## HMA Paving Operations 2023 Yield Calculations

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Plan Quantity Check of HMA Mixture.POE 415+77 POB 158+4241,577 - 15,842 = 25,735'Station EquationSta 329+27.22 Back = Sta 337+26.05 Ahead33,726.05 - 32,927.22 = 798.83'Length of Paving = 25735 - 798.83 = 24,936.17'Proposed plan width from typical plan section.11 + 11 + 3 + 3 + 0.5 + 0.5 = 29'Calculate Area in Syds 24936.17 X 29 / 9 = 80,350 SydsPlan application rate 1.5" = 165 lbs/SydCalculate proposed plan quantity80,350 Syds X 165 lbs/Syd / 2000 lbs/ton = 6629 tonsProject plan quantity of HMA 5E3 = 7437 tons808 tons or 12% extra

Calculating length of paving Plan application 165 lbs/Syd (1.5") Paving Width 15' How many feet will 45 tons cover? Convert tons to pounds 45 tons X 2000 lbs/ton = 90,000 lbs Calculate Area covered by 90,000 lbs at 165 lbs/Syd application rate. 90,000 lbs / 165 lbs/Syd = 545 Syds Convert area to Sft 545 Syds X 9 Sft/Syd = 4905 Sft Calculate length paved 4905 Sft / 15' = 327' 45 tons paved at a rate of 165 lbs/Syd, 15' wide should go 327'. 327'/45 tons = 7.27'/ton

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Calculating Yield on the first pass with a tapered joint. 87+25 to 90+15 Width = 12' lane Taper joint = 1.5' 44.35 tons placed What is your yield? Calculate Length 9015 – 8725 = 290' Calculate Width (1.5 / 2) + 12 = 12.75' Calculate area in Syds 12.75' X 290' / 9 Sft/Syd = 411 Syds Convert tons to pounds 44.35 tons X 2000 lbs/ton = 88,700 lbs Calculate Yield 88,700 lbs / 411 Syds = 216 lbs/Syd Ticket for the last load of the day = 32.84 tons 150' remaining to pave. Width = 12' Previous load yielded 168 lbs/Syd. How many tons should be remaining after paving is complete to be returned for nonpayment? Calculate area in Syds 150' X 12' / 9 = 200 Syds Calculate required mix in pounds 200 Syds X 168 lbs/Syd = 33,600 lbs Convert pounds to tons 33,600 lbs / 2000 lbs/ton = 16.8 tons needed to complete paving. 32.84 tons – 16.8 tons = 16 tons to be returned.

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Yield for the day
Accumulation of tickets for the day = 1090.61 tons
Start of paving station 86+35
Night joint station 157+79
Paving width 12'
Calculate Length 15779 - 8635 = 7144'
Calculate area paved in Syds 7144' X 12' / 9 = 9,525 Syds
Convert tons for the day to pounds 1090.61 X 2000 = 2,181,220 lbs
Calculate Yield 2,181,220 lbs / 9525Syds = 229 lbs/Syd
Plan application rate is 220 lbs/Syd, how many tons over plan for the day?
9 lbs/Syd X 9525 Syds = 85,725 lbs
85,725 lbs / 2000 lbs/ton = 42.86 tons over or 4% over.

Paving 1.7 miles at 165lbs/Syd. Contractor is over paving at CL and planning to mill out. MDOT will pay for 2" over but contractor is paving 6" beyond CL. What is the deduct?

4"/12=0.33'

1.7miles x 5280'/mile = 8976' 8976' x 0.33'/9 = 329.12 Syds 329.12Syds x 165lbs/Syd = 54304.80 lbs

54304.8 lbs / 2000lbs/ton = 27.15 tons

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Number of Detail 7 joint repairs?5.1 miles, 2-12' lanes 11,016' Pavt Joint and Crack Repr, Det 711,016'/24' = 459 Full width joints459/5.1 miles = 90 joints/mile5280'/mile / 90 = 59' approximate joint spacing.At a width of 2' and a depth of 5" how much hand patch for each joint?(2' X 24')/9 = 5.33 Syds 550lbs/Syd X 5.33 = 2,933.33lbs2933.33lbs/2000lbs/ton = 1.47 tons of Hand Patch/jointHand Patch for the project? 1.47tons X 459 = 675tons of Hand PatchHand Patch required for a day's production of 2 miles, 1 lane?(2' X 12')/9 = 2.67Syds2.67Syds X 550lbs/Syd = 1468.5lbs1468.5lbs / 2000lbs/ton = 0.73 tons0.73tons X 180 = 131.40 tons for the day

Calculate the speed of the paver to match the delivery of the mix for continuous paving. Paving 12' lane at an application rate of 330lbs/Syd. The contractor can produce and deliver 300 tons/hour.

2000lbs/ton / 330lbs/Syd = 6.06Syds/ton

6.06Syds/ton X 9Sft/Syd = 54.54Sft/ton

54.54Sft/ton / 12' = 4.55'/ton

4.55'/ton X 300tons/hour = 1365'/hour

1365'/hour /60minutes/hour = 22.75'/minute

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Yield = ? W=12' L=2000' 250Tons 12' X 2000' / 9 = 2666.67 Syds 250 tons X 2000 lbs/ton = 500,000 lbs 500,000 lbs / 2666.67 Syds = 187 lbs/Syd

Yield=?
W=15'
L=3000'
450 tons
15' X 3000' / 9 = 5,000 Syds
450 tons X 2000 lbs/ton = 900,000 lbs
900,000 lbs / 5,000 Syds = 180 lbs/Syd

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How much mix is needed? W=12' L=1000' D=2" 12' X 1000' / 9 = 1333.33 Syds 1333.33 Syds X 220 lbs/Syd = 293,332.6 lbs 293,332.6 lbs / 2000 lbs/ton = 146.67 tons What is the minimum gallons of bond coat that should be applied? W=15'

L=1500'

Calculate area 15' X 1500' / 9 = 2500 Syds

Calculate gallons 2500 Syds X 0.05 gal/Syd = 125 gals

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What is the minimum gallons of bond coat that should have been applied for the day?

W=15'

L=10,560'

(15' X 10,560')/9 = 17,600Syds 17,600Syds X 0.05gals/Syd = 880gals