

# N.U.Q.Q.

## NEW ULM QUARTZITE QUARRIES

### 2011 PRODUCT QUALITY TEST SUMMARY

**PRODUCT: 3/4" CLEAN, (3/4" x #4)**

### GRADATION

NUMBER OF TESTS PERFORMED: 25

DATE OF LAST TEST: 06/23/2011

SIEVES (millimeters in parentheses)	MNDOT SPEC LIMITS FOR CA-5	MNDOT SPEC MEDIAN FOR CA-5	N.U.Q.Q. RUNNING AVERAGE	SAMPLE STANDARD DEVIATION ABOUT RUNNING AVERAGE	N.U.Q.Q. PRODUCTION WORKING RANGE	% OF FOUR CONSECUTIVE TESTS INSIDE OF WORKING RANGE
1.0" (25.0)	100%	100%	100.0%	0.0%	100%	100.0%
0.75" (19.0)	85% - 100%	92.5%	100.0%	0.0%	100%	100.0%
0.5" (12.5)			75.6%			
0.375" (9.5)	30% - 60%	45.0%	41.9%	5.9%	36% - 48%	95.2%
#4 (4.75)	0% - 10%	5.0%	3.9%	1.2%	3% - 5%	81.0%

3/4" Clean will meet A.S.T.M. #67 specification for gradation.

NOTE: VALUES INDICATE THE PERCENT BY WEIGHT PASSING SQUARE OPENING SIEVES.

### GENERAL QUALITY

QUALITY PARAMETERS	N.U.Q.Q. RUNNING AVERAGE	MNDOT SPEC LIMITS	NOTE
NON 'CLASS A' MATERIAL BY WEIGHT:	3.2%	10.0% MAX.*	SANDSTONE
L.A.R. ABRASION LOSS, (A.S.T.M. C131-89):	39.6%	40% MAX.	TOUGHNESS
MAGNESIUM SULFIDE LOSS, (A.S.T.M. C88-90 - 5 CYCLES):	< 10.0%	15% MAX.	SOUNDNESS
FLAT & ELONGATED PARTICLES, (A.S.T.M. D-4791):	0.0%	10.0% MAX.	3:1 RATIO
SPECIFIC GRAVITY, (A.S.T.M. C127-88):	2.63 / 2.66 / 2.64	N/A	BULK / APPARENT / SSD
ABSORPTION IN BULK SAMPLE, (A.S.T.M. C126):	< 0.7%	N/A	POROSITY
UNIT WEIGHT, PCF, (A.S.T.M. C29):	88.4 / 82.3	N/A	DRY RODDED / LOOSE
VOIDS, %, (A.S.T.M. C29):	46.0% / 49.8%	N/A	DRY RODDED / LOOSE
FREEZE THAW DURABILITY, (A.S.T.M. 666 METH. A, 306 CYCLES):	88.5% / 0.006%	N/A	RDME / LENGTH CHANGE
A.S.R. EXPANSION, (A.S.T.M. C-1260-94 @ 14 DAYS):	0.220%		A.S.R. REACTIVITY
200 MESH, (75 MICRON), MATERIAL, (A.S.T.M. C117-90):	0.1%	0.8% MAX.	SURFACE DUST

\* MAXIMUM NON 'CLASS A' MATERIAL FOR M.N.D.O.T. 3137 CLASS C AGGREGATE SPECIFICATION: 10.0%.

QUARTZITE AGGREGATES CONTAIN NO SHALE, IRON OXIDE, SLATE, UNSOUND CHERT OR CLAY BALLS.

3/4" Clean meets all M.N.D.O.T. 3137 'Class C'  
quality specifications for concrete aggregate and, when applicable, meets MNDOT QA/QC  
bonus criteria for < 15% carbonate in the 'Class C'.

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SAMPLES AVAILABLE UPON REQUEST