IL-4.75 Schaumburg Surface Friction Course: This work shall consist of constructing a 4.75 mm Hot-Mix Asphalt (HMA) surface friction course. Minimum lift thickness of this material shall be 1.0 inch. Work shall be according to Sections 406 and 1030 of the Standard Specifications for Road and Bridge Construction, except as modified herein. At the contractor's option, the engineer will allow the use of Warm Mix Technology in accordance with the IDOT WARM MIX ASPHALT (BDE), Revised: April 1, 2016.

Materials.

Fine Aggregate. Fine aggregate shall be three or a combination of the following: Manufactured Sand from Gravel or Steel Slag, 039FM22
Manufactured Sand, 038FM20
Natural Sand, 027FM02
Fractionated RAP of Steel Slag, Quartzite or Granite, FM22 gradation*
Fractionated RAP, Passing No. 4 sieve of Steel Slag, Quartzite or Granite*

*Originating pavement shall be in accordance with FRICTION SURFACE AGGREGATE (D1), the most recently dated.

Virgin aggregates shall be at least "B" Quality and approved by IDOT. Recycled aggregate sources and gradations shall be approved by the Engineer. The quality control program for FRAP shall be according to the Special Provision for RECLAIMED ASPHALT PAVEMENT AND RECLAIMED ASPHALT PAVEMENT SHINGLES (D-1), Revised: January 1, 2018.

Reclaimed Asphalt Shingles. Source approved by IDOT. Production and quality control for Reclaimed Asphalt Shingles (RAS) shall be according to the Special Provision for RECLAIMED ASPHALT PAVEMENT AND RECLAIMED ASPHALT SHINGLES (D-1), Revised: January 1, 2018

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Asphalt Binder. The asphalt binder shall be selected based on the amount of asphalt binder replacement (ABR) in the approved mix design.

ABR	PG Binder	Max. RAS (Total Mix)
0-19%	PG 64-22	0 %
20-39%	PG 58-28	4.0%
40-60%[1]	PG 46-34	5.0%

1/ Requires the use of a WMA Technology.
Foaming technology may be used on the virgin component of the mixture total AC but a chemical additive will be required to dose the recycled ABR component. Chemical dose rate will be according to manufacturer recommendation.

The resulting HMA/WMA shall achieve a fracture energy of 350 J/m^2 as measured using a Disk-shaped Compact Tension (DCT) test (ASTM D7313) when tested at -12°C. This will be tested during mix verification and during production.

Equipment.

Compaction Equipment. Steel-wheeled tandem roller(s) for breakdown (T_b) shall meet the requirements of Article 406.07(a) of the Standard Specifications; minimum width shall be 54 inches and minimum weight of 305 pound per linear inch (PLI). Finish steel-wheeled roller(s) shall meet

the requirements of Article 1101.01(e) of the Standard Specifications. Pneumatic- tired rollers will not be allowed.

Vibratory and Oscillatory rollers will be allowed if set on their lowest amplitude and highest frequency settings and the contractor demonstrates that the rollers don't displace the mixture or create uneven surface texture.

Mixture Design

Mixture Composition. According to Article 1030.04(a)(4)
Volumetric Requirements:

Volumetric Parameter	Requirement
Design Air Voids	3.0% @ N_{DESIGN}
Voids in the Mineral Aggregate (VMA)	18.0% minimum
Dust/AC Ratio	1.0
Maximum Drain-down	0.3%

Hamburg Wheel Test Criteria

# Repetitions*	Max Rut Depth
10,000	12.5 mm

*Specimen air voids are 6.0% +/- 1.0%

Material Proportions. Natural and recycled materials may be combined to meet the Volumetric Requirements and optimize the use of recycled ingredients. The table below reflects the minimum percentages of steel slag FRAP and manufactured sand required for friction.

Ingredient	**Percentage**
FM02 Natural Sand	30% Maximum
FM20 Manufactured Sand	25% Minimum combined
FM22 Manufactured Sand from Gravel; or Steel Slag	
Fractionated RAP of Steel Slag, Quartzite or Granite, FM22 gradation[1]	35% Minimum combined
Fractionated RAP, Passing No. 4 sieve of Steel Slag, Quartzite or Granite[1]	

1/ Fractionated non-friction Fine Frap may be used up 25% maximum if the virgin FM20 and/or FM22 is from a Steel Slag, Quartzite, or Granite source.

Mix Design Verification. The engineer will verify the mix design according to the most current D1 Mix Verification Procedure and the RAP/RAS (D1) Special Provision.
The contractor shall submit and pass the verification (Volumetric's, Hamburg, and DCT) prior to scheduling pavement milling operations. A test strip will be required and no paving day greater than 400

tons shall be permitted until the contractor successfully completes a test strip. This work is considered incidental to the pay item.

QC/QA Requirements. According to Article 1030.05, except that the mix shall be controlled and density shall be monitored according to the IDOT SPECIAL PROVISION FOR GROWTH CURVE, Revised: January 1, 2010. The engineer reserves the right to require cores at the contractor's expense.

Construction Requirements. According to Articles 460 and 1030.

This work will be measured and paid for at the contract unit price per ton (metric ton) for IL-4.75 SCHAUMBURG SURFACE FRICTION COURSE and shall include all labor, materials, and equipment necessary to complete the installation.

IL-9.5FG C N30 Schaumburg Leveling Binder (Machine Method) , Binder & Surface Course: This work shall consist of constructing a 9.5 mm Hot-Mix Asphalt (HMA) Leveling, Binder and Surface Course. Minimum lift thickness of this material shall be 1.25 inches. Work shall be according to Sections 406 and 1030 of the Standard Specifications for Road and Bridge Construction, except as modified herein. At the contractor's option, the engineer will allow the use of Warm Mix Technology in accordance with the IDOT WARM MIX ASPHALT (BDE), Revised: April 1, 2016 except modified herein.

Materials: Both Coarse and Fine aggregates must be in accordance to the Standard Specifications for Road and Bridge Construction Section 1003 and 1004 respectively.

Coarse Aggregate: All coarse aggregate must meet Standard Specifications for Road and Bridge Construction Section 1004.03(a) – HMA High ESAL / Low ESAL.

Virgin aggregates shall be at least "C" Quality and be AGCS Certified. Virgin aggregate must conform to "Friction Aggregate (BDE)" November 1, 2014 except, recycled concrete will not be permitted.

Recycled Materials
The production of FRAP and RAS Shall be in accordance with "Recycled Asphalt Pavement and Reclaimed Asphalt Shingles (D1)" January 1, 2018

Asphalt Binder. The asphalt binder shall be selected based on the amount of asphalt binder replacement (ABR) in the approved mix design.

ABR	PG Binder	Max. RAS (% Total Mix)
0 – 19%	PG 64-22	0 %
20 -39%	PG 58-28	4.0 %
40-60%[1]	PG 46-34	5.0 %

Note 1 Requires the use of a WMA Technology.
Foaming technology may be used on the virgin component of the mixture total AC but a chemical additive will be required to dose the recycled ABR component. Chemical dose rate will be according to manufacturer recommendation.

The resulting HMA/WMA shall achieve a fracture energy of 350 J/m^2 as measured using a Disk-shaped Compact Tension (DCT) test (ASTM D7313) when tested at -12°C. This will be tested during mix verification and during production.

Equipment: All plants, paving, rolling and transportation equipment shall comply with Articles 406 and Division 1100 of the IDOT Standard Specifications.

Revise article 1102.01(a)(10) in the IDOT Standard Specifications to read:

"(10) Equipment for Anti-Strip and WMA Additives

When an anti-stripping or WMA additive is required and a liquid additive is used…"

Mixture Design: Mixture Composition shall be according to the following Table:

"LOW ESAL, MIXTURE COMPOSITION (% PASSING)		
Sieve Size	IL-9.5FG	
	min	max
1 1/2 in (37.5 mm)		
1 in. (25 mm)		
3/4 in. (19 mm)		
1/2 in. (12.5 mm)		100
3/8 in. (9.5 mm)	90	100
#4 (4.75 mm)	60	75
#8 (2.36 mm)	45	60
#16 (1.18 mm)	25	40
#30 (600 μm)	15	30
#50 (300 μm)	8	15
#100 (150 μm)	6	10
#200 (75 μm)	4	6.5
Ratio Dust/Asphalt Binder		1.0

Volumetric Requirements:

Volumetric Parameter	Requirement
Design Air Voids	3.0% @ N_{DESIGN} 30
Voids in the Mineral Aggregate (VMA)	15.0% minimum
Dust/AC Ratio	1.0

Hamburg Wheel Test Criteria

# Repetitions*	Max Rut Depth

10,000	12.5mm

*Specimen air voids are 6.0% +/- 1.0%

Mix Design Verification: The engineer will verify the mix design according to the most current D1 Mix Verification Procedure and the RAP/RAS (D1) Special Provision as well as additional specifications herein. The WMA technology that is intended to be used must be stated on the mix design.
The contractor shall submit and pass the verification (Volumetric's, Hamburg, and DCT) prior to scheduling pavement milling operations. A test strip will be required and no paving day greater than 400 tons shall be permitted until the contractor successfully completes a test strip. This work is considered incidental to the pay item.

QC/QA Requirements: According to Article 1030.05, except that the mix shall be controlled and density shall be monitored according to the IDOT SPECIAL PROVISION FOR GROWTH CURVE, Revised: January 1, 2010. Except as herein modified:

Revise the first sentence of the second paragraph of LR 1030 to read:

"The contractor shall perform a growth curve at the beginning of placement of each type of mix for each lift on each day of placement, unless directed otherwise by the engineer."

Revised the first sentence of the fifth paragraph of the LR 1030 to read:

"Daily core samples are not required, and shall only be taken when requested by the engineer. If so requested, payment for the cutting of the cores will be considered incidental to the contract unit price of the pay item."

Replace the last sentence of the sixth paragraph of LR 1030 with the following:

"An average nuclear gauge results shall be based on all tests across the mat, including all confined longitudinal joint density tests, at each location. A test location result will consist of the average of five tests across the mat, including readings 4" from the confined edges. If there is an unconfined edge at the test location, three equally spaced readings will be performed 4" from the unconfined edge of pavement and averaged together."

Revise the first sentence of the seventh paragraph of the LR 1030 to read:

"Quality Control density tests shall be performed at randomly selected locations within ¼ mile intervals per lift"

QC plant and field reports shall be reported using the IDOT QC software. QC reports shall be electronically sent to both the Resident and the QA representative within 24 hours of mixture placement.

Construction Requirements: According to Articles 460 and 1030. A Test Strip will be required. Payment for the test strip shall be considered incidental to the HMA pay item contract unit price.

This work shall be measured and paid for at the contract unit price per ton (metric ton) for IL-9.5FG C N30 SCHAUMBURG LEVELING BINDER COURSE (MACHINE METHOD), IL-9.5FG C N30 SCHAUMBURG BINDER COURSE, IL-9.5FG C N30 SCHAUMBURG SURFACE COURSE.