I. SCOPE

This method describes the specific inspection, sampling and testing procedures for the quality assurance of Sodium Chloride Crushed Rock Salt and Solar Salt (Type A). This method also applies to salt procured through OGS Purchase Groups 01800, 32000, and 32100. Several kinds of salt are normally purchased, including:

- untreated rock salt
- untreated solar salt
- treated rock salt with magnesium chloride liquid deicer
- treated rock salt with liquid deicer plus an organic based performance enhancer

Example situations are used here to illustrate the desired sampling rates and to determine the quantity of material involved in any price reductions. Procedures for obtaining representative salt samples are contained in Appendix A, and laboratory testing is covered in Appendix B.

II. CONTENTS

I. Scope .........................................................................................................................1
II. Contents ....................................................................................................................1
III. General Method .......................................................................................................2
IV. Definitions ...............................................................................................................2
V. Forms .......................................................................................................................3
VI. Sampling ................................................................................................................3
VII. Product Suitability .................................................................................................5
VIII. Delivery Requirements .......................................................................................5
IX. Price Reductions .......................................................................................................6
Appendix A ..................................................................................................................7
Appendix B ...................................................................................................................9
III. GENERAL METHOD

The Department maintains quality control by random inspection, sampling and testing of the final delivered product. Delivery trucks should be inspected (and cleaned if necessary) prior to loading to prevent contamination of salt loads by residual materials found in the truck bodies. Upon inspection, the material shall be uniform in appearance, free flowing and free from visible evidence of contamination from foreign matter, including: dirt, stone, chips, trash or any other material that could reasonably be expected to interfere with the use, handling or storage of the salt.

Any loads found to be contaminated may be subject to rejection, with all the related cleanup and/or replacement costs borne by the supplier. Furthermore, any loads that appear wet or poorly graded may be sampled and tested by the Department at their discretion, at Contractor’s expense.

IV. DEFINITIONS

a. Manufacturer – A company engaged in the mining and production of salt, or any of its treatments.

b. Supplier/Contractor – A company or individual to whom the OGS contract (or portion thereof) for salt has been awarded.

c. Department – The New York State Department of Transportation.

d. Materials Bureau – A facility of the Department of Transportation which may be contacted by mailing to:

Director, Materials Bureau
New York State Department of Transportation
Materials Bureau, Mail POD 3-4
50 Wolf Road
Albany, NY  12232

or by telephone at (518) 457-4576, or by fax at (518) 457-8171.

e. Office of Transportation Maintenance – A facility of the Department of Transportation which may be contacted by mailing to:

Director, Office of Transportation Maintenance
New York State Department of Transportation
50 Wolf Road  POD 5-1
Albany, NY  12232

or by telephone at (518) 457-6435, or by fax at (518) 457-4203.
f. **Stockpile, Department** – A supply or reserve of salt delivered to the destination points prescribed in the contract proposal.

g. **Stockpile, Supplier** – A larger supply or reserve of salt, stocked by a supplier at various locations both in and out of state.

h. **Lot** – A quantity of salt, used by the Department for the purpose of accepting, rejecting or adjusting price of delivered salt. This quantity may involve a whole order or a portion thereof. *Usually considered to be one day’s worth of material.*

i. **Truck Sample** – A small quantity of salt, properly taken from a truck delivery, which will be representative of the entire truckload.

j. **Stockpile Sample** – A small quantity of salt, properly taken from a stockpile, which will be representative of the entire stockpile, or portion thereof.

V. **FORMS**

The following form is published and issued by the Department for use by their designated representatives:

Form R 243B, Salt Sampling Record – This form accompanies the salt sample throughout its test cycle. The form is completed by the individuals responsible for the sampling, testing and documentation. Instructions for its use are contained in Appendix A. Note that gradation spec range has changed, and also the “Regional” Computations are now “Residency” computations. The 2.0 % maximum moisture content applies to untreated rock salt, 3.0 % for solar salt, and 5.3 % for treated rock salt.

VI. **SAMPLING**

This section is intended to describe several sampling scenarios that would most likely be encountered. The first part of this section describes the general policy for sampling, while the second part gives example cases.

A.) **General Policy**

Any sampling process encompasses four factors:

a.) The rate at which samples should be taken.

b.) Where the samples should be taken.

c.) When the samples should be taken and

d.) How the samples should be taken.
The rate at which samples are taken is primarily determined by how accurate the answer must be to make the required decision. The sampling rate for salt can be viewed from two different levels:

- The Statewide or Region rate, expressed as sample per ton. This rate controls the maximum effort devoted to the task.
- The Residency or Department Stockpile rate.

This Stockpile rate is described via a case method approach to fit individual situations. Ideally, by applying the individual approaches at the Residency level, each Region should develop the same region sampling rate.

The minimum Statewide or Region sampling rate should be one sample per 500 tons of delivered salt (about every 20 trucks). This rate represents a reasonable value in terms of the protection it offers the State in buying salt. As mentioned above, this rate is of value only in monitoring the overall region and statewide effort. A higher sample rate would be taken in cases where the material being delivered did not appear to meet specifications.

“Where” the samples are taken depends on the product and the process. In the case of salt, since the delivery process can be a vital factor in determining the quality of the product, it is generally desirable to sample at the delivery destination. “When” the sample is taken is generally influenced by the practical aspects of the sampling situation. The sample should be taken from the Department stockpile immediately after completion of the day’s delivery or within 24 hours. If this is not practical, samples may be taken from the delivery vehicle before it unloads or while it is unloading, if safe to do so. The Department reserves the right to sample and inspect when circumstances warrant. “How” to sample bulk products, such as salt, is a difficult procedure. However, it is important that the procedures outlined in this Materials Method be followed to insure that truly representative samples are taken.

B.) Case Method Approach

The following examples are intended to describe the desired sampling plans, in terms of practical situations.

Example 1: At a stockpile location remote from the Residency, 300 tons of salt is ordered and will be delivered in one day. The weather is good with no precipitation, and the stockpile is either placed in a storage shed or covered as soon as it is completed. If personnel were available on this day the sample could be taken from the stockpile after completion of the delivery. If personnel are not available until after the stockpile is complete, the pile can be sampled after it has been built and within a 24 hour period after the last truck load has been delivered, so long as the pile remains adequately protected. The sample taken represents the entire stockpile quantity. Any necessary rebate action shall be applied to the entire stockpile quantity.
Example 2: The same as example 1, except that it is impossible to sample either the trucks or the pile until four days after it was built. The pile may be sampled if so desired, but no rebate action can be based on the test results since it is no longer reasonable to presume that the sample is representative of what was delivered, as more than 24 hours has elapsed since the last truck load was delivered.

Example 3: Same as example 1, except that material is being delivered during precipitation and it is impractical to obtain a representative stockpile sample. Truck samples may be taken. If any of these samples fail, any penalties occurring may only be applied to the truck loads from which the failing samples were taken.

Example 4: A large stockpile, 5000 tons, is being built at a Residency location. It takes 10 days to build the pile. There are two ways to sample in this situation:

a.) each day’s addition to the stockpile could be sampled from the exposed faces as a stockpile, or
b.) the entire stockpile could be sampled after completion.

Method (b.) is the least desirable method since it depends upon good weather prevailing during the buildup period and good covering practice being maintained. If this option is elected, the price reduction is only applied to the quantity of salt delivered on the tenth day. If option (a.) is selected, the price reduction action is applied to the quantity of material which was delivered on the day the sample was taken.

VII. PRODUCT SUITABILITY

Deviation from specifications may result in rejection of any delivery. All costs associated with rejected deliveries will be the responsibility of the contractor. Should a product be found to be contaminated (after application, with non-specified elements) and become cause for environmental concerns that necessitate clean-up of yards, storage facilities, or roadsides, etc., the contractor shall be responsible for any and all expenses incurred.

All shipments of treated 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. The certification must bear the weigh master’s signature; weights shall be recorded from a scale equipped with a weight printing device.

VIII. DELIVERY REQUIREMENTS

Product shall be shipped in bulk delivery. All shipments of product shall be totally covered with a waterproof tarpaulin or similar sheeting material. Torn or ripped coverings may be cause for rejection of shipment. Also, evidence of free flowing water/brine in particular shipments may be cause for rejection.
Salt shall be received in a free-flowing and usable condition. Sampling shall be done in accordance with current ASTM D632. The Department reserves the right to take the samples from the contractor’s stockpile or transfer point or from shipments at the point of destination. The right is also reserved to consider truckloads of treated salt delivered by the contractor to any one agency on a single day to be a single delivery. Penalties imposed because of deviation from specifications may be imposed on the total day’s delivery. The treated salt may be rejected if it fails to conform to any of the requirements of this specification.

IX. **PRICE REDUCTIONS – (NONCOMPLYING PRODUCT)**

A.) **MOISTURE CONTENT**

1.) If the moisture content of untreated rock salt is found to be above 2.0%, a deduction for moisture content will be made from the delivered bid price based on the following formula:

\[
\text{Reduced Price/Ton} = \text{Delivered Contract Price/Ton} \times (1.02 - 2X)
\]

where: \(X = \) Moisture content of the sample (expressed as the decimal equivalent of the percentage of the original sample weight to the nearest 1%)

2.) If the moisture content of treated rock salt is found to be above 5.3%, a deduction for moisture content will be made from the delivered bid price based on the following formula:

\[
\text{Reduced Price/Ton} = \text{Delivered Contract Price/Ton} \times (1.053 - 2X)
\]

where: \(X = \) Moisture content of the sample (expressed as the decimal equivalent of the percentage of the original sample weight to the nearest 1%)

3.) If the moisture content of solar salt is found to be above 3.0%, a deduction for moisture content will be made from the delivered bid price based on the following formula:

\[
\text{Reduced Price/Ton} = \text{Delivered Contract Price/Ton} \times (1.03 - 2X)
\]

where:
\(X = \) Moisture content of the sample (expressed as the decimal equivalent of the percentage of the original sample weight to the nearest 1%)

B.) **GRADATION (Particle Size Distribution)**

If, after delivery, the gradation of the untreated rock salt, solar salt or treated salt is found to be out of tolerance, a deduction from the price shall be made based on the following formula:
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.

C.) CONTAMINATION

If the Department accepts contaminated salt for operational reasons, a 10% non-complying price deduction may be placed on the contractor.

APPENDIX A

FORM INSTRUCTIONS

The Salt Sampling Record form (R 243B) is printed on a three-part pressure sensitive paper. Several individuals or offices are involved in the processing of the Salt Sampling Record form. To help clarify the portion of the form that each of the parties involved are usually responsible for, it has been divided into three sections as follows:

1. The SAMPLE INFORMATION section will be filled in by the sampler at a Residency Shop. Both the sample and the R 243B form are then forwarded to the Regional Materials Engineer.

2. The Regional Materials Office performs the Gradation and Moisture Content tests, and records that information under the Test Information section of the form. The Regional Materials Engineer keeps the pink copy of the form for his records and returns the white and yellow copies to the test Requestor.

3. The Residency will then perform the price reduction calculations in the section of the form entitled RESIDENCY COMPUTATIONS. The Residency will then make the appropriate adjustments to the payment voucher. Copies of the form are to be attached to the invoices, and delivery tickets affected by the price reduction are to be kept in the Residency.

4. A copy of the Salt Sampling Record form is to be made available to the salt supplier upon request.

5. The quantity that the Price Reduction is applied to is described earlier under SAMPLING.
New York State Department of Transportation

**SALT SAMPLING RECORD:**

(Mineral Crushed Rock Salt: Untreated Rock Salt, Treated Rock Salt & Solar Salt)

**Region:**

**Residency:**

**Delivery Location:**

**Sample Type:**

**Sample Taken From:**

- [ ] Truck
- [ ] Unloaded Truck
- [ ] Stockpile

**Sample Date:**

**Supplier:**

**Bid Price Per Ton:**

- [ ] F.O.B. $__
- [ ] Delivered

**Total Quantity Sampled:**

**Supplier’s Invoice No.:**

**Supplier’s Order No.:**

**Invoice Date:**

**D.O.T. Purchase Order No.:**

**Delivery Ticket Numbers of Salt Being Sampled:**

**Test Date:**

**Tester:**

---

**Moisture Test:**

- **Specification:**
  - Max. 1.5% for Untreated Rock Salt, 4.5% for Treated Rock Salt, 2.5% for Solar Salt

- **Initial Weight of Sample:**

- **Weight After Drying:**

- **Difference (A-H):**

  - **Moisture Content:**
    
    \[ \text{Moisture Content} = \frac{C \times 100}{A} \%

- **Gradation Test:**

- **Salt Type:**
  - [ ] Untreated Rock Salt
  - [ ] Treated Rock Salt
  - [ ] Solar Salt

**Test Information:**

<table>
<thead>
<tr>
<th>Sieve</th>
<th>Weight Retained</th>
<th>Individual % Retained</th>
<th>Cumulative % Passing (100 - Cum. %)</th>
<th>Specification Range (Cumulative, Treated) (Cum. % PASS)</th>
<th>Specification Range (Solar Salt) (Cum. % PASS)</th>
<th>% Out of Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4&quot;</td>
<td>N/A</td>
<td>100</td>
<td>100</td>
<td>0 - 15 *</td>
<td>0 - 15 *</td>
<td>0%</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>100</td>
<td>95 - 100</td>
<td>95 - 100</td>
<td>20 - 80 *</td>
<td>20 - 80 *</td>
<td>0%</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>N/A</td>
<td>95 - 100</td>
<td>95 - 100</td>
<td>10 - 60 *</td>
<td>10 - 60 *</td>
<td>0%</td>
</tr>
<tr>
<td>5/8&quot;</td>
<td>20 - 80 *</td>
<td>20 - 80 *</td>
<td>20 - 80 *</td>
<td>0 - 15 *</td>
<td>0 - 15 *</td>
<td>0%</td>
</tr>
<tr>
<td>No. 4</td>
<td>10 - 60 *</td>
<td>10 - 60 *</td>
<td>10 - 60 *</td>
<td>0 - 15 *</td>
<td>0 - 15 *</td>
<td>0%</td>
</tr>
<tr>
<td>No. 8</td>
<td>20 - 80 *</td>
<td>20 - 80 *</td>
<td>20 - 80 *</td>
<td>0 - 15 *</td>
<td>0 - 15 *</td>
<td>0%</td>
</tr>
<tr>
<td>No. 30</td>
<td>0 - 15 *</td>
<td>0 - 15 *</td>
<td>0 - 15 *</td>
<td>0 - 15 *</td>
<td>0 - 15 *</td>
<td>0%</td>
</tr>
<tr>
<td>Pan</td>
<td>0 - 15 *</td>
<td>0 - 15 *</td>
<td>0 - 15 *</td>
<td>0 - 15 *</td>
<td>0 - 15 *</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Information for samples failing moisture and/or gradation:**

- **Total Moisture Content If Greater Than 2.0% for Untreated Rock Salt**

- **3.0% for Solar Salt**

**Total % Out of Specification If Failing Gradation:**

**Total % Deduction (Sum of A-B):**

**Information Reviewed By:**

- **MC:**
  - Reduced Price/ Ton (Treated Rock Salt greater than 5.53% MC) = Delivered Contract Price/ Ton x (1.053 - X)
  - Reduced Price/ Ton (Untreated Rock Salt greater than 3.5% MC) = Delivered Contract Price/ Ton x (1.03 - X)

  - Reduced Price/ Ton (Solar Salt greater than 3.5% MC) = Delivered Contract Price/ Ton x (1.03 - X), where X is MC of sample expressed as the decimal equivalent of the percentage of the dry sample weight to the nearest 1%.

**Grad:**

- Reduced Price/ Ton (Untreated, Treated, Solar Salt) = 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.

**MC:**

- **Contract Price/ Ton x Calculated % Reduction** = Reduced Price/ Ton

**Grad:**

- **Contract Price/ Ton x Calculated % Reduction** = Reduced Price/ Ton

**Total Delivered Contract Price (less) Total Penalty Price** = Total Reduced Price
APPENDIX B

SAMPLING PROCEDURES FOR
SODIUM CHLORIDE CRUSHED ROCK SALT AND SOLAR SALT- TYPE A

I. SCOPE

The importance of proper salt sampling from the standpoint of quality control and acceptance cannot be overemphasized. It is the intent of this section to prescribe procedures for obtaining salt samples that will be representative of a lot, or portion thereof, for the purposes of accepting, rejecting or applying price reductions to delivered salt. Methods for obtaining samples from both truck shipments and stockpiles are presented.

II. GENERAL

Only samples of delivered salt, which will be used to build the Department's stockpile, will be used in price reduction determinations. The sample may be, as described herein, a truck sample at the point of discharge or a Department stockpile sample.

Department stockpile samples are preferable to the other sampling methods. There may be some instances when a sample may be taken at the supplier’s stockpile. This may occur when Department vehicles pick up salt at the suppliers stockpile for immediate use or when a supplier requests that his stockpile be sampled. When the former occurs, a sample may be taken from the suppliers stockpile and will be considered as representative of the lot, or portion thereof, for the purposes of price reduction determinations. When the latter occurs (supplier requests that his pile be sampled) the sample will be considered as being for informational purposes only. Suppliers requesting that their stockpiles be sampled should be given as much cooperation as is practicable.

III. SAMPLING PROCEDURES

A. Sampling at Point of Discharge

Samples may be obtained while the truck is discharging or "dumping" its load. A total of 5 increment samples should be taken throughout the unloading operation with a shovel or bucket. The total of the 5 increment sample size should approximate 5-10 pounds. The shovel or bucket should be passed through the salt stream, and at such times during the unloading process, so as to insure a representative sample. The sample shall be immediately placed in the plastic bag, the top twisted and a "tie" used to insure air-tightness. The fact that a sample has been taken should be noted on the
delivery ticket. The R 243B form and sample shall then be transmitted to the Residency Office.

NOTE: Caution should be exercised by those individuals obtaining samples at the point of discharge. Be certain that the truck operator knows that you are collecting a sample. Do not place yourself in such a position that the salt is liable to be dumped upon you and always remain clear of the tailgate. It is strongly recommended that a second person be present to act as a “spotter”.

B. Samples taken from a Pile (Department and Supplier)

A Pile can be a stockpile or a freshly unloaded pile from a truck. Under most conditions a pile will tend to segregate. To obtain a representative sample of the entire pile, increment samples should be taken from at least three locations: top, bottom and intermediate points as shown in Figure 1.

![Figure 1 - Increment Sample Locations](image)

At each sampling point, the face or surface of the pile should be exposed to a minimum depth of one foot. Care should be taken to insure that salt adjacent to the sampling point does not fall into the sampling area. This is best done by inserting a rigid board or other suitable item above the sampling point as shown in Figure 2.
The sample should be taken and bagged with a shovel or other suitable device. The total sample size for the three increment locations should approximate 5-10 pounds. The salt sampling record form should be transmitted as per the procedures outlined earlier.

Note that if the piles are large (approximately 10,000+ tons) the number of locations should be increased, but the increment locations (top, middle, bottom) should remain the same.