



# The Role And Responsibilities Of The Asphalt Paving Inspector

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Effective inspection can be the difference between a poor or excellent performing pavement.

- **Course Outline**

- Module 1: Inspector's Authority and Responsibility
- Module 2: Materials
- Module 3: Mixtures and Mix Design
- Module 4: Plants & Production
- Module 5: Transportation, Delivery, & Preparation
- Module 6: Placement
- Module 7: Compaction
- Module 8: Acceptance and Testing

- **Each module roughly 90-120 mins**

- **Modules consist of ppt slides with audio, exam**

**<http://www.asphaltinstitute.org/training/seminars/paving-inspector-certification-pic/>**



- A. Definitions
- B. Desirable attributes of an Inspector
- C. Inspector's role in asphalt paving
- D. Tasks before project begins
- E. Tasks in the Field

**A. Definitions**

B. Desirable attributes of an Inspector

C. Inspector's role in asphalt paving

D. Tasks before project begins

E. Tasks in the Field

# A. Definitions:

## Engineer

- A project engineer or resident engineer will be the designated owner's lead technical representative responsible for confirming overall contract compliance.

# A. Definitions:

## **Contractor**

- The company that undertakes a contract to provide materials and labor to complete the paving project. The contractor is responsible for complying with the project plans and specifications.

# A. Definitions:

## **Inspector**

- The inspector's job is to inspect anything and everything that affects the quality of the project, from the quarry, to the plant, to paving and to testing.



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## B. Desirable Attributes of an Inspector

1. Knowledge
2. Common Sense
3. Observation Skills
4. Communication Skills



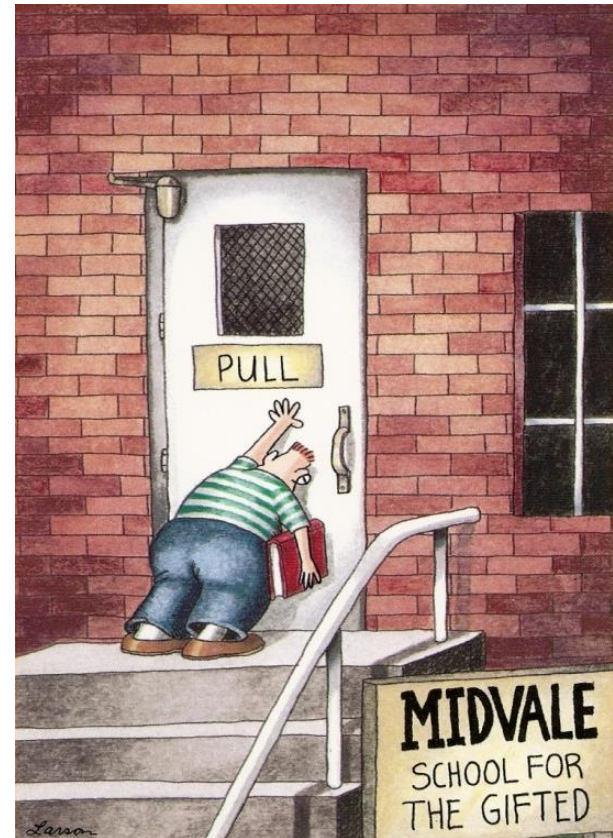
## B. Desirable Attributes of an Inspector

**Knowledge:** About the work, materials, equipment, and construction procedures. Actively pursue increasing your knowledge.



## B. Desirable Attributes of an Inspector

**Common Sense:** Able to interpret situations and specifications, and properly enforce their intent.



Credit: The Far Side - Gary Larson

## B. Desirable Attributes of an Inspector

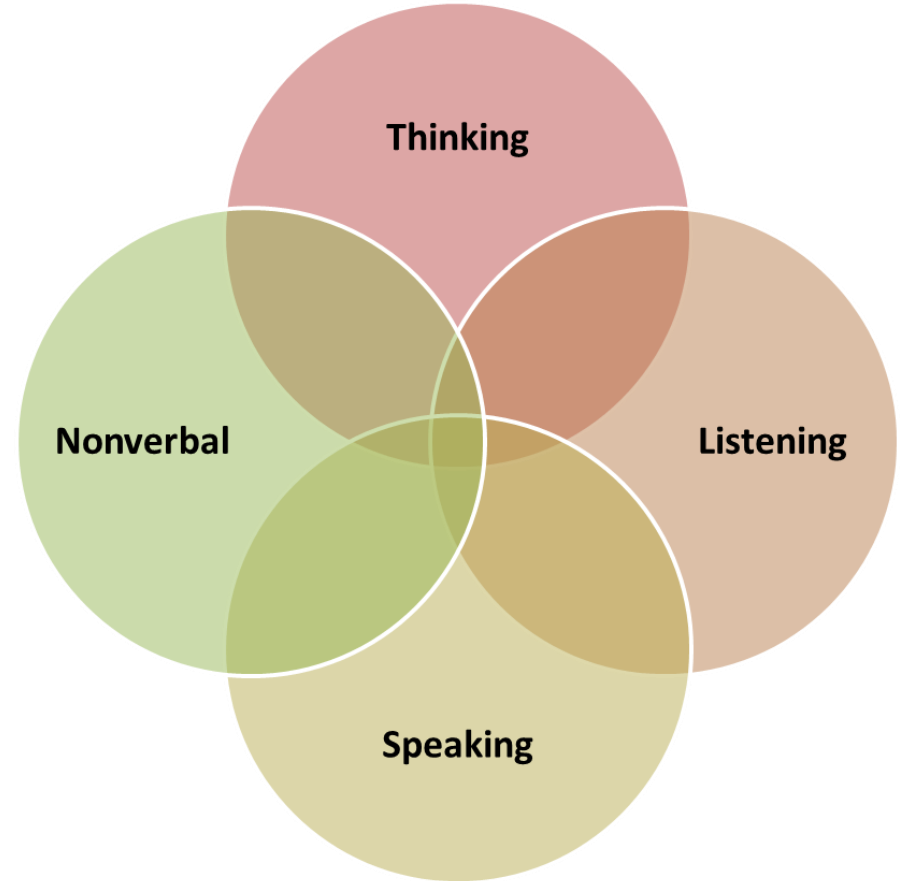
### **Observation Skills:**

Knowing what to look for. Looking carefully at everything going on. Thinking carefully about what you observe.



## B. Desirable Attributes of an Inspector

**Communication Skills:**  
Providing valid criticism and objects in a professional manner, for a good working relationship.



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# C. Inspector's Role in Asphalt Paving

- Represent owner's interest
- Keeping daily construction diary
- Observing materials and workmanship
- Ensuring best practices are followed
- Identifying nonconforming work and materials as early as possible
- Being alert for any potentially unsafe situations





# C. Inspector's Role in Asphalt Paving

perature. After the split sample has been calculated the difference in the bulk...  
Calculate the difference in the bulk...  
The average difference using the...  
rection factor for a reheated bulk...  
cretion of the Contractor or the

**TOLERANCES**

**Tolerance**

± 5 %  
± 3 %  
± 1.5 %  
± 1.0 %  
± 1  
± 10 %  
± 1.2 %  
± 0.020  
± 0.020

After the calibration cold feed and specified tolerances, the Contractor

ampling and testing on the asphalt...  
er will randomly determine sample...  
Contractor obtains samples by the...  
concrete Manual.

a minimum frequency of one per...  
ch per 5000 ton (M ton) lot. Pay...  
lot for each lot.

e specified frequencies indicated in

**TABLE D - MINIMUM FREQUENCY FOR PRODUCTION SAMPLING/TESTING**

TEST	MINIMUM FREQUENCY	TEST METHOD
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Max. Specific Gravity of Asphalt Concrete (Rice Method)**	1/1000 ton (M ton)	SD 312
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Hydrated Lime Content	1 per day	
Moisture Content of Mix**	1/10,000 ton (M ton)	
Density, In Place***	2/1000 ton (M ton)	SD 315

\* Samples shall be taken according to SD 201 Section 3.2.

\*\* Samples shall be taken from behind the laydown machine.

\*\*\* Two density cores per 1000 ton (M ton) sublot shall be taken for determination of in place density. The average of the two core density results will be the 1000 ton (M ton) sublot value used for density in the pay factor calculations. The Engineer will determine and mark the core locations after the mix is placed and compacted. The cores will be taken the next working day after the asphalt pavement is placed. The Contractor shall perform the coring under observation by the Engineer. The Engineer will take immediate possession of the core samples for density testing. The Contractor shall patch all core holes with hot asphalt concrete to the satisfaction of the Engineer.

The Engineer shall randomly locate all samples to be taken for testing. Sampling and splitting not performed by the Engineer will be witnessed by the Engineer. The cold feed gradation and the hot mix samples shall be obtained at the same random tonnage. There will be a 200 ton (M ton) buffer between the random locations of the cold feed gradation/hot mix sample. The intent of the buffer is to prevent back to back sampling and to more evenly distribute the sampling and testing workload.

## Represent the owner how?

- Specifications
- Contract
- Plans
- Procedures
- Policies
- Best Practices


The inspector's authority and responsibilities are typically provided in the owner's **Standard Specifications**.

# Outline

- A. Definitions
- B. Desirable attributes of an Inspector
- C. Inspector's role in asphalt paving
- D. Tasks before project begins**
- E. Tasks in the Field

# D. Tasks Before Project Begins

1. Review the project plans and contract documents
2. Check asphalt plan quantities
3. Review policies and procedures
4. Review material sampling and testing requirements
5. Inspector's equipment checklist
6. Review safety precautions

A graphic with a dark, textured background resembling asphalt with yellow diagonal lines. The text "MS-22" and "Section 2.4" is centered in white.

MS-22  
Section 2.4

# D. Tasks Before Project Begins

## 1. Review **contract documents**:

- A requirement in one document is binding in all
- If there is a discrepancy between the documents, confirm the order of precedence.

## **Contract Documents**

- Plans
- Standard Specs
- Special Provisions
- Supplementary Documents

MS-22  
Section 2.2

# D. Tasks Before Project Begins

## What can be found in the project plans?

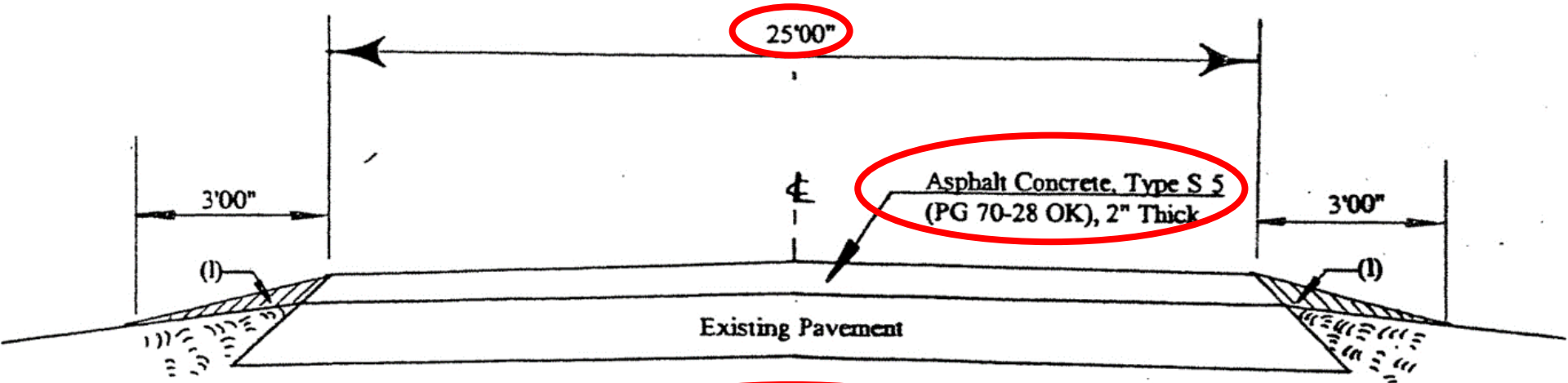
- Plans may be full size: 11"x17" or 8 ½" x 11"
- Sections found in many plans
  - Title Page
  - Typical Sections
  - Summary of Pay Quantities
  - General Construction Notes
  - Plan and Profile Sheets

# D. Tasks Before Project Begins

## **The Title Page often contains a lot of good information**

- The project number
- The county or city name
- The highway, street, or other name/number
- A map of the project location and extents
- Traffic information used in the design
- Information about who prepared the plans
- A statement regarding what specifications govern the project
- Any equations

# D. Tasks Before Project Begins

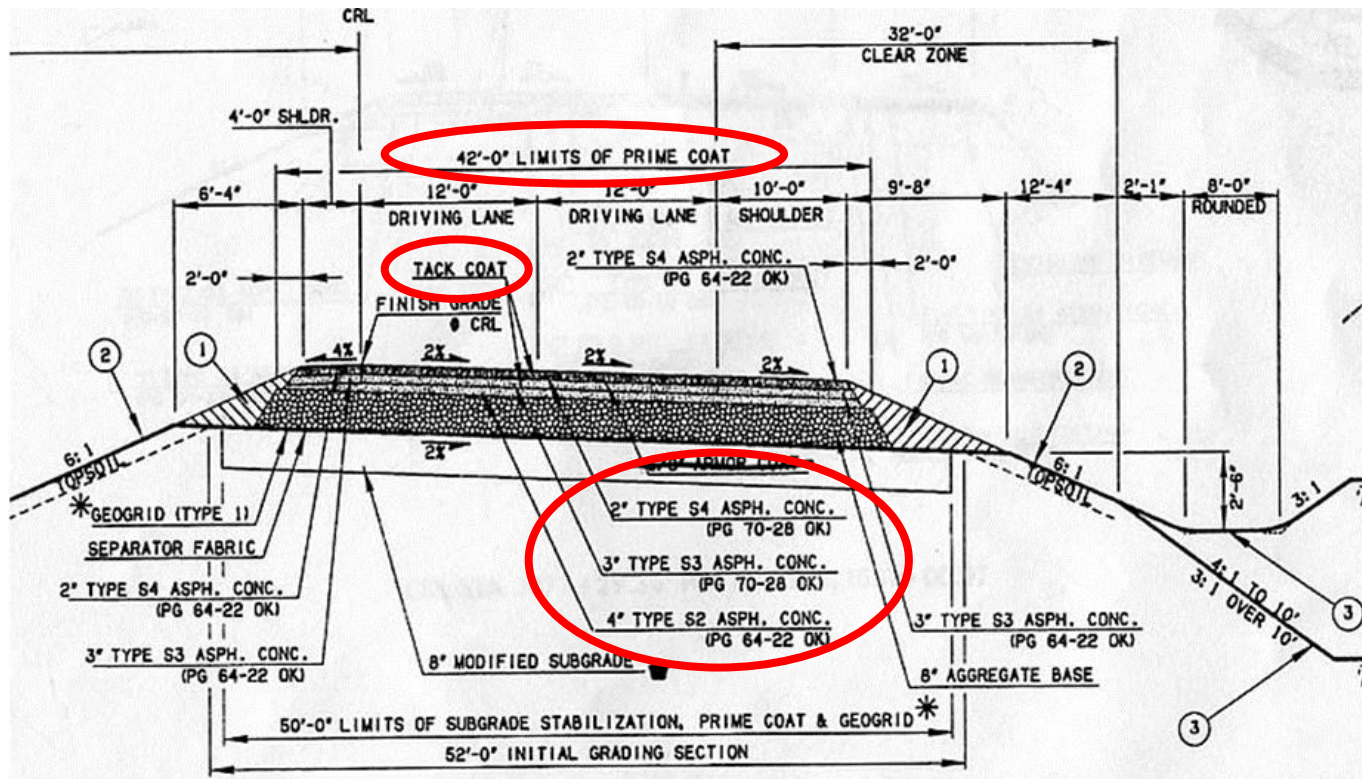


Length = 2.93 miles

(1) Traffic Bound Surface Course, Type F  
(See Backfill Note)

Simple Typical Section

# D. Tasks Before Project Begins



Detailed Typical Section ([www.fhwa.dot.gov](http://www.fhwa.dot.gov))



PAY QUANTITIES			
Roadway			
ITEM	DESCRIPTION	UNITS	QUANTITY
201	0102	CLEARING AND GRUBBING	LSUM 1.00
202(A)	0183	UNCLASSIFIED EXCAVATION (R-2)	CY 3876.00
202(C)	0184	UNCLASSIFIED BORROW (R-2)	CY 41402.00
205	4229	TYPE A-SALVAGED TOPSOIL (H-10)	LSUM 1.00
223	2801	TEMPORARY SILT FENCE (H-1)(H-15)	LF 900.00
227	0100	TEMPORARY SILT DIKE (H-1)(H-15)	LF 174.00
229	4318	DITCH LINER PROTECTION (R-1)	LF 155.00
230(A)	2806	SOLID SLAB SODDING (H-11)	SY 15273.00
230(B)	2807	MULCH SODDING (H-11)	SY 39080.00
232(B)	2814	SEEDING METHOD B (H-14)	AC 11.30
233(A)	2817	VEGETATIVE MULCHING(H-13)	AC 11.30
235(A)	0100	ROCK FILTER DAM, TYPE 1 (H-1)	CY 36.00
241	2832	MOWING	AC 11.30
246(A)	7041	(SP) GEOGRID EARTH REINFORCEMENT	S.Y. 11,095.00
303	0192	AGGREGATE BASE	CY 2383.00
325	5271	SEPARATOR FABRIC	SY 12764.00
326(A)	4200	FLY ASH	TON 389.00
326(B)	4210	(SP) LIME (F-15)	TON 37.00
326(E)	4240	(SP) CEMENTITIOUS STABILIZED SUBGRADE	S.Y. 13506.00
326(G)	4260	(SP) LIME PRETREATMENT	S.Y. 2026.00
403(A)	0217	TRAFFIC BOUND SURFACE COURSE TYPE A (F-7)	TON 2884.00
407	0250	TACK COAT (F-25)	GAL 954.00
408	5774	PRIME COAT (F-55) (F-70)	GAL 3400.00
411(S3)	5945	(SP) ASPH.CONC., TYPE S3(PG 64-22 OK) (F-66)	TON 3315.00
411(S4)	5960	(SP) ASPH.CONC., TYPE S4(PG 64-22 OK) (F-66)	TON 1216.00
509(D)	0325	CLASS C CONCRETE (R-1)	CY 10.00
601(A)	1359	TYPE I PLAIN RIPRAP	TON 2015.00
613(CC)	7186	TYPE A4 CULVERT END TREATMENT	EA 3.00
613(CC)	7187	TYPE B4 CULVERT END TREATMENT	EA 1.00
613(CC)	7196	TYPE A6 CULVERT END TREATMENT	EA 3.00
613(CC)	7197	TYPE B6 CULVERT END TREATMENT	EA 1.00
613(D)	0689	18" CORR. GALV. STEEL PIPE	LF 270.00
613(D)	0690	24" CORR. GALV. STEEL PIPE	LF 78.00
619(B)	4728	REMOVAL OF ASPHALT PAVEMENT (F-37)(F-43)	SY 6394.00
619(B)	4780	REMOVAL OF GUARD RAIL (F-43)	LF 838.00
619(C)	0924	SAWING PAVEMENT	LF 44.00
623(A)	0932	BEAM GUARD RAIL-W-BEAM-SINGLE	LF 350.00
623(E)	7113	BEAM GUARD RAIL-THRIE-BEAM TRANS. SECT.	EA 4.00
623(H)	8571	(SP) G.E.T. GUARD RAIL END SECTION (R-3)	EA 4.00
624(C)	4459	(SP) FENCE-STYLE SWF (5 B.W.) (F-31)(F-32)	LF 7086.00
640	1426	FIELD OFFICE	EA 1.00
641	1552	MOBILIZATION	LSUM 1.00

## Summary of Pay Quantities:

- Description of the materials
- Estimated quantities to complete the project
- Units of measure

### GENERAL CONSTRUCTION NOTES

THIS PROJECT SHALL BE CONSTRUCTED WITHOUT CLOSING THE EXISTING ROAD TO LOCAL & THROUGH TRAFFIC. SEE STANDARD SPECIFICATIONS FOR MAINTENANCE OF LOCAL & THROUGH TRAFFIC.

ALL TREES, BRUSH, & OTHER DEBRIS THAT MIGHT INTERFERE WITH THE FLOW OF WATER IS TO BE CLEANED OUT TO THE RIGHT-OF-WAY LINE AT EACH STRUCTURE & OR BRIDGE, IN A MANNER APPROVED BY THE ENGINEER. ALL COST TO BE INCLUDED IN THE PRICE BID FOR OTHER ITEMS OF WORK.

ALL FLOWLINES THAT ARE TO BE FILLED SHALL BE THOROUGHLY TAMPED BEFORE CONSTRUCTION OR EXTENSION OF DRAINAGE STRUCTURES. ALL COST TO BE INCLUDED IN THE PRICE BID FOR OTHER ITEMS OF WORK.

THE CONTRACTOR SHALL REMOVE & RESET EXISTING MAILBOXES AS NECESSARY. EXISTING MAILBOXES ARE TO BE MAINTAINED IN AN UPRIGHT POSITION & ACCESSIBLE TO MAIL CARRIER'S CAR DURING CONSTRUCTION. ANY DAMAGE TO BOXES OR SUPPORTS SHALL BE REPAIRED BY THE CONTRACTOR. COST TO BE INCLUDED IN OTHER ITEMS OF WORK DURING THE CONSTRUCTION CONTRACT.

IN ORDER TO ALLEVIATE DUST CONDITIONS DURING GRADING OPERATIONS & BEFORE PAVEMENT WORK IS COMPLETED, THE CONTRACTOR SHALL SPRINKLE GRADING AT INTERVALS APPROVED BY THE ENGINEER. COST OF SPRINKLING TO BE INCLUDED IN THE PRICE BID FOR OTHER ITEMS OF WORK.

THE CONTRACTOR SHALL KEEP ALL OPEN TRENCHES DRAINED. COST TO BE INCLUDED IN THE PRICE BID FOR OTHER ITEMS OF WORK.

ALL EXISTING STRUCTURES SHALL BE CLEANED & CLEARED OF ALL SEDIMENTATION & DEBRIS, AND ALL EXISTING DITCHES CLEARED TO DRAIN. COST TO BE INCLUDED IN THE PRICE BID FOR OTHER ITEMS OF WORK.

FOR WIDENING & RESURFACING PROJECTS THE CONTRACTOR SHALL SCHEDULE OPERATIONS TO MINIMIZE POTENTIAL DROP-OFF HAZARDS & SHALL SUBMIT A SEQUENCE OF CONSTRUCTION OPERATIONS TO THE ENGINEER FOR REVIEW BEFORE CONSTRUCTION BEGINS.

EXCAVATION FOR PAVEMENT WIDENING, EXTENSION OF ROADWAY STRUCTURES, & ASPHALT LAYING OPERATIONS THAT PRESENT AN EDGE DROP-OFF OF GREATER THAN TWO (2) INCHES SHALL BE LIMITED TO ONE SIDE AT A TIME. ONLY THAT AMOUNT OF OPEN TRENCH WILL BE ALLOWED THAT CAN BE RESURFACED IN TWO (2) DAYS TIME WITHOUT PRIOR APPROVAL OF THE ENGINEER. LIGHTS, SIGNS, & BARRICADES SHALL BE MOVED AS THE WORK PROGRESSES.

THIS PROJECT SHALL BE CONSTRUCTED WITHOUT CLOSING THE EXISTING SECTION LINE ROADS TO LOCAL AND THROUGH TRAFFIC. SEE STANDARD SPECIFICATIONS FOR MAINTENANCE OF LOCAL AND THROUGH TRAFFIC.

ASPHALT REPAIRS IN PLACE SHALL BE REMOVED WHEN DESIGNATED AND IN A MANNER APPROVED BY THE ENGINEER.

## General Construction Notes

# D. Tasks Before Project Begins

## What is the purpose of reviewing the contract documents before the project starts?

- Get thoroughly familiar with the scope of the project
- Understand Inspector's authority and responsibility as stated in Standard Specifications
- Understand the project extents
- Types of asphalt mixtures specified
- Review specifications and special provisions



# D. Tasks Before Project Begins

## 2. Check the **asphalt plan quantities**

Reviewing asphalt plan quantities before the project begins provides two major benefits:

- It ensures that the quantities on the plans will fulfill the actual needs
- It acquaints the inspector with how much asphalt should be expected to be used where on the project

# D. Tasks Before Project Begins

## 3. Review Policies and Procedures

Make sure you have a clear understanding of the owner's policies and procedures:

- What authority do I have in making decisions on the project?
- Am I simply documenting the construction process, or do I intervene when I see a problem?
- What communication with the contractor can be oral and what needs to be documented?



# D. Tasks Before Project Begins

In addition to the owner's (or agency's) specifications, there are many sources of information regarding best construction practices.



# D. Tasks Before Project Begins

## 4. Review material sampling and testing requirements

- Which materials should be sampled and at what frequency? Depends on size of the project and material quantities.
- Who is responsible for sampling and delivery?
- What test methods are to be followed?

perature. After the split sample has been calculated the difference in the bulk is. The average difference using the correction factor for a rebound bulk discretion of the Contractor or the

**TOLERANCES**

**Tolerances**

- ± 5%
- ± 3%
- ± 1.5%
- ± 1.0%
- ± 1
- ± 10%
- ± 1.2%
- ± 0.020
- ± 0.020

After the calibration cold feed and specified tolerances, the Contractor

Sampling and testing on the asphalt Contractor will randomly determine sample Contractor obtains samples by the Concrete Manual

a minimum frequency of one per each per 5000 ton (M ton) lot. Pay lot for each lot

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# D. Tasks Before Project Begins

## 5. Inspector's **equipment checklist**

An inspector should either wear or have these equipment or have them in their vehicle at all times:

- ✓ A hard hat (mandatory at plant sites)
- ✓ A high visibility soft cap
- ✓ A reflective safety vest (ANSI Class III, Level II)
- ✓ Heavy / heat resistant gloves
- ✓ Heavy, long-sleeved shirt or jacket
- ✓ Steel-toed boots
- ✓ Eye protection
- ✓ Hearing protection



# D. Tasks Before Project Begins

An inspector should either wear or have these equipment in their vehicle at all times (continued):

- First aid kit
- Yellow/White lumber crayons
- Orange spray paint
- Measuring tape
- Ruler
- Temperature measuring devices – air, surface, interior of asphalt mix



# D. Tasks Before Project Begins

## 6. Review **Safety Precautions**

You have one of the most dangerous jobs. You are not only tasked with watching out for yourself, but your co-workers and the traveling public as well.



# D. Tasks Before Project Begins

**Review the following safety precautions before you go out into the field:**

- Never get between the paver and a hauling truck backing into the hopper
- Stay back when the truck dump bed is in motion
- When collecting asphalt tickets from the truck driver, remember that fast-moving traffic is only a step away
- Inform the driver before climbing up on the truck bed

# D. Tasks Before Project Begins

## **Review the following safety precautions before you go out into the field (continued):**

- Minimize non-work related talk with drivers and laydown crew while working to reduce unnecessary distractions
- Park your vehicle out of the way of traffic
- Be constantly vigilant regarding construction equipment and vehicles as they come and go
- Always keep an eye on traffic as it passes through the work zone

# D. Tasks Before Project Begins

**Review the following safety precautions before you go out into the field (continued):**

- Be aware of loose material, excavation drop-off, tripping hazards, uneven ground and other obstructions
- Review and ensure proper traffic control signs and devices are in place as required
- Observe and stay clear of overhead utility lines
- One more time - Always keep an eye on traffic as it passes through the work zone and on construction traffic

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# E. Tasks in the Field

1. Keep daily construction diary
2. Monitor tack coat application
3. Monitor temperatures
4. Track tonnage with truck tickets
5. Checking yield
6. Monitor compaction
7. Visual inspection of the mix

# E. Tasks in the Field

## 1. Keep a **daily construction diary**

### What to document in a construction diary:

- Date
- Weather
- Pavement temperatures
- Construction activities (start and stop times)
- Beginning station, lane, and direction of paving, mix design used





# E. Tasks in the Field

## What to document in a construction diary (continued):

- Mix temperatures checked throughout the day
- Unusual conditions encountered
- Relevant communications and decisions



## 2. Monitor **tack coat**

- Verify proper application rates
- Complete and uniform application
- Allow emulsion to break
- No tracking of tack coat



## 3. Monitor **temperatures**

- Ambient temperatures
- Pavement surface temperatures
- Asphalt mix temperature:
  - Plant, Laydown, Compaction



# E. Tasks in the Field

Most agencies specify minimum mix temperatures.



Check requirements for your owner or agency.

Warm Mix Asphalt may be placed at significantly lower temperatures!

# E. Tasks in the Field

## Why does it matter if the asphalt mix is too cool?

- Asphalt mix stiffens as it cools. This makes it difficult to obtain proper roadway compaction.
- Proper roadway compaction is the most important factor in determining the longevity of the roadway.



# E. Tasks in the Field

Most agencies also specify maximum mix temperature.



Check requirements for your owner or agency.

# E. Tasks in the Field

## Why does it matter if the asphalt mix is too hot?

- Lighter fractions of the asphalt binder evaporate at high temperatures.
- Causes early aging of the binder.
- Aged binder tends to be more brittle, and more susceptible to cracking.



**What should you do if the mix arrives at the job site at more than the maximum allowable temperature?**

**Do not allow the mix to be laid on the project. Send the truck away!**



# E. Tasks in the Field

## Temperature and Weather Limitations:

Most agencies specify minimum surface temperatures on which to lay asphalt. Example:



**Lift Thickness, in  
Temp., °F**

> 3

2 – 3

< 2

**Min. Surface**

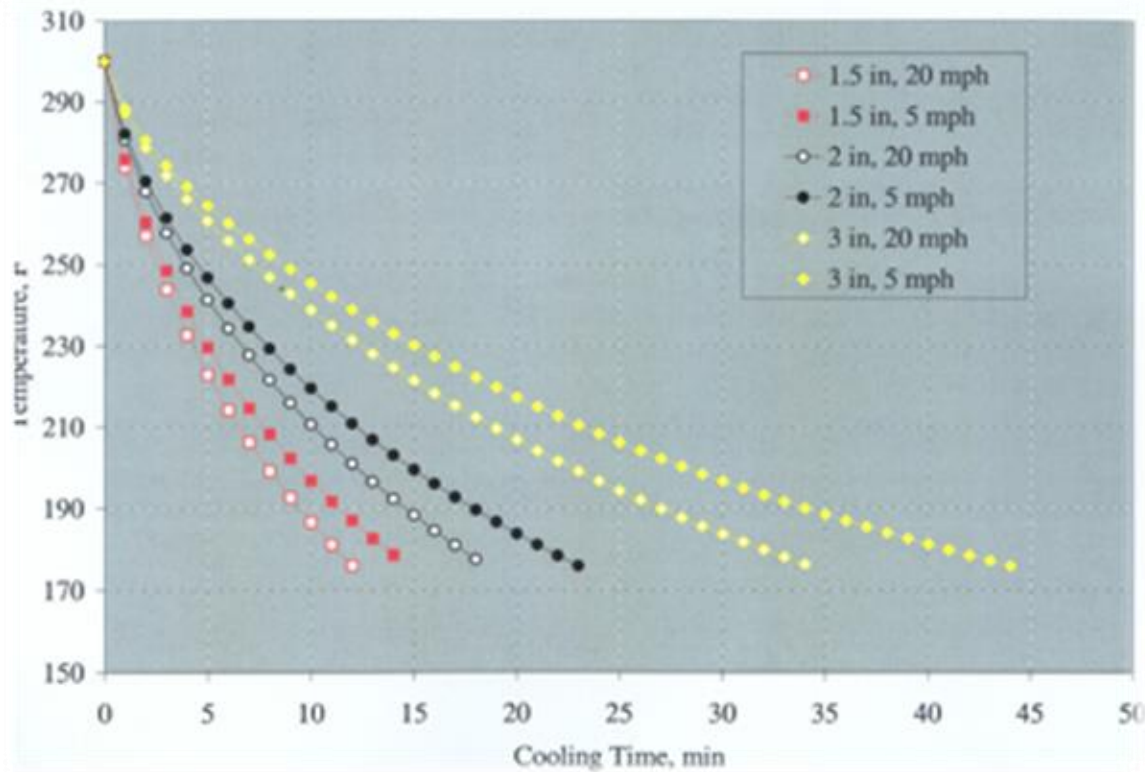
40

45

50

# E. Tasks in the Field

Use tools available to determine time available for compaction.



## PaveCool and MultiCool

Lift thickness 2 inch

Wind speed of 20 mph

Mix Delivery temp - 300°F

Time to compact <20 minutes

Lift thickness 3 inch

Time to compact 30 minutes

# E. Tasks in the Field

## 4. Track tonnage with truck delivery tickets

### Some important information on the ticket:

- Mix supplier
- Paving contractor
- Job site location
- Mix type
- Asphalt binder grade
- Quantity (check units)
- Truck driver name

HIGHLAND PAVING Co.,LLC      Ticket: 298022  
PO Box 1843  
Fayetteville, NC 28302  
PHONE: (910) 433-2871  
FAX: (910) 483-2119

Date: 8/26/2021      Time: 9:19:25 AM  
Job: 21033      Truck: 2035  
POPE ARMY AIRFIELD  
RUNWAY PAVEMENT AND  
AIRFIELD LIGHTING & REHAB

Customer: RC CONST      Mix: S-12.5MM(76-22)  
JMF# 21-0003-151

Job Totals:      14 Loads  
273.54 Tons      Mg

Comments:

\*\*\*\*\*248.15\*\*\*\*  
GROSS (1)      33.83 Tons      Mg\*  
\*  
\*TARE (1)      13.66 Tons      30.69 Mg\*  
\*  
\*NET      20.17 Tons      12.39 Mg\*  
\*\*\*\*\*  
PLANT CERTIFICATION #AS-239  
Weighmaster: JAMES YARBOROUGH      (K) = Manual Weight      18.30  
License # 41500EXP.DATE6/30/21      (S) = Stored Weight

# E. Tasks in the Field

## 5. Check Yield

What is yield (also know as spread rate)?

- Calculated quantity of asphalt mix that has been placed in a given width and length of paving

**An important task of the inspector** is to monitor the number of tons that is being placed

- Make sure that too much or too little material is not being placed



## 5. Check Yield

Checking whether the paving crew is **over-running** or **under-running** plan quantity at a given point is the primary focus of the inspector at the project site.

Making sure that the **plan quantity** of asphalt doesn't over-run **protects the owner**

# E. Tasks in the Field

## 6. Monitor Compaction

Compaction can be monitored with either a thin lift asphalt nuclear gauge or an electromagnetic gauge

**Thin Lift Nuclear Gauge**



**Electromagnetic Gauge**

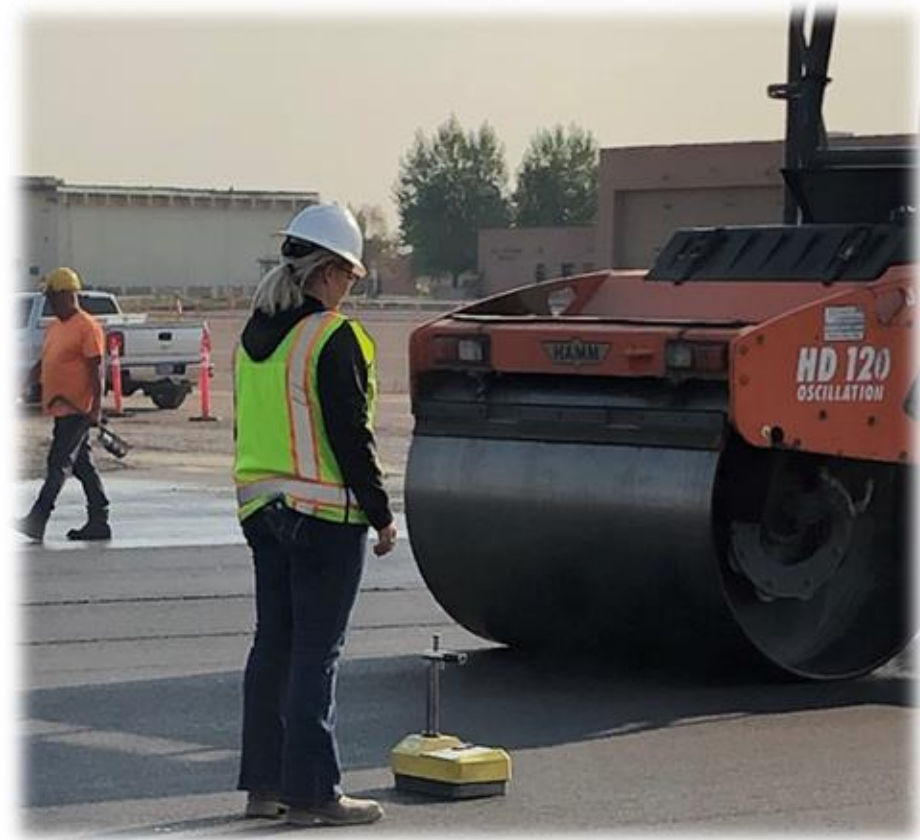




# E. Tasks in the Field

## Calibrate the Gauge

- Each density gauge is factory-calibrated using an average “standard” asphalt mix.
- Calibrate the gauge to your specific asphalt mix
  - Gauge could read high or low by several percentage points!



# E. Tasks in the Field

## 7. Visual inspection of the mix

### During delivery

- Is the mix dull or shiny
- Uncoated aggregates
- Blue smoke

### During placement and compaction

- Segregation
- Material pick-up behind the roller

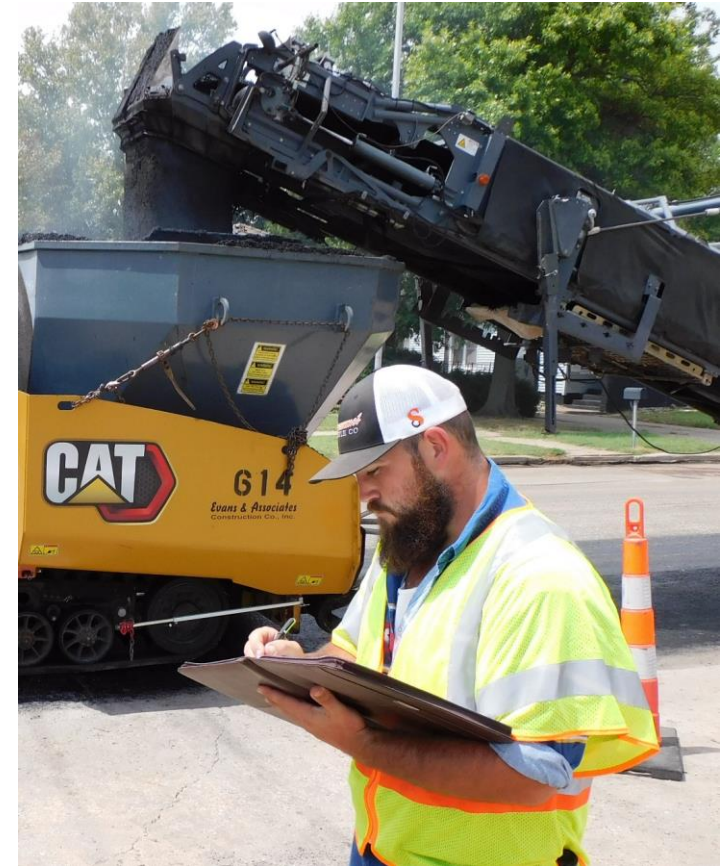




# Key Inspection Takeaways

## Inspector's Role in Asphalt Paving:

- Plays a vital role in ensuring quality
- Keeping daily construction diary
- Observing materials and workmanship
- Ensuring best practices are followed
- Identifying nonconforming work and materials as early as possible
- Work closely and communicate with others on contractor's construction team



# Key Inspection Takeaways

- Inspector represents the owner – inspect anything and everything that affects the quality of the project
- Represent the owner by ensuring adherence to the contract, specifications, plans, procedures, policies, and best practices
- Be proactive, review what tasks to complete before the project begins





# Asphalt Institute Members





*In Loving Memory of  
Gregory M. Harder  
December 12, 2002  
December 21, 2022*

*#LLGH*







# Questions?



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