Philip Doucet	Assoc. Dir. Airside Facilities	404-276-1882	philip.doucet@atl.com	x	x
BWI, Maryand Aviation Admin.	Linthicum Hts. MD	Jason Gardner	Martin Airport	410-859-7111	jGardner@bwiairport.com		x
Central Wisconsin	Mossinee, WE	Mark Cihlar	Assistant Airside Director	715-693-2147	mcihlar@fly-cwa.org	x	
Cherry Capital	Traverse City, MI	Chris Sieklucki	Operations Mgr.	231-645-8600	chris.sieklucki@TVCAirport.com		x
Cleveland Hopkins	Cleveland, OH	Patrick Ruedisueli	Assistant Ops Commissioner	216-265-6611	pruedisueli@clevelandairport.com	x	x
Dallas/Ft. Worth	Dallas, TX	Bob Lowry	Ground Maintenance Super.	469-500-3060	rlowry@dfwairport.com	x	x
Denver Int'l	Denver, CO	Dave Valdez	Assis. Dir. Of Field Maint.	303-342-2680	dave.valdez@flydenver.com		x
Detroit Metro, Wayne County	Detroit, MI	Ken Arnett	Mgr, Field Maint.	734-626-1297	ken.arnett@wcaa.us		x
Eugene	Eugene, OR	Shannon McNatt	Supervisor, Airfield Maintenance	541-682-5544	smcnatt@eugene-or.gov	x	x
Ft. Wayne, Allen County	Ft. Wayne, IN	Jeff Hermansen	Purchasing Mgr.	260-446-3430	jhermansen@fwairport.com	x	x
Gerald R. Ford	Grand Rapids, MI	Rory Walters	Purchasing Mgr.	616-233-6068	rwalters@grf.org		x
Glacier Park, Flathead Int'l	Kalispell, MT	Darin Turner	Supervisor, Airfield Maintenance	406-257-5994	Dturner@glacierairport.com	x	x
John Glenn Int'l	Columbus, OH	Brad Ontrop	Supervisor, Airfield Maintenance	614-239-4022	Bontrop@columbusairports.com	x	x
Hays Regional Airport	Hays, KS	Jamie Salter	Airport Director	785-628-7370	jsalter@haysusa.com		x
Manchester-Boston Airport	Manchester, NH	Chris Mulhern	Purchasing Mgr.	603-624-6539	cmulhern@flymanchester.com		x
O'Hare Int'l	Chicago, IL	Jennifer Laverty	Chief Airport Ops. Supervisor	773-462-1703	jennifer.laverty@cityofchicago.org	x	
Rockford Int'l	Rockford, IL	Chip Geiger	Purchasing Mgr.	815-969-4466	cgeiger@flyrfd.com		x
Salt Lake City Int'l Airport	SLC, UT	Dave Tingey	Maintenance Ops. Support Mgr	801-531-4653	dave.tingey@slc.gov	x	x
Sioux Falls Regional	Sioux Falls, SD	Dan Lefellier	Executive Director	605-336-0762	dan.letellier@sfairport.com		x
Toledo Express	Toledo, Ohio	Tad Fisher	Supervisor, Airfield Maintenance	567-703-8633	tfisher@toledoport.org	x	

BID ITEM #1
SODIUM ACETATE: Solid Pellets

NO BID

1. **The product is FAA-approved and meets the latest version of SAE-AMS 1431B.**

□ YES □ NO

2. **The vendor shall provide a copy of independent laboratory certification of the product to the latest AMS 1431B. Certification shall be dated within twenty-four months of vendor bid submittal.**

□ YES □ NO

3. **The vendor shall provide comprehensive on-site training to Airport Authority representative(s) for each shift, at no additional cost to the Airport Authority.**

□ YES □ NO

4. **The vendor shall provide the names of five (5) clients to whom it has supplied the product during the past two years.**

□ YES □ NO

5. **Vendor will be required to provide a certified laboratory analysis for product conformance to bid specifications for each delivery. Certification shall be dated within twenty-four (24) months of vendor bid submittal.**

□ YES □ NO

6. **The Bidder shall provide and include the product's biological oxygen demand (BOD) and toxicity along any other environmental test results with its bid.**

□ YES □ NO

BID ITEM # 2
SODUM FORMATE/ Solid Pellets

1. **The product is FAA-approved and meets the latest version of SAE-AMS 1431B.**

   ☑ YES ☐ NO **Actually, latest version is 1431E.**

2. **The vendor shall provide a copy of independent laboratory certification of the product to the latest AMS 1431B. Certification shall be dated within twenty-four months of vendor bid submittal.**

   ☑ YES ☐ NO

3. **The vendor shall provide comprehensive on-site training to Airport Authority representative(s) for each shift, at no additional cost to the Airport Authority.**

   ☑ YES ☐ NO

4. **The vendor shall provide the names of five (5) clients to whom it has supplied the product during the past two years.**

   ☑ YES ☐ NO

5. **Vendor will be required to provide a certified laboratory analysis for product conformance to bid specifications for each delivery. Certification shall be dated within twenty-four (24) months of vendor bid submittal.**

   ☑ YES ☐ NO

6. **The Bidder shall provide and include the product's biological oxygen demand (BOD) and toxicity along any other environmental test results with its bid.**

   ☑ YES ☐ NO

7. **The vendor shall provide written technical information covering at minimum The product's environmental impact, MSDS, handling, storage and application guidelines.**

   ☑ YES ☐ NO **Included in the AMS1431 test results**

NO BID

BID ITEM #3
SODUM FORMATE / ACETATE BLEND / Solid Pellets

1. **The product is FAA-approved and meets the latest version of SAE-AMS 1431B.**

   □ YES □ NO

2. **The vendor shall provide a copy of independent laboratory certification of the product to the latest AMS 1431B. Certification shall be dated within twenty-four months of vendor bid submittal.**

   □ YES □ NO

3. **The vendor shall provide comprehensive on-site training to Airport Authority representative(s) for each shift, at no additional cost to the Airport Authority.**

   □ YES □ NO

4. **The vendor shall provide the names of five (5) clients to whom it has supplied the product during the past two years.**

   □ YES □ NO

5. **Vendor will be required to provide a certified laboratory analysis for product conformance to bid specifications for each delivery. Certification shall be dated within twenty-four (24) months of vendor bid submittal.**

   □ YES □ NO

6. **The Bidder shall provide and include the product's biological oxygen demand (BOD) and toxicity along any other environmental test results with its bid.**

   □ YES □ NO

7. **The vendor shall provide written technical information covering at minimum The product's environmental impact, MSDS, handling, storage and application guidelines.**

   □ YES □ NO

BID ITEM #4
POTASSIUM ACETATE BASE FLUID / Liquid:

1. **The product provided must be FAA-approved and meet the latest version of SAE-AMS 1435 Generic Fluid Specification.**
   ☑ YES ☐ NO

2. **The deicing liquid product must be potassium-acetate based, and must not contain any Glycol products.**
   ☑ YES ☐ NO

3. **The fluid shall be a minimum 50% potassium by weight, with a freezing point of -70° F, or lower (colder).**
   ☑ YES ☐ NO

4. **The fluid shall not contain urea, ethylene or propylene glycol.**
   ☑ YES ☐ NO

5. **The vendor shall provide a copy of an independent laboratory certification of the fluid to the latest AMS 1435. Certification shall be dated within twenty-four month of the vendor's quote submittal.**
   ☑ YES ☐ NO

6. **The fluid PH must not exceed 11.5.**
   ☑ YES ☐ NO

7. **The fluid must remain stable and not separate during long term storage.**
   ☑ YES ☐ NO AMS 1435 requires one year stability testing Alpine RF-11 does conform.

8. **Fluid shall be color coded blue for easy identification.**
   ☑ YES ☐ NO

9. **The vendor shall provide an independent third party test report of the fluid's compatibility with asphalt concrete pavement materials, including bitumen softening and asphalt concrete adhesion strength before and after immersion.**
   ☑ YES ☐ NO Included in the AMS1435 test report.

10. **The vendor shall provide written technical information covering, at minimum, the fluid's environmental impact, MSDS, handling, storage and application guidelines.**
    ☑ YES ☐ NO

11. **The vendor shall provide and include the product's biological oxygen demand (BOD) and toxicity, along with any other environmental test results with it's submittal.**

☑ YES ☐ NO

12. **Vendor will provide a certified laboratory analysis for product conformance to bid specifications for each delivery. A tank or lot analysis will be considered sufficient.**

☑ YES ☐ NO

13. **Vendor must provide 24 hour, 7 days a week emergency contact names and telephone numbers.**

☑ YES ☐ NO

14. **Supply will be delivery by tank truck. Vendor will be responsible for any adapters, hoses, fittings or valves needed to hook supplying tank trucks to chemical storage tanks.**

☑ YES ☐ NO

15. **Deliveries of liquid deicer shall not be less than 4,000 gallon lots, bulk form. Delivery must be made within 48 hours after order is placed, holidays and weekends included.**

☑ YES ☐ NO

16. **The vendor shall provide the names of five (5) clients to whom it has supplied the fluid during the past two years.**

☑ YES ☐ NO

17. **The Authority, at its discretion may require a 5 gallon sample, at no cost to the Authority, to assure that the product when tested on dry, clean asphalt or concrete pavement (a) at full concentration and (b) at 50-50 solution with water, both in no less than 7 evenly spaced square feet, must not depress the dry pavement value of the coefficient of friction by more than 0.15 MU or result in a wet/dry ration of less than 0.85 (85%).**

☑ YES ☐ NO

18. **Deliveries shall not be less than 4,000 gallon lots, bulk form. Delivery must be guaranteed forty-eight (48) hours after order is placed, holidays and weekends included.**

☑ YES ☐ NO

19. **The vendor shall provide comprehensive on-site training to Albany County Airport Authority Personnel for each shift, at no additional cost to Albany County Airport Authority.**

☑ **YES** ☐ **NO**

EXHIBIT D-6: BID SHEET(S)

1. COMPLIANCY

Listed in EXHIBIT C are the minimum specifications and standards intended to govern, in general, the deicers desired. Please check "Yes: or "No" if you can meet these specifications and standards. Variations offered as "or equal" should include a justification for each to be used in the evaluation of the product offered. The Authority reserves the right to make the final determination if the "as equal" variation is acceptable to the Authority.

All requirements of the Minimum Specifications and Standards will be met for each deicer:

YES ✓ NO _____

2. PRODUCT PRICING

ITEM # 1: SODIUM ACETATE

NO BID

Price for Super Sacks(2,000lb) $_____

Price per Half Sack (1,000lb) $_____

Price Per 55lb bags: $_____

Maximum Amount Available For Delivery Per Week: _____

Brand Bid (for information only): _____

As stated in specifications, delivery must be made within 48 hours of placing order.

Hours Available for Placement of Orders by Airport:

Monday–Friday _____ **Saturday** _____ **Sunday**_____

Phone Number _____

Contact Person _____

3. PROMPT PAYMENT DISCOUNTS

Percent discount available for prompt payment: _____**%**

Terms: _____

VENDOR IS REQUIRED TO SUBMIT A SAMPLE PRODUCT WITH BID RESPONSE

BID ITEM #2: SODIUM FORMATE

Price for Super Sacks(2,000lb) $ 1851.86 SS Weight is 2204.6 #

Price per Half Sack (1,000lb) N/A

Price Per 55lb bags: $1848.00

Maximum Amount Available For Delivery Per Week: about 10 loads if needed.

Brand Bid (for information only): NASi-SF, IceCare, Ecoway

As stated in specifications, delivery must be made within 48 hours of placing order.

Hours Available for Placement of Orders by Airport:

Monday–Friday 24 hours **Saturday** 24 hours **Sunday** 24 hours

Phone Number 800-622-4877 x300

Contact Person customer service - Ashley Saad

3. **PROMPT PAYMENT DISCOUNTS**

Percent discount available for prompt payment: N/A %

Terms: NET 30 DAYS

VENDOR IS REQUIRED TO SUBMIT A SAMPLE PRODUCT WITH BID RESPONSE.

NO BID

BID ITEM #3: SODIUM FORMATE/ ACETATE BLEND

Price for Super Sacks(2,000lb) $_____

Price per Half Sack (1,000lb) $_____

Price Per 55lb bags: $_____

Maximum Amount Available For Delivery Per Week: _____

Brand Bid (for information only): _____

Sacks size(s) available: _____

_____

As stated in specifications, delivery must be made within 48 hours of placing order.

Hours Available for Placement of Orders by Airport:

Monday–Friday _____ **Saturday** _____ **Sunday**_____

Phone Number _____

Contact Person _____

3. **PROMPT PAYMENT DISCOUNTS**

Percent discount available for prompt payment: _____**%**

Terms: _____

VENDOR IS REQUIRED TO SUBMIT A SAMPLE PRODUCT WITH BID RESPONSE.

BID ITEM # 4: POTASSIUM ACETATE BASE FLUID

PRICE PER GALLON: $ 6.54 **PER GALLON**

Truck Load Size in Pounds (for information only): 4400 gallons

Maximum Amount Available For Delivery Per Week: about 10 loads if needed.

Brand Bid (for information only): Alpine RF-11

Sacks size(s) available: Not available, athough 265 or 275 gallon totes are available but at higher cost.

As stated in specifications, delivery must be made within 48 hours of placing order.

Hours Available for Placement of Orders by Airport:

Monday–Friday 24 hours **Saturday** 24 hours **Sunday** 24 hours

Phone Number 800-622-4877 x300

Contact Person customer service - Ashley Saad

3. **PROMPT PAYMENT DISCOUNTS**

Percent discount available for prompt payment: NA %

Terms: NET 30 DAYS

VENDOR IS REQUIRED TO SUBMIT A SAMPLE PRODUCT WITH BID RESPONSE.

AGENDA ITEM NO. 11

Authorization of Change Orders

AGENDA ITEM NO. 11.1

Change Order 16: Authorization to Award Contract Change Order No. 16 to Construction Contract 21-1082-INT STR for the Pre-TSA Terminal Expansion to MLB Construction Services, LLC.

AGENDA ITEM NO: 11.1
MEETING DATE: October 13, 2026

ALBANY COUNTY AIRPORT AUTHORITY
REQUEST FOR AUTHORIZATION

DEPARTMENT: *Planning and Engineering*

Contact Person: *John A. O'Donnell, Chief Operating Officer*

PURPOSE OF REQUEST:

Change Order 16: *Authorization to Award Contract Change Order No. 16 to Construction Contract 21-1082-INT STR for the Pre-TSA Terminal Expansion to MLB Construction Services, LLC.*

CONTRACT AMOUNT:

Base:	**$46,474,000.00**	
Change Order No. 1	**37,371.00**	**ACAA Approved 02/10/2025**
Change Order No. 2	**169,821.00**	**ACAA Approved 02/10/2025**
Change Order No. 3	**251,152.00**	**ACAA Approved 03/24/2025**
Change Order No. 4	**110,137.00**	**ACAA Approved 04/16/2025**
Change Order No. 5	**54,641.00**	**ACAA Approved 05/14/2025**
Change Order No. 6	**278,334.00**	**ACAA Approved 09/15/2025**
Change Order No.7	**226,507.00**	**ACAA Approved 10/20/2025**
Change Order No.8	**257,131.00**	**ACAA Approved 11/21/2025**
Change Order No.9	**88,113.00**	**ACAA Approved 12/15/2025**
Change Order No.10	**(-514,746.00)***	**CREDIT Approved 02/09/2026**
Change Order No. 11	**453, 947.00**	**ACAA Approved 04/13/2026**
Change Order No. 12	**466,390.00**	**ACAA Approved 05/12/2026**
Change Order No. 13	**(-548,936.00)***	**CREDIT Approved 06/13/2026**
Change Order No. 14	**30,653.00**	**ACAA Approved 07/13/2026**
Change Order No. 15	**43,655.00**	**ACAA Approved 08/17/2026**
Change Order No. 16	**144,438.00 ***	

Total: **$ 48,022,628 (Total includes change orders to date of $1,548,628.00)**

****Pending Board Approval at this meeting.***

BUDGET INFORMATION:

Anticipated in Current ALB Capital Plan: Yes √ No___ NA
Funding Account No.: *CPN 50-2021*

AWARD CONDITIONS MET:

Apprenticeship √ DBE √ MWBE √

Service Disable Veteran Owned Business (SDVOB) N/A

AGENDA ITEM NO: 11.1
MEETING DATE: October 13, 2026

FISCAL IMPACT - FUNDING (Dollars or Percentages)

Federal *40%* **State** 60% **Airport** *N/A*
Term of Funding: *2023-2026*
Grant No.: *N/A* **STATE PIN:** *N/A*

JUSTIFICATION:

Requesting approval of change order #16 to Contract #21-1082-STR INT. The most significant change included in this change order entails Signage changes. The changes are, for the most part, the result of Owner Directed changes which modified the signs to be more easily understood, such as changing the signs to read "Ticketing" versus "Departures "and "Baggage Claim" versus "Arrivals" along the curbside. The second significant change was the result of the design documents not addressing an electrical closet located under the existing escalators. The escalators were demolished and there weren't any provisions in the bid documents to rebuild the appended small electrical closet. Subsequently, the electrical closet framing was added as it is necessary for the continuity of power to locations in the Ticketing and Vestibule areas. The less consequential changes were related to minor details that were omitted in the design process such as blocking, light framing, some omitted diffusers and terrazzo finishing strips.

CHIEF EXECUTIVE OFFICER'S RECOMMENDATION:

Recommend approval.

FINAL AGREEMENT SUBJECT TO APPROVAL BY COUNSEL: YES ✓ **NA**_____

PROCUREMENT DEPARTMENT APPROVAL:

Procurement complies with Authority Procurement Guidelines and Acting Chief Financial Officer has approved. **YES** ✓ **NA**___

BACK-UP MATERIAL:

Please refer to the attached Change Order No. 16 backup information compiled by Turner Construction Company.

AIA® Document G731™ – 2019

Change Order, Construction Manager as Adviser Edition

PROJECT: *(name and address)*
Albany Airport

737 Albany Shaker Road Albany, NY 12211

CONTRACT INFORMATION:
Contract For:
General Construction [1082-INT STR]
Date:
11-08-2023

CHANGE ORDER INFORMATION:
Change Order Number:
016
Date:
09-08-2026

OWNER: *(name and address)*
Albany County Airport Authority
737 Albany Shaker Road
Albany, NY 12211

ARCHITECT: *(name and address)*
CHA Consulting Inc.
3 Winners Circle
Albany, NY 12205

CONTRACTOR: *(name and address)*
MLB Construction Services LLC
One Stone Brook Road
Malta, NY 12020

CONSTRUCTION MANAGER: *(name and address)*
Turner Construction Company
1 Computer Drive South
Albany, NY 12205

THE CONTRACT IS CHANGED AS FOLLOWS:
(Insert a detailed description of the change and, if applicable, attach or reference specific exhibits. Also include agreed upon adjustments attributable to executed Construction Change Directives.)

01. PCO-266 RFI-247 Ticketing Low Ceiling Diffuser Trim (Add $1,581.00)
02. PCO-306 ASI-131 Signage Revisions (Add $48,169.00)
03. PCO-308 ASI-134 L1 Existing Electrical Room Changes (Add $41,402.00)
04. PCO-315 (BP-04 RFI 356)Fastening and Blocking Requirements at Snowguards (Add $11,459.00)
05. PCO-352 (BP-04 RFI 414) Level 1 Garage Framing Revisions (Add $2,748.00)
06. PCO-455b ASI-167 Replacement of HHWP-1 and 2 [Laboir Only] (Add $21,291.00)
07. PCO-504 (BP-04 RFI-615) Precast Terrazzo Strips in Lieu of Core Drills (Add $17,788.00)

The original Contract Sum was	$	46,474,000.00
Net change by previously authorized Change Orders	$	1,404,190.00
The Contract Sum prior to this Change Order was	$	47,878,190.00
The Contract Sum will be increased by this Change Order in the amount of	$	144,438.00
The new Contract Sum including this Change Order will be	$	48,022,628.00

The Contract time will be unchanged by (0) days.
The Contractor s Work shall be substantially complete onMarch 28, 2025.

NOTE: This Change Order does not include adjustments to the Contract Sum or Guaranteed Maximum Price, or the Contract Time, that have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONSTRUCTION MANAGER, CONTRACTOR, AND OWNER.

ARCHITECT *(Signature)*	**CONSTRUCTION MANAGER** *(Signature)*
BY: Anthony Stellato - Vice President	BY: Scott Bridie - Senior Project Manager
(Printed name, title, and license number if required)	*(Printed name and title)*
Date	*Date*

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User Notes: (6aa06276cf68e037949118e

PCO-266

MLB Construction Services LLC
One Stone Break Road
Malta, NY 12020
Tel: 518-289-1371
Fax: 518-289-1652

PCO-266b Rec'd TCCo 08/19/26

PROPOSAL

SUBMITTED TO:
Scott Bridie
Turner Construction Company
1 Computer Drive South
Albany, NY 12205

PROJECT NAME	
Alb. Airport 21-1082-STR & INT	
PROJECT NO.	DATE
23-114	8/19/26
PROPOSAL NO.	PROPOSAL AMOUNT
130A	$ 1,581.00

Per NOC 130A dated 6/5/2025, MLB Construction Services LLC is pleased to present our proposal for the following:

Please see the attached mark-ups showing changes in the scope of work at the low ceilings in the 'Ticketing' area.

This proposal is solely for the added diffuser trim. All T&M labor will be submitted as NOC #130B.

Description	Labor	Material	Equipment	Subcontract	Other	Price
John W Danforth Company				$1,512.61		$1,512.61
					Subtotal:	$1,512.61
		MLB OH&P (Subcontractor)		$1,375.10	4.97%	$68.39
					Total:	**$1,581.00**

If you have any questions, please contact me at 518-289-1371.

- [X] We reserve the right to request an extension of time together with additional cost incurred at a later date.
- [ ] We request calendar days extension of time for the above work.
- [ ] This proposal may be withdrawn by us if not accepted within 10 days.

WE HAVE NOT BEEN DIRECTED TO PROCEED WITH THIS WORK.

OWNER MUST RETURN THIS PROPOSAL WITH THEIR SIGNED APPROVAL SHOWN BELOW BEFORE WORK CAN BEGIN .

Submitted by: 8/19/26
Craig Dittl
MLB Construction Services LLC

Approved by: _____
Date: _____

Cc: JMD/SAS/File (MLB Construction Services LLC)

PCO-266b Rec'd TCCo 08/19/26

CHANGE ORDER REQUEST

76

danforth
An EMCOR Company

Title: NOC 130 - PCO 266 - Ticketing Ceiling Diffuser Trim Frames
Project Name: Albany Airport Terminal Expansion
Project Address: 737 Albany Shaker Road
Albany, NY 12211
COR Date: 08/17/2026
John W Danforth Company Job Number: 90272-100
Customer Job Number:
Customer Reference Number: NOC 130

Our Information

John W Danforth Company
300 Colvin Woods Parkway
Tonawanda, NY 14150
Phone: (716)-955-0035

Customer Information

MLB Construction Services
1 Stonebreak Road
Ballston Spa, NY 12020
Phone: (518)-289-1371

Description of Change Order Request

Provide 24x24 Diffuser Trim Frames (material only)

Material

Description	Qty of Material	Unit of Measure	Rate	Total Cost
24x24 Diffuser Trim Frames	30.00	each	$38.17	$1,145.10
			Total Material:	**$1,145.10**

Other

Description	Qty of Other	Unit of Measure	Rate	Total Cost
10 Day Quick Build Expediting Option	1.00	each	$230.00	$230.00
			Total Other:	**$230.00**

Subtotal		**$1,375.10**
Tax Rate (Materials)	0.000%	$0.00
Mark Up Rate (Subtotal)	10.000%	$137.51
Requested Total		**$1,512.61**

CLEARSTORY

PCO-266b Rec'd TCCo 08/19/26

Terms & Conditions

Exclusions to include :Retention; unforeseen conditions; roofing work of any kind; cleanup; dumpsters; painting; temporary facilities of any kind; any design calculations or PE stamp; full time on-site safety rep; sales tax; bonding or special insurances of any kind; concrete cutting or concrete work of any kind; cut & patch of any kind; grouting; electrical/power wiring of any kind; controls wiring; environmental remediation; excavation/backfilling; dewatering; chemical/mechanical pipe cleaning; flushing/draining/refilling/venting of systems; instructions to operating personnel; operational tests; valve tagging; equipment/system identification; shop drawings; as-built drawings; escutcheons; caulking; reconditioning and cleaning of owner equipment or material; shoring/tamping; labor to perform x-ray quality welding; schedule update; any work that is not explicitly called out in scope of work description above.

This change proposal covers only the direct costs associated with the change order work described above. The contractor expressly reserves the right to submit, at a later date, added costs and/or time extension requests attendant to this modification arising from, but not limited to: extended field and home office overhead, labor and equipment inefficiencies, disruptions, cumulative impacts, impacts to the critical path and related delay costs, schedule resequencing and/or overtime and acceleration.

We reserve the right to modify this estimate, if additional work not covered by this proposal is required.

Unless noted otherwise, it is anticipated that all work required by this change will be done on a straight time basis. Overtime work, if required, will be billed as an additional item.

This proposal is for acceptance within 20 days and is subject to escalation thereafter.

Please advise as soon as possible if we are to proceed. We will not proceed without formal written change order, per contract terms.

ACCEPTANCE OF PROPOSAL: The above prices, specifications, and conditions are satisfactory and are hereby accepted. John W. Danforth Company is authorized to do the work as indicated. Payment will be made as outlined above. The conditions of the proposal above stand good for 30 days. Pricing is based on conditions at time of bid. Danforth reserves its right for an adjustment in contract time, price, or both, due to changing conditions relating, but not limited to COVID-19, or any pandemic, epidemic, disease outbreak, or conflict; or any governmental regulations that are enacted after this date that may impact project cost.

PCO-266b Rec'd TCCo 08/19/26

RF PECK
Commercial HVAC Equipment

22 Computer Dr West • Albany, NY 12205 • Phone (585) 697-0836

To: JW Danforth
Attn: Michael Reverdatto

Date: 8/17/2026
Quotation valid for 60 days
Salesperson: Terry Seery
Estimator: Terry Seery

Job: 23-3390 - Albany International Airport Terminal Passenger Screening Expansion Amenities Enhancements

Addendum: 0

30	**Nailor Industries - 24x24 DFS Frames Appliance White Finish**	$1,145.00
	****STANDARD LEADTIME 4 WEEKS****	
1	**10 BUSINESS DAY QUICK BUILD**	$230.00

THANK YOU FOR YOUR BUSINESS
TERMS: Net 30; Sales Tax is NOT included;
Unless otherwise indicated all quotations are freight allowed F.O.B. Factory.
Product warranties are for parts ONLY unless noted otherwise. Standard ship

PCO-306

MLB Construction Services LLC
One Stone Break Road
Malta, NY 12020
Tel: 518-289-1371
Fax: 518-289-1652

PROPOSAL

SUBMITTED TO:
Scott Bridie
Turner Construction Company
1 Computer Drive South
Albany, NY 12205

PROJECT NAME	Alb. Airport 21-1082-STR & INT
PROJECT NO.	23-114
DATE	8/19/26
PROPOSAL NO.	167
PROPOSAL AMOUNT	$ 48,169.00

Per NOC 167 dated 8/19/2025, MLB Construction Services LLC is pleased to present our proposal for the following:

ASI-131 has been issued to update drawings for the signage modifications. ACAA made additional changes in the final submittal review and that final, approved submittal is what this proposal is based on.

Description	Labor	Material	Equipment	Subcontract	Other	Price
ID Signsystems Inc				$46,075.00		$46,075.00
					Subtotal:	$46,075.00
		MLB OH&P (Subcontractor)		$41,886.36	5.00%	$2,094.00
					Total:	**$48,169.00**

If you have any questions, please contact me at 518-289-1371.

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- [ ] We request calendar days extension of time for the above work.
- [ ] This proposal may be withdrawn by us if not accepted within 10 days.

WE HAVE NOT BEEN DIRECTED TO PROCEED WITH THIS WORK.

OWNER MUST RETURN THIS PROPOSAL WITH THEIR SIGNED APPROVAL SHOWN BELOW BEFORE WORK CAN BEGIN .

Submitted by: 8/19/26
Craig Ditti
MLB Construction Services LLC

Approved by: _____
Date: _____

Cc: JMD/SAS/File (MLB Construction Services LLC)

BASED ON FINAL, ACAA-APPROVED, SUBMITTAL

	SIGN TYPE	SIZE	QTY	UNIT PRICE 2023			ASI-131 QTY	QTY DIFF	ASI-131 CO #2
1	W01A	24"x144"	5	$ 6,096.00	$ 30,480.00		6	1	$ 6,096.00
2	W01A	24"x72"	1	$ 4,592.00	$ 4,592.00		0	-1	$ (4,592.00)
3	W01A	18"x72"	3	$ 4,473.00	$ 13,419.00		4	1	$ 4,473.00
4	W01B	24"x72"	1	$ 5,068.00	$ 5,068.00		1	0	$ -
5	W01C	18"x72"	1	$ 2,769.00	$ 2,769.00		2	1	$ 2,769.00
6	W02A	24"x48"	6	$ 3,798.00	$ 22,788.00		13	7	$ 26,586.00
7	W04	10"x49"	13	$ 425.00	$ 5,525.00		14	1	$ 425.00
8	W05	16"x18"	2	$ 2,579.00	$ 5,158.00		2	0	$ -
9	W06	8"x6"	6	$ 135.00	$ 810.00		6	0	$ -
10	B01	30"x94"	2	$ 3,496.00	$ 6,992.00		2	0	$ -
11	B02	72"X130"	1	$ 6,781.00	$ 6,781.00		0	-1	$ (6,781.00)
12	B02.R	41.25"X134"	0	$ 6,250.00	$ -		1	1	$ 6,250.00
13	D01	1.5"	1	$ 26,915.00	$ 26,915.00		1	0	$ -
14	R01	6.5"x8"	22	$ 154.50	$ 3,399.00		20	-2	$ (309.00)
15	R02	6.5"x8"	19	$ 169.00	$ 3,211.00		14	-5	$ (845.00)
16	R03	8"x10"	2	$ 224.00	$ 448.00		2	0	$ -
17	R04	8"x6"	2	$ 135.00	$ 270.00		2	0	$ -
18	R05	12.5"x15.5"	2	$ 540.00	$ 1,080.00		2	0	$ -
19	R06	12.5"x16.5"	2	$ 574.00	$ 1,148.00		2	0	$ -
20	R07	12"x12"	8	$ 401.00	$ 3,208.00		11	3	$ 1,203.00
21	S10	14"x10"	2	$ 390.00	$ 780.00		2	0	$ -
22	INSTALL		1	$ 90,138.00	$ 90,138.00		1	0	$ 10,800.00

Lines 7, 14, 15, and 20 (GREEN) are essentially a wash. These are placard-style signs mounted on foam tape. IDS has given the material credit, however, the labor on a foam-tape mounted sign is negligible. Discussed with S. Bridie on 8/18/26.

Lines 2 and 3 (YELLOW) were a wash on the labor side as they are the same sign type but IDS did give the material credit for the larger sign that was deleted.

Lines 11 and 12 (PINK) were a wash on the labor side as they are the same sign type but IDS did give the material credit for the larger sign that was deleted.

After that breakdown, you can see the (9) added signs highlighted on lines 1, 5, and 6. While the net add is only (6) signs, that is due to signs with far less labor being deleted. The sign type W01s are far more elaborate signs that are suspended from the structure and require IDS to capture that labor. The included rate of $1,200/sign is comparable to (2) union workers for a day which is reasonable as discussed with S. Bridie on 8/18/26.

PCO-308

MLB Construction Services LLC
One Stone Break Road
Malta, NY 12020
Tel: 518-289-1371
Fax: 518-289-1652

PROPOSAL

SUBMITTED TO:
Scott Bridie
Turner Construction Company
1 Computer Drive South
Albany, NY 12205

PROJECT NAME	
Alb. Airport 21-1082-STR & INT	
PROJECT NO.	DATE
23-114	7/29/26
PROPOSAL NO.	PROPOSAL AMOUNT
155R1	$ 41,402.00

Per NOC 155R1 dated 7/29/2026, MLB Construction Services LLC is pleased to present our proposal for the following:

ASI-134 has been issued to update drawings for the existing electrical room changes on Level 1.

Description	Labor	Material	Equipment	Subcontract	Other	Price
Misc. Removals	$1,063.08					$1,063.08
Architectural Metalwork	$405.55	$534.24				$939.79
Metal Doors & Frames	$171.82	$1,563.00				$1,734.82
Adirondack Taping & Supply Inc				$21,204.57		$21,204.57
Painting				$2,194.00		$2,194.00
Absolute Fire Protection LLC				$1,056.00		$1,056.00
George J Martin & Son Inc				$11,216.00		$11,216.00
					Subtotal:	$39,408.26
		MLB OH&P (Self-performed)		$3,737.69	10.00%	$373.74
		MLB OH&P (Subcontractor)		$32,405.30	5.00%	$1,620.00
					Total:	**$41,402.00**

If you have any questions, please contact me at 518-289-1371.

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- [ ] This proposal may be withdrawn by us if not accepted within 10 days.

WE HAVE NOT BEEN DIRECTED TO PROCEED WITH THIS WORK.

OWNER MUST RETURN THIS PROPOSAL WITH THEIR SIGNED APPROVAL SHOWN BELOW BEFORE WORK CAN BEGIN.

Submitted by: 7/29/26
Craig Dittl
MLB Construction Services LLC

Approved by: _____
Date: _____

Cc: JMD/SAS/File (MLB Construction Services LLC)

mlb
Over 75 Years of Construction Excellence

General Contractors and
Construction Managers

One Stone Break Road
Malta, New York 12020
518.289.1371 www.mlbind.com

Project # 23-114 Date 6/4/26
Project ALBANY AIRPORT EXPANSION
Issue ASI-134
Remarks DEMO Prepared By ED

- AD-101 BID DOCS DID NOT IDENTIFY ANY DEMO OUTSIDE OF THE ESCALATOR SCOPE

3 MEN, 4 HOURS (NIGHT SHIFT)

= 12 MH x $88.59

= $1,063.08 ✓

LABORERS

		J	J OT	J DT	J 2SHIFT	J 3SHIFT	J 3SHIFT OT	F	F OT	F 2SHIFT	F 3SHIFT	F 3SHIFT OT	Super	Super OT	Super DT	Super 2SHIFT	Super 2SHIFT OT	Super 3SHIFT	Super 3SHIFT OT
Base Rate		40.21	60.32	80.42	43.86	45.79	68.68	43.21	64.82	47.62	49.69	74.54	52.63	78.95	105.26	60.52	90.79	63.16	94.73
Union Fringes																			
Welfare		$ 8.16	$ 8.16	$ 8.16	$ 8.16	$ 8.16	$ 8.16	$ 8.16	$ 8.16	$ 8.16	$ 8.16	$ 8.16	$ 8.16	$ 8.16	$ 8.16	$ 8.16	$ 8.16	$ 8.16	$ 8.16
Pension		$ 15.05	$ 15.05	$ 15.05	$ 15.05	$ 15.05	$ 15.05	$ 15.05	$ 15.05	$ 15.05	$ 15.05	$ 15.05	$ 15.05	$ 15.05	$ 15.05	$ 15.05	$ 15.05	$ 15.05	$ 15.05
Annuity		$ 2.00	$ 2.00	$ 2.00	$ 2.00	$ 2.00	$ 2.00	$ 2.00	$ 2.00	$ 2.00	$ 2.00	$ 2.00	$ 2.00	$ 2.00	$ 2.00	$ 2.00	$ 2.00	$ 2.00	$ 2.00
Training & Ed		$ 1.32	$ 1.32	$ 1.32	$ 1.32	$ 1.32	$ 1.32	$ 1.32	$ 1.32	$ 1.32	$ 1.32	$ 1.32	$ 1.32	$ 1.32	$ 1.32	$ 1.32	$ 1.32	$ 1.32	$ 1.32
Health & Safety		$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10	$ 0.10
190 LECET		$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05
LECET		$ 0.15	$ 0.15	$ 0.15	$ 0.15	$ 0.15	$ 0.15	$ 0.15	$ 0.15	$ 0.15	$ 0.15	$ 0.15	$ 0.15	$ 0.15	$ 0.15	$ 0.15	$ 0.15	$ 0.15	$ 0.15
CIAP		$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38
Total Fringe Benefits		$ 27.21	$ 27.21	$ 27.21	$ 27.21	$ 27.21	$ 27.21	$ 27.21	$ 27.21	$ 27.21	$ 27.21	$ 27.21	$ 27.21	$ 27.21	$ 27.21	$ 27.21	$ 27.21	$ 27.21	$ 27.21
Payroll Taxes & Insurances																			
SOC	6.20%	$ 2.49	$ 3.74	$ 4.99	$ 2.72	$ 2.84	$ 4.26	$ 2.68	$ 4.02	$ 2.95	$ 3.08	$ 4.62	$ 3.26	$ 4.89	$ 6.53	$ 3.75	$ 5.63	$ 3.92	$ 5.87
MED	1.45%	$ 0.58	$ 0.87	$ 1.17	$ 0.64	$ 0.66	$ 1.00	$ 0.63	$ 0.94	$ 0.69	$ 0.72	$ 1.08	$ 0.76	$ 1.14	$ 1.53	$ 0.88	$ 1.32	$ 0.92	$ 1.37
FUTA	1.00%	$ 0.40	$ 0.60	$ 0.80	$ 0.44	$ 0.46	$ 0.69	$ 0.43	$ 0.65	$ 0.48	$ 0.50	$ 0.75	$ 0.53	$ 0.79	$ 1.05	$ 0.61	$ 0.91	$ 0.63	$ 0.95
SUTA	9.90%	$ 3.98	$ 5.97	$ 7.96	$ 4.34	$ 4.53	$ 6.80	$ 4.28	$ 6.42	$ 4.71	$ 4.92	$ 7.38	$ 5.21	$ 7.82	$ 10.42	$ 5.99	$ 8.99	$ 6.25	$ 9.38
WC	15.50%	$ 6.23	$ 6.23	$ 6.23	$ 6.80	$ 7.10	$ 7.10	$ 6.70	$ 6.70	$ 7.38	$ 7.70	$ 7.70	$ 8.16	$ 8.16	$ 8.16	$ 9.38	$ 9.38	$ 9.79	$ 9.79
Vacation - F	1.92%							$ 0.83	$ 0.83	$ 0.83	$ 0.83	$ 0.83							
Vacation - S	3.84%												$ 2.02	$ 2.02	$ 2.02	$ 2.02	$ 2.02	$ 2.02	$ 2.02
Total PR/Insurance		$ 13.69	$ 17.42	$ 21.15	$ 14.94	$ 15.59	$ 19.84	$ 15.54	$ 19.55	$ 17.04	$ 17.75	$ 22.36	$ 19.94	$ 24.82	$ 29.70	$ 22.63	$ 28.24	$ 23.53	$ 29.38
Total Fringe Benefits/PR/Ins		$ 40.90	$ 44.63	$ 48.36	$ 42.15	$ 42.80	$ 47.05	$ 42.75	$ 46.76	$ 44.25	$ 44.96	$ 49.57	$ 47.15	$ 52.03	$ 56.91	$ 49.84	$ 55.45	$ 50.74	$ 56.59
Overhead (Base Rate + Fringes + PR/Ins)	10%	$ 8.11	$ 10.49	$ 12.88	$ 8.60	$ 8.86	$ 11.57	$ 8.60	$ 11.16	$ 9.19	$ 9.46	$ 12.41	$ 9.98	$ 13.10	$ 16.22	$ 11.04	$ 14.62	$ 11.39	$ 15.13
Profit (Base Rate + Fringes + PR/Ins)	5%	$ 4.06	$ 5.25	$ 6.44	$ 4.30	$ 4.43	$ 5.79	$ 4.30	$ 5.58	$ 4.59	$ 4.73	$ 6.21	$ 4.99	$ 6.55	$ 8.11	$ 5.52	$ 7.31	$ 5.69	$ 7.57
Total OHP		$ 12.17	$ 15.74	$ 19.32	$ 12.90	$ 13.29	$ 17.36	$ 12.89	$ 16.74	$ 13.78	$ 14.20	$ 18.62	$ 14.97	$ 19.65	$ 24.33	$ 16.55	$ 21.94	$ 17.08	$ 22.70
*Grand Total (Base Rate+Total Fringes Benefits/PR /Ins+OHP)		$ 53.28	$ 60.05	$ 68.10	$ 58.04	$ 101.11	$ 70.03	$ 68.64	$ 74.44	$ 105.62	$ 103.87	$ 142.72	$ 114.76	$ 150.42	$ 196.50	$ 126.92	$ 168.13	$ 130.98	$ 174.01

Journeyman

Laborer Differential	$27.41	$54.84	$5.66	$8.60	$39.81	$5.58	$35.03	$12.38	$15.57	$49.44	
Super Differential											$35.87	$71.75	$12.17	$53.43	$16.23	$59.28

Foreman $29.45

$88.59

mlb
Over 75 Years of Construction Excellence
General Contractors and Construction Managers
One Stone Break Road
Malta, New York 12020
518.289.1371 www.mlbind.com

Project # 23-114 Date 6/4/26
Project ALBANY AIRPORT EXPANSION
Issue ASI-134
Remarks METAL BASE ADDS Prepared By CD

- TOTAL QUANTITY

↳ 6 OUTSIDE CORNERS (2 @ CURVE WALL) + 2 INSIDE CORNERS
↳ FOOTAGE OF BASE: START @ WEST WALL & PROCEED CW

- 12'
- 1'
- 1'
- 12'
- 6'
- 1'
- 1'
- 1'
- 13'

= 48'

↳ MATERIAL:

48' x $11.13/LF = $534.24 ✓ *CORNERS INCLUDED

↳ LABOR:

UNLOAD & BRING TO WORK AREA: 2 MEN, ½ HOUR = 1 MH
CORNERS: 1 MAN, ½ HOUR = ½ MH
LAYOUT SEAMS: 1 MAN, ½ HOUR = ½ MH
INSTALL: 1 MAN, 2 HOURS = 2 MH
REMOVE TAPE/CLEAN-UP: 1 MAN, 1 HOUR = 1 MH

= 5 MH x $81.11

= $405.55 ✓

R&J Sheet Metal Distributors, Inc

114 Railroad Ave
Albany, NY 12205

FOR REFERENCE

Invoice

Date	Invoice #
4/27/2026	31557

Bill To	Ship To
MLB Construction Services LLC 1 Stonebreak Rd. Malta, NY 12020	MLB Construction Services LLC 1 Stonebreak Rd. Malta, NY 12020

P.O. Number	Terms	Rep	Ship	Via	F.O.B.	Project
23-114	Net 30	BG	4/27/2026	Pick Up		

Description	Quantity	Price Each	Amount
18g SS #4 Finish 304	1	1,335.00	1,335.00T
14- 6x6 outside corners			
8 - 6x6 inside corners			
2- 48"x6" flat strip → 4' x 2 = 8'			
14- 72"x6" → 6' x 14 = 42'			
7- 120"x 6" → 10' x 7 = 70'			
Albany Airport			
PO 23-114			
Tax Exempt Sales Tax		0.00%	0.00

TOTAL = 120 LF

↳ $11.13/LF (CD)

	Total	$1,335.00

Dormitory Authority
State of New York
515 Broadway
Albany, NY 12207

LABOR RATE WORKSHEET

Contractor Name:	Adirondack Taping & Supply, Inc.	Date:	07/01/26
Address:	1	DASNY Project No.:	
	Glens Falls, NY 12801	Project Name:	
Telephone Number:	(518) 744-2134	County:	Albany

LABOR RATE BREAKDOWN (Use a separate worksheet for each trade and classification) Trade/Classification: Carpenter Foreman/Super

Check One Box Only: Union Shop: ☑ Local: 279

Open Shop: ☐

Effective Dates for Wage Rates: From: 7/1/2026 To: 6/30/2027

	Taxable Benefits	% per hour	$ per hour	REGULAR BASE RATE	PREMIUM TIME (only when directed)
A. BASE RATE PER HOUR				**$45.88**	**$68.82**
BENEFITS (check all taxable benefits that apply)					
Vacation and Holiday	No		$2.00		
Health and Welfare	No		$0.00		
Pension	No		$0.00		
Annuity	No		$0.00		
Education / Apprentice Training	No		$0.00		
Supplemental Unemployment	No		$0.00		
Security Fund	No		$0.00		
Total Package	No		$25.73		
Shop	No		$1.20		
	No		$0.00		
(Identify Taxable Benefits)	No		$0.00		
B. TOTAL BENEFITS PER HOUR			$28.93	**$28.93**	**$28.93**
PAYROLL TAXES AND INSURANCE					
FICA			6.2000%		
Medicare			1.4500%		
Federal Unemployment			0.8000%		
State Unemployment			9.9000%		
Disability			1.7300%		
Workers' Compensation Code:		5445	10.0000%		
Liability			7.5000%		
C. TOTAL TAXES AND INSURANCE PER HOUR					
○ All benefits are paid directly to Employee.					
◉ Only benefits identified above are Taxable.		$45.88 X	0.3758 % =	**$17.24**	**$21.85**
D. TOTAL LABOR RATE			(A + B + C) =	**$92.05**	**$119.60**

E. CONTRACTOR'S CERTIFICATION

I certify that the labor rates, insurance enumerations, labor fringe enumerations and expenses are correct and in accordance with actual and true cost incurred.

Signature of Authorized Representative

Jeanne Rizzo
Print Name

Print Title

Sworn before me this _____ day of _____, 20 _____.

Notary Public

Dormitory Authority
State of New York
515 Broadway
Albany, NY 12207

LABOR RATE WORKSHEET

Contractor Name:	Adirondack Taping & Supply, Inc.	Date:	07/01/26
Address:	46 Elm Street	DASNY Project No.:	
	Glens Falls, NY 12801	Project Name:	
Telephone Number:	(518) 744-2134	County:	Albany

LABOR RATE BREAKDOWN (Use a separate worksheet for each trade and classification) Trade/Classification: Carpenter

Check One Box Only: Union Shop: ☑ Local: 279

Open Shop: ☐

Effective Dates for Wage Rates: From: 7/1/2026 To: 6/3/2027

				REGULAR BASE RATE	PREMIUM TIME (only when directed)
A. BASE RATE PER HOUR				**$43.38**	**$65.07**
BENEFITS (check all taxable benefits that apply)	Taxable Benefits	% per hour	$ per hour		
Vacation and Holiday	No		$0.00		
Health and Welfare	No		$0.00		
Pension	No		$0.00		
Annuity	No		$0.00		
Education / Apprentice Training	No		$0.00		
Supplemental Unemployment	No		$0.00		
Security Fund	No		$0.00		
Total Package	No		$25.16		
Shop	No		$1.30		
Tools	No		$2.20		
(Identify Taxable Benefits)	No		$0.00		
B. TOTAL BENEFITS PER HOUR			$28.66	**$28.66**	**$28.66**
PAYROLL TAXES AND INSURANCE					
FICA			6.2000%		
Medicare			1.4500%		
Federal Unemployment			0.8000%		
State Unemployment			9.9000%		
Disability			1.7300%		
Workers' Compensation	Code:	5445	10.0000%		
Liability			7.5000%		
C. TOTAL TAXES AND INSURANCE PER HOUR					
○ All benefits are paid directly to Employee.					
◉ Only benefits identified above are Taxable.		$43.38 X	0.3758 % =	**$16.30**	**$20.66**
D. TOTAL LABOR RATE			(A + B + C) =	**$88.34**	**$114.39**

E. CONTRACTOR'S CERTIFICATION

I certify that the labor rates, insurance enumerations, labor fringe enumerations and expenses are correct and in accordance with actual and true cost incurred.

Signature of Authorized Representative

Jeanne Rizzo
Print Name

Print Title

Sworn before me this _____ day of _____, 20 _____.

Notary Public

Dormitory Authority
State of New York
515 Broadway
Albany, NY 12207

LABOR RATE WORKSHEET

Contractor Name:	Adirondack Taping & Supply, Inc.	Date:	05/01/26
Address:	46 Elm Street	DASNY Project No.:	
	Glens Falls, NY 12801	Project Name:	
Telephone Number:	(518) 744-2134	County:	Albany

LABOR RATE BREAKDOWN (Use a separate worksheet for each trade and classification) Trade/Classification: Taper- Foreman

Check One Box Only: Union Shop: ☑ Local: DC 9

Open Shop: ☐

Effective Dates for Wage Rates: From: 5/1/2026 To: 04/31/27

				REGULAR BASE RATE	PREMIUM TIME (only when directed)
A. BASE RATE PER HOUR				**$36.60**	**$54.90**
BENEFITS (check all taxable benefits that apply)	Taxable Benefits	% per hour	$ per hour		
Vacation and Holiday	No		$0.00		
Health and Welfare	No		$0.00		
Pension	No		$0.00		
Annuity	No		$0.00		
Education / Apprentice Training	No		$0.00		
Supplemental Unemployment	No		$0.00		
Security Fund	No		$0.00		
Total Package	No		$22.91		
Shop	No		$1.20		
Tool	No		$1.00		
(Identify Taxable Benefits)	No		$0.00		
B. TOTAL BENEFITS PER HOUR			$25.11	**$25.11**	**$25.11**
PAYROLL TAXES AND INSURANCE					
FICA			6.2000%		
Medicare			1.4500%		
Federal Unemployment			0.8000%		
State Unemployment			9.9000%		
Disability			1.7300%		
Workers' Compensation	Code:	5445	10.0000%		
Liability			7.5000%		
C. TOTAL TAXES AND INSURANCE PER HOUR					
○ All benefits are paid directly to Employee.					
◉ Only benefits identified above are Taxable.		$36.60	X 0.3758 % =	**$13.75**	**$17.43**
D. TOTAL LABOR RATE			(A + B + C) =	**$75.46**	**$97.44**

E. CONTRACTOR'S CERTIFICATION

I certify that the labor rates, insurance enumerations, labor fringe enumerations and expenses are correct and in accordance with actual and true cost incurred.

Signature of Authorized Representative

Jeanne Rizzo
Print Name

Print Title

Sworn before me this _____ day of _____, 20 _____.

Notary Public

Bridie, Scott F - (NYN)

From: Craig Dittl <cdittl@mlbind.com>
Sent: Wednesday, August 5, 2026 12:34 PM
To: Bridie, Scott F - (NYN); McNeil, Brian - (NYN)
Subject: FW: Albany Airport Expansion, BP-4: Proposal #155R1 (ASI-134)
Attachments: Carpenter- ForemanSuper - 7.1.26 Albany.pdf; Carpenter- Albany 7.01.26.pdf; Taper Foreman- Albany 5.01.2026.pdf

EXTERNAL EMAIL - Please Handle Cautiously

Here you go, Brian. For some reason it's not letting me open them but I'm having computer issues today...if you cannot open them let me know.

Craig Dittl, Senior Project Manager
MLB Construction Services, LLC

mlb

Over 75 Years of Construction Excellence

1 Stonebreak Road Malta, NY 12020
P: 518.289.1371 EXT. 146 C: 518.450.9774
www.mlbconstructionservices.com

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EASTERN CONTRACTORS ASSOCIATION ECA

AGC NEW YORK STATE ASSOCIATED GENERAL CONTRACTORS NEW YORK STATE

NAWIC The National Association of Women in Construction Capital District, NY

From: Taylor Oldroyd <toldroyd@adk-drywall.com>
Sent: Wednesday, August 5, 2026 12:26 PM
To: Craig Dittl <cdittl@mlbind.com>
Subject: RE: Albany Airport Expansion, BP-4: Proposal #155R1 (ASI-134)

Please see attached labor sheets.

Taylor Oldroyd
Estimator/Project Manager
C: (315) 921-0129
P: (518) 761-0089
toldroyd@adk-drywall.com

Adirondack Drywall & Taping
NYS Certified WBE

SUBCONTRACTOR PROPOSAL

Albany Airport Terminal Expansion Project BP-04

Field Order | Change Order

Subcontractor Name:	Adirondack Taping & Supply, Inc.	Date:	6/24/26
Address:	46 Elm Street	Project No.:	23114
	Glens Falls, NY 12801	ADK COR #	51R
Telephone No.:	(518) 761-0089	NOC #	155

LABOR

Work Description	Trade	Hours	Total Rate from Labor Rate Breakdown	Total Labor Cost
Updated drawings in ASI-134 added electrical room B129 into	Carpenter Foreman	64	$92.05	$5,891.20
project scope on level 1 in the terminal.	Carpenter	64	$88.34	$5,653.76
	Taper Foreman	48	$75.46	$3,622.08
	Taper		$74.09	
	A. TOTAL SUBCONTRACTOR LABOR			**$15,167.04**

MATERIAL

Material Description	Quantity	Unit	Unit Cost	Material Cost
3-5/8" studs 20ga	460	LF	$0.84	$386.40
3-5/8" track 20ga	120	LF	$0.84	$100.80
8" studs 20ga	112	LF	$1.55	$173.60
8" track 20ga	50	LF	$1.38	$69.00
3.5" SAFB Insulation	645	SF	$1.06	$683.70
5/8" drywall	1,056	SF	$0.60	$633.60
1/4" drywall	320	SF	$0.77	$246.40
1/2" drywall	320	SF	$0.50	$158.40
Mud	5	Pails	$25.00	$125.00
Tape	5	Rolls	$10.00	$50.00
Cornerbead	100	LF	$0.42	$42.00
Screws	2	Boxes	$105.00	$210.00
Fire-Caulk	6	Tubes	$39.00	$234.00
1/2" fire-rated plywood	192	SF	$1.50	$287.94
	Total from additional Material Worksheet Extension(s) if required.			
	B. TOTAL SUBCONTRACTOR MATERIAL			**$3,400.84**

EQUIPMENT — Lift time due to ladder last policy

C. TOTAL SUBCONTRACTOR EQUIPMENT	**709.00**

SUMMARY

Total labor, material,equipment (A + B + C)	$19,276.88
Subcontractor's Override (10%)	$1,927.69
TOTAL SUB-PROPOSAL	**$21,204.57**

Taylor Oldroyd
Subcontractor's Signature

6/24/26
Date

Taylor Oldroyd
Please Type or Print Name

This Price is valid for, and work must be agreed upon within 7 days from date of submission upon which it becomes null and void.

Kelley Bros, LLC
11B Commerce Dr
Ballston Spa, NY 12020
Phone: 518-884-9503

CHANGE PROPOSAL

Change Proposal # CO-10
Contractor Ref # ASI# - ~~149~~ 134 (ED)
Date: 1/13/2026
Kelley Job # 82401710
Contractor Job # 23114-07

Project: 82401710 Albany County Airport Authority - Terminal Expansion
MLB CONSTRUCTION SERVICES, LLC
Jeff Lino
ONE STONE BREAK RD
MALTA, NY 12020

Ship To: MLB CONSTRUCTION SERVICES, LLC
Mike Washburn
c/o Albany County Airport Authority-Terminal
737 Shaker Road

Albany, NY 12211
Tel:
Cell: 518-378-8477
Attn:

Kelley Bros Will Not Proceed With The Ordering of ANY Material Until We Have A Signed Approval

Qty	Manuf	Mfr Part# / Description	Unit Price	Extended
		DOOR B129		
1		HM FRAME	$394.50	$394.50
1		HM DOOR	$706.50	$706.50
1		HDWE SET 2 + CLOSER	$462.00	$462.00

Standard exclusion and clarifications from our base bid apply to this proposal.
All work will be done under the same terms and conditions as the base contract

Customer PO#: *23114-07*
Customer Acceptance: _____ Date: _____
Printed Name: _____

SubTotal:	$ 1,563.00
Freight:	0
Tax:	✓ 0
Project Total:	**$ 1,563.00**

Given building material cost inflation, this quote is good for 30 days. Any material released for order after this time will be subject to re-quote.
Quoted price is subject to change based on the implementation of tariffs. No language in a contract award shall prohibit Kelley Bros from passing along supplier price increases related to tariffs.

NET 30 subject to credit approval — **Orders may be subject to $25.00 minimum.**
Freight is PrePay and Add unless otherwise specified in writing.
Credit Card orders will be charged PRIOR to delivery and receipt will be provided upon request. Credit cards used 30 days after sale date subject to a 3% fee.
Returns must be requested through issuing office and are subject to restocking fees.
Due to recent US Supreme Court ruling, we may have to charge sales tax if required by law unless the project is specifically tax exempt.

✓
INSTALL

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General Contractors and Construction Managers
One Stone Break Road
Malta, New York 12020
518.289.1371 www.mlbind.com

Project # 23-114	Date 6/4/26
Project ALBANY AIRPORT EXPANSION	
Issue ASI-134	
Remarks PAINT	Prepared By CD

- PUBLIC SIDE WALLS
  - ↳ TOTAL SF (9.5' HEIGHT)
    - WEST = 110SF
    - NORTH = 121SF
    - EAST = 83SF
    - SOUTH = 121SF
    - TOTAL = 435SF x $2.25
      - + SOFFIT
      - + 1 HM FRAME
      - = $1,000
      - + 10% OH & P ($100)
      - = $1,100 ✓

- INTERIOR WALLS/CEILING
  - ↳ TOTAL SF, WALLS (8.5' HEIGHT)
    - ↳ 41.5' (8.5') - 30"70 DOOR = 332SF
  - ↳ TOTAL SF, CEILING
    - ↳ 110SF

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Construction Managers

One Stone Break Road
Malta, New York 12020
518.289.1371 www.mlbind.com

Project # 23-114	Date 6/4/26
Project ALBANY AIRPORT EXPANSION	
Issue ASI-134	
Remarks PAINT	Prepared By GD

TOTAL = 442 SF x $2.25

= $994.50

+10% OH&P ($99.45)

= $1,094 ✓

ABSOLUTE Fire Protection LLC

1182 US Route 9W (PO Box 10) • Selkirk, NY 12158

(518) 767-3700 • (518) 767-3711 Fax

www.AbsoluteFirePro.com • mail@AbsoluteFirePro.com

FIRE PROTECTION PROPOSAL
REQUEST FOR CHANGE ORDER

PROPOSAL SUBMITTED TO: ***MLB Construction***		***PHONE:*** ***CELL:***	***DATE: 3/12/2026***
STREET ***1 Stonebreak Rd***		***JOB NAME:*** AIA BP04	
CITY, STATE AND ZIP CODE: ***Malta, NY***		***JOB LOCATION:*** ***Albany, NY***	
ATTENTION: Craig Dittl	***EMAIL:*** ***Cdittl@mlbind.com***	***REFERENCE:*** ASI 134	***COR NUMBER:*** 013

This change order proposal reflects the cost to maintain sprinkler coverage in existing room shown on NOC #155 (ASI 134).
Includes:

- **Labor**
- **Material**
- **10% OH&P**

Excludes:

- All control, power, fire alarm, disconnects, detection wiring, or other electrical work etc.
- Allowances, sales taxes, overtime, unit prices, bond costs, permit fees, OCP/CCIP insurance requirements.
- All labor and material required for re-located main piping, branch line piping, system risers, backflow preventers, FDC's, main drains etc.
- All labor and material required for ceiling removals and re-installations needed to access our work.
- All labor and material required for insulating, heat tracing, cleaning, disinfecting, painting, and/or labeling of pipe.
- All labor and material required for covering, protecting, and/or replacing sprinkler heads damaged from paint.
- All labor and material required for fire watches, temporary fire protection, or impairment plans.
- All labor and material required for re-location of existing to remain piping due to conflicts with other trades new work.
- All WMBE/SDVOB goals and/or participation

WE PROPOSE TO FURNISH MATERIAL AND LABOR - COMPLETE IN ACCORDANCE WITH ABOVE SPECIFICATIONS, FOR THE ADDITIONAL SUM OF:

ONE THOUSAND, FIFTY-SIX ***DOLLARS ($1,056.00)***

PAYMENT TO BE MADE AS FOLLOWS: **1% - 10 net 30- Plus sales tax if required.**

All material is guaranteed to be as specified. All work to be completed in a workmanlike manner according to standard practices. Any alteration or deviation from above specifications involving extra costs will be executed only upon written orders and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents, or delays beyond our control. Owner to carry fire, tornado, and other necessary insurance. Our workers are fully covered by Workman's Compensation Insurance.

Authorized
Signature: Jordan Newton

Note: This proposal may be withdrawn by us if not accepted within: 15 *days.*

Acceptance of Proposal - *The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.*
Date of Acceptance:

Signature: _____

Signature: _____

PROPOSAL PRICING SHEET

Job Name: AIA BP04				Bid #:	
Description of Work:				Job #:	1269
NOC 155- ASI 134- Existing Electrical Room					
				DATE:	3/12/26
DESCRIPTION	**QUANITY**	**@**			**EXTEN.**
Material					
1" Schedule 10 Black Pipe	21	$2.36		$49.56	
1" Thd 90	4	$2.15		$8.60	
Victaulic 920 Mech Tee	1	$14.13		$14.13	
Victaulic V2704 Upright	1	$7.50		$7.50	
				$0.00	
				$0.00	
				$0.00	
				$0.00	
				$0.00	
				$0.00	
				$0.00	
				$0.00	
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				$0.00	
				$0.00	
				$0.00	
				$0.00	
				$0.00	
				$0.00	
				$0.00	
				$0.00	
				$0.00	
				$0.00	
				$79.79	$79.79
		Tax	0%		$0.00
Labor					
Foreman	4	$114.32		$457.28	
Fitter	4	$105.84		$423.36	
Foreman (Premium)				$0.00	
Fitter (Premium)				$0.00	
PM/Design	0	$80.00		$0.00	
Truck				$0.00	
				$880.64	$880.64
				SUB-TOTAL:	960.43
				OH & P:	96.04 10%
				TOTAL:	1056.47

MARTIN ELECTRIC
est. 1939

JOB # 6846-90R1

MLB Constructions Services, LLC.
1 Stonebreak Rd. Malta, NY 12020

December 11, 2025
Prepared by: Everett Jones
Contact Info: ejones@martinelectric.com

Attn: Craig Dittl cdittl@mlbind.com

RE: Albany Airport BP-04 – NOC-155 ASI-134 L1 Existing Elec Room Changes

Craig,

Martin Electric is pleased to provide this CO Proposal for the above referenced project.
Please review our clarifications and exclusions for this scope and thank you for this opportunity.

SCOPE OF WORK

Original demolition per the bid documents is BP-2 and will need to be submitted separately (separate contracts)
-CD, MLB Construction

1. Dwg ED-101 BP-04 Scope
   - KN # 3 Added scope of Work was nullified via RFI answer.
   - KN # 21 is too subjective without defined circuit identifications and tracing. To be fair and reasonable we have not included this work in ASI-134 price. Please provide separate PCO to perform work on T&M

PCO-308 as confirmed with E. Andres on 6/4/26
-CD, MLB Construction

2. Dwg E-101 –
   - No work was ever priced for said relocations to Escalator Machine Room 128 as this relocation was overcome by events/RFI's/ACAA decision to keep existing L1 Panels and create a new Electric Room.
   - Delete conduit/circuit rough-in for floor box. The already purchased floor box cover will be turned over to ACAA.
3. Dwg E-201 - Added 2-Type B4 Lights and 1-single pole toggle switch
4. Dwg FA-101 - Added 1-Smoke Detector, 1-Wall Mtd Speaker Strobe, & 1- Ceiling Mtd Speaker Strobe.

CLARIFICATIONS

- Coordinate work with MLB.
- All Labor, Material, Management, Equipment, Tools, and Service Vehicles included.
- Please reference updated **PROPOSAL TERMS**, regarding the Commodities Market.

APPROACH

Martin Electric plans to approach this project in the following manner:

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JOB # 6846-90R1

MLB Constructions Services, LLC.

1 Stonebreak Rd. Malta, NY 12020

December 11, 2025
Prepared by: Everett Jones
Contact Info: ejones@martinelectric.com

- Review all the requirements of the systems/equipment to be installed with the appointed representative.
- Review and determine with the site representative the proposed routing, for approval, prior to installation of conduit, and wire.
- Review and make every effort to expedite delivery of long lead materials.
- Complete the installation of the required services within schedule, unless delayed by others.
- Evaluate project activity periods and maintain scheduled activity completions.

EXCLUSIONS

- Dumpster Cost of any type.
- Cost for seismic restraints of any type.
- All field modifications of equipment furnished by others.
- Third party or certification testing of the electrical systems.
- Any concrete, cutting, patching, or painting.
- Daily coordination with ACAA of work areas (by MLB)
- Overtime

PROPOSAL COST

Based on the Services to provide the Proposed Scope of Work, the Approach, and the Clarifications, Inclusions and Exclusions listed above; Martin Electric is proposing the amount of:

MATERIALS / QUOTES	$	3,623
LABOR	$	7,593
TOTAL	**$**	**11,216**

PROPOSAL TERMS:

Terms for payment shall be net 30 days based on a schedule of values from the contract. This quote is valid for **15 days** due to the current market for commodities and Material pricing will be updated, as necessary, upon the date of Approval, and is made contingent upon both parties reaching mutually agreeable terms and conditions.

NOTICE:

MARTIN
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JOB # 6846-90R1

MLB Constructions Services, LLC.

1 Stonebreak Rd. Malta, NY 12020

December 11, 2025

Prepared by: Everett Jones
Contact Info: ejones@martinelectric.com

THIS PROPOSAL IS CONTINGENT ON A LACK OF IMPACT BY THE CORONAVIRUS NATIONAL EMERGENCY. Given the existence of the coronavirus pandemic, Martin Electric Inc. will use its best efforts to staff and supply this project to be able to hit the scheduled completion date but reserves its right to seek an excusable extension of time if Martin Electric Inc., or its subcontractors and suppliers are unable to maintain planned crew sizes due to the illness, supply shortages or governmental restraints on business, travel and/or assembly. To the extent that the project is suspended pursuant to the terms of the proposed Martin Electric Inc. Subcontract, we intend to seek additional costs associated with the suspension.

Job ID: PG-23-116A
Project: Albany Airport BP-04

GJM MARTIN ELECTRIC
Certified WBE

CO: 6846-90: ASI-134 NOC # 155 L1 Exist Elec Rm

Change Order Summary

11 Dec 2025 12:11:01

Tax Rate status: Default **Bid Name:** BASE BID **Bid Template:** SHORT MARKUP -ELECTRIC

Drawing	Phase	Quote $	Material $	Equip $	SubCon $	Labor Hrs
	FIXTURES	0.00	648.60	0.00	0.00	36.34
	BRANCH > LEVEL 1	0.00	-137.25	0.00	0.00	-9.18
	FIRE ALARM	2,600.00	0.00	0.00	0.00	0.00
	FIRE ALARM > LEVEL 1	0.00	175.24	0.00	0.00	29.84
	Sheet Totals:	2,600.00	686.58	0.00	0.00	57.00
	Tax:	0.00	0.00	0.00	0.00	
					Sub Total (Quo/Mat/Equip/Sub):	3,286.58	

Bid Notes:

TAX RATES			**Sales Tax:**	0.00	
Material:	0.0000%		**Sub Total:**	3,286.58	3,286.58
Quote:	0.0000%		**Direct Labor $:**		6,622.03
Labor:	0.0000%		**Indirect Labor $:**		0.00
Equipment:	0.0000%		**Labor Escalation:**		0.00
Subcontract:	0.0000%		**Labor Tax:**		0.00
Job:	0.0000%		**Direct Job Costs** (2.36%):		264.88
MISCELLANEOUS					
Avg. Lbr. Rate (Cost):	121.99		**Prime Cost:**		10,173.49
Avg. Lbr. Rate (Bid):	128.09		**Overhead** (Avg. 5.00%):		508.67
Total Square Feet:	1.00		**Net Cost:**		10,682.17
Cost Per Sq. Ft.:	11,216.28				
Labor $ Per Sq. Ft.:	6,622.03		**Profit** (Avg. 5.00%):		534.11
Labor Hrs Per Sq. Ft.:	57.00		**Job Tax:**		0.00
Quantity of Units:	1.00		**Bond** (0.0000%):		0.00
Cost Per Unit:	11,216.28		**Lump Sum:**		0.00
Calc. Adjustment:	0.00%		**Selling Price:**		11,216.28

LABOR ADJUST

ESTIMATED HOURS	ELECTRICAL	MACHINE OPERATOR	LOW VOLTAGE	Labor Class 4	Labor Class 5	Labor Class 6	Labor Class 7	Labor Class 8	Labor Class 9	Labor Class 10
REGULAR	57.00	--	--	--	--	--	--	--	--	--
OVERTIME	--	--	--	--	--	--	--	--	--	--
SHIFT-2	--	--	--	--	--	--	--	--	--	--
SHIFT-3	--	--	--	--	--	--	--	--	--	--
DOUBLE TIME	--	--	--	--	--	--	--	--	--	--
ESTIMATED HOURS:	57.00	--	--	--	--	--	--	--	--	--
LOSS LBR ADJ:	--	--	--	--	--	--	--	--	--	--
CALCULATED HRS										
REGULAR	57.00	--	--	--	--	--	--	--	--	--
OVERTIME	--	--	--	--	--	--	--	--	--	--
SHIFT-2	--	--	--	--	--	--	--	--	--	--
SHIFT-3	--	--	--	--	--	--	--	--	--	--
DOUBLE TIME	--	--	--	--	--	--	--	--	--	--
TOTAL ADJ LABOR:	57.00	--	--	--	--	--	--	--	--	--

TOTAL ADJUSTED LABOR HOURS: 57.00

DIRECT LABOR

Labor Class	Job Description	Labor Type	Crew	Rate	Man Hours	Extension
ELECTRICAL	FOREMEN (WORKING)	REGULAR	1	$127.52	28.50	$3,634.04
	JOURNEYMEN	REGULAR	1	$104.85	28.50	$2,987.99

AVERAGE DIRECT LABOR RATE: $116.19

TOTAL DIRECT LABOR: $6,622.03

INDIRECT LABOR

Labor Description	Hours	Rate	Ext $

TOTAL INDIRECT LABOR: $0.00

DIRECT LABOR TOTAL:	6,622.03	
INDIRECT LABOR TOTAL:	0.00	
LABOR ESCALATION:	0.00	
LABOR $ ADJUSTMENT:	0.00	
LABOR TAX:	0.00	
LABOR TOTAL:		$6,622.03

MATERIAL:	686.58	
MATERIAL ESCALATION:	0.00	
MATERIAL ADJUSTMENT:	0.00	
MATERIAL TAX:	0.00	
MATERIAL TOTAL:		$686.58

QUOTES

Component	Vendor	Amount
FIRE ALARM	Fire Security & Sound, Inc	2,600.00

QUOTED MATERIAL:	2,600.00	
ADJUSTMENT:	0.00	
QUOTE TAX:	0.00	
QUOTED MATERIAL TOTAL:		$2,600.00

SUBCONTRACTS

Component	Vendor	Amount

SUBCONTRACTS:	0.00	
ADJUSTMENT:	0.00	
SUBCONTRACT TAX:	0.00	
SUBCONTRACTS TOTAL:		$0.00

EQUIPMENT

Component	Vendor	Amount

EQUIPMENT:	0.00	
ADJUSTMENT:	0.00	
EQUIPMENT TAX:	0.00	
EQUIPMENT TOTAL:		$0.00

DIRECT JOB COSTS

Description	Dollars
WARRANTY	66.22
SAFETY	198.66

DIRECT JOB COSTS:	264.88	
ADJUSTMENT:	0.00	
TOTAL DIRECT JOB COSTS:		$264.88
JOB COST w/NO OVERHEAD:		**$10,173.49**

OVERHEAD

MATERIAL OVERHEAD:(5% markup)	34.33
QUOTES OVERHEAD:(5% markup)	130.00
LABOR OVERHEAD:(5% markup)	331.10
SUBCONTRACTS OVERHEAD:(5% markup)	0.00
EQUIPMENT OVERHEAD:(5% markup)	0.00
DJC OVERHEAD:(5% markup)	13.24

TOTAL OVERHEAD:	$508.67
JOB COST w/OVERHEAD:	**$10,682.17**

PROFIT	
MATERIAL PROFIT:(5% markup)	36.05
QUOTES PROFIT:(5% markup)	136.50
LABOR PROFIT:(5% markup)	347.66
SUBCONTRACTS PROFIT:(0% markup)	0.00
EQUIPMENT PROFIT:(0% markup)	0.00
DJC PROFIT:(5% markup)	13.91

TOTAL PROFIT: $534.11

MISCELLANEOUS	
JOB TAX:	0.00
BOND:	0.00

MISCELLANEOUS TOTAL: $0.00

LUMP SUM	
LUMP SUM 1:	0.00
LUMP SUM 2:	0.00
LUMP SUM 3:	0.00
LUMP SUM 4:	0.00

LUMP SUM TOTAL: $0.00

BID TOTAL: **$11,216.28**

Job ID: PG-23-116A
Project: Albany Airport BP-04

GJM MARTIN ELECTRIC
Certified WBE

CO: 6846-90: ASI-134 NOC # 155 L1 Exist Elec Rm

Takeoff

11 Dec 2025 12:09:24

Phase: FIXTURES

Item #	Qty	U/M	Q/M	Size	Description	Material Unit	Material Result	Labor Unit	Labor Result
	0.00				**B4 4' FIXTURE**				
TITLE	2.00	EA	M	#12	LED PENDANT MNT /GYP/MTL-STD	0.0000	0.00	0.0000	0.00
120894	2.00	EA	M		LED PENDANT MOUNT FIXTURE	156.0000	312.00	2.7300	5.46
150266	2.00	EA	M	1-1/2"D 15.8-CI	4" OCTAGON BOX COMB KO	2.1675	4.34	0.4000	0.80
630409	2.00	EA	M	TSGB16	STUD BRACKET ADJ 11 TO 18" OC	6.6280	13.26	0.1500	0.30
161188	12.00	EA	M	#10 x 1"	TEK SCREW	0.1635	1.96	0.0360	0.43
100155	2.00	EA	M	#12 SOL	8" PIGTAIL W/GRD SCREW	0.6823	1.36	0.1000	0.20
100137	2.00	EA	M	#18 to 10	WIRE-NUT SML -YELLOW	0.1976	0.40	0.0900	0.18
100139	6.00	EA	M	#18 TO 8	WIRE-NUT MED -RED	0.1610	0.97	0.1000	0.60
10054	20.00	FT	M	3/4	EMT	1.3811	27.62	0.0698	1.40
161692	3.00	EA	M	3/4	EMT 1-HOLE STEEL STRAP	0.4598	1.38	0.0600	0.18
161188	3.00	EA	M	#10 x 1"	TEK SCREW	0.1635	0.49	0.0360	0.11
30562	2.00	EA	M	3/4	EMT STEEL-COMP COUPLING RT	0.4398	0.88	0.2100	0.42
30708	4.00	EA	M	3/4	EMT STEEL COMP INS-THRT CONN RT	0.7425	2.97	0.4500	1.80
70033	66.00	FT	M	12	THHN/THWN CU (STR)	0.2429	16.03	0.0090	0.59
70228	22.00	FT	M	12.	GREEN THHN CU (GRD 20A)	0.2429	5.34	0.0090	0.20
TITLE	1.00	EA	M	3/4 EMT #12	20A-1G-SW-SPEC	0.0000	0.00	0.0000	0.00
140460	1.00	EA	M	20A	1P TOGGLE SPECIFICATION -GRADE	8.2500	8.25	0.3750	0.38
150754	1.00	EA	M		1G FS/FD SWITCH COVER	9.7375	9.74	0.1500	0.15
150628	1.00	EA	M	2"D	1G FS MALLEABLE BOX W/ 1 x 3/4" HUB	42.7125	42.71	1.0500	1.05
100155	1.00	EA	M	#12 SOL	8" PIGTAIL W/GRD SCREW	0.6823	0.68	0.1000	0.10
100139	1.00	EA	M	#18 TO 8	WIRE-NUT MED -RED	0.1610	0.16	0.1000	0.10
100137	1.00	EA	M	#18 to 10	WIRE-NUT SML -YELLOW	0.1976	0.20	0.0900	0.09
10054	15.00	FT	M	3/4	EMT	1.3811	20.72	0.0750	1.13
30698	2.00	EA	M	3/4	EMT STEEL COMP IN-THRT CONN	0.7425	1.48	0.4500	0.90
30552	2.00	EA	M	3/4	EMT STEEL-COMP COUPLING	0.5059	1.01	0.2100	0.42
70033	50.00	FT	M	12	THHN/THWN CU (STR)	0.2429	12.14	0.0090	0.45

Phase: FIXTURES

Item #	Qty	U/M	Q/M	Size	Description	Material Unit	Material Result	Labor Unit	Labor Result
70228	17.00	FT	M	12.	GREEN THHN CU (GRD 20A)	0.2429	4.13	0.0090	0.15
161692	1.00	EA	M	3/4	EMT 1-HOLE STEEL STRAP	0.4598	0.46	0.0600	0.06
160346	1.00	EA	M	1/8 x 2"	TOGGLE BOLT	0.6114	0.61	0.1650	0.17
160394	1.00	EA	M	1/4"	PLTD FLAT WASHER	0.0854	0.09	0.0018	0.00
161692	2.00	EA	M	3/4	EMT 1-HOLE STEEL STRAP	0.4598	0.92	0.0600	0.12
160346	4.00	EA	M	1/8 x 2"	TOGGLE BOLT	0.6114	2.45	0.1650	0.66
160394	2.00	EA	M	1/4"	PLTD FLAT WASHER	0.0854	0.17	0.0018	0.00
TITLE	40.00	EA	M		3/4 EMT SUSP T-BAR SINGLE RUN	0.0000	0.00	0.0000	0.00
10054	40.00	FT	M	3/4	EMT	1.3811	55.25	0.0750	3.00
20749	2.00	EA	M	3/4	EMT 90-ELBOW	5.1699	10.34	0.3300	0.66
20739	0.00	EA	M	3/4	EMT FIELD-BEND	0.0000	0.00	0.2880	0.00
30562	6.00	EA	M	3/4	EMT STEEL-COMP COUPLING RT	0.4398	2.64	0.2100	1.26
630141	11.00	EA	M	3/4	EMT PUSH-IN WING-MTD #12 WIRE>1/4 ROD	1.5486	17.03	0.3750	4.13
121363	11.00	EA	M	6FT	STRAIGHT CEILING WIRE -GALVANIZED	1.1744	12.92	0.1080	1.19
30708	2.00	EA	M	3/4	EMT STEEL COMP INS-THRT CONN RT	0.7425	1.49	0.4500	0.90
40233	2.00	EA	M	3/4	PLASTIC BUSHING	0.2370	0.47	0.1700	0.34
70033	132.00	FT	M	12	THHN/THWN CU (STR)	0.2429	32.06	0.0090	1.19
100139	6.00	EA	M	#18 TO 8	WIRE-NUT MED -RED	0.1610	0.97	0.1000	0.60
100139	2.00	EA	M	#18 TO 8	WIRE-NUT MED -RED	0.1610	0.32	0.1000	0.20
150096	2.00	EA	M		4"SQ BLANK COVER	1.1723	2.34	0.1000	0.20
630504	2.00	EA	M	THREAD ROD MOUNT	COMB BOX & 1/2 > 3/4" SNP-CLS COND HGR	8.2471	16.49	0.3750	0.75
100155	2.00	EA	M	#12 SOL	8" PIGTAIL W/GRD SCREW	0.6823	1.36	0.1000	0.20
10548	1.00	EA	M	1	CORED HOLE UP TO 8" D	0.0000	0.00	2.1875	2.19
740131	1.00	EA	M		FIRE STOP FIT TO CONDUIT LBR	0.0000	0.00	0.9500	0.95
						Phase Totals:	**648.60**		**36.34**

Phase: BRANCH
└**SubPhase:** LEVEL 1

Item #	Qty	U/M	Q/M	Size	Description	Material Unit	Material Result	Labor Unit	Labor Result
	0.00				**E-101 ELIMINATE 1-FLOOR BOX AND 2-DUPLEX OUTLETS (PURCHASED FLOOR BOX COVER TURNED OVER TO ACAA)**				
TITLE	-1.00	EA	M	3/4" PVC W/#12	CONC FLOOR BOX 2G DX/DX 20A COML	0.0000	0.00	0.0000	0.00
140016	-2.00	EA	M	20A	DX RECEPT COMMERCIAL GRADE	2.5375	-5.08	0.2952	-0.59
10164	-100.00	FT	M	3/4	PVC SCH 40	0.4700	-47.00	0.0439	-4.39

Phase: BRANCH
└**SubPhase:** LEVEL 1

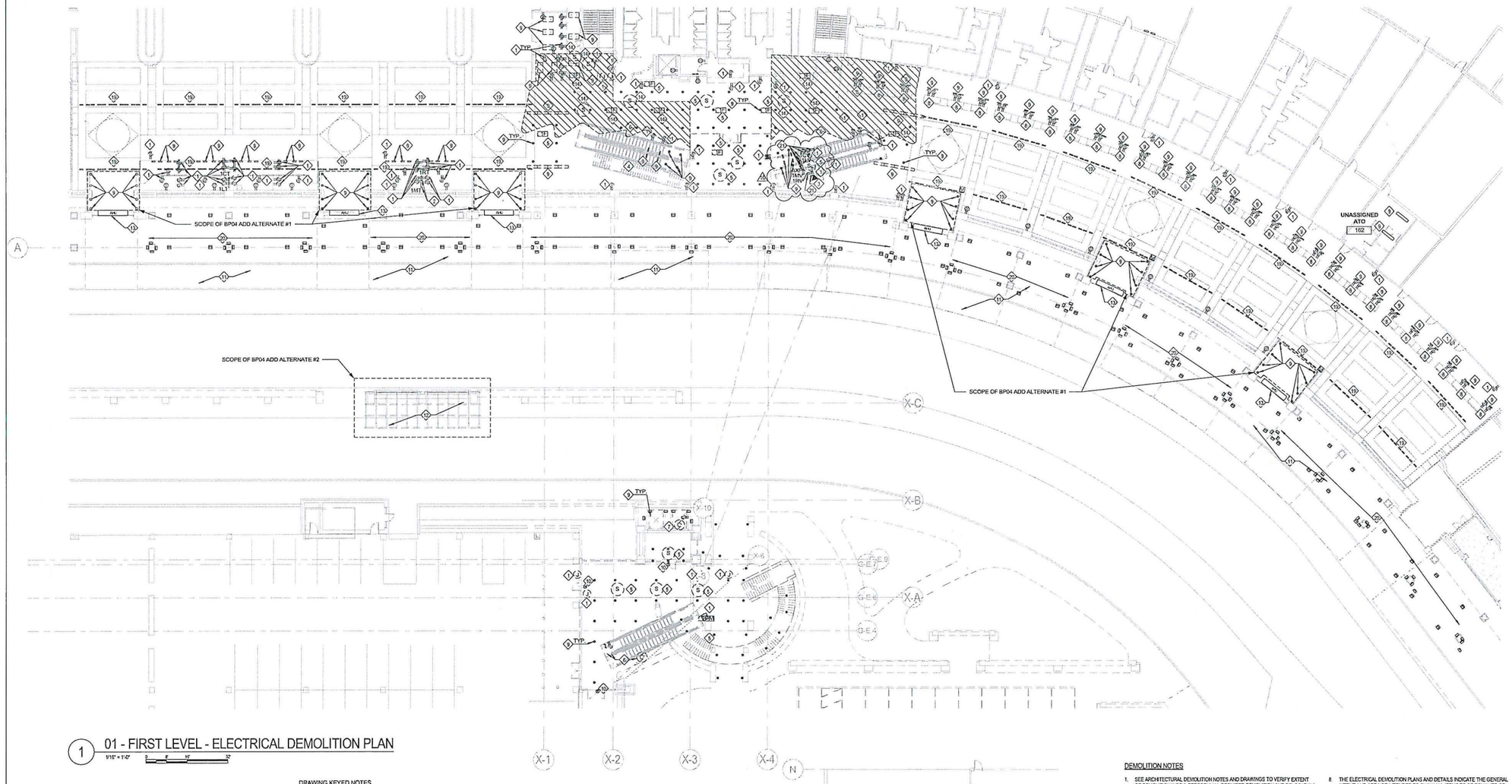
Item #	Qty	U/M	Q/M	Size	Description	Material Unit	Material Result	Labor Unit	Labor Result
20216	-2.00	EA	M	3/4	PVC SCH 40 90-DEG-ELBOW	0.9808	-1.96	0.2145	-0.43
20204	-2.00	EA	M	3/4	PVC FIELD-BEND	0.0000	0.00	0.4875	-0.98
31404	-2.00	EA	M	3/4	PVC COUPLING	0.2304	-0.46	0.1560	-0.31
40043	-2.00	OZ	M	OUNCE	PVC (GLUE) CEMENT	0.6593	-1.32	0.0117	-0.02
31364	-2.00	EA	M	3/4	PVC MALE ADAPTER	0.4285	-0.86	0.1560	-0.31
40256	-2.00	EA	M	3/4	LOCKNUT	0.2185	-0.44	0.1105	-0.22
70033	-220.00	FT	M	12	THHN/THWN CU (STR)	0.2429	-53.43	0.0059	-1.29
70228	-110.00	FT	M	12.	GREEN THHN CU (GRD 20A)	0.2429	-26.71	0.0059	-0.64
					Phase Totals:		**-137.25**		**-9.18**

Phase: FIRE ALARM
└**SubPhase:** LEVEL 1

Item #	Qty	U/M	Q/M	Size	Description	Material Unit	Material Result	Labor Unit	Labor Result
	0.00				**CO/SMOKE**				
TITLE	1.00	EA	M	3/4 EMT	FA ADDRSSBL SMOKE DTCTR	0.0000	0.00	0.0000	0.00
3070068	1.00	EA	M		FIRE ALARM ADDRESSABLE SMOKE DETECTOR	0.0000	0.00	0.3875	0.39
3070066	1.00	EA	M		FIRE ALARM ADDRESSABLE BASE	0.0000	0.00	1.2750	1.28
150266	1.00	EA	M	1-1/2"D 15.8-CI	4" OCTAGON BOX COMB KO	2.1675	2.17	0.5000	0.50
630416	1.00	EA	M	1/8 >1/4" FLANGE	COMB BOX & 1/2 > 3/4" SNP CLS COND HGR	8.2471	8.25	0.1625	0.16
100137	6.00	EA	M	#18 to 10	WIRE-NUT SML -YELLOW	0.1976	1.19	0.1125	0.68
10054	25.00	FT	M	3/4	EMT	1.3811	34.53	0.0938	2.34
30678	2.00	EA	M	3/4	EMT STEEL COMP CONNECTOR	0.4398	0.88	0.5625	1.13
30552	3.00	EA	M	3/4	EMT STEEL-COMP COUPLING	0.5059	1.52	0.2625	0.79
3070536	28.00	FT	M	#14 2/C Red	FA CABLE NON-PLENUM SHLD ADDRESSBL (FPL)	0.7875	22.05	0.0375	1.05
3070531	28.00	FT	M	#16 2/C Red	FA CABLE NON-PLENUM SHLD ADDRESSBL (FPL)	0.6573	18.41	0.0300	0.84
630111	3.00	EA	M	3/4	COND HAMMER-ON HGR 1/4-FLANGE PUSH-IN HD	3.6238	10.87	0.1125	0.34
3070129	1.00	EA	M		FIRE ALARM SMOKE-DET PLASTIC COVER	0.0000	0.00	0.2000	0.20
161194	11.00	EA	M	#10 x 1"	SHEET METAL SCREW	0.1085	1.19	0.0450	0.50
161225	11.00	EA	M	#10-12 x 1"	PLASTIC ANCHOR	0.6875	7.56	0.0500	0.55
161238	11.00	EA	M	1/4 x 1 1/2 - 3"	HAMMER DRILLED HOLE	0.0000	0.00	0.2313	2.54
10548	1.00	EA	M	1	CORED HOLE UP TO 8" D	0.0000	0.00	2.1875	2.19
740131	1.00	EA	M		FIRE STOP FIT TO CONDUIT LBR	0.0000	0.00	1.1875	1.19
	0.00				**HORN/STROBE**				

Phase: FIRE ALARM
└**SubPhase:** LEVEL 1

Item #	Qty	U/M	Q/M	Size	Description	Material Unit	Material Result	Labor Unit	Labor Result
TITLE	1.00	EA	M	3/4 EMT	FIRE ALARM STROBE/SPKR	0.0000	0.00	0.0000	0.00
3070094	1.00	EA	M		FIRE ALARM STROBE/SPEAKER	0.0000	0.00	1.5625	1.56
150006	1.00	EA	M	1-1/2"D	4"SQ CMB-KO NO BRKT	2.1745	2.17	0.5000	0.50
161194	2.00	EA	M	#10 x 1"	SHEET METAL SCREW	0.1085	0.22	0.0450	0.09
161225	2.00	EA	M	#10-12 x 1"	PLASTIC ANCHOR	0.6875	1.38	0.0500	0.10
161238	2.00	EA	M	1/4 x 1 1/2 - 3"	HAMMER DRILLED HOLE	0.0000	0.00	0.2313	0.46
150062	1.00	EA	M	FLAT	1G 4"SQ PLASTER-RING	2.5803	2.58	0.1250	0.13
100137	6.00	EA	M	#18 to 10	WIRE-NUT SML -YELLOW	0.1976	1.19	0.1125	0.68
10054	25.00	FT	M	3/4	EMT	1.3811	34.53	0.0938	2.34
30678	2.00	EA	M	3/4	EMT STEEL COMP CONNECTOR	0.4398	0.88	0.5625	1.13
30552	3.00	EA	M	3/4	EMT STEEL-COMP COUPLING	0.5059	1.52	0.2625	0.79
3070531	28.00	FT	M	#16 2/C Red	FA CABLE NON-PLENUM SHLD ADDRESSBL (FPL)	0.6573	18.41	0.0300	0.84
161692	3.00	EA	M	3/4	EMT 1-HOLE STEEL STRAP	0.4598	1.38	0.0750	0.22
161194	3.00	EA	M	#10 x 1"	SHEET METAL SCREW	0.1085	0.33	0.0450	0.14
161225	3.00	EA	M	#10-12 x 1"	PLASTIC ANCHOR	0.6875	2.06	0.0500	0.15
161238	3.00	EA	M	1/4 x 1 1/2 - 3"	HAMMER DRILLED HOLE	0.0000	0.00	0.2313	0.69
10548	1.00	EA	M	1	CORED HOLE UP TO 8" D	0.0000	0.00	2.1875	2.19
740131	1.00	EA	M		FIRE STOP FIT TO CONDUIT LBR	0.0000	0.00	1.1875	1.19
					Phase Totals:		**175.24**		**29.84**
					Job Totals:		**686.58**		**57.00**



1 01 - FIRST LEVEL - ELECTRICAL DEMOLITION PLAN

1/16" = 1'-0"

DRAWING KEYED NOTES

1. DISCONNECT AND REMOVE ALL EXISTING RECEPTACLES, DISCONNECT SWITCHES, AND JUNCTION BOXES ALONG WITH ALL ASSOCIATED CONDUIT AND WIRING BACK TO SOURCE.
2. EXISTING PANELS TO BE RELOCATED AND WIRED TO A COMMON SOURCE FOR CONNECTION OF TEMPORARY POWER DURING DEMOLITION CONTRACTOR WILL BE RESPONSIBLE FOR MEANS AND METHODS TO KEEP POWER TO EXISTING EQUIPMENT AND DEVICES CONNECTED TO THE PANELS DURING CONSTRUCTION. REFER TO DRAWING A-101 FOR LOCATION OF RELOCATED PANELS.
3. DISCONNECT AND RELOCATE EXISTING FIRE ALARM FIRE ALARM NOTIFICATION DISPLAY PANEL AND FIRE EMERGENCY TELEPHONE, ALONG WITH ASSOCIATED CONDUIT AND WIRING BACK TO SOURCE. REFER TO DRAWING FA-101 FOR LOCATION OF RELOCATED MODULE.
4. DISCONNECT AND RELOCATE EXISTING DATA RACKS ALONG WITH ASSOCIATED CONDUIT AND WIRING BACK TO SOURCE. REFER TO DRAWING E-101 FOR LOCATION OF RELOCATED DATA RACKS.
5. DISCONNECT AND REMOVE EXISTING FIRE ALARM DEVICE ALONG WITH ALL ASSOCIATED CONDUIT AND WIRING BACK TO SOURCE.
6. DISCONNECT AND REMOVE EXISTING ESCALATOR AND ALL ASSOCATE WIRING AND CONDUIT BACK TO SOURCE. ESCALATOR TO BE RETURNED TO AIRPORT MAINTENANCE PERSONNEL.
7. EXISTING POWER AND ASSOCIATED DEVICES TO ELEVATOR TO BE REMOVED ALONG WITH ALL ASSOCIATED CONDUIT AND WIRING BACK TO SOURCE.
8. DISCONNECT AND REMOVE ALL EXISTING TICKETING DESK RECEPTACLES ALONG WITH ALL ASSOCIATED CONDUIT AND WIRING BACK TO SOURCE.
9. DISCONNECT AND REMOVE EXISTING LIGHT FIXTURES AND ALL ASSOCIATED CONDUIT AND WIRING BACK TO SOURCE.
10. DISCONNECT AND REMOVE EXISTING EXIT SIGNS AND ALL ASSOCIATED CONDUIT AND WIRING BACK TO SOURCE.
11. DISCONNECT AND REMOVE ALL EXISTING ELECTRICAL DEVICES AND LIGHTS IMPACTED BY THE CANOPY REMOVAL ALONG WITH ALL ASSOCIATED CONDUITS AND WIRING BACK TO SOURCE.
12. BID PACKAGE 04 ALTERNATE #2 ONLY: DISCONNECT AND REMOVE ALL EXISTING ELECTRICAL DEVICES AND LIGHT FIXTURES IMPACTED BY THE COMMERCIAL CANOPY REMOVAL ALONG WITH ALL ASSOCIATED CONDUITS AND WIRING BACK TO SOURCE.
13. DISCONNECT AND REMOVE EXISTING INTERIOR AIR HANDLING UNITS ALONG WITH ALL ASSOCIATED CONDUITS AND WIRING BACK TO SOURCE.
14. FIRE ALARM CONDUITS AND DEVICES WITHIN THE HATCHED AREA OF STRUCTURAL DEMOLITION MUST REMAIN ACTIVE, TEMPORARILY SUPPORTED AND PROTECTED FROM ANY DAMAGE FROM ABOVE UNLESS OTHERWISE NOTED.
15. DISCONNECT AND REMOVE ALL EXISTING ELECTRICAL AND FIRE ALARM DEVICES LOCATED WITHIN THE NEW SENSORY ROOM AREA ALONG WITH ALL ASSOCIATED CONDUITS AND WIRING BACK TO SOURCE.
16. DISCONNECT AND RELOCATE EXISTING FIRE ALARM MODULE OUTLET, CURRENTLY LOCATED ABOVE FIRE ALARM CONTROL PANEL, ALONG WITH ASSOCIATED CONDUIT AND WIRING BACK TO SOURCE. REFER TO DRAWING FA-101 FOR LOCATION OF RELOCATED MODULE.
17. DISCONNECT AND RELOCATE EXISTING RECEPTACLE BOX, CURRENTLY LOCATED BELOW FIRE ALARM CONTROL PANEL ALONG WITH ASSOCIATED CONDUIT AND WIRING BACK TO SOURCE. REFER TO DRAWING E-101 FOR LOCATION OF RELOCATED RECEPTACLE BOX.
18. DISCONNECT AND REMOVE EXISTING LIGHT FIXTURE ALONG WITH ASSOCIATED CONDUIT AND WIRING BACK TO SOURCE.
19. DISCONNECT AND REMOVE EXISTING LIGHT FIXTURES LOCATED AT CEILING BAFFLES. TO BE REPLACED WITH NEW MODEL. KEEP EXISTING ASSOCIATED CONDUIT AND WIRING FOR NEW FIXTURES.
20. DISCONNECT AND REMOVE EXISTING HEAT TRACING LOCATED ON CANOPY, TO BE REPLACED IN KIND, UTILIZING THE EXISTING CIRCUITS IN EXISTING PANEL 'JMV'
21. CONTRACTOR TO MAINTAIN AND PROTECT EXISTING PANELS DURING DEMOLITION OF WALLS. CONTRACTOR WILL BE RESPONSIBLE FOR MEANS AND METHODS TO KEEP POWER TO EXISTING EQUIPMENT AND DEVICES CONNECTED TO THE PANELS DURING CONSTRUCTION. CONTRACTOR TO TRACE AND VERIFY EXISTING CIRCUITS TO PANELS PRIOR TO ANY DEMOLITION WORK.

Answered RFI eliminated Added Scope of Work-No Charge

KH # 21 is too subjective without defined circuit identifications and tracing. To be fair and reasonable we have not included this work in ASI-134 price. Please provide separate PCO to perform work on T&M

LEGEND

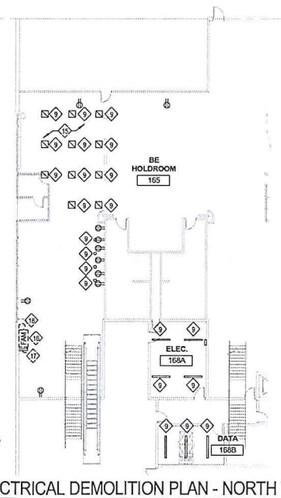
AREA OF STRUCTURAL DEMOLITION ON FLOOR ABOVE

BID PACKAGE 04 ADD ALTERNATE #1 NOTES

1. THE DEMOLITION SCOPE FOR BID PACKAGE 04 ADD ALTERNATE #1 SHALL COMPRISE DISCONNECTIONS AND REMOVALS FOR ALL LIGHTING AND AIR CURTAINS ASSOCIATED WITH VESTIBULES 122, 124, 126, 102,103,104.

BID PACKAGE 04 ADD ALTERNATE #2 NOTES

1. THE DEMOLITION SCOPE FOR BID PACKAGE 04 ADD ALTERNATE #1 SHALL COMPRISE DISCONNECTIONS AND REMOVALS FOR ALL LIGHTING AND ELECTRICAL DEVICES ASSOCIATED WITH THE COMMERCIAL LANE CANOPY.



2 01 - FIRST LEVEL - ELECTRICAL DEMOLITION PLAN - NORTH TERMINAL SIDE

1/16" = 1'-0"

DEMOLITION NOTES

1. SEE ARCHITECTURAL DEMOLITION NOTES AND DRAWINGS TO VERIFY EXTENT OF DEMOLITION WORK. PERFORM ALL REQUIRED DEMOLITION AND RELOCATION WORK AS WELL AS PROVISION FOR ALL NEW ELECTRICAL EQUIPMENT, WIRING, ETC. AS REQUIRED FOR FULLY FUNCTION SYSTEM.
2. WHERE PORTIONS OF THE EXISTING BRANCH CIRCUITS ARE REMOVED, WIRING TO REMAINING DEVICES ON THE CIRCUIT SHALL BE RECONNECTED OR MODIFIED IN AN APPROVED MANNER AS REQUIRED TO MAINTAIN CONTINUITY OF THE AFFECTED BRANCH CIRCUIT AND OPERATION OF THE REMAINING DEVICES.
3. ANY FIRE ALARM SYSTEM WIRING CUT OR REROUTED DURING DEMOLITION WORK SHALL BE RECONNECTED TO MAINTAIN SYSTEM OPERATION. ANY SYSTEM SHUTDOWNS MUST BE COORDINATED WITH THE OWNER. FIRE WATCHES TO BE PROVIDED AS REQUIRED AT NO ADDITIONAL COST.
4. ALL ELECTRICAL EQUIPMENT IN ADJOINING AREAS WHICH IS REQUIRED TO FUNCTION BUT IS AFFECTED BY DEMOLITION AND/OR PHASING WORK SHALL BE RECONNECTED AND RESTORED TO ITS PRESENT FUNCTION AS PART OF THE ELECTRICAL SYSTEM OF THE BUILDING. PREMIUM TIME AS REQUIRED FOR REWIRING OF DEVICES AFFECTING ADJACENT ACTIVE SHALL BE INCLUDED.
5. PORTIONS OF THE FEEDER LINES THAT HAVE TO BE REMOVED AND ABANDONED AS A RESULT OF DEMOLITION WORK AND/OR PHASING WORK BUT AS REQUIRED TO CONTINUE TO FUNCTION, SHALL BE CUT AT CONVENIENT LOCATIONS, REROUTED AND RECONNECTED FOR CONTINUATION OF THEIR PRESENT FUNCTIONS. NEW FEEDER EXTENSIONS SHALL MATCH EXISTING ONES IN ALL RESPECTS (CONDUCTOR CAPACITY, CONDUIT SIZES, ETC.)
6. SPACE OUTSIDE OF CONSTRUCTION AREA SHALL REMAIN OPERATIONAL. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY INSTALLATIONS AND MODIFICATIONS TO EXISTING AND/OR NEW ELECTRICAL SYSTEMS AS REQUIRED TO MAINTAIN CONTINUITY OF ALL EXISTING AND/OR NEW AND TEMPORARY ELECTRICAL SYSTEMS AND EQUIPMENT IN AREAS NOT BEING AFFECTED BY CONSTRUCTION PHASE AND AS FOLLOWS:

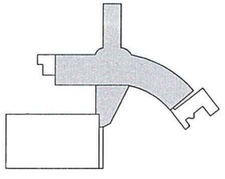
   A. THE TEMPORARY ELECTRICAL SYSTEMS SHALL BE COMPLETELY INSTALLED AND OPERATING AT THE EARLIEST POSSIBLE DATE.

      1. PROVIDE ALL LABOR AND MATERIAL AND PERFORMING ALL REQUIRED WORK TO A SATISFACTORY CONDITION ALL CONDUITS, CONDUCTORS, BOXES, FITTINGS, SWITCHES, PANELBOARDS, OVERCURRENT DEVICES, LAMPS, ETC. OF THE ENTIRE TEMPORARY ELECTRICAL SYSTEM.
      2. PROVIDE TEMPORARY LIGHT AND POWER WIRING AND EQUIPMENT NECESSARY TO PERMIT ALL TRADES TO SATISFACTORILY PERFORM WORK.

   B. EXCEPT AS DIRECTED BY THE ENGINEER AND AS SPECIFIED ABOVE, ALL TEMPORARY ELECTRICAL WIRING AND EQUIPMENT FURNISHED AND INSTALLED BY THE CONTRACTOR (INCLUDING FEEDERS, SAFETY SWITCHES, PANELBOARDS, CONDUITS, BOXES, CONDUCTORS, DROP LIGHTS, ETC.) SHALL BE DISCONNECTED AND REMOVED FROM THE PREMISES WHEN DIRECTED FOR UPON COMPLETION OF WORK.

   C. INSTALLATION OF TEMPORARY ELECTRICAL WORK SHALL BE IN COMPLIANCE WITH LOCAL ELECTRICAL CODE AND CONTRACT DOCUMENTS.

7. ALL RACEWAYS WHICH BECOME EXPOSED BEYOND FINISHED SURFACE OR BELOW THE REQUIRED HEADROOM BECAUSE OF ALTERATION SHALL BE REMOVED & REROUTED BEHIND THE FINISHED SURFACE OR ABOVE THE REQUIRED HEAD ROOM/HUNG CEILING.
8. THE ELECTRICAL DEMOLITION PLANS AND DETAILS INDICATE THE GENERAL INTENT AND ARE NOT INTENDED TO SHOW ALL ITEMS TO BE REMOVED OR RETAINED. THE ELECTRICAL CONTRACTOR SHALL VISIT THE SITE PRIOR TO THE SUBMISSION OF BIDS TO BECOME FAMILIAR WITH THE ACTUAL CONDITIONS AND EXTENT OF WORK. DEVICES AND EQUIPMENT LOCATED ON WALLS AND/OR CEILINGS TO BE REMOVED SHALL BE DISCONNECTED AND MADE SAFE. THE ELECTRICAL CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE OF ANY UNANTICIPATED HIDDEN CONDITIONS ENCOUNTERED DURING DEMOLITION.
9. THE CONTRACTOR SHALL INCLUDE IN BID ALL COSTS FOR REMOVAL AND RELOCATION IN THE CONTRACT. THESE COSTS SHALL INCLUDE WORK DESCRIBED IN THE CONTRACT DOCUMENTS WITH ALLOWANCES FOR NORMAL UNFORESEEN DIFFICULTIES WHEN CONCEALED WORK HAS BEEN OPENED. NO CLAIMS FOR ADDITIONAL WORK ASSOCIATED WITH DEMOLITION WILL BE ACCEPTED, EXCEPT IN SPECIFIC CASES CONSIDERED JUSTIFIABLE BY THE ARCHITECT



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ALB - Central Terminal Passenger Screening

No.	Submittal / Revision	Appr.	By	Date
10	BP-04 ASI-134			07.25.2025
9	BP-04 ASI-132			07.03.2025
8	BP-04 ASI-113			03/19/2025
7	BP-04 ASI-091			11/13/2024
6	BP-04 ASI-083			10/15/2024
5	BP-04 ASI-064			07.17.2024
4	BP-02 ASI-053			04.26.2024
3	BP-04 Addendum 6			09.08.23
1	BP-02			05.01.23
2	BP-02 Addendum 2			05.15.23

ELECTRICAL DEMOLITION PLAN - LEVEL 1

Designed By:	Drawn By:	Checked By:
MH	HAJ	MH
Issue Date:	Project No:	Scale:
07/25/23	078935.000	AS SHOWN

Drawing No:

ED-101

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DRAWING GENERAL NOTES

1. INSTALLATION OF POWER CONNECTIONS FOR FURNITURE ARE PART OF THIS DRAWING PACKAGE SCOPE. FURNITURE BY OTHERS.

BID PACKAGE 04 ADD ALTERNATE #1 NOTES

1. THE SCOPE FOR BID PACKAGE 04 ADD ALTERNATE #1 SHALL COMPRISE ALL WORK AND EQUIPMENT ASSOCIATED WITH NEW LIGHTING AND AIR CURTAINS AT VESTIBULES 122, 124, 126, 101, 102,103,104,105.

DRAWING KEYED NOTES

1. EXISTING PANELS RELOCATED FROM ELECTRIC ROOM UNDER ESCALATOR REMOVED IN DEMOLITION PHASE.
2. PROVIDE POWER TO ELEVATOR DISCONNECT FROM 30A CB IN EMERGENCY PANEL 3EM.
3. PROVIDE POWER TO FOUR NON-FUSED DISCONNECTS FOR FOUR ESCALATORS WITH NEW 100A, 3P BREAKERS FROM NEW PANEL 3EM.
4. PROVIDE POWER TO ELEVATOR CAB LIGHTS FROM EXISTING PANEL 1XB. REUSE CIRCUIT 3 FROM ELEVATOR REMOVED IN DEMOLITION PHASE. REPLACE EXISTING 20A BREAKER WITH 30A BREAKER.
5. PROVIDE AND INSTALL BACK BOX FOR NEW CARD READER WITH 3/4" C. STUB UP TO POINT ABOVE CEILING AND PULL STRING. CARD READER LOCATION AND FINAL CONNECTION TO BE COORDINATED WITH SECURITY DRAWINGS AND SECURITY CONTRACTOR.
6. PROVIDE 120V CONNECTION TO ELECTRIC DOOR LOCK AS REQUIRED. REFER TO SECURITY DRAWINGS FOR MORE INFORMATION AND COORDINATE INSTALLATION WITH SECURITY CONTRACTOR.
7. CONNECT NEW RECEPTACLE TO EXISTING RECEPTACLE CIRCUITING.
8. WEIGH SCALES TO BE SHIFTED ACCORDINGLY BETWEEN NEW TICKETING DESKS. EXISTING WEIGH SCALE CIRCUITING TO BE USED.
9. REFER TO AIR CURTAIN SCHEDULE ON DRAWING E-500 FOR AIR CURTAIN CIRCUITS. AC-1 THRU AC-6 ARE PART OF BID ADD ALTERNATE #1.
10. PROVIDE POWER TO LED BANNER FROM NEW PANEL 1TD LOCATED IN IDF ROOM 106. REFER TO DRAWING E-606 FOR PANEL SCHEDULE & CIRCUITS.
11. ALL VENDING MACHINES ARE REQUIRED TO HAVE GFCI PROTECTION INTEGRAL TO THE MACHINE OR THE SUPPLY CORD AND PLUG AS OF 2005. ENSURE THESE MACHINES ARE SUPPLIED WITH EITHER INTEGRAL OR CORD GFCI PROTECTION PRIOR TO INSTALLATION.
12. NOT USED.
13. PROVIDE POWER TO SIGNAGE. REFER TO SIGNAGE DRAWINGS FOR FINAL LOCATION.
14. PROVIDE POWER FOR DIGITAL DISPLAY. REFER TO ARCHITECTURAL DRAWINGS FOR MOUNTING HEIGHT.
15. PROVIDE NEW CORE DRILL AND FLOOR BOX WITH 3/4" C AND 1 1/4" STUB UP FOR TABLE OR FURNITURE CONNECTION. COORDINATE EXACT DEVICE TYPES, PLATES AND LOCATIONS WITH ARCHITECT AND FURNITURE PLANS PRIOR TO ANY NECESSARY CORE DRILLS. FIRESTOP (ACCORDING TO BUILDING SPECIFICATIONS) OR MATCH EXISTING FIRE RESISTIVE RATING WHICH EVER IS GREATER.
16. JUNCTION BOX IN CEILING. SPLICE AND EXTEND EXISTING GARAGE EMERGENCY POWER AS SHOWN.
17. RELOCATE RECEPTACLE BOX FROM UNDER EXISTING FIRE ALARM CONTROL PANEL TO NEW WALL. REUSE EXISTING CIRCUITING. REFER TO ARCHITECTURAL DRAWINGS FOR COORDINATION.

WOMEN'S TOILET 117 · MEN'S TOILET 115 · VENDING 120 · ELEVATOR 404 · INFO DESK 112 · EXIT CORRIDOR 110 · STORAGE 109 · BAGGAGE 121 · FIRE RISER ROOM 127 · CENTRAL ENTRY 113 · TICKETING COUNTERS 108 · TICKETING 107 · ENTRY VESTIBULE 101 · VESTIBULE 102 · VESTIBULE 103 · VESTIBULE 104 · ESCALATOR MACHINE ROOM 128 · IDF ROOM 106

Deleted Floor Box Cktry; Floor Box Cover turned over to ACAA

99'-6 1/4"

SCOPE OF BID PACKAGE 04 ADD ALTERNATE #1

4#1 & 1#8 G IN 2" C. WITHIN CAVITY OF METAL DECK CEILING.

No work was ever priced for said relocations to Escalator Machine Room 128 as this relocation was overcome by events/RFI's/ACAA decision to keep existing L1 Panels

1 01 - FIRST LEVEL ELECTRICAL PLAN - TSA SIDE
3/32" = 1'-0"

2 01 - FIRST LEVEL - EXIST. ELEC. ROOM (AREA B)
1/16" = 1'-0"

ELEC ROOM EB116 · BPS6AM18 · PP-JB · MSB · 1LA SEC 1 · 1LA SEC 2 · 3EM:14,16,18 · ELP1:23 · ELP1:23 · 3EM:19,21,23 · 1TA · 1KT-J4 · 1ET-A

3 01 - FIRST LEVEL - SENSORY ROOM & CHILDREN'S AREA
1/16" = 1'-0"

SENSORY 135 · CHILDREN'S AREA 148 · ELEC. 168A · DATA ROOM 136

4 01 - FIRST LEVEL - CAR RENTAL COUNTER
1/16" = 1'-0"

CAR RENTALS 123 · BAGGAGE 121 · SEATING AREA 125 · VESTIBULE 122 · VESTIBULE 124 · VESTIBULE 126 · AC-1 · AC-2 · AC-3

SCOPE OF BID PACKAGE 04 ADD ALTERNATE #1

ELECTRICAL ROOM

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43 Danforth St.
Portland, ME 04101
207.775.1005 www.chadesign.com

ALBANY COUNTY AIRPORT AUTHORITY

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BID PACKAGE #4 ISSUED FOR BID

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ALB - Central Terminal Passenger Screening

No.	Submittal / Revision	Appd.	By	Date
12	BP-04 ASI-134			07.25.2025
11	BP-04 ASI-118			05/09/2025
10	BP-04 ASI-116			04/16/2025
9	BP-04 ASI-113			03/10/2025
8	BP-04 ASI-094			10/31/2024
7	BP-04 ASI-083			10/15/2024
6	BP-04 ASI-028			02.16.2024
5	BP-04 ASI 12			11.17.23
4	BP-04 Addendum 9			09.15.23
3	BP-04 Addendum 5			09.01.23
2	BP-04 Addendum 3			08.25.23
1	BP-04 Addendum 2			08.18.23

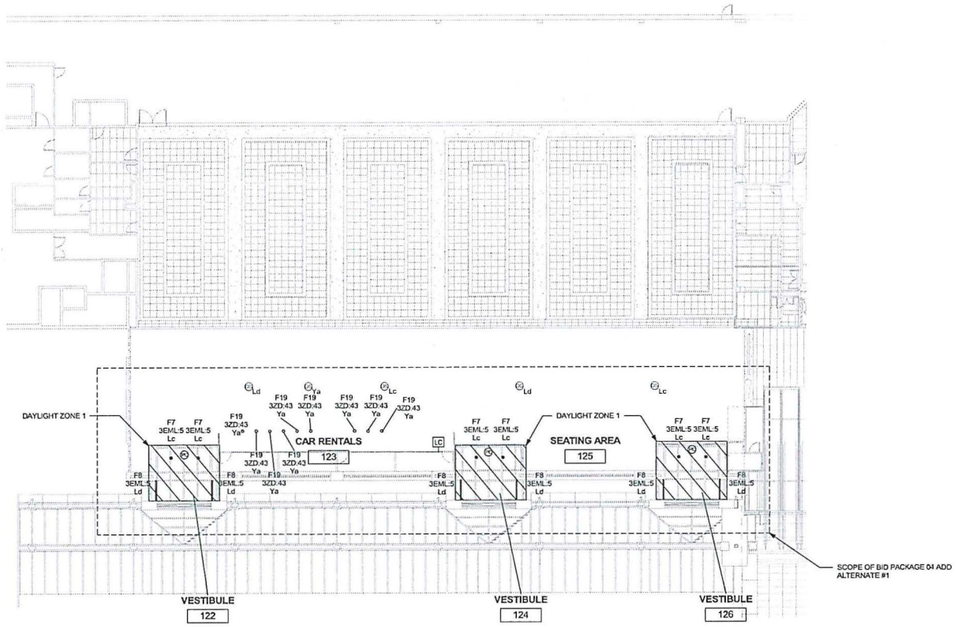
ELECTRICAL PLAN - LEVEL 1 - CONNECTOR FLOOR PLAN - TSA SIDE

Designed By:	Drawn By:	Checked By:
MH	HAJ	MH
Issue Date:	Project No:	Scale:
07/26/23	078935.000	AS SHOWN

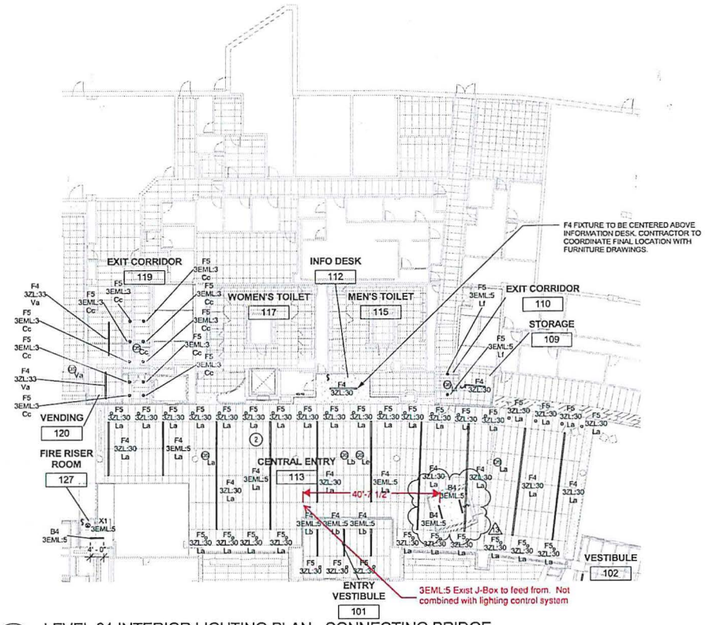
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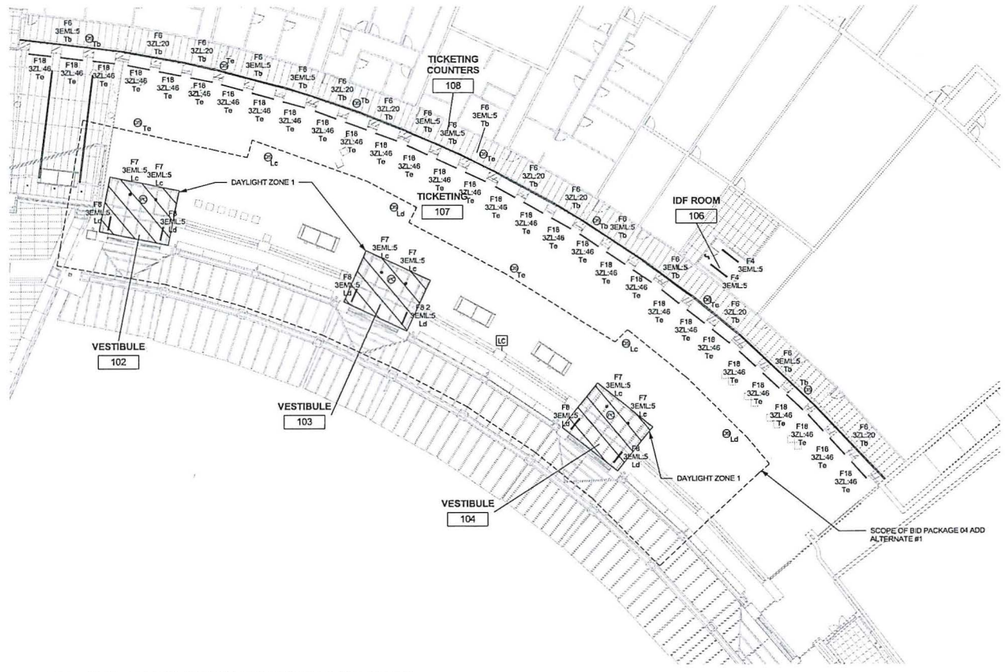
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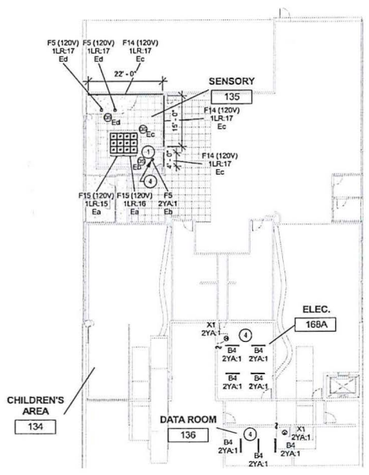
1 LEVEL 01 INTERIOR LIGHTING PLAN - WEST
1/16" = 1'-0"



2 LEVEL 01 INTERIOR LIGHTING PLAN - CONNECTING BRIDGE
1/16" = 1'-0"



3 LEVEL 01 INTERIOR LIGHTING PLAN - EAST
1/16" = 1'-0"



4 LEVEL 01 INTERIOR LIGHTING PLAN - NORTH
1/16" = 1'-0"

BID PACKAGE 04 ADD ALTERNATE #1 NOTES

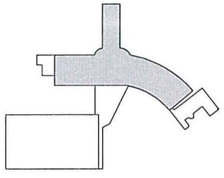
1. THE SCOPE FOR BID PACKAGE 04 ADD ALTERNATE #1 SHALL COMPRISE ALL WORK AND EQUIPMENT ASSOCIATED WITH NEW LIGHTING AND AIR CURTAINS AT VESTIBULES 122, 124, 125, 101, 102,103,104,105.

DRAWING KEYED NOTES

1. PROVIDE SWITCHING FOR ARTIFICIAL SKYLIGHT FIXTURES VIA PROPRIETARY DMX CONTROLLER.
2. CENTRAL ENTRY F18 FIXTURES TO BE LOCATED AT MILLWORK UNDERNEATH F18A FIXTURES. SEE ARCHITECTURAL DRAWINGS FOR DIMENSIONAL INFORMATION.
3. EAST TERMINAL F18 FIXTURES TO BE INSTALLED AT TICKETING COUNTER MILLWORK. SEE ARCHITECTURAL DRAWINGS FOR DIMENSIONAL INFORMATION.
4. CONNECT FIXTURES TO EXISTING EMERGENCY LIGHTING CIRCUIT CURRENTLY SERVING ELEC. AND DATA ROOMS.

GENERAL NOTES - DAYLIGHT RESPONSIVE CONTROLS

1. SEE DRAWING E-702 DETAIL 3 FOR TYPICAL DAYLIGHT CONTROL WIRING SCHEMATICS.
2. ALL DAYLIGHT RESPONSIVE CONTROL SYSTEMS ARE TO BE COMPLIANT WITH CURRENT IECC CODE.
3. PROVIDE AS MANY CONTROLLER UNITS AS NECESSARY TO POWER ALL LOADS IN GIVEN AREA.
4. CONFIGURE DAYLIGHT RESPONSIVE CONTROLS WITHIN EACH SPACE SO THAT THEY CAN BE CALIBRATED FROM WITHIN THAT SPACE BY AUTHORIZED PERSONNEL IN A LOCATION WITH READY ACCESS.



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Portland, ME 04101
207.775.1023 www.chacompanies.com

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BID PACKAGE #4
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Passenger Screening

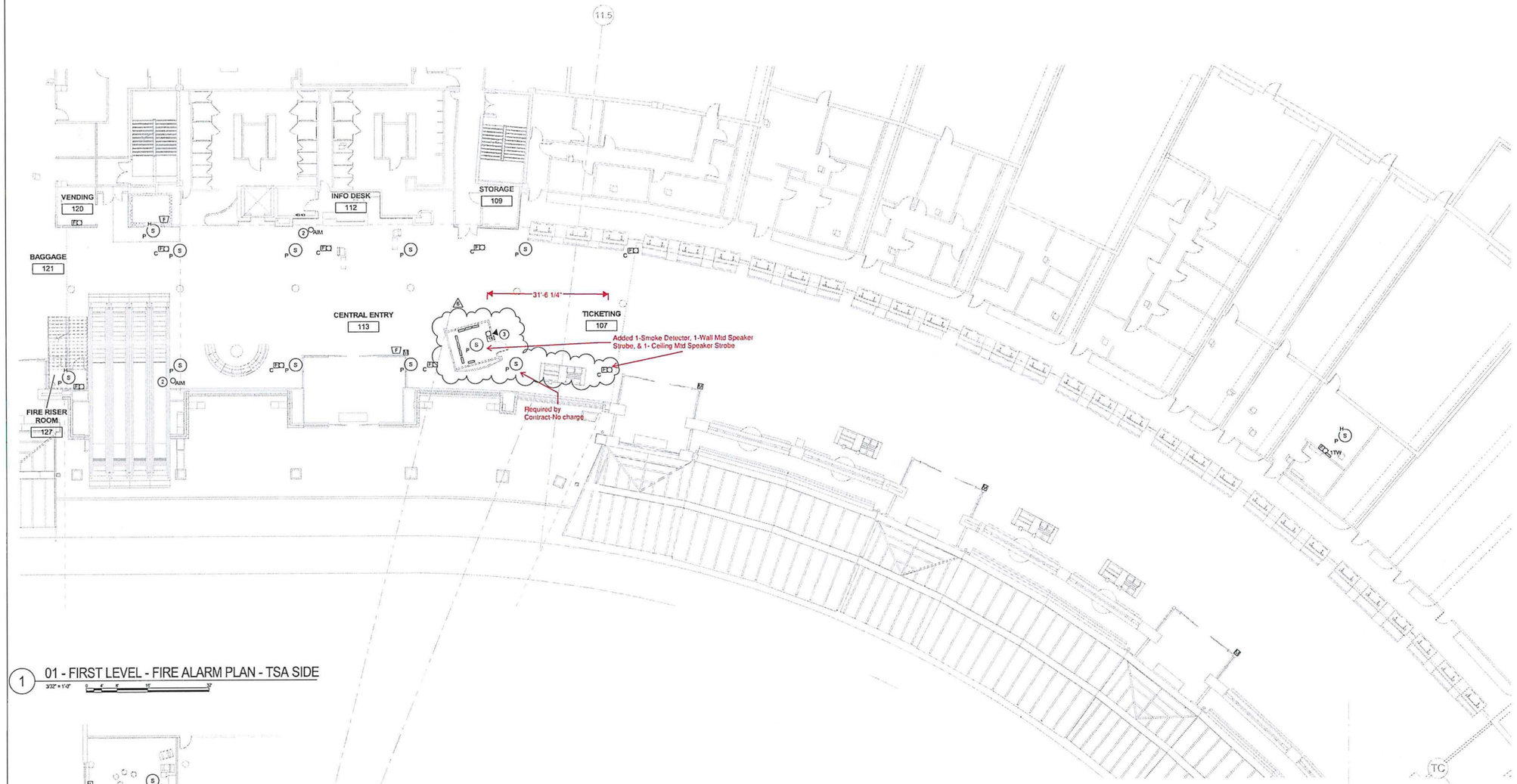
No.	Submittal Revision	App'd	By	Date
13	BP-04 ASI-134			07.25.2025
12	BP-04 ASI-118			05.09.2025
11	BP-04 ASI-114			03.21.2025
10	BP-04 ASI-067			11.05.2024
9	BP-04 ASI-064			10.31.2024
8	BP-04 ASI-063			10.15.2024
7	BP-04 ASI-047			04.05.2024
6	BP-04 ASI-021			01.29.2024
5	BP-04 Addendum 11			09.25.23
4	BP-04 Addendum 9			09.15.23
3	BP-04 Addendum 5			09.01.23
2	BP-04 Addendum 3			08.25.23
1	BP-04 Addendum 2			08.18.23

ELECTRICAL LIGHTING PLANS - LEVEL 1

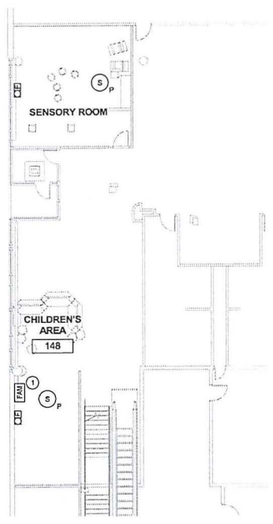
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GCS	GCS	Checker
Issue Date:	Project No:	Scale:
07/26/23	078935.000	AS SHOWN

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E-201

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1 01 - FIRST LEVEL - FIRE ALARM PLAN - TSA SIDE
3/32" = 1'-0"



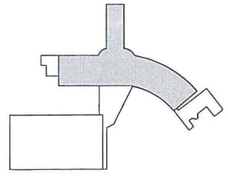
2 01 - FIRST LEVEL - FIRE ALARM PLAN - SENSORY ROOM & CHILDREN'S AREA
3/32" = 1'-0"

DRAWING KEYED NOTES

1. RELOCATE FIRE ALARM MODULE OUTLET TO NEW WALL. REUSE EXISTING CIRCUITING. REFER TO ARCHITECTURAL DRAWINGS FOR COORDINATION.
2. ADDRESSABLE MODULE TO BE TIED INTO DOOR SWITCH AT EACH AED CABINET AND SET TO TRIGGER FIRE ALARM WHEN DOORS OPENED.
3. RELOCATE FIRE ALARM NOTIFICATION DISPLAY PANEL AND FIRE EMERGENCY TELEPHONE TO NEW WALL. REUSE EXISTING CIRCUITING. REFER TO ARCHITECTURAL DRAWINGS FOR COORDINATION.

DRAWING GENERAL NOTES

1. NEW FIRE ALARM DEVICES TO MATCH EXISTING. EXTEND AND CONNECT NEW CIRCUIT TO DEVICE IF EXTENDING AN EXISTING FA CIRCUIT FROM DEMOLITION IS NOT POSSIBLE. VISUAL FA DEVICES POTENTIALLY WITHIN SIGHT OF EACH OTHER MUST BE SYNCHRONIZED.
2. EXISTING FIRE ALARM PANEL IN CHILDREN'S AREA TO REMAIN.



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ALB - Central Terminal Passenger Screening

No.	Submittal Revision	Mod'd	By	Date
6	BP-04 ASI-134			07.25.2025
5	BP-04 ASI-114			03/21/2025
4	BP-04 ASI-106			1/24/2025
3	BP-04 ASI-083			10/15/2024
2	BP-04 ASI 12			11.17.23
1	BP-04 Addendum 2			08.18.23

FIRE ALARM PLAN - LEVEL 1 - CONNECTOR FLOOR PLAN - TSA SIDE

Designed By:	Drawn By:	Checked By:
MH	HAJ	MH
Issue Date:	Project No:	Scale:
07/25/23	078935.000	AS SHOWN

Drawing No:
FA-101

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A DIVISION OF: sciens Building Solutions

Fire Security & Sound Systems, LLC.

4 Avis Drive
Latham, New York 12110
Tel 518.250.4364 Fax 518.250.4365
www.firesecuritysound.com

To: Martin Electric **Sales Team:** Ian Reilly / Steve Herring / Roy A. Yannes

Attn: **Kyle Delair** **Email:** IanReilly@firesecuritysound.com

Quote #: 2025-0415 Rev. 2 **Date:** October 14, 2025

Re: Albany Airport Passenger Screening – ASI-134

We are pleased to submit the following quotation for your review. Our price does not include standard boxes, pipe, wire or installation.

Fire Alarm System Addition (EST): 1 Smoke/CO Detector, 1 Sounder Base, 1 Speaker/Strobe, 1 Ceiling Speaker/Strobe, 2 A/V Mounting Plates & 1 Lot Engineering and Technician Labor

Total Price is: $2,600.00 (plus any appl. taxes)

Equipment: $600.00
Engineering/Technician/ $2,000.00

Note: Quotation includes Technician time during normal business hours 7am-3:30pm to program and test devices. This Quotation also includes after hours 1am-3am Technician time to test AV devices.

The above price includes submittals, demonstration, supervision of final connections of control equipment and assisting in testing the system. It does not include tax, installation, engineered stamped drawings, permits or fees of any kind. Our terms are net 30 days with approved credit. Our proposal is subject to the attached terms and conditions.

This quotation will only be valid for 30 days. Equipment for projects should be released as soon as possible to mitigate delays in product allocation.

Working together as a team to achieve common goals.
We appreciate your business.

Bridie, Scott F - (NYN)

From: Craig Dittl <cdittl@mlbind.com>
Sent: Wednesday, July 29, 2026 2:27 PM
To: Bridie, Scott F - (NYN); McNeil, Brian - (NYN)
Cc: Jeffrey Lino
Subject: Albany Airport Expansion, BP-4: Proposal #155R1 (ASI-134)
Attachments: Proposal #155R1 (ASI-134).pdf

EXTERNAL EMAIL - Please Handle Cautiously

Brian - here is the revised proposal for ASI-134. Reminder that ADK did reduce the taper hours as discussed but also instituted the wage rate increases they hadn't realized in the original proposal.

This one should be ready for August C.O.

Craig Dittl, Senior Project Manager
MLB Construction Services, LLC

Over 75 Years of Construction Excellence
1 Stonebreak Road Malta, NY 12020
P: 518.289.1371 EXT. 146 C: 518.450.9774
www.mlbconstructionservices.com

Proud Members Of:

46 Elm Street
Glens Falls, NY 12801

From: Craig Dittl <cdittl@mlbind.com>
Sent: Monday, August 3, 2026 3:17 PM
To: Taylor Oldroyd <toldroyd@adk-drywall.com>
Subject: FW: Albany Airport Expansion, BP-4: Proposal #155R1 (ASI-134)

See below. Can you shoot over your updated labor sheets?

Thanks

Craig Dittl, Senior Project Manager
MLB Construction Services, LLC

Over 75 Years of Construction Excellence
1 Stonebreak Road Malta, NY 12020
P: 518.289.1371 EXT. 146 C: 518.450.9774
www.mlbconstructionservices.com

Proud Members Of:

From: McNeil, Brian - (NYN) <bmcneil@tcco.com>
Sent: Monday, August 3, 2026 1:14 PM
To: Craig Dittl <cdittl@mlbind.com>; Bridie, Scott F - (NYN) <sbridie@tcco.com>
Cc: Jeffrey Lino <Jlino@mlbind.com>
Subject: RE: Albany Airport Expansion, BP-4: Proposal #155R1 (ASI-134)

Hi Craig –

After a review of the various percentage increases associated with the commercial rates for carpenters out of Local 291 or the tapers out of Local 201 District 9, please provide the most current prevailing wage sheets and labor burden information for Albany County.

Brian McNeil
Field Engineer
Turner Construction Company | 1 Computer Dr. South | Albany, NY 12205

From: Craig Dittl <cdittl@mlbind.com>
Sent: Wednesday, July 29, 2026 2:27 PM
To: Bridie, Scott F - (NYN) <sbridie@tcco.com>; McNeil, Brian - (NYN) <bmcneil@tcco.com>

PCO-315

MLB Construction Services LLC
One Stone Break Road
Malta, NY 12020
Tel: 518-289-1371
Fax: 518-289-1652

PROPOSAL

SUBMITTED TO:
Scott Bridie
Turner Construction Company
1 Computer Drive South
Albany, NY 12205

PROJECT NAME	
Alb. Airport 21-1082-STR & INT	
PROJECT NO.	DATE
23-114	8/19/26
PROPOSAL NO.	PROPOSAL AMOUNT
161	$ 11,459.00

Per NOC 161 dated 8/4/2025, MLB Construction Services LLC is pleased to present our proposal for the following:

Provide blocking for the snow guards at the cornices per the response to RFI-356.

Description	Labor	Material	Equipment	Subcontract	Other	Price
Blocking Material Provided by MLB		$2,301.28				$2,301.28
Gitzen Companies Inc				$8,539.36		$8,539.36
					Subtotal:	$10,840.64
		MLB OH&P (Self-performed)		$2,301.28	10.00%	$230.13
		MLB OH&P (Subcontractor)		$7,763.05	5.00%	$388.23
					Total:	**$11,459.00**

If you have any questions, please contact me at 518-289-1371.

- [X] We reserve the right to request an extension of time together with additional cost incurred at a later date.
- [ ] We request calendar days extension of time for the above work.
- [ ] This proposal may be withdrawn by us if not accepted within 10 days.

WE HAVE NOT BEEN DIRECTED TO PROCEED WITH THIS WORK.

OWNER MUST RETURN THIS PROPOSAL WITH THEIR SIGNED APPROVAL SHOWN BELOW BEFORE WORK CAN BEGIN.

Submitted by: 8/19/26
Craig Dittl
MLB Construction Services LLC

Approved by: _____
Date: _____

Cc: JMD/SAS/File (MLB Construction Services LLC)

TCCo New York North
1 Computer Drive South
Albany, New York 12205
P: (518) 432-0277
F: (518) 432-0279

Project: 230609 Albany Airport: Terminal Expansion
737 Albany Shaker Rd.
Albany, New York 12211

RFI #BP-04 RFI-356: BP-04 RFI-356: Fastening Detail/Blocking Requirements for Snowguards

Revision	0	**Status**	Open
To	Ashley Richards (CHA) Jordan Hudak (CHA) Todd Cirillo (CHA)	**From**	Lori Rowe (MLB Construction Services, LLC)
Date Initiated	Jul 23, 2025	**Due Date**	Aug 13, 2025
Location		**Project Stage**	Course of Construction
Cost Impact		**Schedule Impact**	
Spec Section		**Cost Code**	
Drawing Number		**Reference**	
Linked Drawings			
Received From	Lori Rowe (MLB Construction Services, LLC)		
Copies To	Eddie Andres (Turner Construction Company), Zack Geddies (Albany County Building Department), Natram Lackraj (Turner Construction Company), Marty Millington (MLB Construction Services, LLC), Maureen Moran (CHA), Mike Washburn (MLB Construction Services, LLC)		

Activity

Question

Question from Lori Rowe MLB Construction Services, LLC *on Monday, Jul 21, 2025 at 03:28 PM EDT*

Please see both C2 and C3 on A-326. It seems as though C2 shows no fastening detail for the snowguard and C3 shows the snowguard fastened to a non-structural metal component. Please advise what the intent was regarding the fastening/installation of this item and/or if blocking must be added (and if so, provide details).

Awaiting an Official Response

UNDERSTOOD... WE'RE REFERENCING THE DETAILS IN THE BID DOCS. ED

Details referenced from the construction documents in the RFI are not the contractor proposed roof/metal panel intersection details that are included in the ACM shop drawings.
Provide fire retardant pressure treated blocking as required to securely fasten snow guards to building and install snow guards according to manufacturer's recommendations.

T. Cirillo, CHA 8-1-25

BUILDING THE FUTURE - TOGETHER

Albany
Kamco Supply Corp of NE
36 Railroad Avenue
Albany NY 12205
518-729-1122
Fax: 518-453-9527

CUSTOMER COPY

INVOICE

2510-139607 PAGE 1 OF 1

SOLD TO	SHIP TO
MLB CONSTRUCTION SERVICES LLC One Stone Break Rd Malta NY 12020	ALBANY AIRPORT J#23114 737 SHAKER RD Albany NY 12211 518-289-1371

ACCOUNT	JOB
09026	124
SOLD ON	10/20/2025 7:26:48 AM
DELIVER ON	10/17/2025
BRANCH	AL
CUSTOMER PO#	23114
STATION	ALCZ
CASHIER	ALCB
SALESPERSON	BRAD
ORDER ENTRY	ALKMC

We install Commercial Door & Div 10 Specialties Packages. Contact Kamco for a quote.

ST-120.1 ON FILE TUCKER 518-693-2977

Quantity	UM	Item	Description	D	T	Price	Per	Amount
			Order: 2510-A37567					
50	PCS	2610FT	2"x 6"x10'INT FIRE TREATED LUMBER		Y	13.3600	PCS	668.00
4	PCS	34CDXFT	3/4x4x8 FIRE TREATED SYP CDX PLYWOOD		Y	1.7600	SQFT	225.28
4	PCS	12CDXFT	1/2x4x8 FIRE TREATED SYP CDX PLYWOOD		Y	1.3400	SQFT	171.52

CITEN BLOCK-6

CD

Payment Method(s)

Charge to Acct 1,064.80

NYAL1 8.00% EXE: 04-3747984	SubTotal	1,064.80
	Sales Tax	0.00
	Deposit	
Please Pay This Amount		1,064.80

Remit To: PO Box 530 ,Wallingford, CT 06492
Deduct 1% of the SubTotal if paid by the 10th of next month. Avoid a 1.5% finance charge by paying invoice in full by end of following month.
+No refund or credit for non-stock material.

Signature

BUILDING THE FUTURE - TOGETHER

Albany
Kamco Supply Corp of NE
36 Railroad Avenue
Albany NY 12205
518-729-1122
Fax: 518-453-9527

CUSTOMER COPY

INVOICE

2512-182957 PAGE 1 OF 1

SOLD TO	SHIP TO
MLB CONSTRUCTION SERVICES LLC One Stone Break Rd Malta NY 12020	ALBANY AIRPORT J#23114 737 SHAKER RD Albany NY 12211 518-289-1371

ACCOUNT	JOB
09026	124
SOLD ON	12/12/2025 10:15:35 AM
DELIVER ON	12/12/2025
BRANCH	AL
CUSTOMER PO#	23114
STATION	ALCZ
CASHIER	ALCB
SALESPERSON	BRAD
ORDER ENTRY	ALCB

We install Commercial Door & Div 10 Specialties Packages. Contact Kamco for a quote.

ST-120.1 ON FILE TUCKER 518-466-6779
*FLATBED IS GOOD/ LULL ON SITE

Quantity	UM	Item	Description	D	T	Price	Per	Amount
			Order: 2512-A82502					
48	PCS	2610FT	2"x 6"x10'INT FIRE TREATED LUMBER		Y	13.3600	PCS	641.28
6	PCS	34CDXFT	3/4x4x8 FIRE TREATED SYP CDX PLYWOOD		Y	1.7600	SQFT	337.92
6	PCS	12CDXFT	1/2x4x8 FIRE TREATED SYP CDX PLYWOOD		Y	1.3400	SQFT	257.28
30	EA	358X10-20	3-5/8"x10' Stud 20GA/EQ		Y	0.4800	LFT	144.00
10	EA	358TR20	3-5/8"x10' Track 20GA/EQ		Y	0.4700	LFT	47.00
10	EA	58FC8	5/8" 4x8 F/C Gypsum Drywall		Y	0.5400	SQFT	172.80
10	EA	SUPERWIDE8	8' B1/P1 SUPERWIDE O/S CRNR 50CTN		Y	0.4700	LFT	37.60
2	EA	USGRM	ALL PURPOSE COMPOUND *GREEN* 4.5GAL USG		Y	22.2500	EA	44.50

CITIZENS PER TUCK (G)

MLB MATERIAL TOTAL = $2,301.28 (G)

Payment Method(s)

Charge to Acct 1,682.38

NYAL1 8.00% EXE: 04-3747984	SubTotal	1,682.38
	Sales Tax	0.00
	Deposit	
Please Pay This Amount		1,682.38

Remit To: PO Box 530 ,Wallingford, CT 06492
Deduct 1% of the SubTotal if paid by the 10th of next month. Avoid a 1.5% finance charge by paying invoice in full by end of following month.
+No refund or credit for non-stock material.

Signature

mlb
Over 75 Years of Construction Excellence

General Contractors and Construction Managers

One Stone Break Road
Malta, New York 12020
518.289.1371 www.mlbind.com

Project # 23-114 Date 8/19/26
Project ALBANY AIRPORT EXPANSION
Issue CITIZEN SNOW GUARD T&M
Remarks Prepared By CD

- LABOR TOTAL = $5,246.75
- EQUIPMENT TOTAL = 31.5 HOURS → 4 DAYS
  - ↳ IN LIEU OF CHARGING PER DAY, WEEKLY RATE ATTACHED
  - = $2,275
- MATERIAL TOTAL = 870 QUANTIFIED WITH (6) TICKETS INCLUDING SCREWS BUT NOT SHOWING A QUANTITY.
  - ↳ 1,000 SCREWS / 47 PER BOX
  - = 22 BOXES @ $10.97/EA
  - = $241.30

TOTAL = $7,763.05
10% = $776.31

$8,539.36 CD

Albany Airport

FIELDWIRE

Time & Material Tag #1

Name	Albany airport snow fence wood blocking
Status	Draft
Assignee	Zachary Gitzen (ZGI)

General Information

Issued by	Zachary Gitzen (ZGI) PCO 315
Issued to	
Description of Work	Installing roof blocking for snow fence 11/11/25

Labor

Description	Trade	Labor rate	Regular Time	Overtime	Double Time	Labor cost
Foreman	Ironworker		4.0 hrs. x 90.98 = $363.92			0.0 USD
Total						**0.0 USD**

Equipment

Description	Hours	Quantity	Equipment rate	Equipment cost
86' boom lift	4.0 hrs. ✓			0.0 USD
Total				**0.0 USD**

Material

Description	Quantity	Material price	Unit	Material cost
4" #3 roofing screws				0 USD
Total				**0.0 USD**

Attachments

Approval

Mark Mellon (VTO) 11/13/25

EC Andrea ✓ (VTO) 11/13/25

Signed by Zachary Gitzen
on November 13, 2025 04:37 AM from Zachary Gitzen's device

ZG

Albany Airport

FIELDWIRE

Time & Material Tag #2

Name	Albany airport snow fence wood blocking
Status	Submitted
Assignee	Zachary Gitzen (ZGI)

General Information

Issued by	Zachary Gitzen (ZGI) PCO 315
Issued to	
Description of Work	Installing wood blocking for snow fence 11/12/25

Labor

Description	Trade	Labor rate	Regular Time	Overtime	Double Time	Labor cost
Foreman	Ironworker		2.0 hrs. x 90.98			0.0 USD
Total			= $181.96			**0.0 USD**

Equipment

Description	Hours	Quantity	Equipment rate	Equipment cost
86' boom lift	2.0 hrs. ✓			0.0 USD
Total				**0.0 USD**

Material

Description	Quantity	Material price	Unit	Material cost
4" #3 roofing screws				0 USD
Total				**0.0 USD**

Attachments

Approval

Mark Milbright VTO ✓ 11/13/25

Ed Andrus VTO 11/13/25

Signed by Zachary Gitzen
on November 13, 2025 04:44 AM from Zachary Gitzen's device

Albany Airport

FIELDWIRE

Time & Material Tag #6

Name	Albany airport snow fence blocking
Status	Submitted
Assignee	Zachary Gitzen (ZGI)

General Information

Issued by	Zachary Gitzen (ZGI)
Issued to	
Description of Work	Installing wood blocking for snow fence on roof PCO 315 Zach Gitzen: 3 hours

Labor

Description	Trade	Labor rate	Regular Time	Overtime	Double Time	Labor cost
Foreman	Ironworker		3.0 hrs. × 90.98			0.0 USD
Total			= $272.94			**0.0 USD**

Equipment

Description	Hours	Quantity	Equipment rate	Equipment cost

Material

Description	Quantity	Material price	Unit	Material cost
4" roofing screws				0 USD
Total				**0.0 USD**

Attachments

Martin Mulligan 11/21/25 (AO)

Approval

Ed Aucnes ✓ (AO) 11/21/25

Signed by Zachary Gitzen
on November 21, 2025 08:01 AM from Zachary Gitzen's device

Albany Airport

FIELDWIRE

Time & Material Tag #11

Name	Gitzen Co. snow fence blocking
Status	Draft
Assignee	Zachary Gitzen (ZGI)

General Information

Issued by	Zachary Gitzen (ZGI)
Issued to	
Description of Work	Installing snow fence blocking on west elevation Zach Gitzen: 1 hour PCO: 315

Labor

Description	Trade	Labor rate	Regular Time	Overtime	Double Time	Labor cost
Foreman	Ironworker		1.0 hrs. X 90.98			0.0 USD
Total			= $ 90.98			**0.0 USD**

Equipment

Description	Hours	Quantity	Equipment rate	Equipment cost
86' boom lift	1.0 hrs. ✓	1		0.0 USD
Total				**0.0 USD**

Material

Description	Quantity	Material price	Unit	Material cost

Attachments

Approval

Signed by Zachary Gitzen
on November 26, 2025 03:54 AM from Zachary Gitzen's device

VTO
VTO 11/26/25

Albany Airport

FIELDWIRE

Time & Material Tag #12

Name	Gitzen Co. Snow Fence Blocking
Status	Draft
Assignee	Zachary Gitzen (ZGI)

General Information

Issued by	Zachary Gitzen (ZGI)
Issued to	
Description of Work	Installing snow fence blocking on east elevation. Measuring for lumber needed to finish blocking. Zach Gitzen: 4 hours PCO: 315

Labor

Description	Trade	Labor rate	Regular Time	Overtime	Double Time	Labor cost
Foreman	Ironworker		4.0 hrs.			0.0 USD
Total						**0.0 USD**

×90.98

= $363.92

Equipment

Description	Hours	Quantity	Equipment rate	Equipment cost
86' boom lift	4.0 hrs. ✓	1		0.0 USD
Total				**0.0 USD**

Material

Description	Quantity	Material price	Unit	Material cost
#3 Roofing screws				0 USD
Total				**0.0 USD**

Attachments

Approval EG Andres ✓ (via) 12/12/25

Signed by Zachary Gitzen
on December 12, 2025 04:18 AM from Zachary Gitzen's device

Albany Airport

FIELDWIRE

Time & Material Tag #13

Name	Gitzen Co. Snow Fence Blocking
Status	Draft
Assignee	Zachary Gitzen (ZGI)

General Information

Issued by	Zachary Gitzen (ZGI)
Issued to	
Description of Work	Installing snow fence blocking on East Elevation Zach Gitzen: 7 hours PCO: 315

Labor

Description	Trade	Labor rate	Regular Time	Overtime	Double Time	Labor cost
Foreman	Ironworker		7.0 hrs. x 90.98			0.0 USD
Total			= $636.86			**0.0 USD**

Equipment

Description	Hours	Quantity	Equipment rate	Equipment cost
86' boom lift	7.0 hrs. ✓	1		0.0 USD
Total				**0.0 USD**

Material

Description	Quantity	Material price	Unit	Material cost
#3 roofing screws				0 USD
Total				**0.0 USD**

Attachments

Approval EJ Andres ✓ (VTO) 12/18/25

Albany Airport

FIELDWIRE

Time & Material Tag #32

Name	Gitzen Co. Albany Airport snow fence blocking 3/26/26
Status	Submitted
Assignee	Zachary Gitzen (ZGI)

General Information

Issued by	Zachary Gitzen (ZGI)
Issued to	
Description of Work	Installing wood blocking on roof for our snow fence to fasten to. Fire rated wood provided by MLB PCO 315 Zach Gitzen: 6 hours

Labor

Description	Trade	Labor rate	Regular Time	Overtime	Double Time	Labor cost
Foreman	Ironworker		6.0 hrs. x 90.98			0.0 USD
Total			= $545.88			**0.0 USD**

Equipment

Description	Hours	Quantity	Equipment rate	Equipment cost
86' boom lift	1.5 hrs. ✓	1		0.0 USD
Total				**0.0 USD**

Material

Description	Quantity	Material price	Unit	Material cost
3" roofing screw	220.0			0.0 USD
Total				**0.0 USD**

Attachments

Approval Ed Andres ✓ VTO 3-27-26

Signed by Zachary Gitzen
on March 27, 2026 04:01 AM from Zachary Gitzen's device

Tucker Culk 3-27-26 VTO

Albany Airport

FIELDWIRE

Time & Material Tag #44

Name	Gitzen co Albany Airport snow fence blocking 5/21/26
Status	Submitted
Assignee	Zachary Gitzen (ZGI)

General Information

Issued by	Zachary Gitzen (ZGI)
Issued to	
Description of Work	Installing snow fence blocking on east and west elevation PCO 315

Labor

Description	Trade	Labor rate	Regular Time	Overtime	Double Time	Labor cost
Zach Gitzen	Foreman Ironworker			5.0 hrs. x 119.36		0.0 USD
Nik Mayotte	1st yr apprentice			5.0 hrs. x 66.84		0.0 USD
Total						**0.0 USD**

$931.00

Equipment

Description	Hours	Quantity	Equipment rate	Equipment cost
86' boom lift	5.0 hrs. ✓	1		0.0 USD
Total				**0.0 USD**

Material

Description	Quantity	Material price	Unit	Material cost
3" roofing screws	100.0			0.0 USD
Total				**0.0 USD**

Attachments

Approval Ed Andres ✓ (VTO) 5-28-26 AO 5/29/26

Signed by Zachary Gitzen
on May 28, 2026 04:21 AM from Zachary Gitzen's device

Albany Airport

FIELDWIRE

Time & Material Tag #45

Name	Gitzen Co Albany Airport Airport snow fence blocking 5/27/26
Status	Submitted
Assignee	Zachary Gitzen (ZGI)

General Information

Issued by	Zachary Gitzen (ZGI)
Issued to	
Description of Work	Installing snow fence blocking on east elevation PCO 315

Labor

Description	Trade	Labor rate	Regular Time	Overtime	Double Time	Labor cost
Zach Gitzen	Foreman Ironworker		5.0 hrs. x 90.98			0.0 USD
Nik Mayotte	1st yr apprentice		5.0 hrs. x 49.73			0.0 USD
Total						**0.0 USD**

#703.55

Equipment

Description	Hours	Quantity	Equipment rate	Equipment cost
86' boom lift	5.0 hrs. ✓	1		0.0 USD
Total				**0.0 USD**

Material

Description	Quantity	Material price	Unit	Material cost
3" roofing screws	100.0			0.0 USD
Total				**0.0 USD**

Attachments

Approval Ed Andres ✓ VTO 5-28-26 Michael Webber AIO 5/26/26

Signed by Zachary Gitzen
on May 28, 2026 04:27 AM from Zachary Gitzen's device

LABOR RATE WORKSHEET

☐ Time & Material ☐ Field Order ☐ Change Order

Contractor Name:	**Gitzen Companies, Inc.**	Date:	7/1/25 - 6/30/26
Address:	6166 Eastern Avenue	Project No.:	
	Syracuse, NY 13211	CO/CIC/T&M:	
Telephone No:	(315) 434-9294	County:	Albany

LABOR RATE BREAKDOWN (For T&M Only. Use a separate sheet for each Employee) Trade: **Ironworker - General Foreman**

{T&M Only}Item No. _____

{T&M Only}Employee Name: _____

{T&M Only}Soc. Sec. No. _____

	*	% per hour	$ per hour	REGULAR BASE RATE	PREMIUM TIME BASE RATE
A. WAGE RATE PER HOUR				$ 45.25	$ 67.88
BENEFITS (*Identifies benefits paid directly to Employee)					
Vacation & Holiday			$ -		
Health & Welfare			$ 6.50		
Pension			$ 14.28		
Annuity			$ 5.00		
Education /Apprentice Training			$ 2.90		
Employers Cooperative Trust			$ 2.26		
IWDC of Western NY & Vicinity			$ 3.23		
Industry Advancement			$ 0.04		
I.M.P.A.C.T			$ -		
B. TOTAL BENEFITS PER HOUR			$ 34.21	$ 34.21	$ 34.21

PAYROLL TAXES AND INSURANCE

FICA / Social Security	(Up to maximum required by law)	6.20%
Medicare		1.45%
Federal Unemployment	(Up to a maximum of $____ per Employee per year)	0.60%
State Unemployment	(Up to first $_____ of base salary paid per Employee per year)	7.90%
Workman's Compensator	Code: 5538	5.06%
General Liability		3.74%
Excess Umbrella		0.00%
Disability		0.50%

C. TOTAL TAXES AND INSURANCE PER HOUR

All benefits are paid directly to Employee

Only benefits identified by * above are paid directly to Employee $45.25 times 25.45 % = $ 11.52 | $ 17.27

D. TOTAL LABOR RATE (A + B + C) $ 90.98 | $ 119.36

E. CONTRACTOR'S CERTIFICATION

I certify that the labor rates, insurance enumerations, labor fringe enumerations and expenses are correct and in accordance with actual and true costs incurred.

Signature

Mark Gitzen

Print Name of Authorized Representative

President

Print Title

Sworn before me this 11th day of Nov. 2025

Heather S. Laws

Notary Public

HEATHER S. LAWS
Notary Public, State of New York
Qual. in Oswego Co. No. 01LA5053110
Commission Expires December 11, 2025

LABOR RATE WORKSHEET

☐ Time & Material ☐ Field Order ☐ Change Order

Contractor Name:	**Gitzen Companies, Inc.**	Date:	7/1/25 - 6/30/26
Address:	6166 Eastern Avenue	Project No.:	
	Syracuse, NY 13211	CO/CIC/T&M:	
Telephone No:	(315) 434-9294	County:	Albany

LABOR RATE BREAKDOWN (For T&M Only. Use a separate sheet for each Employee) Trade: **Carpenter - Journeyman**

{T&M Only}Item No. _____

{T&M Only}Employee Name: _____

{T&M Only}Soc. Sec. No. _____

	*	% per hour	$ per hour	REGULAR BASE RATE	PREMIUM TIME BASE RATE
A. WAGE RATE PER HOUR				$ 36.38	$ 54.57
BENEFITS (*Identifies benefits paid directly to Employee)					
Vacation & Holiday			$ -		
Health & Welfare			$ 8.50		
Pension			$ 11.75		
Annuity			$ 2.00		
Education /Apprentice Training			$ 0.75		
Admin & Safety Programs			$ 0.36		
CITF			$ 0.15		
Labor Management			$ 0.15		
HRA			$ 1.50		
B. TOTAL BENEFITS PER HOUR			$ 25.16	$ 25.16	$ 25.16

PAYROLL TAXES AND INSURANCE		
FICA / Social Security	(Up to maximum required by law)	6.20%
Medicare		1.45%
Federal Unemployment	(Up to a maximum of $____ per Employee per year)	0.60%
State Unemployment	(Up to first $_____ of base salary paid per Employee per year)	7.90%
Workman's Compensator	Code: 5538	5.06%
General Liability		3.74%
Excess Umbrella		0.00%
Disability		0.50%

C. TOTAL TAXES AND INSURANCE PER HOUR

All benefits are paid directly to Employee

Only benefits identified by * above are paid directly to Employee $45.25 times 25.45 % = $ 9.26 | $ 13.89

D. TOTAL LABOR RATE (A+B+C) $ 70.80 | $ 93.62

E. CONTRACTOR'S CERTIFICATION

I certify that the labor rates, insurance enumerations, labor fringe enumerations and expenses are correct and in accordance with actual and true costs incurred.

Signature

Mark Gitzen

Print Name of Authorized Representative

President

Print Title

Sworn before me this 11th day of Nov. 2025

Heather S. Laws

Notary Public

HEATHER S. LAWS
Notary Public, State of New York
Qual. in Oswego Co. No. 01LA5053110
Commission Expires December 11, 2025

LABOR RATE WORKSHEET

☐ Time & Material ☐ Field Order ☐ Change Order

Contractor Name:	**Gitzen Companies, Inc.**	Date:	**7/1/25 - 6/30/26**
Address:	6166 Eastern Avenue	Project No.:	
	Syracuse, NY 13211	CO/CIC/T&M:	
Telephone No:	(315) 434-9294	County:	Albany

LABOR RATE BREAKDOWN (For T&M Only. Use a separate sheet for each Employee) Trade: **Carpenter - Appr.**

{T&M Only}Item No. _____

{T&M Only}Employee Name: _____

{T&M Only}Soc. Sec. No. _____

	*	% per hour	$ per hour	REGULAR BASE RATE	PREMIUM TIME BASE RATE
A. WAGE RATE PER HOUR				$ 27.29	$ 40.94
BENEFITS (*Identifies benefits paid directly to Employee)					
Vacation & Holiday			$ -		
Health & Welfare			$ 8.50		
Pension			$ 3.25		
Annuity			$ 1.00		
Education /Apprentice Training			$ 0.75		
Admin & Safety Programs			$ 0.27		
CITF			$ 0.15		
Labor Management			$ 0.07		
HRA			$ 1.50		
B. TOTAL BENEFITS PER HOUR			$ 15.49	$ 15.49	$ 15.49

PAYROLL TAXES AND INSURANCE			
FICA / Social Security	(Up to maximum required by law)	6.20%	
Medicare		1.45%	
Federal Unemployment	(Up to a maximum of $____ per Employee per year)	0.60%	
State Unemployment	(Up to first $_____ of base salary paid per Employee per year)	7.90%	
Workman's Compensator	Code: 5538	5.06%	
General Liability		3.74%	
Excess Umbrella		0.00%	
Disability		0.50%	
C. TOTAL TAXES AND INSURANCE PER HOUR			
All benefits are paid directly to Employee			
Only benefits identified by * above are paid directly to Employee	$23.50 times 25.45 % =	$ 6.95	$ 10.42
D. TOTAL LABOR RATE	(A + B + C)	$ 49.73	$ 66.84

E. CONTRACTOR'S CERTIFICATION

I certify that the labor rates, insurance enumerations, labor fringe enumerations and expenses are correct and in accordance with actual and true costs incurred.

Signature

Mark Gitzen

Print Name of Authorized Representative

President

Print Title

Sworn before me this 11th day of Nov. 2025

Notary Public

HEATHER S. LAWS
Notary Public, State of New York
Qual. in Oswego Co. No. 01LA5053110
Commission Expires December 11, 2025

Time & Material Tag #76

Name	Gitzen Co Albany Airport snow fence blocking 8/5/26
Status	Submitted
Assignee	Zachary Gitzen (ZGI)

General Information

Issued by	Zachary Gitzen (ZGI)
Issued to	
Description of Work	Installing snow fence blocking on west elevation PCO 315

Labor

Description	Trade	Labor rate	Regular Time	Overtime	Double Time	Labor cost
Zach Gitzen	Foreman Ironworker		2.0 hrs. x 96.61 = $193.22			0.0 USD
Total						**0.0 USD**

Equipment

Description	Hours	Quantity	Equipment rate	Equipment cost
86' boomlift	2.0 hrs. ✓	1		0.0 USD
Total				**0.0 USD**

Material

Description	Quantity	Material price	Unit	Material cost
3" roofing screws	50.0			0.0 USD
Total				**0.0 USD**

Attachments

Approval

Ed Andres ✓ VTO 8/6/26

Signed by Zachary Gitzen
on August 06, 2026 03:21 AM from Zachary Gitzen's device

ACKNOWLEDGEMENT OF TIME ONLY 8/6/26

MLB Construction Services LLC

Albany Airport

FIELDWIRE

Time & Material Tag #78

Name	Gitzen Co Albany Airport snow fence blocking 8/7/26
Status	Submitted
Assignee	Zachary Gitzen (ZGI)

General Information

Issued by	Zachary Gitzen (ZGI)
Issued to	
Description of Work	Installing snow fence blocking @ north roof PCO 315

Labor

Description	Trade	Labor rate	Regular Time	Overtime	Double Time	Labor cost
Walfre Perez	Journeyman Carpenter			6.0 hrs. X 116.21		0.0 USD
Total				$697.26		**0.0 USD**

Equipment

Description	Hours	Quantity	Equipment rate	Equipment cost

Material

Description	Quantity	Material price	Unit	Material cost
3" roofing screws	200.0			0.0 USD
Total				**0.0 USD**

Attachments

Approval

Ed Andres (PM) 8/11/26

Signed by Zachary Gitzen
on August 11, 2026 04:01 AM from Zachary Gitzen's device

ACKNOWLEDGEMENT OF TIME ONLY
8/11/26
MLB Construction Services LLC

Albany Airport

FIELDWIRE

Time & Material Tag #79

Name	Gitzen Co Albany Airport Snow Fence Blocking 8/10/26
Status	Submitted
Assignee	Zachary Gitzen (ZGI)

General Information

Issued by

Issued to

Description of Work Installing snow fence blocking @ north roof

PCO 315

Labor

Description	Trade	Labor rate	Regular Time	Overtime	Double Time	Labor cost
Walfre Perez	Journeyman Carpenter		6.0 hrs. x 89.71 = $538.26			0.0 USD
Total						**0.0 USD**

Equipment

Description	Hours	Quantity	Equipment rate	Equipment cost

Material

Description	Quantity	Material price	Unit	Material cost
3" roofing screws	200.0			0.0 USD
Total				**0.0 USD**

Attachments

Approval

Ed Andres ✓ VTO 8/11/26

Signed by Zachary Gitzen
on August 11, 2026 04:14 AM from Zachary Gitzen's device

ACKNOWLEDGEMENT
OF TIME ONLY
8/11/26
MLB Construction Services LLC

LABOR RATE WORKSHEET

☐ Time & Material ☐ Field Order ☐ Change Order

Contractor Name:	**Gitzen Companies, Inc.**	Date:	7/1/26 - 6/30/27
Address:	6166 Eastern Avenue	Project No.:	
	Syracuse, NY 13211	CO/CIC/T&M:	
Telephone No:	(315) 434-9294	County:	Albany

LABOR RATE BREAKDOWN (For T&M Only. Use a separate sheet for each Employee) Trade: **Ironworker - General Foreman**

{T&M Only}Item No.

{T&M Only}Employee Name:

{T&M Only}Soc. Sec. No.

				REGULAR BASE RATE	PREMIUM TIME BASE RATE
A. WAGE RATE PER HOUR				$ 47.75	$ 71.63
BENEFITS	(*Identifies benefits paid directly to	*	% per hour	$ per hour	
Vacation & Holiday	Employee)			$ -	
Health & Welfare				$ 7.00	
Pension				$ 14.50	
Annuity				$ 5.50	
Education /Apprentice Training				$ 3.40	
Employers Cooperative Trust				$ 2.76	
IWDC of Western NY & Vicinity				$ 3.51	
Industry Advancement				$ 0.04	
I.M.P.A.C.T				$ -	
B. TOTAL BENEFITS PER HOUR				$ 36.71	$ 36.71	$ 36.71

PAYROLL TAXES AND INSURANCE			
FICA / Social Security	(Up to maximum required by law)		6.20%
Medicare			1.45%
Federal Unemployment	(Up to a maximum of $____ per Employee per year)		0.60%
State Unemployment	(Up to first $_____ of base salary paid per Employee per year)		7.90%
Workman's Compensator	Code:	5538	5.06%
General Liability			3.74%
Excess Umbrella			0.00%
Disability			0.50%

C. TOTAL TAXES AND INSURANCE PER HOUR

All benefits are paid directly to Employee

Only benefits identified by * above are paid directly to Employee $47.75 times 25.45 % = $ 12.15 | $ 18.23

D. TOTAL LABOR RATE (A + B + C) $ 96.61 | $ 126.56

E. CONTRACTOR'S CERTIFICATION

I certify that the labor rates, insurance enumerations, labor fringe enumerations and expenses are correct and in accordance with actual and true costs incurred.

Signature

Mark Gitzen

Print Name of Authorized Representative

President

Print Title

Sworn before me this _____ day of _____ 20__

Notary Public

LABOR RATE WORKSHEET

☐ Time & Material ☐ Field Order ☐ Change Order

Contractor Name:	**Gitzen Companies, Inc.**	Date:	**7/1/26 - 6/30/27**
Address:	6166 Eastern Avenue	Project No.:	
	Syracuse, NY 13211	CO/CIC/T&M:	
Telephone No:	(315) 434-9294	County:	Albany

LABOR RATE BREAKDOWN (For T&M Only. Use a separate sheet for each Employee) Trade: **Ironworker - Journeymen**

{T&M Only}Item No. _____

{T&M Only}Employee Name: _____

{T&M Only}Soc. Sec. No. _____

					REGULAR BASE RATE	PREMIUM TIME BASE RATE
A. WAGE RATE PER HOUR					$ 42.25	$ 63.38
BENEFITS	(*Identifies benefits paid directly to	*	% per hour	$ per hour		
Vacation & Holiday	Employee)			$ -		
Health & Welfare				$ 7.00		
Pension				$ 14.50		
Annuity				$ 5.50		
Education /Apprentice Training				$ 3.40		
Employers Cooperative Trust				$ 2.76		
IWDC of Western NY & Vicinity				$ 3.51		
Industry Advancement				$ 0.04		
I.M.P.A.C.T				$ -		
B. TOTAL BENEFITS PER HOUR				$ 36.71	$ 36.71	$ 36.71

PAYROLL TAXES AND INSURANCE		
FICA / Social Security	(Up to maximum required by law)	6.20%
Medicare		1.45%
Federal Unemployment	(Up to a maximum of $____ per Employee per year)	0.60%
State Unemployment	(Up to first $_____ of base salary paid per Employee per year)	7.90%
Workman's Compensator	Code: 5538	5.06%
General Liability		3.74%
Excess Umbrella		0.00%
Disability		0.50%

C. TOTAL TAXES AND INSURANCE PER HOUR			
All benefits are paid directly to Employee			
Only benefits identified by * above are paid directly to Employee	$42.25 times 25.45 % =	$ 10.75	$ 16.13
D. TOTAL LABOR RATE	(A + B + C)	$ 89.71	$ 116.21

E. CONTRACTOR'S CERTIFICATION

I certify that the labor rates, insurance enumerations, labor fringe enumerations and expenses are correct and in accordance with actual and true costs incurred.

Signature

Mark Gitzen
Print Name of Authorized Representative

President
Print Title

Sworn before me this _____ day of _____ 20

_____
Notary Public

Use the Sunbelt Rentals App
Find, rent, and return equipment, right at your fingertips
DOWNLOAD APP

SUNBELT RENTALS

What are you looking for?

LATHAM NY - Branch #287 (0.00 mi)
Pickup • 8/31—9/3

Edit

EQUIPMENT AND TOOLS / AERIAL WORK PLATFORMS, SCAFFOLDING AND LADDERS / MANLIFT STRAIGHT BOOM

CAT CLASS: 0580823

Share

85' Straight Boom Lift with Jib

Use the Sunbelt Rentals App
Find, rent, and return equipment, right at your fingertips



KEY SPECS View all specs

360° continuous rotation turntable
Up to 72' of horizontal outreach
Dual fuel and diesel power options

ONLINE RATE ⓘ

$1,010	$2,275	$5,040
1 DAY	1 WEEK	4 WEEK

Add to Cart

Call an expert

Overview

Key Features

- 360° continuous rotation turntable
- Up to 72' of horizontal outreach
- Dual fuel and diesel power options
- 500 lbs platform capacity

High-reach construction and industrial projects are a breeze w/ an 85 ft boom lift rental. An articulating jib and 4WD traction provide enhanced precision & stability. Perfect for large-scale utility work, signage, lighting, or inspections requiring height capability and a large platform to hold workers plus gear. Reaches working height in 70 sec.

#1 Home Improvement Retailer

Clifton Park 10PM 12065 W. Clifton Park 10PM 12065 Shop All Services DIY Log In

Internet # 100153825 Model # PTN4S1 Store SKU # 137008

Feedback



Hover Image to Zoom



Shop Grip-Rite

#10 x 4 in. #2 Phillips Bugle Head Coarse Thread Coated Exterior Wood Deck Screws 1 lb. Box

4.5 (8139) Questions & Answers (163)

$10.97

- #10 x 4 in. screws designed for outdoor construction
- Hand drive fastener for use in exterior wood to wood applications
- Made from high strength steel for robust durability

ALUCOBOND
Aug 21, 2026 at 10:21:02 AM EDT

PCO-352

MLB Construction Services LLC
One Stone Break Road
Malta, NY 12020
Tel: 518-289-1371
Fax: 518-289-1652

PROPOSAL

SUBMITTED TO:
Scott Bridie
Turner Construction Company
1 Computer Drive South
Albany, NY 12205

PROJECT NAME	
Alb. Airport 21-1082-STR & INT	
PROJECT NO.	DATE
23-114	8/5/26
PROPOSAL NO.	PROPOSAL AMOUNT
316	$ 2,748.00

Per NOC 316 dated 8/5/2026, MLB Construction Services LLC is pleased to present our proposal for the following:

Wall revisions per RFI-414 to update fire-rating of walls beneath the garage stair. Work completed on T&M.

Description	Labor	Material	Equipment	Subcontract	Other	Price
Adirondack Taping & Supply Inc				$2,748.00		$2,748.00
					Subtotal:	$2,748.00
					Total:	**$2,748.00**

If you have any questions, please contact me at 518-289-1371.

- [X] We reserve the right to request an extension of time together with additional cost incurred at a later date.
- [ ] We request calendar days extension of time for the above work.
- [ ] This proposal may be withdrawn by us if not accepted within 10 days.

WE HAVE NOT BEEN DIRECTED TO PROCEED WITH THIS WORK.

OWNER MUST RETURN THIS PROPOSAL WITH THEIR SIGNED APPROVAL SHOWN BELOW BEFORE WORK CAN BEGIN.

Submitted by: 8/5/26
Craig Dittl
MLB Construction Services LLC

Approved by: _____
Date: _____

Cc: JMD/SAS/File (MLB Construction Services LLC)

SUBCONTRACTOR PROPOSAL

Albany Airport Terminal Expansion Project BP-04

Field Order ☐Change Order

Subcontractor Name:	Adirondack Taping & Supply, Inc.	Date:	9/22/25
Address:	46 Elm Street	Project No.:	**23114**
	Glens Falls, NY 12801	ADK COR #	**66**
Telephone No.:	(518) 761-0089	NOC #:	**PCO352**

LABOR

Work Description	Trade	Hours	Total Rate from Labor Rate Breakdown	Total Labor Cost
Arch drawings did not layout for RM 130,& RM 131,	Carpenter Foreman	2	$82.94	$165.88
Had to layout for cross beam in both rooms being wider than	Carpenter	26	$78.39	$2,038.14
indicated, not to lose the door layout				
RFI 414				
	A. TOTAL SUBCONTRACTOR LABOR			**$2,204.02**

MATERIAL

Material Description	Quantity	Unit	Unit Cost	Material Cost
3-5/8" 20ga stud	-140	LF	$0.84	-$117.60
3-5/8" 20ga track	-140	LF	$0.84	-$117.60
6" 20ga stud	160	LF	$1.43	$228.80
6" 20ga track	170	LF	$1.43	$243.10
saw blade	1	blade	$12.00	$12.00
No credit for door hardware & install not in our contract				
	Total from additional Material Worksheet Extension(s) if required.			
	B. TOTAL SUBCONTRACTOR MATERIAL			**$248.70**

EQUIPMENT

	C. TOTAL SUBCONTRACTOR EQUIPMENT	**45.00**

SUMMARY

Total labor, material,equipment (A + B + C)	$2,497.72
Subcontractor's Override (10%)	$249.77
TOTAL SUB-PROPOSAL	**$2,747.49**

Jeanne Rizzo
Subcontractor's Signature

9/22/25
Date

Jeanne Rizzo
Please Type or Print Name

This Price is valid for, and work must be agreed upon within 7 days from date of submission upon which it becomes null and void.

Adirondack Taping & Supply Inc.
46 Elm St. Glens Falls, NY 12801
Phone: (518) 761-0089
Fax: (518) 793-7517

Daily Extra Work Order Form

Date: 9/8/2025

Job:	Albany Airport Terminal Expansion [BP-04]
General Contractor:	MLB Construction
ADK's Extra Work Order #:	66
Location of Extra Work:	Laying out walls, change stud and track
Description of Extra Work:	Change out metal on two walls in Rms 130 and 131

to verif walls. The walls on plans did not fit the space, the cross bars made the dimensions not work

LABOR:		Hours:		
Employee name	Classification	Regular	OT	Total
	Carpenter Foreman			
Jsson Robbins	Carpenter	1 8		1 8
Ben Vallano	Carpenter	1 7		1 7
	Carpenter			
	Carpenter			
	Taper Foreman			
	Taper Foreman			
	Taper Foreman			

MATERIALS:		
Material Description	QTY	Units
6 inch track		
6 inch stud		
	1	

Signature: _____ Date: 9/8/25
Adirondack Taping & Supply Inc.

Signature: _____ Date: _____
General Contractor

Signature: Ed Andrus MLB Date: 9-18-25
Owner's Representative

Adirondack Taping & Supply Inc.
46 Elm St. Glens Falls, NY 12801
Phone: (518) 761-0089
Fax: (518) 793-7517

Daily Extra Work Order Form

Date: 9/8/2025

Job:	Albany Airport Terminal Expansion [BP-04]
General Contractor:	MLB Construction
ADK's Extra Work Order #:	66
Location of Extra Work:	Laying out walls, change stud and track
Description of Extra Work:	Change out metal on two walls in Rms 130 and 131 – PCO352

to verif walls. The walls on plans did not ~~fit the space~~, the cross bars made the dimensions not work

Brought Ed over to verify the layout & new wall type switched out

LABOR:		Hours:		
Employee name	Classification	Regular	OT	Total
	Carpenter Foreman			
Jsson Robbins	Carpenter	4½		4½
Ben Vallano	Carpenter	4½		4½
	Carpenter			
	Carpenter			
	Taper Foreman			
	Taper Foreman			
	Taper Foreman			

MATERIALS:		
Material Description	QTY	Units
6 inch track		
6 inch stud		
	1	

Signature: _____ **Date:** 9/10/25
Adirondack Taping & Supply Inc.

Signature: _____ **Date:** 9/10/25
General Contractor

Signature: _____ **Date:** 9-18-25
Owner's Representative

Adirondack Taping & Supply Inc.
46 Elm St. Glens Falls, NY 12801
Phone: (518) 761-0089
Fax: (518) 793-7517

Daily Extra Work Order Form

Date: 9/15/25

Job: Albany Airport RFI 414

General Contractor: MLB Construction

ADK's Extra Work Order #: PCO 352

Location of Extra Work: X Beam 6" wall under stairs

Description of Extra Work: change from 3 5/8 wall to 6" wall to swallow Beam under stairs at 2 Locations.

LABOR:		Hours:		
Employee name	Classification	Regular	OT	Total
Jim Standhart	Carpenter Foreman	1 ✓		1
Jason Robbins	Carpenter	8		8
Ben Velano	Carpenter	8		8
	Carpenter			
	Carpenter			
	Taper Foreman			
	Taper			
	Taper			

MATERIALS:		
Material Description	QTY	Units
6" Track 10'	14	
6" Studs 10'	14	
* PROVIDE CREDIT FOR		
DOOR SAM, DOOR, HARDWARE		
AND INSTALL FROM LIFT		

Signature: _____ Adirondack Taping & Supply Inc. Date: 9/18/25

Signature: _____ General Contractor Date: 9/17/25

Signature: _____ Owner's Representative Date: 9-18-25

17

Adirondack Taping & Supply Inc.
46 Elm St. Glens Falls, NY 12801
Phone: (518) 761-0089
Fax: (518) 793-7517

Daily Extra Work Order Form

Date: 9/22/25

Job:	Albany Airport
General Contractor:	MLB Construction
ADK's Extra Work Order #:	
Location of Extra Work:	GARAGE Level 1 LOBBY under Stairs
Description of Extra Work:	Install 18" x 18" ACCESS DOOR under X Brace Steel in framing

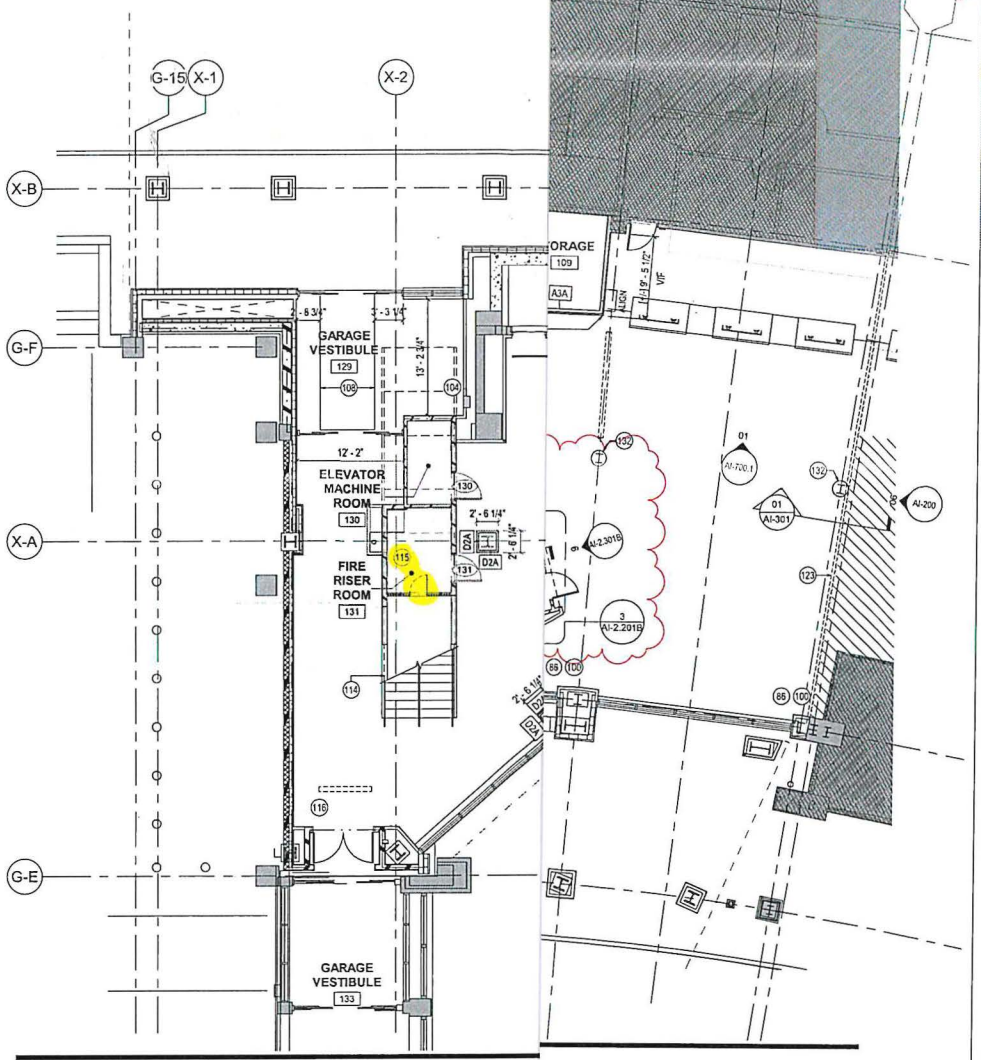
LABOR:		Hours:		
Employee name	Classification	Regular	OT	Total
Jim Standhart	Carpenter Foreman	1 ✓		1
	Carpenter			
	Carpenter			
	Carpenter			
	Carpenter			
	Taper Foreman			
	Taper			
	Taper			

MATERIALS:		
Material Description	QTY	Units
6" Track 10'	1	
LIFT		

Signature: _____ Date: 9/23/25
Adirondack Taping & Supply Inc.

Signature: _____ Date: 9/23/25
General Contractor

Signature: Ed Andres ✓ UTO only MB Date: 9-23-25
Owner's Representative



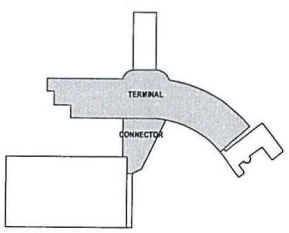
02 GARAGE LOBBY CONSTRUCTION PLAN - LEVEL

SCALE: 1/8" = 1'-0"

SHEET NOTES

- 86 REFER TO CORE AND SHELL PACKAGE FOR WALL CONSTRUCTION
- 95 REFER TO A-SERIES DRAWINGS FOR STAIR & ELEVATOR PLANS AND DETAILS
- 100 REFER TO CORE AND SHELL PACKAGE FOR DETAILED DIMENSIONS
- 104 RECESSED FIRE EXTINGUISHER CABINET
- 108 RECESSED SLAB FOR ENTRANCE GRILL
- 114 SEE CORE & SHELL PACKAGE FOR RATED ENCLOSURE
- 115 1-HOUR RATED ACCESS HATCH
- 116 SEE CORE AND SHELL PACKAGE FOR RATED DOOR VESTIBULE DETAILS AND DIMENSIONS
- 117 EXISTING 2-HOUR CORRIDOR WALL RATING TO BE MAINTAINED
- 123 LINE OF EXISTING EXPANSION JOINT TO REMAIN. PROVIDE EXPANSION JOINT FLOOR / CEILING / WALL COVER IF REQUIRED, COORDINATE IN FIELD.
- 124 REFER TO DETAIL ST STL CASED OPENING HEAD/JAMB FOR CASED OPENING INFORMATION
- 125 PARTITION TO ALIGN TO EXISTING CEILING S
- 132 ALUM COLUMN COVER Ø 1'- 10", REFER TO 01/AI-503

KEY PLAN



Drawing Copyright © 2022

CHA ARCHITECTURE
49 Dartmouth St
Portland, ME 04101
207.775.1059 www.chacompanies.com

ALBANY COUNTY AIRPORT AUTHORITY

Gensler

PLAN NORTH

TRUE NORTH

BID PACKAGE #4
ISSUED FOR BID

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

ALB - Central Terminal

No.	Submittal / Revision	Appr.	By	Date
26	ASI-134			07/25/2025
20	ASI-114			03/21/2025
10	ASI-32			02/23/2024
8	ASI-12			11/17/2023
2	Addendum #3			09/25/2023
1	Addendum #2			09/18/2023

ENLARGED CONSTRUCTION PLAN - CENTRAL ENTRY & GARAGE LOBBY - LEVEL 1

Designed By:	Drawn By:	Checked By:
Designer	Author	Checker
Issue Date:	Project No:	Scale:
08/25/23	090103000	1/8" = 1'-0"

Drawing No:

AI-2.101B

Central File: Update this text with Central file location
Saved: 7/25/2025 11:46:24 AM Current Local File: Autodesk Docs://078935 ALB Ctrl Terminal Exp/090103000-ARCH-CENTRAL-GAY

PCO-455b

MLB Construction Services LLC
One Stone Break Road
Malta, NY 12020
Tel: 518-289-1371
Fax: 518-289-1652

PROPOSAL

SUBMITTED TO:
Scott Bridie
Turner Construction Company
1 Computer Drive South
Albany, NY 12205

PROJECT NAME	
Alb. Airport 21-1082-STR & INT	
PROJECT NO.	DATE
23-114	8/20/26
PROPOSAL NO.	PROPOSAL AMOUNT
287B	$ 21,291.00

Per NOC 287B dated 8/20/2026, MLB Construction Services LLC is pleased to present our proposal for the following:

The physical replacement pumps were approved in NOC #287A. This proposal is for the labor to swap the pumps out.

Electrical disconnect and re-energizing will be completed on T&M/separately.

Description	Labor	Material	Equipment	Subcontract	Other	Price
John W Danforth Company				$20,365.03		$20,365.03
					Subtotal:	$20,365.03
		MLB OH&P (Subcontractor)		$18,513.66	5.00%	$925.97
					Total:	**$21,291.00**

If you have any questions, please contact me at 518-289-1371.

- [X] We reserve the right to request an extension of time together with additional cost incurred at a later date.
- [ ] We request calendar days extension of time for the above work.
- [ ] This proposal may be withdrawn by us if not accepted within 10 days.

WE HAVE NOT BEEN DIRECTED TO PROCEED WITH THIS WORK.

OWNER MUST RETURN THIS PROPOSAL WITH THEIR SIGNED APPROVAL SHOWN BELOW BEFORE WORK CAN BEGIN .

Submitted by: 8/20/26
Craig Pittl
MLB Construction Services LLC

Approved by: _____
Date: _____

Cc: JMD/SAS/File (MLB Construction Services LLC)

CHANGE ORDER REQUEST

74.1

Title: NOC #287/ASI-167 HHWP Pump Change--Piping Rework
Project Name: Albany Airport Terminal Expansion
Project Address: 737 Albany Shaker Road
Albany, NY 12211
COR Date: 07/28/2026
John W Danforth Company Job Number: 90272-100
Customer Job Number:
Customer Reference Number:

Our Information

John W Danforth Company
300 Colvin Woods Parkway
Tonawanda, NY 14150
Phone: (716)-955-0035

Customer Information

MLB Construction Services
1 Stonebreak Road
Ballston Spa, NY 12020
Phone: (518)-289-1371

Description of Change Order Request

In order to make the new HHWP's fit per manufacturer's recommendations, the existing piping the the West Mechanical Room will need to be modified.
Isolate, Drain and Recover Glycol; Cut/Shorten existing pipe in order to raise up vertical piping in order to accommodate new HHWPs; Install new 4" Strainers, 4x3 reducers, 2 new pumps and misc. piping to tie into the existing circuit setter. Test, Fill and re-install glycol. Provide Manufacturer Start Up.
Following new installation, balancing of HHW system can be re-tested.
Electrical tie in by others.

MATERIAL APPROVED IN NOC #287A (GD)

→ TO BE DONE ON T&M / SEPARATELY (GD)

Labor

Description	Qty (HR)	Unit (HR)	Rate (HR)	Total Cost
Local 7 Foreman	43.00	ST	$114.35	$4,917.05
Local 7 Journeyman	43.00	ST	$111.16	$4,779.88
Hours Subtotals: ST: 86.00			**Total Labor:**	**$9,696.93**

Material

Description	Qty of Material	Unit of Measure	Rate	Total Cost
Piping and Accesories	1.00	lot	$4,116.73	$4,116.73
			Total Material:	**$4,116.73** ✓

Subcontractor

Company	Contract	Description	Qty of Unit	Unit of Measure	Rate	Total Cost
Siemens	Controls	Controls	1.00	lot	$2,200.00	$2,200.00
KIM Industries	Insulation	Insulation	1.00	lot	$2,500.00	$2,500.00
					Total Subcontractor:	**$4,700.00**

Subtotal		**$18,513.66**
Tax Rate (Materials)	0.000%	$0.00
Mark Up Rate (Subtotal)	10.000%	$1,851.37
Requested Total		**$20,365.03**

Terms & Conditions

Exclusions to include :Retention; unforeseen conditions; roofing work of any kind; cleanup; dumpsters; painting; temporary facilities of any kind; any design calculations or PE stamp; full time on-site safety rep; sales tax; bonding or special insurances of any kind; concrete cutting or concrete work of any kind; cut & patch of any kind; grouting; electrical/power wiring of any kind; controls wiring; environmental remediation; excavation/backfilling; dewatering; chemical/mechanical pipe cleaning; flushing/draining/refilling/venting of systems; instructions to operating personnel; operational tests; valve tagging; equipment/system identification; shop drawings; as-built drawings; escutcheons; caulking; reconditioning and cleaning of owner equipment or material; shoring/tamping; labor to perform x-ray quality welding; schedule update; any work that is not explicitly called out in scope of work description above.

This change proposal covers only the direct costs associated with the change order work described above. The contractor expressly reserves the right to submit, at a later date, added costs and/or time extension requests attendant to this modification arising from, but not limited to: extended field and home office overhead, labor and equipment inefficiencies, disruptions, cumulative impacts, impacts to the critical path and related delay costs, schedule resequencing and/or overtime and acceleration.

We reserve the right to modify this estimate, if additional work not covered by this proposal is required.

Unless noted otherwise, it is anticipated that all work required by this change will be done on a straight time basis. Overtime work, if required, will be billed as an additional item.

This proposal is for acceptance within 20 days and is subject to escalation thereafter.

Please advise as soon as possible if we are to proceed. We will not proceed without formal written change order, per contract terms.

ACCEPTANCE OF PROPOSAL: The above prices, specifications, and conditions are satisfactory and are hereby accepted. John W. Danforth Company is authorized to do the work as indicated. Payment will be made as outlined above. The conditions of the proposal above stand good for 30 days. Pricing is based on conditions at time of bid. Danforth reserves its right for an adjustment in contract time, price, or both, due to changing conditions relating, but not limited to COVID-19, or any pandemic, epidemic, disease outbreak, or conflict; or any governmental regulations that are enacted after this date that may impact project cost.

J. W. Danforth

Recap with Total Cost

Project Name:	**Albany Airport Change Orders**
Bid ID:	**90272-074**
Report Time:	**7/28/2026 12:03 PM**
Profile Name:	**Standard**
Labor Book:	**JWD Labor + Test**
Scoped By:	**Base Bid;**

AutoBid Version: 2019 v2

J. W. Danforth
Recap with Total Cost

There was one calculation message.

Project Name: Albany Airport Change Orders
Page: 1 of 5
Bid ID: 90272-074
Report Time: 7/28/26 12:03 PM
Data Calculated: 7/28/2026 11:59:58 AM
Base Bid;

Pipe

Carbon Steel - Grooved End Black Sch 40 - Grooved

Material Multiplier: P1000 - Steel Pipe - Black, Grooved -

Item	Size	Quantity	Total Hrs
A53 ERW			
	3	19	10
	4	12	9
Carbon Steel - Grooved End Black Sch 40 - Grooved Totals:			
		31	**19**

Carbon Steel - Plain End Black Sch 40 - Thread

Material Multiplier: P1100 - Steel Pipe - Black, Plain End / Threaded

Item	Size	Quantity	Total Hrs
A53 CW			
	3/4	2	0
Carbon Steel - Plain End Black Sch 40 - Thread Totals:			
		2	**0**
Pipe Totals:		**33**	**19**

Fittings

Malleable Iron - Grooved, Painted - Grooved

Material Multiplier: F1200 - Grooved Fittings -

Item	Size	Quantity	Total Hrs
90 Deg Elbow			
	3	2	6
	4	1	4
Tee-Reducing			
	3x3x3/4	2	9

Material Multiplier: F1230 - Grooved Couplings -

Item	Size	Quantity	Total Hrs
Coupling #07			
	3	9	2
	4	8	3
Red Coupling #750			
	4x3	2	7
Malleable Iron - Grooved, Painted - Grooved Totals:			
		24	**3,319**	**32**

J. W. Danforth
Recap with Total Cost

There was one calculation message.

Project Name: Albany Airport Change Orders

Bid ID: 90272-074
Report Time: 7/28/26 12:03 PM
Data Calculated: 7/28/2026 11:59:58 AM
Base Bid;

Fittings

Malleable Iron - Threaded, Black Class 150 - Thread

Material Multiplier: F1400 - Malleable Iron Fittings -

Item	Size	Quantity	Total Hrs
Coupling			
	3/4	2	4
Malleable Iron - Threaded, Black Class 150 - Thread Totals:			
		2	**4**
Fittings Totals:		**26**	**36**

Flanges

Malleable Iron - Grooved Flange Adapters - MIGrv

Material Multiplier: L1200 - Grooved Flanges -

Item	Size	Quantity	Total Hrs
150# 741 Victaulic			
	3	2	1
	4	2	1
Malleable Iron - Grooved Flange Adapters - MIGrv Totals:			
		4	**2**
Flanges Totals:		**4**	**2**

Valves

Bronze Thd/Flg/Grv - Ball 2PC SP SST Thd - Thread

Material Multiplier: VLS - APOLLO - Apollo - Conbraco Valves -

Item	Size	Quantity	Price	Mat. Cost	Unit Lab Hr	Total Hrs
150# 70-140 Apollo						
	3/4	2				4
Bronze Thd/Flg/Grv - Ball 2PC SP SST Thd - Thread Totals:						
		2				**4**

Ductile Iron - Y-Strainer Grv - Grooved

Material Multiplier: VLS - VICT - Victaulic Valves -

Item	Size	Quantity	Total Hrs
300# 732 Victaulic			
	4	2	14
Ductile Iron - Y-Strainer Grv - Grooved Totals:			
		2	**14**
Valves Totals:		**4**	**18**

J. W. Danforth
Recap with Total Cost

There was one calculation message.

Project Name: Albany Airport Change Orders
Page: 3 of 5
Bid ID: 90272-074
Report Time: 7/28/26 12:03 PM
Data Calculated: 7/28/2026 11:59:58 AM
Base Bid;

Hanger Components

- Clevis -

Material Multiplier: H0001 - Hanger Materials -

Item	Size	Quantity	Total Hrs
Fig 260 Clevis			
	3	5	0
	4	1	0
- Clevis - Totals:			
		6	**0**

- Struct Attach-Conc -

Material Multiplier: H0001 - Hanger Materials -

Item	Size	Quantity	Total Hrs
Rawl 6300 Drop-In			
	1/2	5	0
	5/8	1	0
- Struct Attach-Conc - Totals:			
		6	**0**

Carbon Steel - Rods -

Material Multiplier: H0003 - Hanger Materials - All Thread Rod

Item	Size	Quantity	Total Hrs
Allthread - Galv			
	1/2	20	0
	5/8	4	0
Carbon Steel - Rods - Totals:			
		24	**0**
Hanger Components Totals:		**36**	**0**

Labor

Hangers

Item	Size	Quantity	Total Hrs
Clevis Hanger(HgrItem IBm&Tr Machine)			
	3	5	8
	4	1	2
Hangers Totals:			
		6	**10**
Labor Totals:		**6**	**10**

J. W. Danforth
Recap with Total Cost

There was one calculation message.

Data Calculated: 7/28/2026 11:59:58 AM

Base Bid;

HVAC Equipment

HVAC Equipment - -

Material Multiplier:

Item	Size	Quantity	Total Hrs
Pump Vertical Pump*			
		2	0
HVAC Equipment - - Totals:			
		2	**0**
HVAC Equipment Totals:		**2**	**0**

Misc. Consumables

- CS Joints CS Threaded Joint -

Material Multiplier:

Item	Size	Quantity	Total Hrs
CS Threaded Joint			
	Cutting Oil	0	0
	Joint Compound	0	0
- CS Joints CS Threaded Joint - Totals:			
		0	**0**

- CS Joints Vic Lube -

Material Multiplier:

Item	Size	Quantity	Total Hrs
Vic Lube			
	Victaulic Lube	0	0
- CS Joints Vic Lube - Totals:			
		0	**0**
Misc. Consumables Totals:		**0**	**0**

Misc. Steel Items

- Bolts,Nuts&Washers -

Material Multiplier:

Item	Size	Quantity	Total Hrs
Nuts - Cadmium Pltd			
	1/2	10	0
	5/8	2	0
Washers - Cad, Pltd			
	1/2	10	0
	5/8	2	0

J. W. Danforth
Recap with Total Cost

There was one calculation message.

Project Name: Albany Airport Change Orders

Report Time: 7/28/26 12:03 PM

Bid ID: 90272-074

Data Calculated: 7/28/2026 11:59:58 AM

Base Bid;

Misc. Steel Items

- Bolts,Nuts&Washers -

- Bolts,Nuts&Washers - Totals:

	24	0
Misc. Steel Items Totals:	24	0

Total Hrs

Grand Totals **86**

* Items flagged with an asterisk may have their price and labor overwritten in Excel's Rapid Reports

FERGUSON

FEL-COHOES, NY #364
5 GREEN MOUNTAIN DRIVE
COHOES, NY 12047-4807

Phone: 518-268-6749
Fax: 518-708-8225

Deliver To:
From: Nicholas Schuhmann
nick.schuhmann@ferguson.com
Comments:

12:59:15 JUN 15 2026

FERGUSON ENTERPRISES LLC #501
Price Quotation
Phone: 518-268-6749
Fax: 518-708-8225

Bid No: B214074
Bid Date: 06/15/26
Quoted By: NZS

Cust Phone: 716-832-1940
Terms: NET 10TH PROX

Customer: JOHN W DANFORTH CO
5 LIEBECH LANE
ALBANY AIRPORT
ALBANY ACCOUNT
CLIFTON PARK, NY 12065

Ship To: JOHN W DANFORTH CO
5 LIEBECH LANE
ALBANY AIRPORT
ALBANY ACCOUNT
CLIFTON PARK, NY 12065

Cust PO#:

Job Name: ALBANY AIRPORT

Item	Description	Quantity	Net Price	UM	Total
G0766601033	4 PTD GRV WYE STRN 768	2	1260.358	EA	2520.72
G0390028660	4X3 PTD GRV CONC RED 7072	2	52.015	EA	104.03
A70105HC	*NP 1 BRZ 600# THRD SP BV 3/4 HOSE	2	75.054	EA	150.11
TOL36MG	36 - 3 X 1 FS 3000# TOL	2	10.083	EA	20.17
G0390014306	4 PTD GRV 90 ELL 7050	2	58.134	EA	116.27
G0390014264	3 PTD GRV 90 ELL 7050	2	53.471	EA	106.94
GBPRGRA53BP	4 BLK RG A53B S40 ERW SRL PIPE	21	1319.625	C	277.12
GBPRGRA53BM	3 BLK RG A53B S40 ERW SRL PIPE	21	926.181	C	194.50
G0390201101	4 PTD GRV FLG COUP W/ E GSKT 7012	2	179.539	EA	359.08
G0390201044	3 PTD GRV FLG COUP W/ E GSKT 7012	2	133.920	EA	267.84

	2-DAY LEAD TIME				

Net Total:	$4116.78
Tax:	$0.00
Freight:	$0.00
Total:	$4116.78

HOW ARE WE DOING? WE WANT YOUR FEEDBACK!
Scan the QR code or use the link below to
complete a survey about your bids:
https://survey.medallia.com/?bidsorder&fc=364&on=1068807

mlb
Over 75 Years of Construction Excellence
General Contractors and Construction Managers
One Stone Break Road
Malta, New York 12020
518.289.1371 www.mlbind.com

Project # 23-114 Date 8/20/26
Project ALBANY AIRPORT EXPANSION
Issue ASI-167 HHWP SWAP
Remarks MLB REVIEW COMMENTS Prepared By GD

LABOR

- DAY 1: ISOLATE & DRAIN EXISTING SYSTEM, RECOVER GLYCOL
- DAY 2: REMOVE INSULATION, DISASSEMBLE EXISTING CONFIGURATION, MODIFY EXISTING PIPE, REMOVE WASTE FROM BUILDING
- DAY 3: LOAD-IN MATERIALS, BEGIN RE-ASSEMBLY OF NEW CONFIGURATION.
- DAY 4: COMPLETE INSTALL OF NEW CONFIGURATION.
- DAY 5: REFILL SYSTEM & TEST

↳ 2 MEN FOR A WEEK SEEMS REASONABLE (GD)

MATERIAL

- WHY NEW STRAINERS?
  ↳ ORIGINAL INSTALL UTILIZED SUCTION DIFFUSERS BUT DUE TO THE SIZE OF THE NEW PUMPS, THEY NEED TO MOVE A VERTICAL ORIENTATION THE S.D. ARE OBSOLETE & STRAINERS ARE REQUIRED. (GD)

SUBS

- SIEMENS
  ↳ IN-FIELD TECH, 1 DAY = #840
  ↳ PROGRAMMER, 1 DAY = #800
  ↳ + OH & P

> SEEMS FAIR? (GD)

→

mlb
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Construction Managers

One Stone Break Road
Malta, New York 12020
518.289.1371 www.mlbind.com

Project # 23-114	Date 8/20/26
Project ALBANY AIRPORT EXPANSION	
Issue ASI-16.7 HHWP SWAP	
Remarks MLB REVIEW COMMENTS	Prepared By GD

- INSULATOR
  - ↳ INS. FOR 2 DAYS = $1,800
  - ↳ MISC. MATERIAL = $500
  - ↳ OH&P

> DOESN'T SEEM CRAZY. GD

PCO-504

MLB Construction Services LLC
One Stone Break Road
Malta, NY 12020
Tel: 518-289-1371
Fax: 518-289-1652

PCO-504 Rec'd TCCo 08.20.26

PROPOSAL

SUBMITTED TO:
Scott Bridie
Turner Construction Company
1 Computer Drive South
Albany, NY 12205

PROJECT NAME	
Alb. Airport 21-1082-STR & INT	
PROJECT NO.	DATE
23-114	8/20/26
PROPOSAL NO.	PROPOSAL AMOUNT
319	$ 17,788.00

Per NOC 319 dated 8/20/2026, MLB Construction Services LLC is pleased to present our proposal for the following:

Per the response to RFI-615, provide precast terrazzo strips at the slab edges identified to allow for welding of handrails in lieu of the core drills shown in the bid documents.

Description	Labor	Material	Equipment	Subcontract	Other	Price
Euro Tile & Stone Inc				$17,014.37		$17,014.37
					Subtotal:	$17,014.37
			MLB	$15,467.61	5.00%	$773.63
					Total:	**$17,788.00**

If you have any questions, please contact me at 518-289-1371.

- [X] We reserve the right to request an extension of time together with additional cost incurred at a later date.
- [ ] We request calendar days extension of time for the above work.
- [ ] This proposal may be withdrawn by us if not accepted within 10 days.

WE HAVE NOT BEEN DIRECTED TO PROCEED WITH THIS WORK.

OWNER MUST RETURN THIS PROPOSAL WITH THEIR SIGNED APPROVAL SHOWN BELOW BEFORE WORK CAN BEGIN .

Submitted by: 8/20/26
Craig Dittl
MLB Construction Services LLC

Approved by: _____
Date: _____

Cc: JMD/SAS/File (MLB Construction Services LLC)

PCO-504 Rec'd TCCo 08.20.26

euro TILE & STONE
24 Airport Road | Schenectady, New York 12302

Change Order Request

2403 - Albany Airport Terminal Exp - Interior

COR Subject: PRECAST-GAR LOBBY 2-3-4

To: Jeff Lino
MLB Construction
1 Stonebreak Rd
Ballston Spa, NY 12020

COR Number: 33
COR Date: 2026-06-25
Work Type: Quoted Proposal
GC COR / RFI No:

Return To: Joseph Eats
Euro Tile and Stone
24 Airport Road
Schenectady, NY 12302
(518) 631 -9184 x203

Details

Line No	Description	Type	Cost/Rate	Qty/Hrs	UOM	Ext
1	MATERIAL:					
2	4IN X 3/8" FLAT PRECAST TO MATCH TE03	Material	$75.85	90.00	Each	$ 6,826.50
3	12IN X 3/8" FLAT PRECAST TO MATCH TE03	Material	$215.85	15.00	Each	$ 3,237.75
4	Freight	Material	$450.00	1.00	Each	$ 450.00
5	Laticrete Prime-N-Bond	Material	$52.88	1.00	1 Gallon	$ 52.88
6	Laticrete 254 Platinum	Material	$58.37	3.00	50lb Bag	$ 175.11
7	Laticrete Permacolor	Material	$28.75	1.00	25lb Bag	$ 28.75
8	Laticrete Caulk Latasil	Material	$18.30	5.00	10.5oz	$ 91.50
9						
10	LABOR:					
11	Prime Back of Precast, Assist in installing	Labor	$59.04	24.00	Per Hour	$ 1,416.96
12	Install Flat Precast	Labor	$73.80	24.00	Per Hour	$ 1,771.20
13	Grout Flat Precast	Labor	$59.04	24.00	Per Hour	$ 1,416.96

NOTES:
- Lead time for precast terrazzo is 8 weeks minimum.

Labor:	$4,605.12
Overhead Percent ~~15%~~ 10%:	~~$690.76~~ 460.51
Material:	$10,862.49
Overhead Percent ~~15%~~ 10%:	~~$1,629.38~~ 1,086.2
Equipment	$0.00
Overhead Percent 15%:	$0.00
Sales Tax:	$0.00
Other	$0.00
Total:	~~$17,787.75~~ $17,014.37

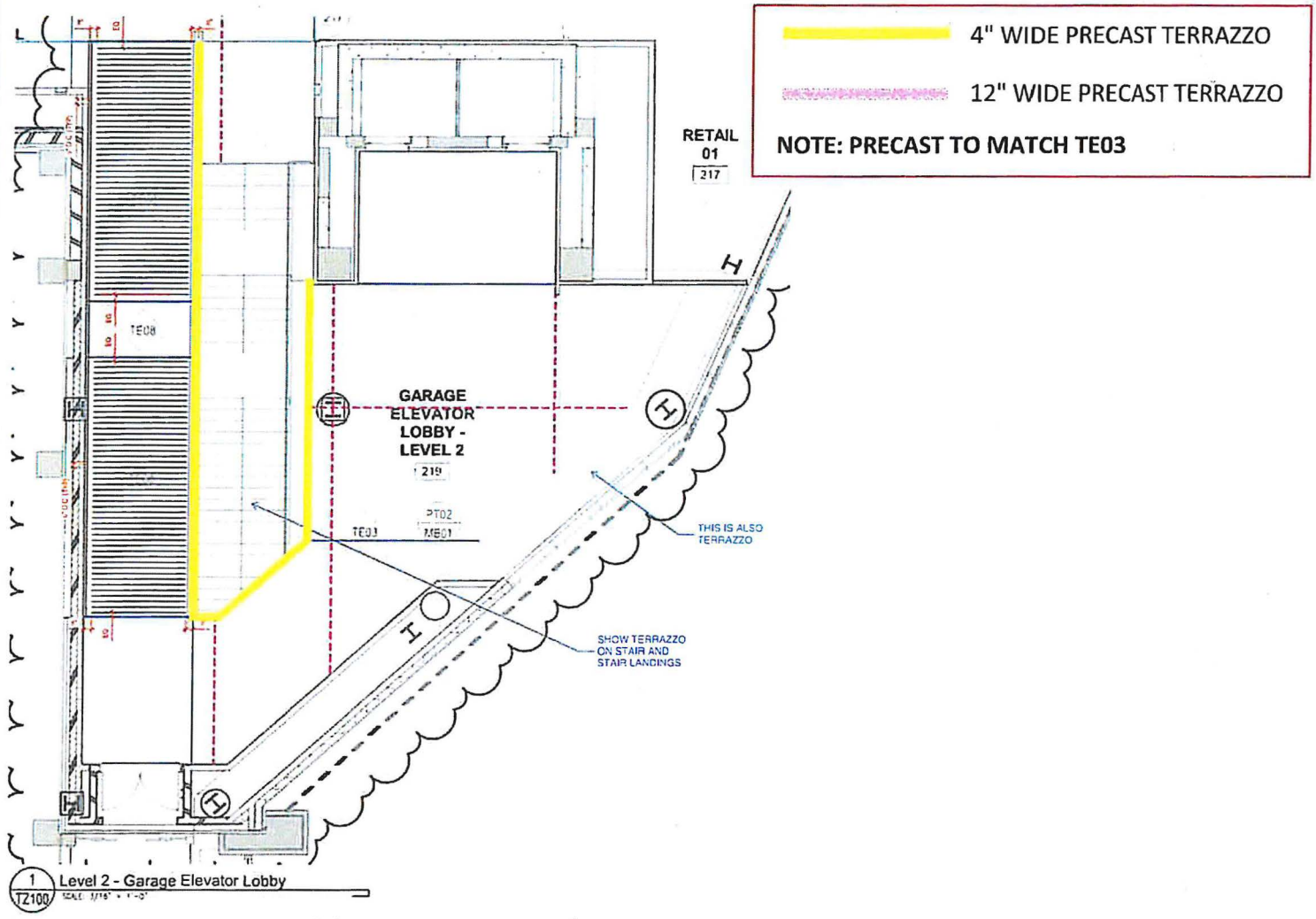
SD

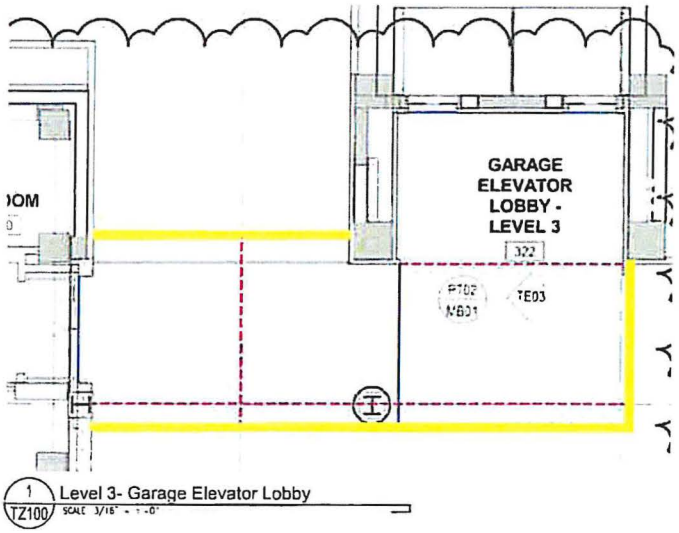
Signed By: Joseph Eats

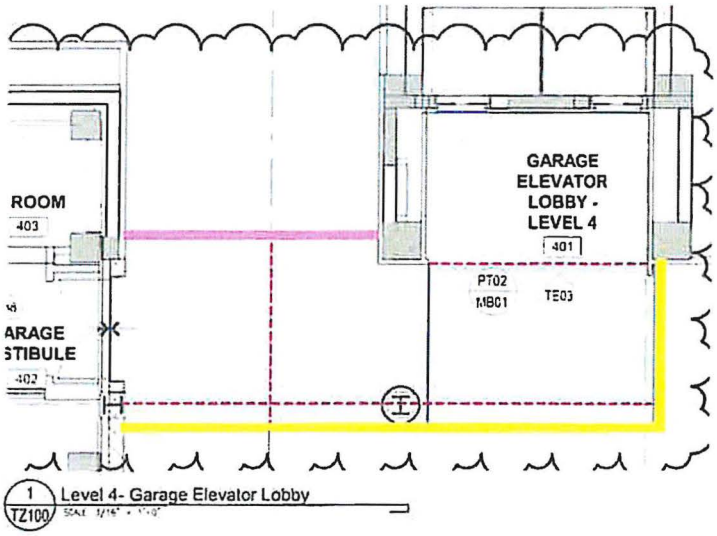
Dated: 2026-06-25

euro TILE & STONE
24 Airport Road : Schenectady, New York 12302

PCO-504 Rec'd TCCo 08.20.26







08/14/26 PCO Meeting Minutes:

PCO-238 ASI-114 AJAY Glass TSA Wall Revisions: ERIE proposal requests an add of $54,600, after a linear sf comparison/takeoff it was found that the difference in sf was within 2 lf. Please advise on the add of $54,600 compared to the small difference in lf of the work. See the final drawing of the proposal for a side-by-side display of this scope of work. Based on our takeoff, the new scope of work is 121 Lf while the base bid work was 120 Lf. If we do have around the same linear footage of wall, advise on the fabrication and materials prices for this scope of work. MLB to also send the changes to the door schedule based on ASI-114 changes as backup for the Level 3 door opening changes.

PCO-308 NOC-155R1 ASI-134 Electrical Room Revisions: Price is accepted by Turner.

PCO-326a Sidewalks and Curbs Credit: We discussed the ASI-122 added area drains cost and found that 12 days to perform this work (1 AD per day) is fair and reasonable. Turner also accepts the revision of the credit for the deletion of sidewalks and curbs provided by MLB. MLB to provide a formal proposal.

Precast Terrazzo Revision: Turner recommends this proposal to be accepted. Turner does not feel based on the means and methods of the standard installation that a subtraction of 4" will ~~not~~ result in a credit. MLB to send an official proposal.

Confirmed typo with B. McNeil.

PCO-326c Canopy Glass Scope Deletion Credit: As discussed, we have an email stating that AJAY was onsite for 3-4 hours reviewing the canopy glass scope. MLB to go to AJAY and request further information on the $50,000 price based on this information. Turner to send the email to MLB for discussion with AJAY.

Ticketing High Ceilings: Turner to issue a PCO to MLB/ADK for this work. MLB to perform this work on T&M.

TCCo New York North
1 Computer Drive South
Albany, New York 12205
P: (518) 432-0277
F: (518) 432-0279

PCO-504 Rec'd TCCo 08.20.26

Project: 230609 Albany Airport: Terminal Expansion
737 Albany Shaker Rd.
Albany, New York 12211

RFI #BP-04 RFI-615: BP-4 Garage Steel Handrail Clarifications

Revision	0	**Status**	Open
To	Ashley Richards (CHA Consulting, Inc.) John Pugh (LERA Consulting Structural Engineers) Rahul Joag (LERA Consulting Structural Engineers) Sean Singh (CHA Consulting, Inc.) Todd Cirillo (CHA Consulting, Inc.) Tony Stellato (CHA Consulting, Inc.)	**From**	Craig Dittl (MLB Construction Services, LLC)
Date Initiated	Jun 12, 2026	**Due Date**	Jun 19, 2026
Location		**Project Stage**	Course of Construction
Cost Impact	TBD	**Schedule Impact**	TBD
Spec Section		**Cost Code**	
Drawing Number		**Reference**	
Linked Drawings			
Received From	Craig Dittl (MLB Construction Services, LLC)		
Copies To	Eddie Andres (Turner Construction Company), Scott Bridie (Turner Construction Company), Todd Cirillo (CHA Consulting, Inc.), Craig Dittl (MLB Construction Services, LLC), Zack Geddies (Albany County Building Department), Jordan Hudak (CHA Consulting, Inc.), Jeff Lino (MLB Construction Services, LLC), Kelsey Martin (MLB Construction Services, LLC), Marty Millington (MLB Construction Services, LLC), Maureen Moran (CHA Consulting, Inc.), Jo Anne Nichols (MLB Construction Services, LLC), Lori Rowe (MLB Construction Services, LLC), Mike Washburn (MLB Construction Services, LLC)		

Activity

Question

Question from Craig Dittl MLB Construction Services, LLC *on Wednesday, Jun 10, 2026 at 02:00 PM EDT*

Following the 6/10/26 discussion with Eddie Andres of TCCo and Tony Stellato of CHA, CHA is going to formally respond to the following items:

A.) Section C2/A-409 identifies the vertical posts of the handrails to be set in concrete with epoxy fill. However, detail D3/A-409 further clarifies that the structural design includes a double angle slab edge. The question was posed if LERA is aware of the amount of cores that would be done through this top angle and the group agreed that is probably not acceptable. CHA is confirming with LERA that this needs to be a welded connection to the top of the upper angle.

B.) The cut sections of the handrail show the bottom rail being 3-3/4" above the slab. It was questioned if these actually need a toe kick. CHA verbally noted they believe a toe kick would be required. CHA will confirm and provide guidance on a general detail. The weld calculations for the toe kick to the slab edge angles will then be included in a revised delegated design submittal.

C.) Not part of the discussion, but for added clarification/record TCCo/ACAA/CHA to confirm that the airport wants painted steel handrails as previously discussed. The drawings show contradicting materials. For example, section C2/A-409 calls the railing on the West wall to be 1-1/2" stainless while the railing on the opposite (East) side of the ramp is to be painted steel. It appears that the two railings called as stainless would be the one on the West side of the Level 2 ramp and the railing that goes down the center of the garage stair.

See next page for responses.

PCO-504 Rec'd TCCo 08.20.26

Awaiting an Official Response

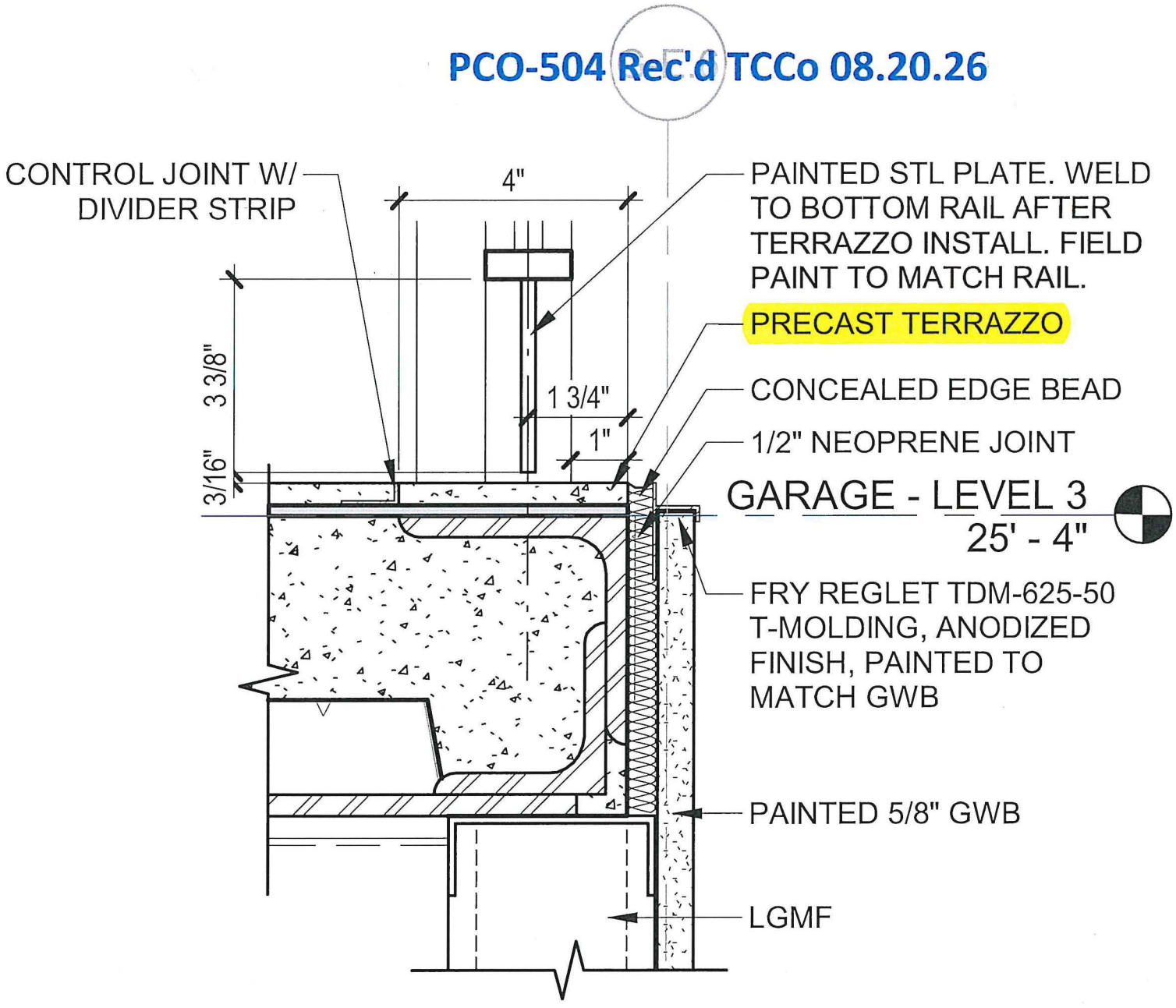
A. Do not core through installed angles. Weld vertical railing posts to angles as proposed. Refer to attached revised detail D3/A-409 for typical floor finish at edge of slab.

B. Building code does not require a toe kick. Airport Authority prefers toe kicks for safety considerations. Refer to attached revised detail D3/A-409 for typical toe kick.

C. Shop prime and field paint steel railings and handrails according to specification 055000 2.12 M(3) for all garage side ramp, stair, and floor railings. Submit paint product information for review as noted in specifications.

T. Cirillo, CHA 6-18-26

PCO-504 Rec'd TCCo 08.20.26



D3 TYPICAL SLAB EDGE FINISH DETAIL

3" = 1'-0"

AGENDA ITEM NO. 11.2

Change Order 24: Authorization to Award Contract Change Order No. 24 to Construction Contract 21-1082-GC for the Pre-TSA Terminal Expansion to MLB Construction Services, LLC.

AGENDA ITEM NO: 11.2
MEETING DATE: October 13, 2026

ALBANY COUNTY AIRPORT AUTHORITY
REQUEST FOR AUTHORIZATION

DEPARTMENT: ***Planning and Engineering***

Contact Person: ***Matt Mokey, Airport Engineer***

PURPOSE OF REQUEST:

Change Order 24: ***Authorization to Award Contract Change Order No. 24 to Construction Contract 21-1082-GC for the Pre-TSA Terminal Expansion to MLB Construction Services, LLC.***

CONTRACT AMOUNT:

Base:	**$32,796,900.00**	
Change Order #1	**49,999.00**	**ACAA Approved 01/23/2024**
Change Order #2	**49,999.00**	**ACAA Approved 01/23/2024**
Change Order #3	**49,999.00**	**ACAA Approved 01/23/2024**
Change Order #4	**113,499.81**	**ACAA Approved 01/23/2024**
Change Order #5	**188,732.19**	**ACAA Approved 01/23/2024**
Change Order #6	**344,659.00**	**ACAA Approved 02/12/2024**
Change Order #7	**No Cost**	**ACAA Approved 03/18/2024**
Change Order #8	**115,765.00**	**ACAA Approved 05/09/2024**
Change Order #9	**273,508.00**	**ACAA Approved 10/15/2024**
Change Order #10	**260,909.00**	**ACAA Approved 04/16/2025**
Change Order #11	**531,855.00**	**ACAA Approved 04/16/2025**
Change Order #12	**98,296.00**	**ACAA Approved 05/12/2025**
Change Order #13	**61,603.00**	**ACAA Approved 06/9/2025**
Change Order #14	**329,753.00**	**ACAA Approved 09/15/2025**
Change Order #15	**50,696.00**	**ACAA Approved 10/20/2025**
Change Order #16	**9,619.00**	**ACAA Approved 11/21/2025**
Change Order #17	**73,861.00**	**ACAA Approved 11/21/2025**
Change Order #18	**(21,105.00)**	**ACAA Approved 02/09/2026**
Change Order #19	**99,880.00**	**ACAA Approved 03/23/2026**
Change Order #20	**70,478.00**	**ACAA Approved 05/12/2026**
Change Order #21	**99,028.00**	**ACAA Approved 06/13/2026**
Change Order #22	**88,507.00**	**ACAA Approved 08/17/2026**
Change Order #23	**191,000.00**	**ACAA Approved 09/23/2026**
Change Order #24	**136,901.00**	*****
Total:	**$36,064,342.00**	

(Total includes total change orders to date of $3,267,492.00)

***Pending Board Approval at this meeting.**

AGENDA ITEM NO: 11.2
MEETING DATE: October 13, 2026

BUDGET INFORMATION:

Anticipated in Current ALB Capital Plan: Yes √ No___ NA
Funding Account No.: ***CPN 50-2021***

AWARD CONDITIONS MET:

Apprenticeship √ DBE √ MWBE___

Service Disable Veteran Owned Business (SDVOB) N/A

FISCAL IMPACT - FUNDING (Dollars or Percentages)

Federal ***40%*** **State 60%** **Airport** ***N/A***
Term of Funding: ***2023-2026***
Grant No.: ***N/A*** **STATE PIN:** ***N/A***

JUSTIFICATION:

Requesting approval of change order #24 to Contract #21-1082-GC. This request comprises of the two following elements of work:

1.) ***PCO - 276 is the result of Owner Directed changes whereby the scope of the work relative the sidewalks, drainage below the sidewalks and the curbing was, for the most part, deleted. The area impacted is mostly beneath the Terminal canopy. This change only reflects the "ADD" portion of the work and does not include the "DELETED" portion of the work. Tuner and the ACAA staff are currently evaluating the credit to the contract.***

2.) ***PCO – 457 is the result of a 16-inch discrepancy in the elevation of the sidewalk as it exits the North Parking Garage. The impact included in this change order are for the sitework portion of the work only. The need for a stainless-steel railing, due to the change in elevation, is not included in this change order.***

CHIEF EXECUTIVE OFFICER'S RECOMMENDATION:

Recommend approval.

FINAL AGREEMENT SUBJECT TO APPROVAL BY COUNSEL: YES √ NA_____

PROCUREMENT DEPARTMENT APPROVAL:

Procurement complies with Authority Procurement Guidelines and Acting Chief Financial Officer has approved. **YES √ NA___**

AGENDA ITEM NO: 11.2
MEETING DATE: October 13, 2026

BACK-UP MATERIAL:

Please refer to the attached Change Order #24 backup information compiled by Turner Construction Company.

AIA® Document G731™ – 2019

Change Order, Construction Manager as Adviser Edition

PROJECT: *(name and address)*
Albany Airport

737 Albany Shaker Road Albany, NY 12211

CONTRACT INFORMATION:
Contract For:
General Construction [1082-GC]
Date:
August 28, 2023

CHANGE ORDER INFORMATION:
Change Order Number:
024
Date:
September 08, 2026

OWNER: *(name and address)*
Albany County Airport Authority
737 Albany Shaker Road
Albany, NY 12211

ARCHITECT: *(name and address)*
CHA Consulting Inc.
3 Winners Circle
Albany, NY 12205

CONTRACTOR: *(name and address)*
MLB Construction Services LLC
One Stone Brook Road
Malta, NY 12020

CONSTRUCTION MANAGER: *(name and address)*
Turner Construction Company
1 Computer Drive South
Albany, NY 12205

THE CONTRACT IS CHANGED AS FOLLOWS:
(Insert a detailed description of the change and, if applicable, attach or reference specific exhibits. Also include agreed upon adjustments attributable to executed Construction Change Directives.)
01. PCO-276 ASI-122 Civil Scope Changes [i.e. Curbs, drains, sidewalks, etc.] [Add $94,957.00]
02. PCO-457 ASI-150 Garage Ramp Revisions [Add $41,944.00]

The original Contract Sum was	$	32,796,900.00
Net change by previously authorized Change Orders	$	3,130,541.00
The Contract Sum prior to this Change Order was	$	35,927,441.00
The Contract Sum will be increased by this Change Order in the amount of	$	136,901.00
The new Contract Sum including this Change Order will be	$	36,064,342.00

The Contract time will be unchanged by (0) days.
The Contractor s Work shall be substantially complete onJuly 10, 2024 for Phase 1-2, August 7, 2024 for Phase 3a -4c and November 12, 2024 for Sitework.

NOTE: This Change Order does not include adjustments to the Contract Sum or Guaranteed Maximum Price, or the Contract Time, that have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONSTRUCTION MANAGER, CONTRACTOR, AND OWNER.

ARCHITECT *(Signature)*	**CONSTRUCTION MANAGER** *(Signature)*
BY: Anthony Stellato - Vice President	BY: Scott Bridie - Senior Project Manager
(Printed name, title, and license number if required)	*(Printed name and title)*
Date	*Date*

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User Notes: (6aa05e00887f4a24688bc82

CONTRACTOR *(Signature)*	**OWNER** *(Signature)*
BY: Jeff Lino, Vice President *(Printed name and title)*	BY: Stephen Clark, Chief Executive Officer *(Printed name and title)*
Date	*Date*

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User Notes: (6aa05e00887f4a24688bc820)

PCO-276

MLB Construction Services LLC
One Stone Break Road
Malta, NY 12020
Tel: 518-289-1371
Fax: 518-289-1652

PCO-276 Rec'd TCCo 08.25.26

PROPOSAL

SUBMITTED TO:
Scott Bridie
Turner Construction Company
1 Computer Drive South
Albany, NY 12205

PROJECT NAME	
Alb. Airport 21-1082-GC	
PROJECT NO.	DATE
23-110	8/25/26
PROPOSAL NO.	PROPOSAL AMOUNT
134	$ 94,957.00

Per NOC 134 dated 6/4/2025, MLB Construction Services LLC is pleased to present our proposal for the following:

ASI-122 has been issued to update drawings for civil scope revisions (curbs, drains, sidewalks, etc.).

Description	Labor	Material	Equipment	Subcontract	Other	Price
M Sullivan Construction Inc				$72,050.00		$72,050.00
Concrete Infills of Area Drains	$7,592.00					$7,592.00
Concrete Removal	$3,400.00					$3,400.00
Drill & Grout Dowels	$1,020.00	$200.00				$1,220.00
JJP Slipforming Inc				$5,134.00		$5,134.00
Caulking/Sealants	$756.00					$756.00
					Subtotal:	$90,152.00
		MLB OH&P (Self-performed)		$12,968.00	10.00%	$1,296.80
		MLB OH&P (Subcontractor)		$70,167.27	5.00%	$3,508.20
					Total:	**$94,957.00**

If you have any questions, please contact me at 518-289-1371.

- [X] We reserve the right to request an extension of time together with additional cost incurred at a later date.
- [ ] We request calendar days extension of time for the above work.
- [ ] This proposal may be withdrawn by us if not accepted within 10 days.

WE HAVE NOT BEEN DIRECTED TO PROCEED WITH THIS WORK.

OWNER MUST RETURN THIS PROPOSAL WITH THEIR SIGNED APPROVAL SHOWN BELOW BEFORE WORK CAN BEGIN.

Submitted by: 8/25/26
Craig Dittl
MLB Construction Services LLC

Approved by: _____
Date: _____

Cc: JMD/SAS/File (MLB Construction Services LLC)

PCO-276 Rec'd TCCo 08.25.26

BP-2

BP02 ASI 122 site changes
THIS IS BP 04 WORK SCOPE

1	**Credit BP04 Site work and removals - complete bid scope** (see attached MSC BP04 proposal)			$	(351,000)
2	**Eliminate BP04 Sidewalks and Curbs** see attached JJP proposal				
A	eliminate sidewalks 11,570sf @ $10.60/sf		$ (122,642)		
B	eliminate 465 lf curb @ $45.60/lf		$ (21,204)		
C	eliminate (3) cast detectable tiles (3) @2x6 @43.55	36sf	$ (1,568)		
	Total credit from JJP Scope			$	(145,414)
3	**Credit concrete curb backing material only 22 yds @110**			$	(2,420)
4	**Credit joint sealants 1,200 lf @ $4.50 lf**			$	(5,400)
5	**Add area drainage at planters** see attached MSC Proposal			$	72,050 BP-2
6	**Add concrete pads at area drains (JJP) 685sf @ $11.10/sf**			$	7,592 BP-2
7	**Add cast detactable warning tiles at existing sidewalk crossings**				
A	saw cut/remove existing concrete (6) @ 5'x6' = 180 sf	40 hrs	$ 3,400		
B	drill and dowel to existing	12 hrs	$ 1,020		
	materials - dowels and epoxy	LS	$ 200		
C	pour new sidewalk sections 180sf @ 11.10 JJP units		$ 1,998		
D	cast detectable tiles (6) 2x6 =72 sf @ 43.55 JJP units		$ 3,136		
E	joint sealants	168 lf	$ 756		
	Total to add cast detactable tiles			$	10,510 BP-2
	Total Cost work scope			**$**	**(414,082)**

BP-

Qualifications:
Unit prices for added scope are subject to escallation and may need to be adjusted based on schedule.
Removal and relacement of concrete sidealks for installation of cast detectable warning tiles is limitted to size indicated. If more removals are required for any reason additional compensation will be required.

LINES 5→7
= #90,152 GD

MSC M. Sullivan Construction

EXCAVATING CONTRACTOR

Customer: MLB Construction Services

NOC 134 ASI 122 Civil Revisions

Project: Albany Airport Bid Package 2

Date: June 23, 2026

PCO-276 Rec'd TCCo 08.25.25

	Material				Equipment				Labor						
Description	**Material**	**Qty**	**Unit Cost**	**Subtotal**	**Equipment**	**Qty**	**Unit Cost**	**Subtotal**	**Laborer ST Hrs $84.04**	**Operator ST Hrs $114.98**	**Foreman ST Hrs $97.91**	**Laborer OT Hrs $112.89**	**Operator OT Hrs $155.08**	**Foreman OT Hrs $133.71**	**Subtotal**
Furnish and isntall area drains in planters	8" Nyoplast Drain	12	$620.00	$7,440.00	Case 027 Excavator	96	$35.00	$3,360.00	96	192					$30,144.00
	4" Perf. Single Wall Pipe w/Sock 100' Roll	2	$175.00	$350.00	Kubota 75 Skid Steer	96	$100.00	$9,600.00							$0.00
Assumes 2' maximum planter depth.	4" Solid Single Wall Pipe - 100' Roll	1	$150.00	$150.00	Single Axle Dump	48	$165.00	$7,920.00							$0.00
Assumes 1" grout layer (bag mixed onsite)	4" HDPE Wye	12	$17.02	$204.24	Flatbed Truck	4	$100.00	$400.00							$0.00
	4" HDPE End Cap	12	$6.25	$75.00	Concrete Mixer (Days)	12	$53.00	$636.00							$0.00
	Grout 50# Bag	120	$22.97	$2,756.40				$0.00							$0.00
	Type 2 - Ton	106	$23.25	$2,464.50				$0.00							$0.00
				$0.00				$0.00							$0.00
				$0.00				$0.00							$0.00
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				$0.00				$0.00							$0.00
				$0.00				$0.00							$0.00
			Material:	$13,440.14			Equipment:	$21,916.00						Labor:	$30,144.00

Subtotal:	**$65,500.14**
OH&P:	**$6,550.01**
Total:	**$72,050.15**

PCO-276 Rec'd TCCo 08.25.26

JJP Slipforming, Inc.
Curb · Barrier · Sidewalk
PO BOX 979, Middleburgh, New York 12122
(518) 827-7447 (518) 827-7418 Fax

PROPOSAL

Project: Albany Airport Terminal Proposal # 6-23005 RI

Contractor: MLB Date: August 8, 2025

JJP will construct the following items on subject contract, in accordance with project specifications, for the following prices, per JJP's conditions. In any case whatsoever, all terms, conditions and exclusions are to be incorporated into any contract between both parties. If these requirements are not met, then prices are subject to change or will be respectfully withdrawn.

5" Concrete Walks (6x6x2.9 WWM) Approx 27,370 SF at $11.10 Per SF (4 Moves & 22 Days)
5" Exposed Aggerate Concrete Walks (6x6x2.9 WWM) 1,330 SF at $16.50 Per SF (Completed with Walks)
Cast Iron Warning Detectable Surfaces Approx 728 SF at $43.55 Per LF (Completed with Walks)
5x16 Granite Curb Approx 1,765 LF at $56.65 Per LF (10 Days) Approx 80 CY B&B

No Winter Conditions (No Hot Water, Polar Set or Covering)

For these prices, JJP will install the above items using material furnished as indicated below.

Protectosill 300S Sealer at ($1.05 to $2.00 Per SF Depending on Volume) (Seal 30 Days After Completion)

JJP Slip Forming: Expansion Material, Concrete (5,000 PSI), Granite Curb (5x16), Curing Spray, Wire Mesh,(6x6x2.9) Warning Detecable Surfaces (Cast Iron)

General Contractor: Bedding/Backing for granite curb. Approx 80 CY, Sealers & Caulking

Notes: Handicap ramps (raised domes) in sidewalks are to be installed Per ADAAG, effective July 2002

SALES TAX : ☑ Is NOT Included in price

CONDITIONS:

The Contractor shall, at No Cost to JJP:

- **JJP will be given 3 (THREE) Weeks' Notice to Schedule Prior to Commence Work**
- Furnish all payment and/or performance bonds, use tax, permits and licenses
- Furnish and /or install all Wet Cure, Sealants, Caulking, Anti-Spalling Compound, Other Then Curing Spray.
- Furnish all testing and/or inspection of JJPs work.
- Excavate and provide radius / survey points offset within 3 (three) feet behind curb at intervals of no more than 50 (fifty) feet apart for curb and control points for sidewalk.
- Be solely responsible for the maintenance and protection of both vehicular and pedestrian traffic.
- Notify UFPO and Maintain all Utility Layout Marks for our Use Till Our Work is Completed
- Be responsible for any damage to JJPs finish work not caused by JJP.
- Furnish and place specified sub-base bedding material within tolerance limits, or 0" to + 1/4".
- Provide 13 lf of access along face side of curb area for equipment.
- Assure that all catch basins, DI's, and curb boxes are set to correct line and grade.
- Remove any/all concrete & granite remnants generated from operations.
- Provide operator / loader to unload granite curb & pavers. Also spot pavers in work areas.
- Provide access to all areas for the discharging of concrete from concrete trucks using its own power.
- Provide access to bridge deck for the unloading of granite curb and materials via truck.
- Remove, Clean and Store reset items, where applicable.
- Forward all backcharges to JJP within 10 days after occurrence, including concrete invoices.

**********GC to pay any and all extra costs resulting from working this contract during cold weather conditions. GC to Furnish & Install thermal blankets & ground heaters if needed. For work between November 15th and April 15th, add 30% to unit pricing for winter conditions (unless other pricing has been specifically agreed upon). JJP will not be liable for or warranty any work installed during this period, unless specific terms have been agreed upon.**

08/14/26 PCO Meeting Minutes:

PCO-238 ASI-114 AJAY Glass TSA Wall Revisions: ERIE proposal requests an add of $54,600, after a linear sf comparison/takeoff it was found that the difference in sf was within 2 lf. Please advise on the add of $54,600 compared to the small difference in lf of the work. See the final drawing of the proposal for a side-by-side display of this scope of work. Based on our takeoff, the new scope of work is 121 Lf while the base bid work was 120 Lf. If we do have around the same linear footage of wall, advise on the fabrication and materials prices for this scope of work. MLB to also send the changes to the door schedule based on ASI-114 changes as backup for the Level 3 door opening changes.

PCO-308 NOC-155R1 ASI-134 Electrical Room Revisions: Price is accepted by Turner.

PCO-326a Sidewalks and Curbs Credit: We discussed the ASI-122 added area drains cost and found that 12 days to perform this work (1 AD per day) is fair and reasonable. Turner also accepts the revision of the credit for the deletion of sidewalks and curbs provided by MLB. MLB to provide a formal proposal.

Precast Terrazzo Revision: Turner recommends this proposal to be accepted. Turner does not feel based on the means and methods of the standard installation that a subtraction of 4" will not result in a credit. MLB to send an official proposal.

PCO-326c Canopy Glass Scope Deletion Credit: As discussed, we have an email stating that AJAY was onsite for 3-4 hours reviewing the canopy glass scope. MLB to go to AJAY and request further information on the $50,000 price based on this information. Turner to send the email to MLB for discussion with AJAY.

Ticketing High Ceilings: Turner to issue a PCO to MLB/ADK for this work. MLB to perform this work on T&M.

PCO-457

MLB Construction Services LLC
One Stone Break Road
Malta, NY 12020
Tel: 518-289-1371
Fax: 518-289-1652

PROPOSAL

SUBMITTED TO:
Scott Bridie
Turner Construction Company
1 Computer Drive South
Albany, NY 12205

PROJECT NAME	
Alb. Airport 21-1082-GC	
PROJECT NO.	DATE
23-110	8/21/26
PROPOSAL NO.	PROPOSAL AMOUNT
155A	$ 41,944.00

Per NOC 155A dated 8/21/2026, MLB Construction Services LLC is pleased to present our proposal for the following:

As discussed with Turner Construction, this proposal is being submitted for the sitework portion only related to ASI-150. The stone support angles, the stainless steel railing, and remaining concrete work are to be submitted separately.

Description	Labor	Material	Equipment	Subcontract	Other	Price
M Sullivan Construction Inc				$40,120.07		$40,120.07
					Subtotal:	$40,120.07
		MLB OH&P (Subcontractor)		$36,472.79	5.00%	$1,823.93
					Total:	**$41,944.00**

If you have any questions, please contact me at 518-289-1371.

- [X] We reserve the right to request an extension of time together with additional cost incurred at a later date.
- [ ] We request calendar days extension of time for the above work.
- [ ] This proposal may be withdrawn by us if not accepted within 10 days.

WE HAVE NOT BEEN DIRECTED TO PROCEED WITH THIS WORK.

OWNER MUST RETURN THIS PROPOSAL WITH THEIR SIGNED APPROVAL SHOWN BELOW BEFORE WORK CAN BEGIN .

Submitted by: 8/21/26
Craig Dittl
MLB Construction Services LLC

Approved by: _____
Date: _____

Cc: JMD/SAS/File (MLB Construction Services LLC)

Customer: MLB Construction Services

NOC 155 Grading and Ramp Revisions

Project: Albany Airport Bid Package 2

Date: April 8, 2026

MSC M. Sullivan Construction

EXCAVATING CONTRACTOR

	Material				Equipment				Labor						
Description	Material	Qty	Unit Cost	Subtotal	Equipment	Qty	Unit Cost	Subtotal	Laborer ST Hrs $80.89	Operator ST Hrs $110.10	Foreman ST Hrs $94.06	Laborer OT Hrs $108.90	Operator OT Hrs $148.22	Foreman OT Hrs $127.46	Subtotal
C001 - Existing Ramp to Remain (Portion of ramp has been removed for electrical work and requires replacement)	Type 2 - Ton	-3	$23.25	-$69.75	Kubota 80 Excavator	-1	$75.00	-$75.00	-1	-1					-$191.09
				$0.00				$0.00							$0.00
C-101 Eliminate one (1) bollard - Labor Only. Bollards have been puchased. No Credit for bollards.	Concrete	-0.24	$146.00	-$35.04	KX80 Excavator w/Auger	-3	$110.00	-$330.00	-3	-3	-3				-$815.91
	Bollard Support/Form Matl.	-1	$100.00	-$100.00				$0.00							$0.00
				$0.00				$0.00							$0.00
C-201 Ramp Foundation Excavation and Backfill	#57 Stone - Ton	24	$24.25	$582.00	Kubota KX80 Excavator	32	$75.00	$2,400.00	32	32	32				$8,703.04
	Type 2 Backfill-Ton	228	$24.25	$5,529.00	Tandem Axle Dump Truck	16	$175.00	$2,800.00							$0.00
	Valve Box Extension	2	$69.00	$138.00				$0.00							$0.00
				$0.00				$0.00							$0.00
A-108 CIP Stepped Ledge Evcavation and Backfill	Type 2 Backfill-Ton	154	$24.25	$3,734.50	Kubota KX 80 Excavator	32	$75.00	$2,400.00	32	32	32				$8,703.04
	Tipping Fee	6	$50.00	$300.00	Tandem Axel Dump Truck	16	$175.00	$2,800.00							$0.00
				$0.00				$0.00							$0.00
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				$0.00				$0.00							$0.00
				$0.00				$0.00							$0.00
			Material:	$10,078.71		Equipment:		$9,995.00						Labor:	$16,399.08

Subtotal:	$36,472.79
OH&P:	$3,647.28
Total:	**$40,120.07**

131 Tivoli Street • Albany, NY 12207 • (518) 465-0311 • Fax (518) 465-0732

AGENDA ITEM NO. 12

Authorization of Federal and State Grants

AGENDA ITEM NO. 13

Informational Only

Old Business

New Business

Executive Session

Attorney-Client Privilege Matters