REQUIREMENTS – ITEM #1 – DEICING SALT (SODIUM CHLORIDE)

The Deicing Salt (Sodium Chloride) shall be either Rock Salt #1-medium CC or Solar Salt obtained by evaporation of sea water. The delivered product shall comply with the New Jersey Department of Transportation Standard Specifications for Road and Bridge Construction of 2007. Copies of these specifications are on file in the Ocean County Road Department.

1. **SODIUM CHLORIDE (ROCK SALT)**

Sodium Chloride shall be in the form of Rock Salt containing at time of delivery no more than 1.0 percent moisture when dried at 221ºF (105ºC) to constant weight.

2. **CHEMICAL COMPOSITION**

Sodium Chloride (**DEICING SALT**), when dried to constant weight as specified above, shall conform to the following requirements:

Sodium Chloride (NaCl), minimum percent	97.0
Solubility in boiling distilled water, minimum percent	99.0

3. **GRADING**

Sodium Chloride (**DEICING SALT**), when dried as specified above, shall conform to the following requirements as determined by laboratory sieves.

TOTAL PERCENT PASSING

4. **SIEVE**	**MIN.**	**MAX.**
½ inch	100	-
No. 3	90	100
No. 8	5	35
No. 30	0	5

The sieve analysis shall be in accordance with the applicable provisions of current A.A.S.H.O. Designation T27.

All Sodium Chloride shall be treated with an anti-caking agent and meet A.S.T.M., A.A.S.H.O., New Jersey D.O.T. Specifications and grade CC.

Evaporated salt from mines shall not be furnished in lieu of Rock Salt or Solar Salt.

REQUIREMENTS - ITEM #2 – TREATED DEICING SALT, AS SPECIFIED

GRANULAR SODIUM CHLORIDE TREATED WITH LIQUID MAGNESIUM CHLORIDE/ LIQUID ORGANIC BASED, US PATENT #4,676,918

SCOPE:

It is the intent of this specification to describe a mixture of Sodium Chloride Type "A" crushed rock salt treated with Liquid Magnesium Chloride/Patent #4,676,918 or County of Ocean approved equivalent. The liquid treatment is intended to enhance the performance of the regular rock salt over untreated salt by reducing corrosiveness, improving low temperature performance, reducing bounce and scatter, preventing clumping, salt pile freezing and enhancing flow ability. The treated salt is intended to be used to facilitate snow and ice prevention and removal on County of Ocean roads and bridges.

DESCRIPTION:

The finished product shall be composed of two primary constituents:

Crushed rock salt as described and specified in Section A below.

Liquid magnesium chloride/Toth Patented as described in Section B below.

The two components shall be mixed to produce a finished product as *described in Section C. The final product shall meet all the requirements described in Section D, also below.

SECTION A

Sodium Chloride Type "A" Crushed Rock Salt Specifications

The crushed rock salt used in the preparation of the final product shall meet the following requirements:

A.1 CONTAMINATION

Upon inspection, 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.

A.2 CHEMICAL COMPOSITION

Shall be not less than 95% Sodium Chloride. Percent of Sodium Chloride shall be determined in accordance with current ASTM-D-632.

A.3 SIZE GRADING

The salt, when tested using sieves as described in ASTM-C-136 (*) shall conform to the following requirements for particle size distribution:

SIEVE SIZE	PERCENT PASSING
1/2" - (12.5 MM)	100
3/8" - (9.5 MM)	95 - 100
No. 4 - (4.75 MM)	20 - 90
No. 8 - (2.36 MM)	10 - 60
No. 30 - (600 Microns)	0 – 15

* A drying temperature of 110°C ± 5°C should be used.

Tolerance of 5 percentage points on the maximum value of the range for each sieve except 1/2" (12.5 mm) and 3/8" (9.5 mm) sizes, on which no tolerance will be allowed.

REQUIREMENTS - ITEM #2 – TREATED DEICING SALT, AS SPECIFIED (Cont'd)

SECTION A (Cont'd)

A.4 MOISTURE CONTENT

Moisture content shall not exceed 1-1/2%* when determined as follows: % Moisture = (WI - W2) / (Wi) X 100

Where: WI = Initial weight of sample

W2 = Weight of sample after drying to a constant weight at 110°C ± 5°C.

* Procedure shall be in accordance with American Water Works Association B200-88, Section 4.3. A tolerance of 0.5% will be allowed before a non-complying product - moisture - price deduction is assessed.

A.5 SAMPLING

Sampling shall be done in accordance with current ASTM-D632. The County of Ocean, or any of its authorized representatives, reserves the right to take samples from the contractor's stockpile or transfer point.

A.6 ACCEPTANCE

The salt may be rejected if it fails to conform to any of the requirements of this specification.

SECTION B

MAGNESIUM CHLORIDE WITH OBPE

Material used for this component of the finished product shall be a 1 to 1 blend of liquid magnesium chloride and liquid Patent #4,676,918 or equivalent sufficient to allow the finished material to meet the specific requirements and performance criterion listed below.

Note Well: Sections B1 and B2 apply only to products offered that do not have a Beneficial Use Determination (BUD) from New Jersey Department of Environmental Protection. *HOWEVER, ALL PRODUCTS MUST CONTAIN 250 PPM OR LESS PHOSPHORUS WITH OR WITHOUT BENEFICIAL USE DETERMINATION, NO DILUTIONS ALLOWED PRIOR TO PHOSPHORUS TESTING.*

B.1 Bids may not be accepted on any product that contains constituents in excess of the following established total concentration limits as tested in accordance with the listed test methodology noted in Test Section. Results are stated as Parts per Million (ppm). If product exceeds any of the following constituents then the bidder shall identify the exception(s) and explain any mitigating circumstances. The County reserves the right to evaluate these exceptions and make a determination of product eligibility based on the best interests of the County.

Phosphorus	250.00 ppm	Chromium	0.50 ppm
Cyanide	0.20 ppm	Cadmium	0.20 ppm
Arsenic	5.00 ppm	Barium	10.00 ppm
Copper	4.00 ppm	Selenium	5.00 ppm
Lead	1.00 ppm	Zinc	10.00 ppm
Mercury	0.05 ppm		

B.2 pH - The pH of submitted liquid chemical products shall be 6-8. The pH limit of liquid chemical products may be waived by the County of Ocean. The right to waive the pH will be at the discretion of the County of Ocean. The County of Ocean decision to waive the pH requirement shall be in the best interest of the County and shall be final.

REQUIREMENTS - ITEM #2 – TREATED DEICING SALT, AS SPECIFIED (Cont'd)

SECTION B (Cont'd)

B.3 Material shall contain 15% MgCl2 by weight plus or minus 2%

B.4 Material shall contain 21% plus or minus 2% Patent #4,676,918 or equivalent to produce a final material having a eutectic (freezing) point of -20°F or lower.

B.5 A table showing Freezing Point-Specific Gravity for various percentage dilutions of product in water shall be provided. Table shall include data starting from at least 5% product in water and continue to include the percentage product in water to produce the eutectic (lowest freezing point) composition.

B.6 A 3% solution of the corrosion inhibited chemical product shall have a corrosion value of at least 70% less than that of a 3% solution of Sodium Chloride. (Determined by NACE (National Association of Corrosion Engineers) - Standard TM-01-69 as modified by PNS (Pacific Northwest Snow-fighters).

B.7 This chemical product shall not contain greater than 4.0% (V/V) Total Settleable Solids and shall have ninety nine percent (99.0%) of the Solids Passing through a Number 10 sieve after being stored at -17.8°C +/- 1°C (0°F +/- 2°F) for 168 hours.

SECTION C

MIXING THE SODIUM CHLORIDE AND MAGNESIUM CHLORIDE/OBPE

The materials described in Section A and Section B above shall be mixed as described in this section to produce the finished product. Mixing procedures shall comply with all requirements described in this section.

C.1 The County of Ocean, or any of its authorized representatives, reserves the right to take samples from the contractor's stockpile or transfer point before the salt is mixed with the Liquid Magnesium Chloride/ liquid Patent #4,676,918. Both salt and liquid samples may be taken.

C.2 The contractor will thoroughly mix a minimum of 8 gallons of Liquid Magnesium Chloride/Toth per ton of salt.

C.3 The Contractor will ensure a consistent thorough mix (e.g. spray system, pugmill, conveyor) so that there is maximum coverage of the liquid on the salt crystals (loader mixing and stockpile injection methods are not acceptable) and will specify the mix method in the bid.

C.4 Trucks must be weighed on certified scale with printout after loading the final product (salt and liquid mixture) and prior to delivery destination. The weight ticket shall include the net weight of the final product and the stockpile source. The certification must bear the weighmaster's signature. Handwritten weights are not acceptable.

C.5 All shipments of finished product shall be accompanied by a ticket indicating the amount of Liquid Magnesium Chloride/Toth mixed in the finished product. This amount will be indicated on the ticket by Gallons. The amount of gallons shall be recorded by a printing device or handwritten.

REQUIREMENTS - ITEM #2 – TREATED DEICING SALT, AS SPECIFIED (Cont'd)

SECTION C (Cont'd)

C.6 The finished product shall be shipped via bulk delivery. Trucks delivering the mixture shall have the entire cargo area completely covered by a waterproof tarpaulin or similar sheeting material. Torn or ripped covers may be cause for rejection of the shipment.

C.7 The County of Ocean reserves the right to, at any time, inspect the operation to take salt and liquid samples, to ensure that the proper amount of liquid is being applied and that the mix method is appropriate.

SECTION D

FINAL PRODUCT: ROCK SALT TREATED WITH LIQUID MAGNESIUM CHLORIDE/TOTH PATENTED

The Treated Salt shall meet the following requirements:

D.1 CONTAMINATION
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.

D.2 FLOWABILITY
Properly stored product (covered or inside storage) shall be uniform and free flowing in a manner consistent with its intended use and shall show no objectionable clumping or caking.

D.3 LEACHING
Properly stored product (covered or inside storage) shall show no indication of objectionable leaching or separation of components to the extent that such condition produces adverse effects in the handling or usage of the product or routine maintenance of the storage facility.

D.4 CHEMICAL COMPOSITION
Shall be not less than 91.2% Sodium Chloride. Percent of Sodium Chloride shall be determined as follows: Apparent total % Sodium Chloride content shall be determined in accordance with current ASTM-D-632. Magnesium and Calcium content shall be determined in accordance with ASTM E-534 and computed as % Magnesium Chloride and % Calcium Chloride respectively. % Sodium Chloride shall then be computed as follows:

% Sodium Chloride = % Apparent Sodium Chloride - (% Magnesium Chloride + % Calcium Chloride)

REQUIREMENTS - ITEM #2 – TREATED DEICING SALT, AS SPECIFIED (Cont'd)

SECTION D (Cont'd)

D.5 SIZE GRADING

The salt, when tested using sieves as described in ASTM-C-136 (*) shall conform to the following requirements for particle size distribution:

SIEVE SIZE	PERCENT PASSING
1/2" - (12.5 MM)	100
3/8" - (9.5 MM)	95 – 100
No. 4- 14.75 MM)	20 – 90
No. 8 - (2.36 MM)	10 – 60
No. 30 - (600 Microns)	0-15

* A drying temperature of 110°C ± 5°C should be used.

Tolerance of 5 percentage points on the maximum value of the range for each sieve except 1/2" (12.5 mm) and 3/8" (9.5 mm) sizes, on which no tolerance will be allowed.

D.6 MOISTURE CONTENT

Moisture content shall not exceed 4.8% when determined as follows: % Moisture = (WI - W2) / (W1) X 100
Where: WI = Initial weight of sample
W2 = Weight of sample after drying to a constant weight at 110°C± 5°C.

*NOTE: Procedure shall be in accordance with American Water Works Association B200-88, Section 4.3. A tolerance of 0.5% will be allowed before a non-complying product - moisture - price deduction is assessed.

D.7 SAMPLING

Sampling shall be done in accordance with current ASTM-D632. The County of Ocean, or any of its authorized representatives, reserves the right to take samples from the contractor's stockpile or transfer point.

D.8 ACCEPTANCE

The treated salt may be rejected if it fails to conform to any of the requirements of this specification.

Reduced Price/Ton = Delivered Contract Price x (1.00 - Y)
Where: Y = the decimal equivalent of the total % out of gradation. The %out of tolerance for each sieve shall be to the nearest 1%. The total of the individual sieve tolerance deviations shall be used as Y.

D.9 CORROSION RATING OF TREATED SALT

A 3% solution of the treated salt product shall have a corrosion value of at least 50% less than that of a 3% solution of Sodium Chloride. (Determined by NACE (National Association of Corrosion Engineers) - Standard TM-01-69 as modified by PNS (Pacific Northwest Snowfighters)

DELIVERIES

Contractor certifies that all deliveries shall be made within forty-eight (48) hours after contact has been made. Non-compliance with this clause may lead to rescission of contract.

The Deicing Salt is to be delivered by truck in no less than twenty (20) ton quantities.

The Deicing Salt shall be delivered as specified by the Road Supervisor to points in Ocean County, which include, but are not limited to:

- Jackson Garage, 38 Don Connor Boulevard, Jackson, NJ 08527
- Lacey Garage, Dover & Mule Road, Forked River, NJ 08731
- Lakewood Garage, 1300 East Kennedy Boulevard, Lakewood, NJ 08701
- Plumsted Garage, 273 Lakewood Road, Plumsted, NJ 08533
- Manchester Garage, 2820 Ridgeway Blvd., Manchester, NJ 08759
- Manahawkin Garage, 379 Haywood Road, Manahawkin, NJ 08050
- Ship Bottom Garage, 6th & Barnegat Avenue, Ship Bottom, NJ 08008
- Toms River Garage, 152 Chestnut Street, Toms River, NJ 08753

Additional locations may be designated by the County Road Department Director, as needed.