

## 2023 Spring Regional Meetings



Melissa Ehrhart  
Statewide Geologist  
Division of Materials and Tests  
April 10, 11, and 20, 2023



## Updates

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- Specification Changes
- Indiana Test Methods
- Other



## Specification Updates

- September 2022
- Minor clarification added to 904.04(f) - Riprap.

### (f) Sizes of Riprap

Gradation Requirements					
Percent Smaller					
Size, in.	Revetment	Class 1	Class 2	Uniform A	Uniform B
30			100		
24		100	85 - 100		
18	100	85 - 100	60 - 80		
12	90 - 100	35 - 50	20 - 40		
8				100	
6	20 - 40	10 - 30	0 - 20	35 - 80	95 - 100
3	0 - 10	0 - 10	0 - 10		35 - 80
1				0 - 20	0 - 20
Depth of Riprap, min.	18 in.	24 in.	30 in.		

 NextLevel  
INDIANA

## Specification Updates - 904.04(f) Riprap



The maximum dimension of individual pieces shall not be greater than three times the minimum dimension *and no dimension shall exceed the maximum size listed for the respective size of riprap.*

The riprap will be visually inspected for size, shape, and consistency.

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## Specification Updates

- November 2022
  - No. 53 Dense Graded Coarse Aggregate
  - Adjusted allowable upper limit passing the No. 200 sieve from 10% to 13%.
    - After months of discussion between IMAA and INDOT.
    - Deemed easier to produce and compact
  - Effective for use beginning with June 2023 lettings (Testing Memo 22-03 allows its use on active contracts)

## Specification Updates

- Change is on No. 200 sieve

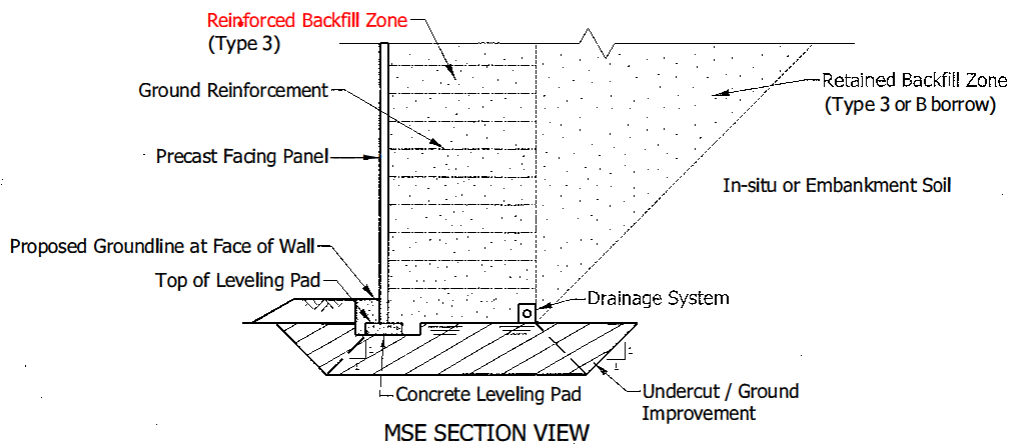
Sieve Sizes	Dense Gr
	53 <sup>(1)</sup>
4 in. (100 mm)	
3 1/2 in. (90 mm)	
2 1/2 in. (63 mm)	
2 in. (50 mm)	
1 1/2 in. (37.5 mm)	100
1 in. (25 mm)	80 - 100
3/4 in. (19 mm)	70 - 90
1/2 in. (12.5 mm)	55 - 80
3/8 in. (9.5 mm)	
No. 4 (4.75 mm)	35 - 60
No. 8 (2.36 mm)	25 - 50
No. 16 (1.18 mm)	
No. 30 (600 μm)	12 - 30
No. 200 (75 μm) <sup>(2)</sup>	5.0 - 10/13.0 <sup>(4)</sup>
Decant (PCC) <sup>(3)</sup>	
Decant (Non-PCC)	
Decant (SC)	

# Specification Updates

- January 2023
  - Structure Backfill Type 3 (MSE Walls) Changes
    - Effective with **September 1, 2023** contracts (the 2024 spec book)
    - **No. 4 structure backfill NO LONGER ALLOWED in the REINFORCED ZONE**
      - (this is NOT retroactive and does not apply to contracts let before September 1, 2023.)
    - Allowable Materials: structure backfill nominal size 1 in. or 1/2 in., or coarse aggregate Nos. 5, 8, 9, 11, 12, or AASHTO No. 57.

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# MSE Section



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# MSE Section Specification Updates

- Problems addressed:



Loss of Backfill



Subsidence due to loss of backfill



# MSE Section Specification Updates

- Problems addressed:



Bulging Panels



Failure



## Indiana Test Method (ITM) Updates

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- ITM 210 – Class AP Coarse Aggregate
- ITM 219 – Acceptance Procedures of Steel Furnace Slag for Deleterious Materials

## Indiana Test Method (ITM) Updates

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- ITM 210
  - Added gradation table for when maximum particle size is 1-1/2 in. in the preparation of test sample section.
    - (The gradation table remained the same when the maximum particle size is 1 in.)

## Indiana Test Method (ITM) Updates

### • ITM 210

- 8.1 **Coarse Aggregate.** The sample shall be separated into the required sieve sizes in accordance with AASHTO T 27. Depending on the maximum particle size of the material, the quantity from each sieve size shall be recombined to obtain the following gradation:

Maximum particle size of 1-1/2 inch.

Sieve Size	Percent Passing
1-1/2 in.	100
1 in.	95
3/4 in.	70
1/2 in.	45
3/8 in.	20
No. 4	0

## Indiana Test Method (ITM) Updates

### • ITM 219

- Added/clarified language in the Sample Preparation section regarding how the sample is to be reduced to the testing size.

- 9.1 Reduce the sample in accordance with AASHTO R 76-16 (Standard Practice for Reducing Samples of Aggregate to Testing Size) to a sample size of  $1500 \pm 50g$  and decant the sample in accordance with AASHTO T 11.

## Other Topics

### • District Geologists (Some New Faces)

LaPorte District Geologist –  
Jaia Montgomery



Fort Wayne District Geologist –  
Kenneth Ray



Crawfordsville District Geologist –  
Amanda Duchek



Greenfield District Geologist –  
Aaron Aldred

Vincennes District Geologist –  
Ryan Young

Seymour District Geologist –  
Chris Bell



## Other Topics

### • December 2022 - Certified Aggregate Producers Product List (aka the CAPP D-list, or D-List)

- Now available online on the QPL page

- Notice any Errors or Omissions?

Please contact Bart Williamson and copy the respective  
INDOT District Geologist

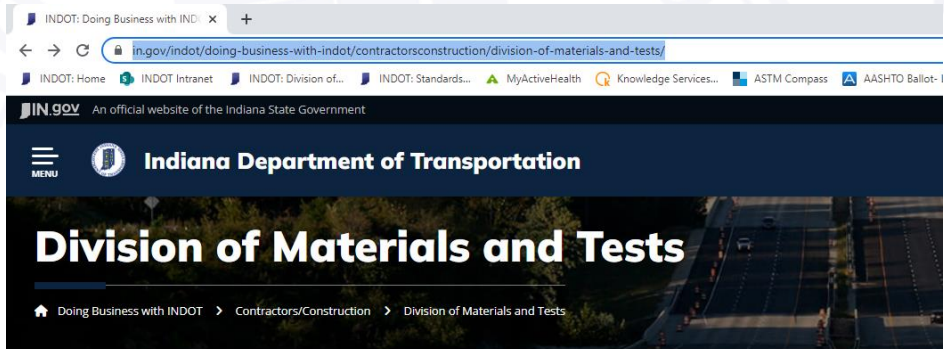
[BartWilliamson@indot.IN.gov](mailto:BartWilliamson@indot.IN.gov)





# Other Topics

• D-List



INDOT strives to develop, inspect, and test materials used to construct and maintain highways, thereby ensuring the mos

## Qualified Products and Sources



- [Qualified Products Lists & Qualified Sources Lists](#)  
A listing of qualified products and sources that meet INDOT specifications for immediate use on INDOT Contracts.
- [Qualified Hot Mix Asphalt Design Labs](#)  
A listing of HMA design laboratories qualified to perform design work for INDOT projects.
- [Ready Mixed Concrete Plants](#)



# Certified Aggregate Producers Product List

Qualified Products Lists & Qualified Source Lists	
List Name	Specification/ITM
<a href="#">ADA Compliant Work Zone Devices</a>	801.03 & 923.09
<a href="#">Anti-Adhesive Materials</a>	409.03(b)
<a href="#">Asphalt Emulsion Suppliers</a>	902.01(b) & ITM 593
<a href="#">Automated Flagger Assistance Devices</a>	923.08
<a href="#">Cable Barrier Systems</a>	627-R-546
<a href="#">CCF Manufacturers/Installers</a>	216
<a href="#">Cement Sources</a>	901.01(b)2d
<a href="#">Certified Aggregate Producers</a>	917 & ITM 211
<a href="#">Certified Aggregate Producers Product List, CAPP D-List</a>	917 & ITM 211
<a href="#">Certified Hot Mix Asphalt Producers</a>	401, 402, 410 & ITM 583
<a href="#">Certified Precast Concrete Producers</a>	907.05 & ITM 813
<a href="#">Certified Precast Prestressed Concrete Producers</a>	707.02 & ITM 814



# Certified Aggregate Producers Product List

CAR#	Dist#	NAME	CITY/STATE	Q#	D#	Status	Size/Spec	Ledges	Comments	District	Brand Name for AASHTO/Spec Project	Mat. Code for AASHTO/Spec Project	Source ID for AASHTO/Spec Project	Material Code Name	Brand Length
0021	0021	ROCK CREEK STONE QUARRY	BLUFFTON, IN	042273	D18100	AP	8APFCS	101-103, 201-202, 301-305		FT WAYNE	8APFCS, 101-103, 201-202, 301-305	304P00030	AGG00021	CA, Class AP, CS, 8	35
0021	0021	ROCK CREEK STONE QUARRY	BLUFFTON, IN	042273	D18000	A	#9ICS	101-103, 201-202, 301-303	Dolomite	FT WAYNE	#9ICS, 101-103, 201-202, 301-303, Dolomite	304P00700	AGG00021	CA, Class A, CS, 9	43
0021	0021	ROCK CREEK STONE QUARRY	BLUFFTON, IN	042273	D18000	B	#3TICS	101-103, 201-202, 301-303	Dolomite	FT WAYNE	#3TICS, 101-103, 201-202, 301-303, Dolomite	304P01371	AGG00021	CA, Class B, CS, 11-SC	45
0021	0021	ROCK CREEK STONE QUARRY	BLUFFTON, IN	042273	D18500	D	#53ICS	101-103, 201-202, 301-305		FT WAYNE	#53ICS, 101-103, 201-202, 301-305	304P02710	AGG00021	CA, Class D, CS, 53	35
0021	0021	ROCK CREEK STONE QUARRY	BLUFFTON, IN	042273	D14500	D	#73ICS	101-103, 201-202, 301-305		FT WAYNE	#73ICS, 101-103, 201-202, 301-305	304P02370	AGG00021	CA, Class D, CS, 73	35
0041	0041	U.S. AGGREGATES, INC.	CLOVERDALE, IN	0052246	D09100	AP	8APFCS	3-403.3		CRAWFORDSVILLE	8APFCS, 3-403.3	304P00030	AGG00041	CA, Class AP, CS, 8	17
0041	0041	U.S. AGGREGATES, INC.	CLOVERDALE, IN	0052246	D09300	A	#1TICS	3-403.3		CRAWFORDSVILLE	#1TICS, 3-403.3	304P00710	AGG00041	CA, Class A, CS, 11	17
0041	0041	U.S. AGGREGATES, INC.	CLOVERDALE, IN	0052246	D09400	D	#2ICS	3-403.3		CRAWFORDSVILLE	#2ICS, 3-403.3	304P02650	AGG00041	CA, Class D, CS, 2	16
0041	0041	U.S. AGGREGATES, INC.	CLOVERDALE, IN	0052246	D09600	F	Revelment P/rap/CS	3-403.3		CRAWFORDSVILLE	Revelment P/rap/CS, 3-403.3	304P05470	AGG00041	CA, Class F, CS, Revelment P/rap	30
0041	0041	U.S. AGGREGATES, INC.	CLOVERDALE, IN	0052246	D17700	F	Class P/rap/CS	3-403.3		CRAWFORDSVILLE	Class P/rap/CS, 3-403.3	304P05500	AGG00041	CA, Class F, CS, Class P/rap	28
0041	0041	U.S. AGGREGATES, INC.	CLOVERDALE, IN	0052246	D17700	F	Class P/rap/CS	3-403.3		CRAWFORDSVILLE	Class P/rap/CS, 3-403.3	304P05530	AGG00041	CA, Class F, CS, Class P/rap	28
0041	0041	U.S. AGGREGATES, INC.	CLOVERDALE, IN	0052246	D09600	F	Uniform P/rap/CS	3-403.3		CRAWFORDSVILLE	Uniform P/rap/CS, 3-403.3	304P05555	AGG00041	CA, Class F, CS, Uniform P/rap	21
0041	0041	U.S. AGGREGATES, INC.	CLOVERDALE, IN	0052246	D18200	NA	Reveal Filter	3-403.3	Per Contract	CRAWFORDSVILLE	Reveal Filter, 3-403.3 Per Contract	304P06210	AGG00041	FA, CS, 16	37
0045	2481	Milestone Concrete North, Inc.	SOUTH BEND, IN	0052248	D22500	D	#2ICS	Level 1, Ledge II	Dig S/c 2481	LA PORTE	#2ICS, Level 1, Ledge II, Dig S/c 2481	304P02550	AGG00045	CA, Class D, CS, 2	36
0045	2481	Milestone Concrete North, Inc.	SOUTH BEND, IN	0052248	D22500	D	#53ICS	Level 1, Ledge II	Dig S/c 2481	LA PORTE	#53ICS, Level 1, Ledge II, Dig S/c 2481	304P02710	AGG00045	CA, Class D, CS, 53	40
0045	2791	Milestone Concrete North, Inc.	SOUTH BEND, IN	0052248	D17500	D	#2BF		Dig S/c 2791	LA PORTE	#2BF, Dig S/c 2791	304P02980	AGG00045	CA, Class D, BF, 2	22
0045	2451	Milestone Concrete North, Inc.	SOUTH BEND, IN	0052248	D19450	D	#53BF		Dig S/c 2451	LA PORTE	#53BF, Dig S/c 2451	304P03040	AGG00045	CA, Class D, BF, 53	23
0045	2791	Milestone Concrete North, Inc.	SOUTH BEND, IN	0052248	D17500	D	#53BF		Dig S/c 2791	LA PORTE	#53BF, Dig S/c 2791	304P03040	AGG00045	CA, Class D, BF, 53	23
0056	0056	MILESTONE RECYCLED - PLANT 43	LAFAYETTE, IN	0052250	D09420	D	#53BB/Recycled PCC		See 203.18 Restrictions	CRAWFORDSVILLE	#53BB/Recycled PCC, See 203.18 Restrictions	304P00000	AGG00056	B-Brown	46
0056	0056	MILESTONE RECYCLED - PLANT 43	LAFAYETTE, IN	0052250	D09420	D	#53BB/Recycled PCC		See 203.18 Restrictions	CRAWFORDSVILLE	#53BB/Recycled PCC, See 203.18 Restrictions	304P05310	AGG00056	CA, CS, Recycled PCC, 53	46
0056	0056	MILESTONE RECYCLED - PLANT 43	LAFAYETTE, IN	0052250	D11710	NA	TSBMS			CRAWFORDSVILLE	TSBMS	304P06820	AGG00056	Structural Basefill, 25mm (1")	11
0056	0056	MILESTONE RECYCLED - PLANT 43	LAFAYETTE, IN	0052250	D11710	NA	#45BNS			CRAWFORDSVILLE	#45BNS	304P06820	AGG00056	Structural Basefill, 25mm (1")	11
0057	0057	SOUTH LAKE STONE	HEBRON, IN	0162278	D17000	NA	EBrown			LA PORTE					
0057	0057	SOUTH LAKE STONE	HEBRON, IN	0162278	D16100	AP	8APFCS	201-302, 303		LA PORTE					
0057	0057	SOUTH LAKE STONE	HEBRON, IN	0162278	D16300	A	#6ICS	201-302, 303		LA PORTE					
0057	0057	SOUTH LAKE STONE	HEBRON, IN	0162278	D16700	A	#1TICS	201-302, 303		LA PORTE					
0057	0057	SOUTH LAKE STONE	HEBRON, IN	0162278	D16700	A	GA1TICS	201-302, 303		LA PORTE					

**Errors? Contact Bart Williamson and the District Geologist**

## Summary of Production Quality Results (Sum Qual)

- The letter changed format around 2018 and remained this way for about 4 years.
- Beginning in May 2022, INDOT returned to the pre-2018 format but with a few changes.
  - Continued the 2018 no effective dates on the Sum Quals, follows the ITM 203 Table II.
  - No signature, just has a line indicating the INDOT reviewer



December 13, 2020

Source #1234  
Attn: Joe McDough  
Rocky Start  
120 Rocky Road  
Taratula, IN 12345

(2018-2022 format)

Subject: Summary of Production Quality Results Letter

Dear Mr. McDough:

Testing is complete and results are attached for 2020 samples of the following products:

Sample ID	Ledges	Product	Class
R19-7-1234-12345	L1-10	8 Stone	A
R19-7-1234-12346	L1-10	11 Stone	A
R19-7-1234-12347	L1-10	24 St. Sand	NA

This is a category II source, subcategory B. These results indicate passing results for the specific products at the quality classification shown at the time the samples were taken. Passing results from physical quality tests, in accordance with INDOT Standard Specifications 904.02 and 904.02(a), are required per Frequency for Sampling and Testing of Source Production Quantities as outlined in ITM 203 Table II. The Source is responsible for producing these products in accordance with Indiana Test Methods, the QCP, and the Standard Specifications in the interim between quality samples. Please keep this letter and attached results on file at your source.

Sincerely,

James Reilman  
State Materials Engineer

Enclosure: results

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# New Sum Qual Format



INDIANA DEPARTMENT OF TRANSPORTATION  
DIVISION OF MATERIALS AND TESTS  
SUMMARY OF PRODUCTION QUALITY RESULTS

JANUARY 4, 2023

LAB NUMBER	DATE SAMPLED	SIZE NUMBER	REMARKS	1234		Q012345		FT LOSS PCT	QUAL RTNG
				BULK SP.G.	ABS PCT	LA WEAR PCT	BRINE LOSS PCT		
R22-7-1234-23456	09-15-22	8 STONE	LEDGES 1-10	2.528	2.34	30.5		1.5	A
R22-7-1234-23457	09-15-22	11 STONE	LEDGES 1-10	2.646	1.21	26.8		2.2	A
R22-7-1234-23458	09-15-22	24 ST. SAND	LEDGES 1-10	2.612	1.65			7.2	NA

THIS IS A CATEGORY I SOURCE, SUBCATEGORY B.

THESE RESULTS INDICATE PASSING RESULTS FOR THE SPECIFIC PRODUCTS AT THE QUALITY CLASSIFICATION SHOWN AT THE TIME THE SAMPLES WERE TAKEN. PASSING RESULTS FROM PHYSICAL QUALITY TESTS, IN ACCORDANCE WITH INDOT STANDARD SPECIFICATIONS 904.02 AND 904.03(A), ARE REQUIRED PER FREQUENCY FOR SAMPLING AND TESTING OF SOURCE PRODUCTION QUALITIES AS OUTLINED IN ITM 203 TABLE II. THE SOURCE IS RESPONSIBLE FOR PRODUCING THESE PRODUCTS IN ACCORDANCE WITH INDIANA TEST METHODS, THE QCP, AND THE STANDARD SPECIFICATIONS IN THE INTERIM BETWEEN QUALITY SAMPLES. PLEASE KEEP THIS LETTER AND ATTACHED RESULTS ON FILE AT YOUR SOURCE.

Reviewed by M. Ehrhart

(2022 - present format)



# AP Letter Updates



February 2, 2021

Source #1234  
Rocky Start  
120 Rocky Road  
Taratula, IN 11111

Attn: Joe McDough

Subject: Status of Coarse Aggregate for use in Slab-on-Grade  
Concrete Applications (Class AP Aggregate)

Dear Mr. McDough:

Testing has been completed on the #8 Crushed Stone coarse aggregate from Ledges 1 - 10 for determination of Class AP classification, under laboratory report number R20-7-1234-1234E.

The average of the test results for the three beams indicate the percentage of change was -0.008.

In accordance with the below noted retest criteria, the subject material meets the requirements for all concrete slab-on-grade applications. RESAMPLING WILL BE PERFORMED ON OR BEFORE 10/26/2023.

Resampling criteria for Class AP freeze-thaw test results:

Elongation (20 cycles)	Relative Condition	Retesting Schedule
0.010% or less	Passes	Retest 3 yrs.
0.010 to 0.045%	Passes	Retest 2 yrs.
0.046 to 0.060%	Marginal Pass	Retest 1 yr. (approx)
0.061 to 0.075%	Marginal Failure	Retest 1 yr. (approx)

Note: Some crushed stone and slag sources may be granted a five year resample period if justified by historical test results.

In accordance with section 2.0 of Indiana Test Method 210, we are in receipt of the Production Control Plan for implementation of this procedure. Any deviation from the Production Control Plan shall be cause for reclassification of the material back to a Class A rating.

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If your aggregate is classified as an AP material, the following items are required to be addressed in your CAPP Quality Control Plan:

1. Stockpiles of AP approved materials are required to be separated from other materials. AP 8's should be separated by another grade of material to prevent confusion.
2. The AP stockpile must be readily identifiable by a sign. In the case of crushed stone, the contributing ledges must be kept for easy reference.
3. AP aggregate delivered to concrete plants must be so identified on the aggregate weigh ticket.

If adding or deleting an AP material, a QCP Annex should be immediately submitted to the District Materials and Tests Engineer for approval and upon approval included in the Appendix of the QCP.

Please contact the Division of Materials & Tests with any questions.

Sincerely,

James Reilman  
State Materials Engineer



# New AP Format 2022 - Current



February 2, 2023

Source #1234  
Rocky Start  
120 Rocky Road  
Taramula, IN 11111

Attn: Joe McDough

Subject: Status of Coarse Aggregate for use in Slab-on-Grade  
Concrete Applications (Class AP Aggregate)

Dear Mr. McDough:

Testing has been completed on the #8 Ledges 1-10 sampled on **11/04/2022** for determination of Class AP classification, under laboratory report number R22-7-1234-12349.

The average of the test results for the three beams indicates the percentage of change was **-0.007**. **This result is valid until subsequent test results are available.**

The subject material meets the requirements for all concrete slab-on-grade applications. **Note: THE #8 LEDGES 1-10 AT THIS SOURCE WILL BE RESAMPLED AND TESTED IN ONE YEAR.**

Any deviation from the AP Production Control Plan shall be cause for reclassification of the material back to a Class A rating.

If your aggregate is classified as an AP material, the following items are required to be addressed in your CAPP Quality Control Plan:

1. Stockpiles of AP approved materials are required to be separated from other materials. AP #'s should be separated by another grade of material to prevent confusion.
2. The AP stockpile must be readily identifiable by a sign. In the case of crushed stone, the contributing ledges must be kept for easy reference.
3. AP aggregate delivered to concrete plants must be so identified on the aggregate weigh ticket.

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If adding or deleting an AP material, a QCP Annex should be immediately submitted to the District Testing Engineer for approval and upon approval included in the Appendix of the QCP.

Please feel free to contact the Division of Materials and Tests with any questions.

Sincerely,

James Reilman, PE  
State Materials Engineer

(2022 - present format)



# AP Letter Updates

February 2, 2021

Source #1234  
Rocky Start  
120 Rocky Road  
Taramula, IN 11111

Attn: Joe McDough

Subject: Status of Coarse Aggregate for use in Slab-on-Grade  
Concrete Applications (Class AP Aggregate)

Dear Mr. McDough:

Testing has been completed on the #8 Crushed Stone coarse aggregate from Ledges 1 - 10 for determination of Class AP classification, under laboratory report number R20-7-1234-12348.

The average of the test results for the three beams indicate the percentage of change was **-0.008**.

The subject material meets the requirements for all concrete slab-on-grade applications. **Note: THE #8 LEDGES 1-10 AT THIS SOURCE WILL BE RESAMPLED AND TESTED IN ONE YEAR.**

In accordance with the below noted retest criteria, the subject material meets the requirements for all concrete slab-on-grade applications. **RESAMPLING WILL BE PERFORMED ON OR BEFORE 10/28/2023.**

Resampling criteria for Class AP freeze/thaw test results:

Elongation (350 cycles)	Relative Condition	Testing Schedule
0.010% or less	Passes	Retest 3 yrs
0.010 to 0.045%	Passes	Retest 2 yrs
0.046 to 0.060%	Marginal-Pass	Retest 1 yr. (approx)
0.061 to 0.075%	Marginal-Failure	Retest 1 yr. (approx)

Note: Some crushed stone and slag sources may be granted a five-year resample period if justified by historical test results.

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In accordance with section 2.0 of Indiana Test Method 210, we are in receipt of the Production Control Plan for implementation of this procedure. Any deviation from the Production Control Plan shall be cause for reclassification of the material back to a Class A rating.



# INDOT Aggregate Specification Chart-Updated



INDOT strives to develop, inspect, and test materials used to construct and maintain highways, thereby ensuring the most efficient and effective p

## Qualified Products and Sources

- [Qualified Products Lists & Qualified Sources Lists](#)  
A listing of qualified products and sources that meet INDOT specifications for immediate use on INDOT Contracts.
- [Qualified Hot Mix Asphalt Design Labs](#)  
A listing of HMA design laboratories qualified to perform design work for INDOT projects.
- [Ready Mixed Concrete Plants](#)

## Publications & Manuals

- [Indiana Test Methods Index](#)  
Test Methods and Procedures developed by INDOT for use with INDOT Specifications.
  - [ITM 226: Review and Validation of CCAs Spreadsheet](#)
- [Frequency of Sampling and Testing Manual](#)  
This is the manual that outlines the Sampling and Testing requirements of materials for acceptance purposes on INDOT contracts.
  - [Highlighted Changes to the Frequency of Sampling and Testing Manual](#)  
There were many revisions in the 2023 manual. They are highlighted in this document for comparison.
- [Directive Index](#)  
Internal procedures developed by INDOT to direct testing activities.
- [Material Certification Guide](#)  
Directive 109
  - [Material Review Letter by INDOT PE/S](#)
  - [Material Review Letter by Consultant PE/S](#)
  - [2023 Aggregate Specification Chart](#)
  - [2023 Management Representative Letter](#)
  - [DMF Entry Reference Manual](#)  
Procedures for enrolling, accessing, and navigating the DMF Entry application.



# INDOT Aggregate Specifications Chart



## INDOT AGGREGATE SPECIFICATIONS 2023

Sieve Sizes	COARSE AGGREGATE SIZES (PERCENT PASSING)										
	COARSE GRADED							DENSE GRADED			
	2	5	8	9	11	12	43 <sup>(1)</sup>	91	93PG <sup>(2)</sup>	83 <sup>(1)</sup>	73 <sup>(1)</sup>
4 in. (100 mm)											
3 1/2 in. (90 mm)											
2 1/2 in. (63 mm)	100										
2 in. (50 mm)	80 - 100										
1 1/2 in. (37.5 mm)		100					100			100	
1 in. (25 mm)	0 - 25	85 - 98	100				70 - 90	100		80 - 100	100
3/4 in. (19 mm)	0 - 10	60 - 85	75 - 95	100			50 - 70			70 - 90	90 - 100
1/2 in. (12.5 mm)	0 - 7	30 - 60	40 - 70	60 - 85	100	100	35 - 50			98 - 100	95 - 80
3/8 in. (9.5 mm)		15 - 45	20 - 50	30 - 60	75 - 95	95 - 100				75 - 100	60 - 90
No. 4 (4.75 mm)		0 - 15	0 - 15	0 - 15	10 - 30	50 - 80	20 - 40			10 - 60	35 - 60
No. 8 (2.36 mm)		0 - 10	0 - 10	0 - 10	0 - 10	0 - 35	15 - 35			0 - 15	25 - 50
No. 30 (600 µm)						0 - 4	5 - 20			0 - 5	12 - 30
No. 200 (75 µm) <sup>(2)</sup>							0 - 6.0			5.0 - 13.0 <sup>(1)</sup>	5.0 - 12.0
Decant (PCCI) <sup>(3)</sup>		0 - 1.5	0 - 1.5	0 - 1.5	0 - 1.5	0 - 1.5				0 - 1.5	
Decant (Non-PCCI)		0 - 2.5	0 - 2.5	0 - 3.0	0 - 2.5	0 - 2.5	0 - 2.0			0 - 2.0	

Notes: 1. The liquid limit shall not exceed 25 (35 if slag) and the plasticity index shall not exceed 5. The liquid limit shall be determined in accordance with AASHTO T 89 and the plasticity index in accordance with AASHTO T 90.  
 2. Includes the total amount passing the No. 200 (75 µm) sieve as determined by AASHTOs T 11 and T 27.  
 3. Decant may be 0 - 2.5 for stone and slag.  
 4. When slag is used for separation layers as defined in 302.01, the total amount passing the No. 200 (75 µm) sieve shall be 10.0 to 12.0.  
 5. Pea gravel shall be generally uncrushed gravel, with a maximum of 20% crushed particles, and shall meet the gradation requirements of 93PG. Determination of crushed particles shall be made from the weight (mass) of material retained on the No. 4 (4.75 mm) sieve in accordance with ASTM D5621.



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