

# Material and Application Guide

## 2NS Natural Sand – Highland



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**Material:** Natural Sand

**Product:** MDOT – 2NS

**Location:** American Aggregate, Highland Plant – State Pit #63-114

**Applications:** Fine aggregate in portland cement concrete  
Filter sand in septic fields  
Pipe bedding and backfill  
General fill

**Description:** A graded fine aggregate, produced by washing and screening natural sand. A yellow to light brown material formed by the natural abrasion and disintegration of rocks by glacial or riverbed action. The particles are sized from  $\frac{3}{8}$ " (9.5mm) to #200 mesh (75 $\mu$ m).



**2NS Natural Sand – Actual size shown**

## Specifications: Michigan Department of Transportation

2NS Natural Sand conforms to all the requirements of Michigan Department of Transportation "2012 Standard Specifications for Construction", section 902 "Aggregates"

## Gradation:

U.S. Sieve	3/8"	#4	#8	#16	#30	#50	#100	LBW
Metric Sieve	9.5mm	4.75mm	2.36mm	1.18mm	600 $\mu$ m	300 $\mu$ m	150 $\mu$ m	
Specification	100	95-100	65-95	35-75	20-55	10-30	0-10	0-3.0
Avg. Gradation	<b>100</b>	<b>99</b>	<b>87</b>	<b>66</b>	<b>45</b>	<b>16</b>	<b>3</b>	<b>0.3</b>

## Physical Properties:

- Fineness Modulus, F.M. – 2.83 (Specification 2.60 – 3.00)
- ASTM C 29, Loose Unit Weight – 109 lb/ft<sup>3</sup>
- ASTM C 29, Rodded Unit Weight – 115 lb/ft<sup>3</sup>
- ASTM C 128, Bulk Specific Gravity Dry – 2.64
- ASTM C 128, Bulk Specific Gravity SSD – 2.67
- ASTM C 128, Absorption – 1.0%
- ASTM C 123, Light Weight Particles (Coal and Lignite) in Aggregate – 0.2%
- ASTM C 142, Clay Lumps and Friable Particles in Aggregate – 0.7%
- ASTM C 88, Soundness of Aggregate by Use of Sodium Sulfate – 4% loss
- ASTM C 40, Organic Impurities in Fine Aggregate for Concrete < 1
- ASTM C 1252, Uncompacted Void Content, Method A – 38.4%
- MTM 118, Fine Aggregate Angularity – 1.7

## General Usage Guide:

The 2NS Natural Sand should be blended into the concrete mixture along with the cement, coarse aggregate, water, admixtures and any special additives in the proportions detailed in the mix design. Care needs to be taken to ensure that the mix water is adjusted to compensate for 2NS Natural Sand moisture.

## Field Estimating Quantities:

	Blast Furnace Slag Coarse Aggregate	Limestone Coarse Aggregate	Natural Gravel Coarse Aggregate
Typical 2NS sand requirements per 1 cy. yd. of 3500 PSI concrete	1350 – 1450 lbs	1200 – 1350 lbs	1200 – 1350 lbs

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