

# Overview of QC/QA Acceptance Program

Presented by

Robert C. Rea



QC / QA

/

QA



QC

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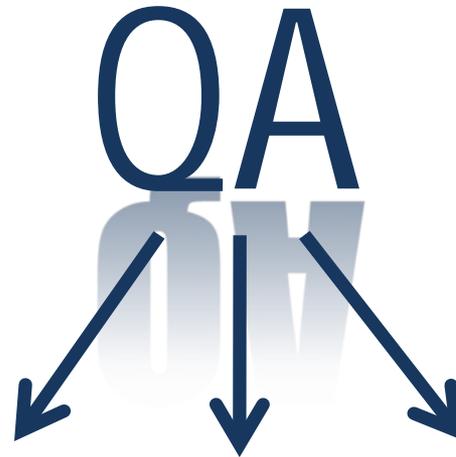
Quality Control

/

A single dark blue diagonal slash is positioned above a dark blue arrow pointing downwards.

Verification  
Testing

QA

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Independent  
Assurance  
Testing

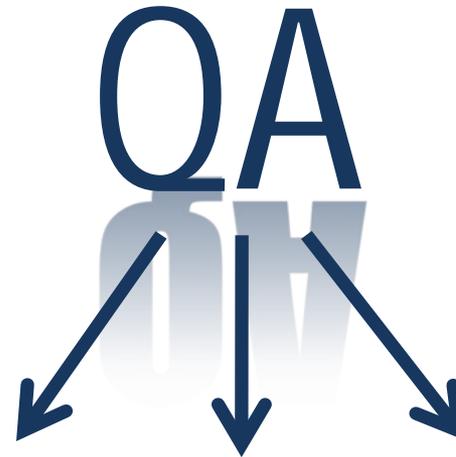
Certification  
Program for Testing  
and Sampling



Quality Control



Verification Testing



Independent Assurance Testing

Certification Program for Testing and Sampling

## Quality Control

QC



1. QC test results **are used** for the material's acceptance criteria, as specified in the contract

2. QC test results are **not used** for acceptance

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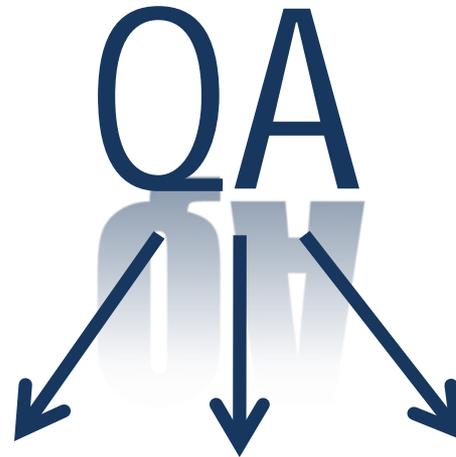
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Independent  
Assurance  
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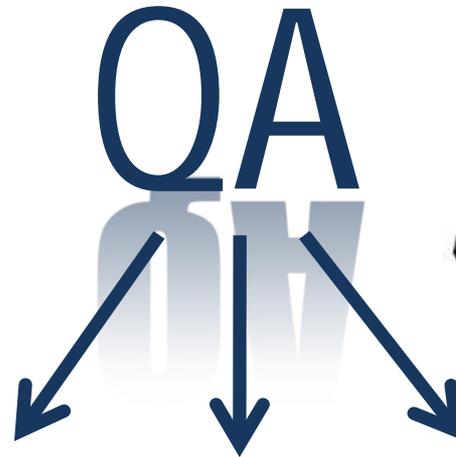
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Verification  
Testing

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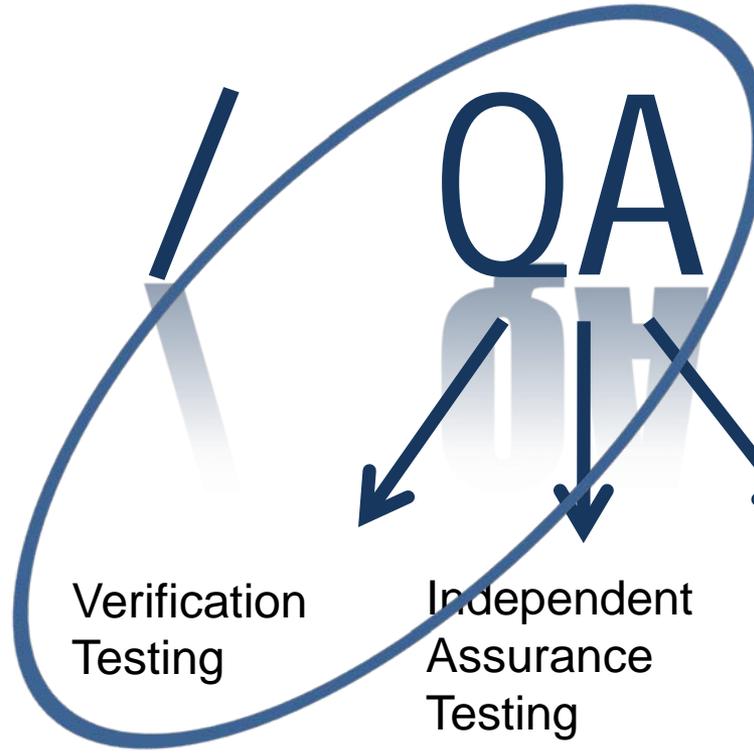
Independent  
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Testing



Certification  
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and Sampling

QC

Quality Control



# QA

## Verification Testing

1. Verifies Quality of the Material/Product  
and/or
2. Validates the Test Results Used for Acceptance

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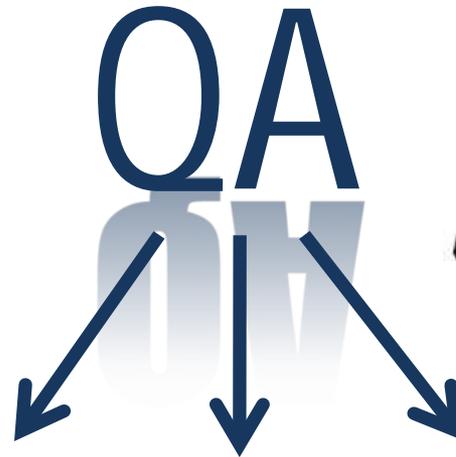
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Assurance  
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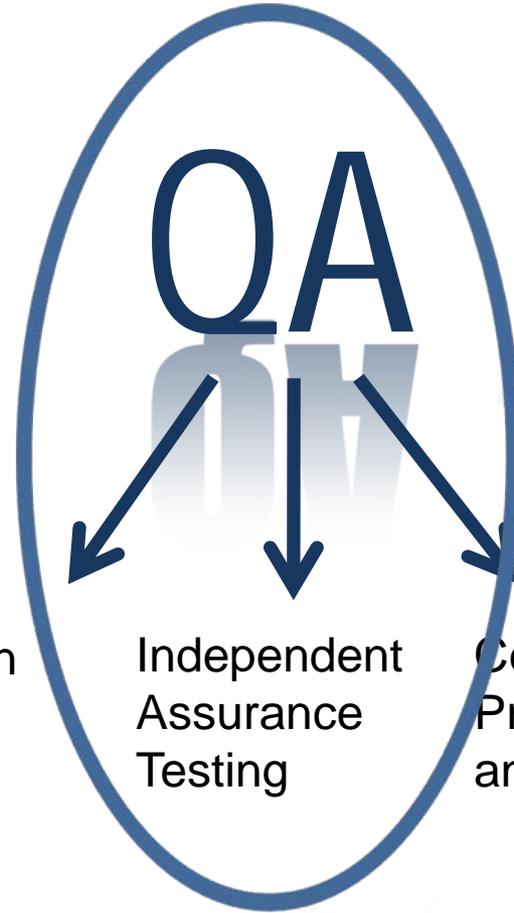
Certification  
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QC

Quality Control



Verification Testing



Independent Assurance Testing

Certification Program for Testing and Sampling



# QA

## **Independent Assurance Testing**

1. Annual Review – Each Tester and Equipment is Reviewed and Calibrated for each Discipline they are Certified for (Asphalt, Concrete, Soils, Aggregate)  
and
2. Test Validation ‘out of tolerance’ – The tester and the equipment for the specific test is reviewed

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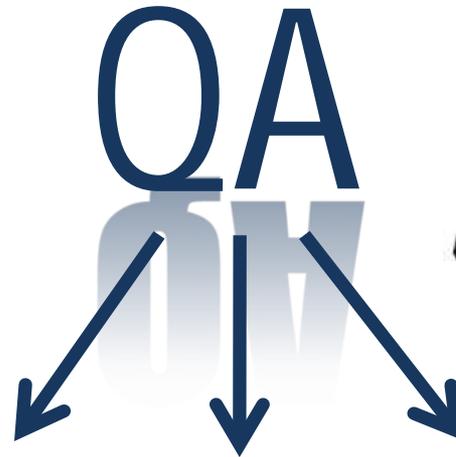
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Verification  
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Independent  
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Certification  
Program for Testing  
and Sampling

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Quality Control

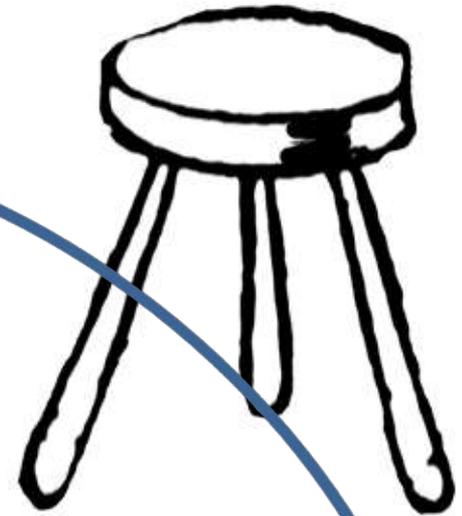
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Verification Testing

QA

Independent Assurance Testing

Certification Program for Testing and Sampling



# QA

## **Certification Program for Testing and Sampling**

1. Technicians Trained and Certified to perform tests
2. Technicians Trained and Certified to sample properly and provide chain of custody
3. Laboratories Accredited and/or Qualified to perform tests

# Lets Compare

- Asphalt Testing with QC Acceptance
- Concrete Aggregate Gradation with NDOR Field Testing for Acceptance
- Concrete Aggregates Quality with NDOR Central Lab Testing for Acceptance



# Lets Compare

- Asphalt Testing with QC Acceptance

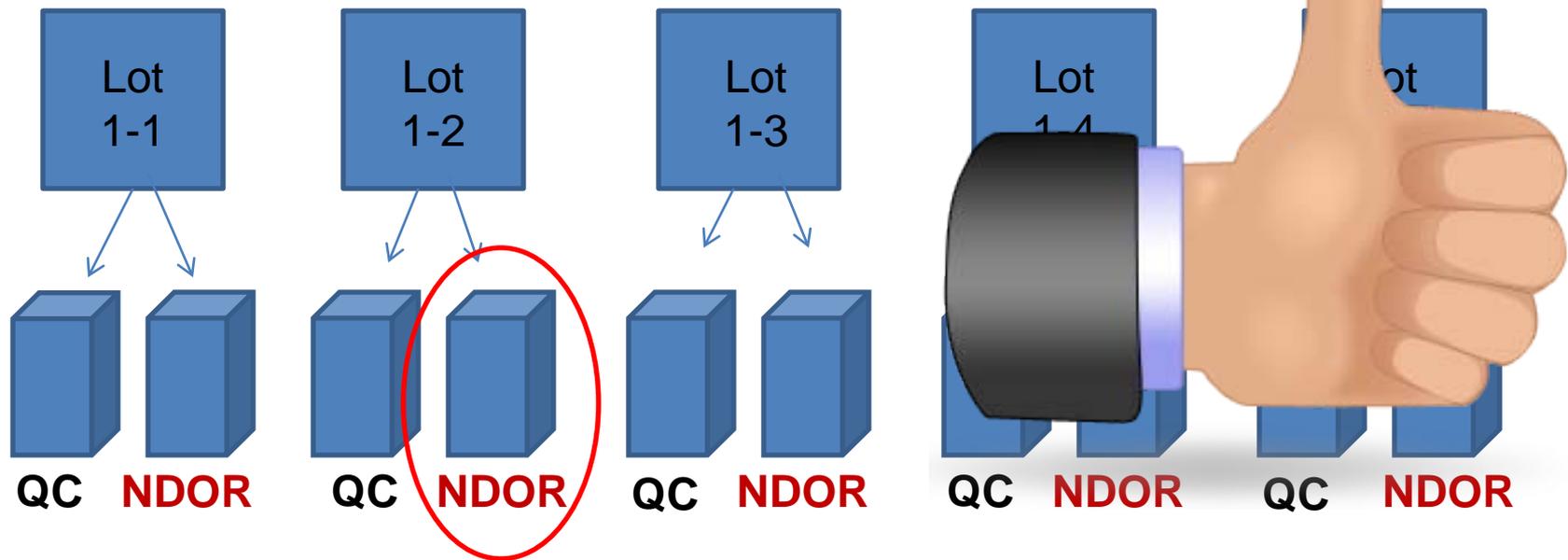
# Lets Compare

- Asphalt Testing with **QC Acceptance**

# Asphalt

**QC Tests are Accepted**

1 Lot = 5 Sublots → 750 Tons Each

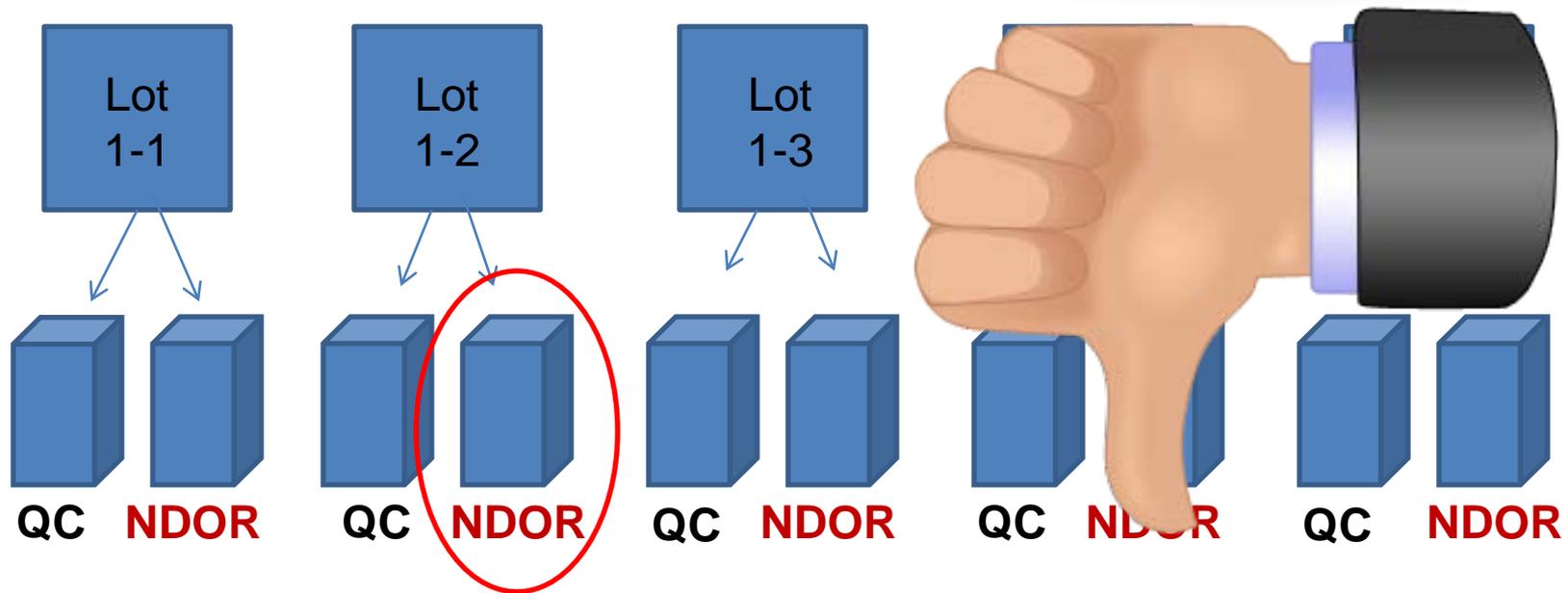


If Sublot 1-2 **Passes** Testing Tolerances for Air Voids and Angularity.....

# Asphalt

**QC Tests are Rejected and NDOR Test Results Take Over**

1 Lot = 5 Sublots → 750 Tons Each



If Sublot 1-2 **Fails** Testing Tolerances for Air Voids and Angularity.....

# Lets Compare

- Asphalt Testing with QC Acceptance
- Concrete Aggregate Gradation with NDOR Field Testing for Acceptance
- Concrete Aggregates Quality with NDOR Central Lab Testing for Acceptance



# Lets Compare

- Concrete Aggregate Gradation with NDOR Field Testing for Acceptance

# Lets Compare

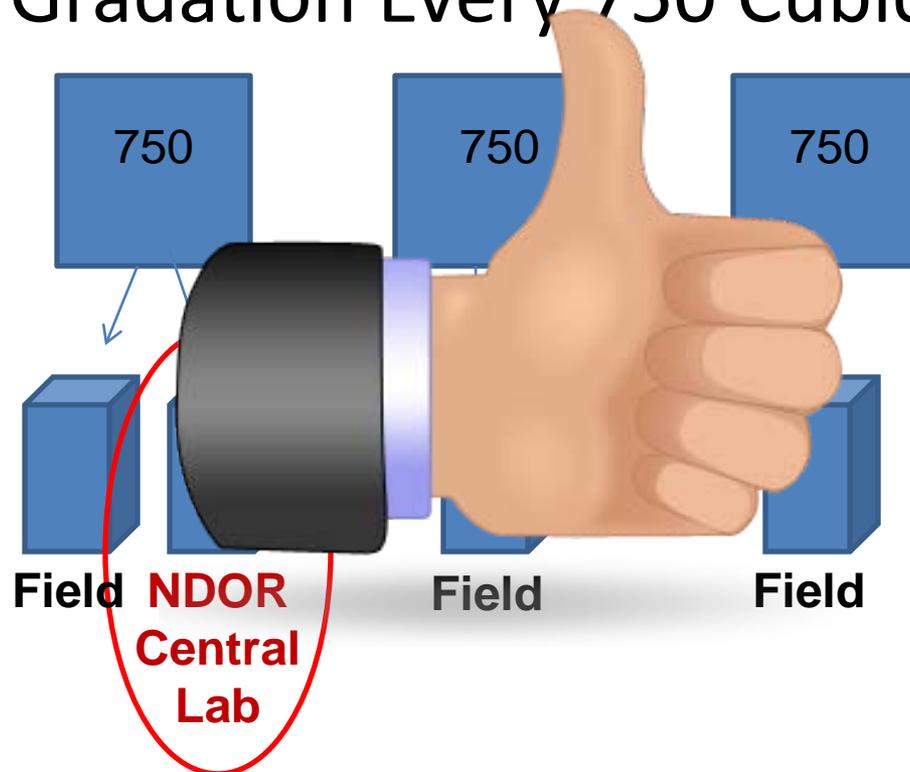
- Concrete Aggregate Gradation with **NDOR Field Testing for Acceptance**



# Concrete Aggregates Gradation

**Material is Accepted and Field Test Passes Validation**

1 Gradation Every 750 Cubic Yards



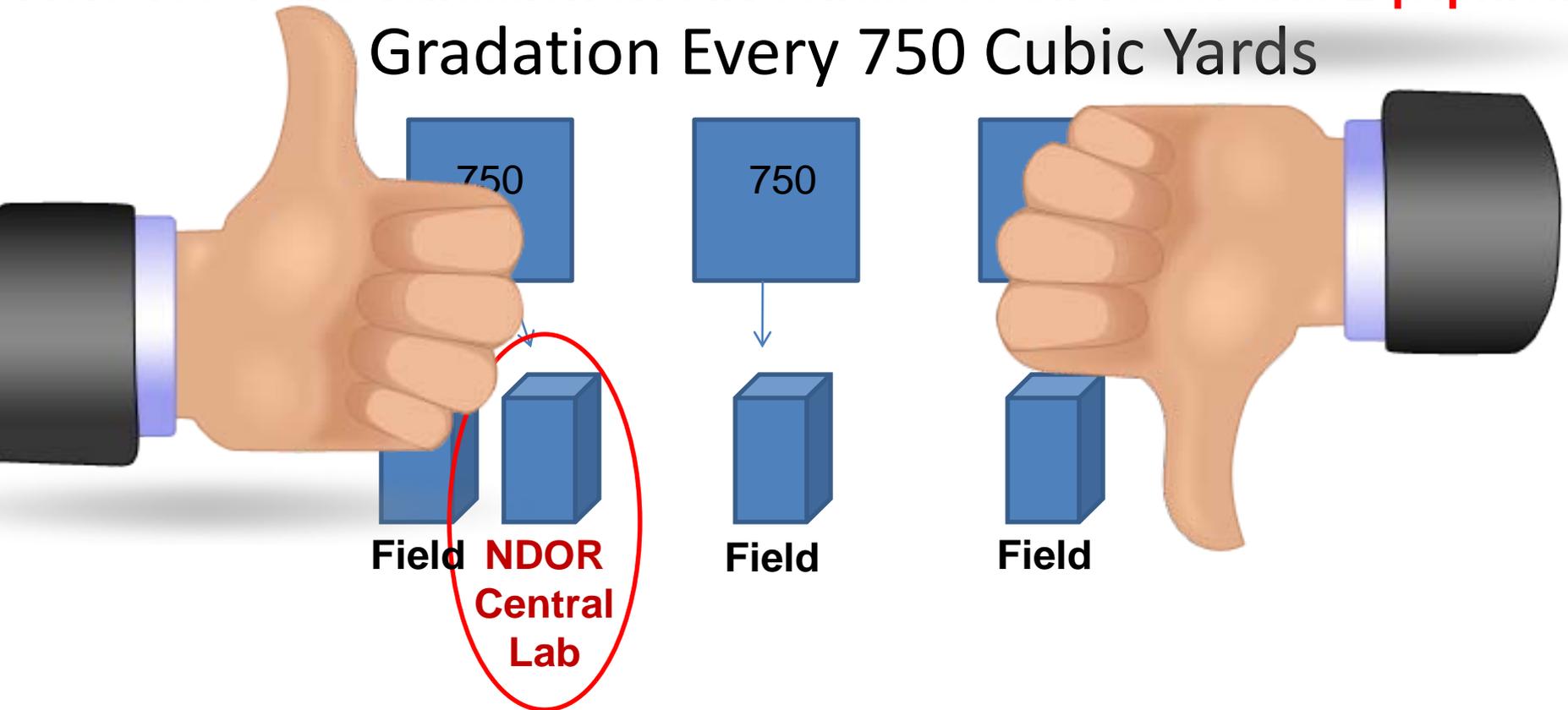
One Split Sample every 2250 Cubic Yards, if it **Passes** multi-laboratory precision for the gradation.....

# Concrete Aggregates Gradation

**Material is Accepted**

**Field Test Fails Validation and IA conducted on Tester and Equipment**

Gradation Every 750 Cubic Yards



One Split Sample every 2250 Cubic Yards, if it **Fails** multi-laboratory precision for the gradation.....

# Lets Compare

- Asphalt Testing with QC Acceptance
- Concrete Aggregate Gradation with NDOR Field Testing for Acceptance
- Concrete Aggregates Quality with NDOR Central Lab Testing for Acceptance



# Lets Compare

- Concrete Aggregates Quality with NDOR Central Lab Testing for Acceptance



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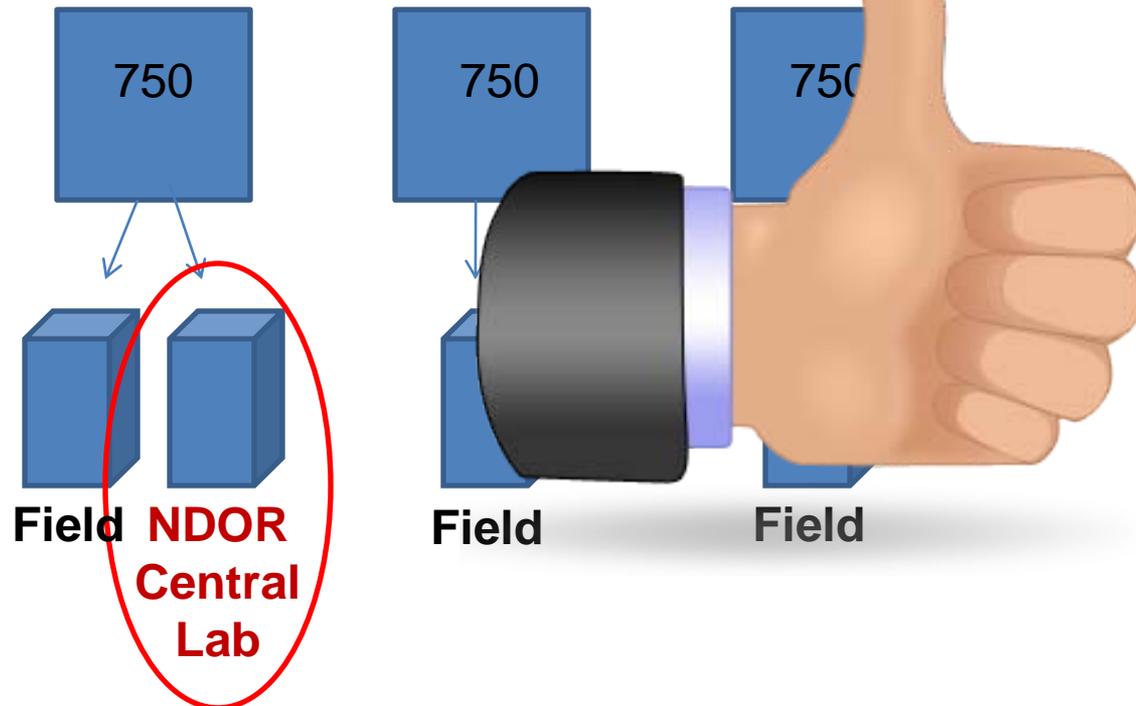
- Concrete Aggregates Quality with **NDOR Central Lab Testing for Acceptance**



# Concrete Aggregates Quality (soundness, abrasion)

**Material is Accepted**

1 Quality Test Every 2250 Cubic Yards

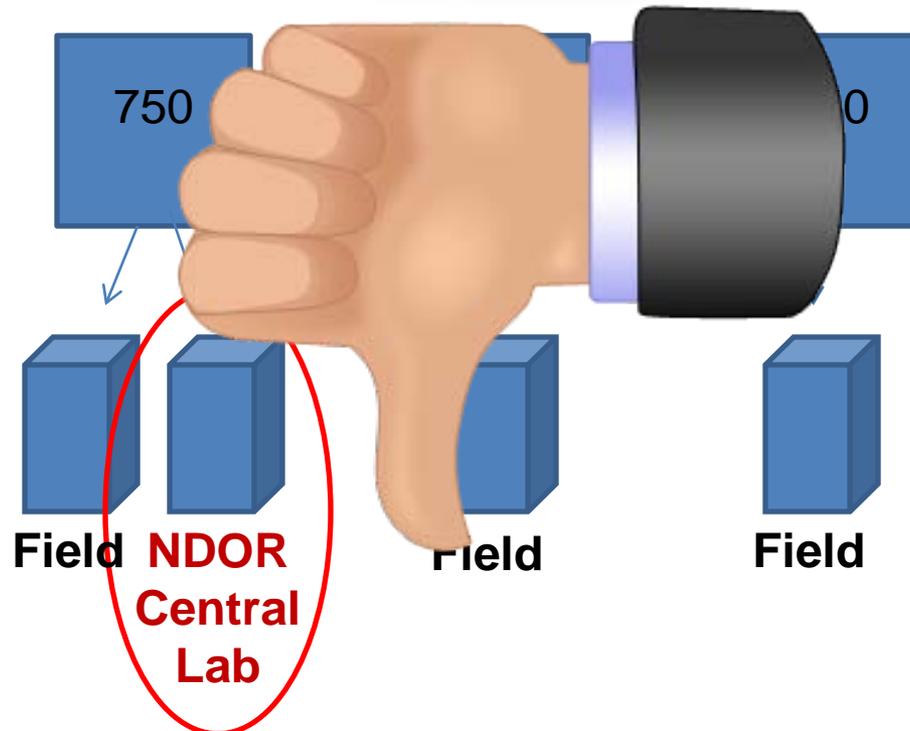


One Sample every 2250 Cubic Yards, if it **Passes** Quality Tests.....

# Concrete Aggregates Quality (soundness, abrasion)

**Material is Penalized or Rejected**

1 Quality Test Every 2250 Cubic Yards



One Sample every 2250 Cubic Yards, if it **Fails** Quality Tests.....

# Bob's Notes

Bob's Notes



# QC/QA Program

QC		QA						
Industry/Contractor	NDOR Certified Field Technician	Qualified Branch Laboratory	NDOR Headquarters Materials Laboratory (AMRL Certified)	Independent Assurance Testing Program	Certification Program for Testing/Sampling	Qualified Laboratory Certification		
Quality Control Testing	Verification Testing			Assurance/Certification Testing of Personnel, Labs, &				
<u>Required by Contract</u> and used for Acceptance of Product (Hot Mix Asphalt) <u>Submits Test Results</u>	Samples	Performs QC Validation Tests		Performed Annually for each Technician performing the tests	NDOR Asphalt Technician Certification	Performed Annually on all outside laboratories		
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Verification Testing and Sampling

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Verification Testing and Sampling

Independent Assurance

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Independent Assurance Testing

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<u>Required by Contract</u> and used for Acceptance of Product (Prestress) <u>Submits Test Results</u>	Samples	Performs QC Validation Tests		Performed Annually for each Technician performing the tests	PCI Certified for Prestress, NRMCA for Precast	Performed Annually on all outside laboratories	
<u>Not Required by Contract</u> and <u>Not</u> used for Acceptance (PG Binders) <u>Does not Submit Results</u>	Samples		Performs Quality Acceptance Test	Performed Annually for each Technician performing the tests	Qualified Branch Lab Training	AMRL Certification	
<u>Not Required by Contract</u> and <u>Not</u> used for Acceptance (Concrete) <u>Does not Submit Results</u>	Samples and Tests for Acceptance for		Performs Field Validation Tests (Gradation)	Performed Annually for each Technician	ACI Certification & NDOR Concrete Technician	Performed Annually on all outside	
		Performs Acceptance Test (Strength)	Performs Quality Acceptance Tests (Final Cores)	Performed Annually for each Technician	ACI Certification & NDOR Concrete Technician	Performed Annually on all outside	
<u>Not Required by Contract</u> and <u>Not</u> used for Acceptance (Aggregates) <u>Does not Submit Results</u>	Samples and Tests for Acceptance for		Performs Field Validation Tests (Gradation)	Performed Annually for each Technician	NDOR Concrete Technician Training	Performed Annually on all outside	
			Performs Quality Acceptance Test (Soundness, etc)	Performed Annually for each Technician	NDOR Concrete Technician Training	Performed Annually on all outside	
<u>Not Required by Contract</u> and <u>Not</u> used for Acceptance (Soil) <u>Does not Submit Results</u>	Samples and Tests for Acceptance for Field Tests	Performs Field Requirement Tests (Moist/Density Curve)		Performed Annually for each Technician performing the tests	NDOR Soils Technician Certification	Performed Annually on all outside laboratories	

# QC/QA Program

QC		QA					
Industry/Contractor	NDOR Certified Field Technician	Qualified Branch Laboratory	NDOR Headquarters Materials Laboratory (AMRL Certified)	Independent Assurance Testing Program	Certification Program for Testing/Sampling	Qualified Laboratory Certification	
Quality Control Testing	Verification Testing						
<u>Required by Contract</u> and used for Acceptance of Product (Hot Mix Asphalt) <u>Submits Test Results</u>	Samples	Performs QC Validation Tests		Performed Annually for each Technician performing the tests	NDOR Asphalt Technician Certification	Performed Annually on all outside laboratories	
<u>Required by Contract</u> and used for Acceptance of Product (Prestress) <u>Submits Test Results</u>	Samples	Performs QC Validation Tests		Performed Annually for each Technician performing the tests	PCI Certified for Prestress, NRMCA for Precast	Performed Annually on all outside laboratories	
<u>Not Required by Contract</u> and <u>Not</u> used for Acceptance (PG Binders) <u>Does not Submit Results</u>	Samples		Performs Quality Acceptance Test	Performed Annually for each Technician performing the tests	Qualified Branch Lab Training	AMRL Certification	
<u>Not Required by Contract</u> and <u>Not</u> used for Acceptance (Concrete) <u>Does not Submit Results</u>	Samples and Tests for Acceptance for		Performs Field Validation Tests (Gradation)	Performed Annually for each Technician	ACI Certification & NDOR Concrete Technician	Performed Annually on all outside	
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<u>Not Required by Contract</u> and <u>Not</u> used for Acceptance (Soil) <u>Does not Submit Results</u>	Samples and Tests for Acceptance for Field Tests	Performs Field Requirement Tests (Moist/Density Curve)		Performed Annually for each Technician performing the tests	NDOR Soils Technician Certification	Performed Annually on all outside laboratories	

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QC		QA					
Industry/Contractor	NDOR Certified Field Technician	Qualified Branch Laboratory	NDOR Headquarters Materials Laboratory (AMRL Certified)	Independent Assurance Testing Program	Certification Program for Testing/Sampling	Qualified Laboratory Certification	
Quality Control Testing	Verification Testing			Assurance/Certification Testing of Personnel, Labs, &			
<u>Required by Contract</u> and used for Acceptance of Product (Hot Mix Asphalt) <u>Submits Test Results</u>	Samples	Performs QC Validation Tests		Performed Annually for each Technician performing the tests	NDOR Asphalt Technician Certification	Performed Annually on all outside laboratories	
<u>Required by Contract</u> and used for Acceptance of Product (Prestress) <u>Submits Test Results</u>	Samples	Performs QC Validation Tests		Performed Annually for each Technician performing the tests	PCI Certified for Prestress, NRMCA for Precast	Performed Annually on all outside laboratories	
<u>Not Required by Contract</u> and <u>Not</u> used for Acceptance (PG Binders) <u>Does not Submit Results</u>	Samples		Performs Quality Acceptance Test	Performed Annually for each Technician performing the tests	Qualified Branch Lab Training	AMRL Certification	
<u>Not Required by Contract</u> and <u>Not</u> used for Acceptance (Concrete) <u>Does not Submit Results</u>	Samples and Tests for Acceptance for		Performs Field Validation Tests (Gradation)	Performed Annually for each Technician	ACI Certification & NDOR Concrete Technician	Performed Annually on all outside	
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<u>Not Required by Contract</u> and <u>Not</u> used for Acceptance (Aggregates) <u>Does not Submit Results</u>	Samples and Tests for Acceptance for		Performs Field Validation Tests (Gradation)	Performed Annually for each Technician	NDOR Concrete Technician Training	Performed Annually on all outside	
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<u>Not Required by Contract</u> and <u>Not</u> used for Acceptance (Soil) <u>Does not Submit Results</u>	Samples and Tests for Acceptance for Field Tests	Performs Field Requirement Tests (Moist/Density Curve)		Performed Annually for each Technician performing the tests	NDOR Soils Technician Certification	Performed Annually on all outside laboratories	

# QC/QA Program

QC		QA					
Industry/Contractor	NDOR Certified Field Technician	Qualified Branch Laboratory	NDOR Headquarters Materials Laboratory (AMRL Certified)	Independent Assurance Testing Program	Certification Program for Testing/Sampling	Qualified Laboratory Certification	
Quality Control Testing	Verification Testing			Assurance/Certification Testing of Personnel			
<u>Required by Contract</u> and used for Acceptance of Product (Hot Mix Asphalt) <u>Submits Test Results</u>	Samples	Performs QC Validation Tests		Performed Annually for each Technician performing the tests	NDOR Asphalt Technician Certification	Performed Annually on all outside laboratories	
<u>Required by Contract</u> and used for Acceptance of Product (Prestress) <u>Submits Test Results</u>	Samples	Performs QC Validation Tests		Performed Annually for each Technician performing the tests	PCI Certified for Prestress, NRMCA for Precast	Performed Annually on all outside laboratories	
<u>Not Required by Contract</u> and <u>Not</u> used for Acceptance (PG Binders) <u>Does not Submit Results</u>	Samples		Performs Quality Acceptance Test	Performed Annually for each Technician performing the tests	Qualified Branch Lab Training	AMRL Certification	
<u>Not Required by Contract</u> and <u>Not</u> used for Acceptance (Concrete) <u>Does not Submit Results</u>	Samples and Tests for Acceptance for		Performs Field Validation Tests (Gradation)	Performed Annually for each Technician	ACI Certification & NDOR Concrete Technician	Performed Annually on all outside	
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Industry/Contractor	NDOR Certified Field Technician	Qualified Branch Laboratory	NDOR Headquarters Materials Laboratory (AMRL Certified)	Independent Assurance Testing Program	Certification Program for Testing/Sampling	Qualified Laboratory Certification	
Quality Control Testing		Verification Testing		Assurance/Certification Testing of Personnel, Labs, &			
<u>Required by Contract</u> and used for Acceptance of Product (Hot Mix Asphalt) <u>Submits Test Results</u>	Samples	Performs QC Validation Tests		Performed Annually for each Technician performing the tests	NDOR Asphalt Technician Certification	Performed Annually on all outside laboratories	
<u>Required by Contract</u> and used for Acceptance of Product (Prestress) <u>Submits Test Results</u>	Samples	Performs QC Validation Tests		Performed Annually for each Technician performing the tests	PCI Certified for Prestress, NRMCA for Precast	Performed Annually on all outside laboratories	
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Quality Control Testing	Verification Testing			Assurance/Certification Testing of Personnel, Labs, &			
<u>Required by Contract</u> and used for Acceptance of Product (Hot Mix Asphalt) <b><u>Submits Test Results</u></b>	Samples	Performs QC Validation Tests		Performed Annually for each Technician performing the tests	NDOR Asphalt Technician Certification	Performed Annually on all outside laboratories	
<u>Required by Contract</u> and used for Acceptance of Product (Prestress) <b><u>Submits Test Results</u></b>	Samples	Performs QC Validation Tests		Performed Annually for each Technician performing the tests	PCI Certified for Prestress, NRMCA for Precast	Performed Annually on all outside laboratories	
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Quality Control Testing	Verification Testing			Assurance/Certification Testing of Personnel, Labs, &				
<u>Required by Contract</u> and used for Acceptance of Product (Hot Mix Asphalt) <u>Submits Test Results</u>	Samples	Performs QC Validation Tests		Performed Annually for each Technician performing the tests	NDOR Asphalt Technician Certification	Performed Annually on all outside laboratories		
<u>Required by Contract</u> and used for Acceptance of Product (Prestress) <u>Submits Test Results</u>	Samples	Performs QC Validation Tests		Performed Annually for each Technician performing the tests	PCI Certified for Prestress, NRMCA for Precast	Performed Annually on all outside laboratories		
<u>Not Required by Contract</u> and <u>Not</u> used for Acceptance (PG Binders) <u>Does not Submit Results</u>	Samples		Performs Quality Acceptance Test	Performed Annually for each Technician performing the tests	Qualified Branch Lab Training	AMRL Certification		
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Quality Control Testing	Verification Testing			Assurance/Certification Testing of Personnel, Equipment, and Materials				
<u>Required by Contract</u> and used for Acceptance of Product (Hot Mix Asphalt) <u>Submits Test Results</u>	Samples	Performs QC Validation Tests		Performed Annually for each Technician performing the tests	NDOR Asphalt Technician Certification	Performed Annually on all outside laboratories		
<u>Required by Contract</u> and used for Acceptance of Product (Prestress) <u>Submits Test Results</u>	Samples	Performs QC Validation Tests		Performed Annually for each Technician performing the tests	PCI Certified for Prestress, NRMCA for Precast	Performed Annually on all outside laboratories		
<u>Not Required by Contract</u> and <u>Not</u> used for Acceptance (PG Binders) <u>Does not Submit Results</u>	Samples		Performs Quality Acceptance Test	Performed Annually for each Technician performing the tests	Qualified Branch Lab Training	AMRL Certification		
<u>Not Required by Contract</u> and <u>Not</u> used for Acceptance (Concrete) <u>Does not Submit Results</u>	Samples and Tests for Acceptance for		Performs Field Validation Tests (Gradation)	Performed Annually for each Technician	ACI Certification & NDOR Concrete Technician	Performed Annually on all outside laboratories		
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# Referee Testing



# Referee Testing



1. Only when QC Testing is used for Acceptance



- Precast/Prestress
- Hot Mix Asphalt

2. Only if specifically added to the contract



- PG Binders
- Emulsions

# Referee Testing

1. Only on Originally Sampled and Tested Material
2. Need Adequate size sample as stated in the MSG or the Special Provisions



# Questions Questions