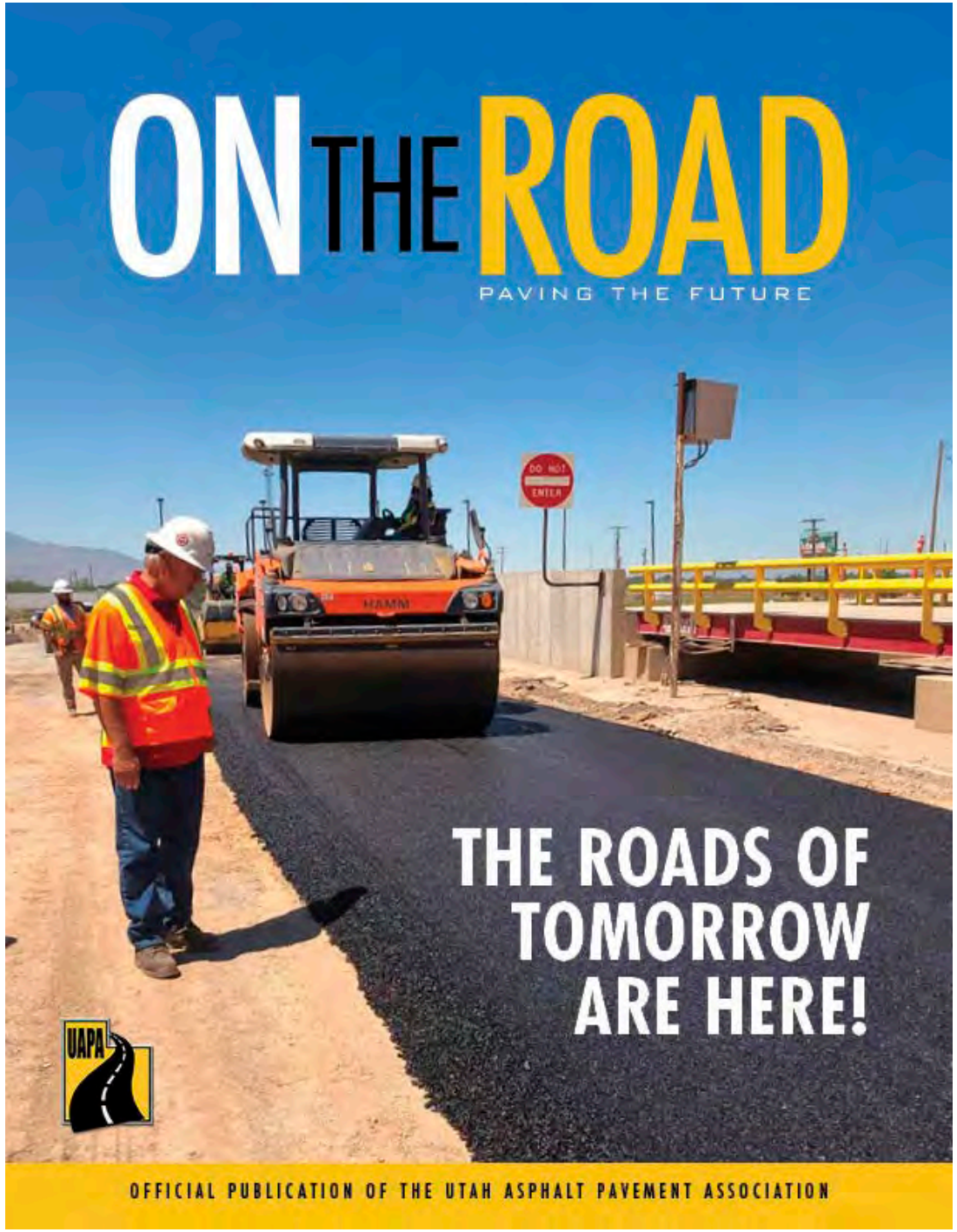



UDOT Keeping Utah Moving

- Density target is an easy 96 percent of the measure maximum for thick or thin lifts.
- Pavement is more rut resistant than our previous Superpave mixes
- HiMod binder allows higher binder contents
- Recycled asphalt pavement allowed in the surface course
- Regular dense graded aggregates used

# Asphalt Binder:

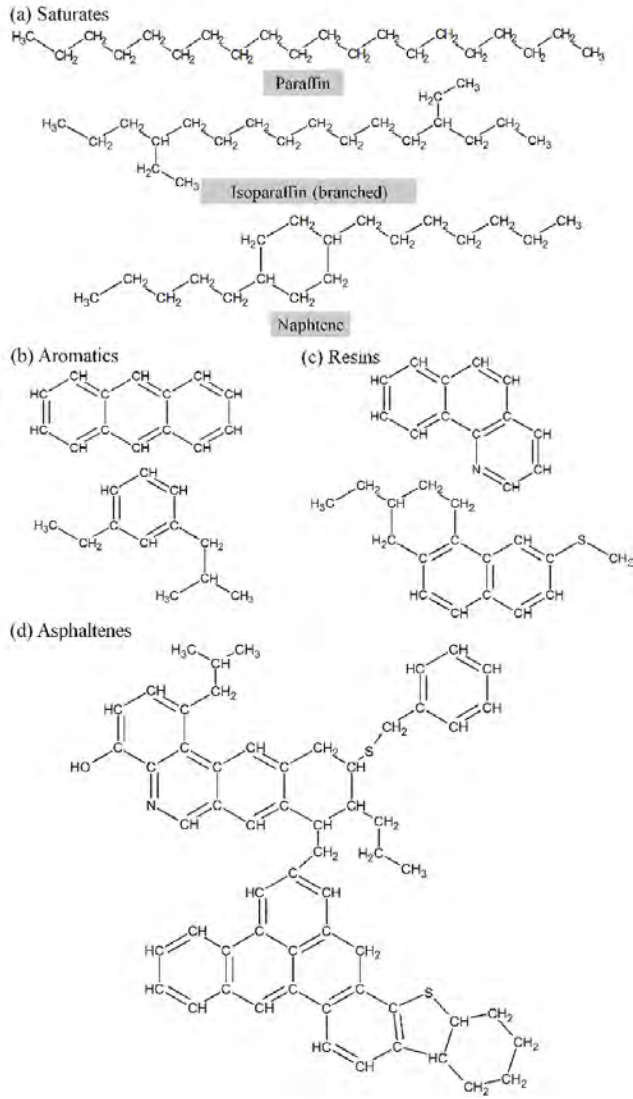




- Asphalt cement or binder is a dark brown to black sticky, semi-solid (viscoelastic), oil-based material that binds together the aggregate components of asphalt concrete.
- It’s a mixture of hydrocarbons that come from crude petroleum, the leftovers after the higher cost volatile fractions are distilled off .

# Typical Asphalt Molecules

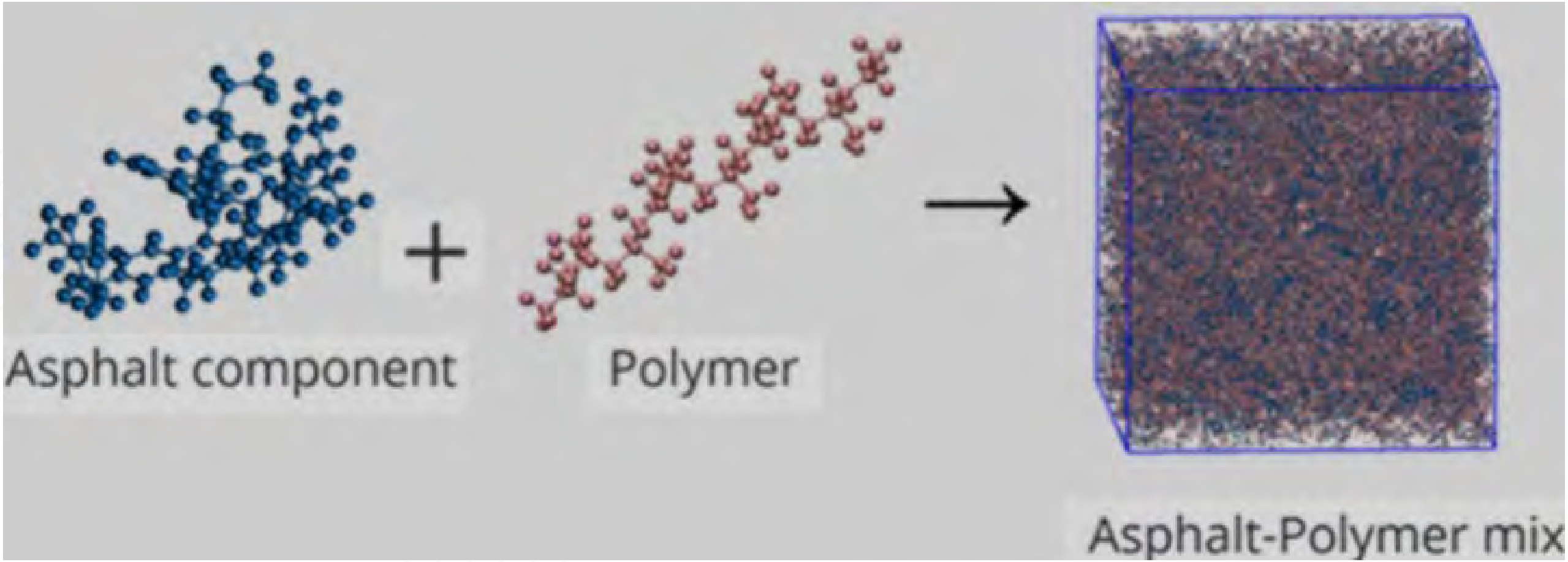
- A chemist understands this….
- What can engineers see that may help?
- We have Hydrogen and Carbon atoms.
- We can learn the names and the basic properties of each.
- Asphalt is a hydrocarbon





SBS comes in different types. It is generally combatable with asphalt with a little help from the chemist.

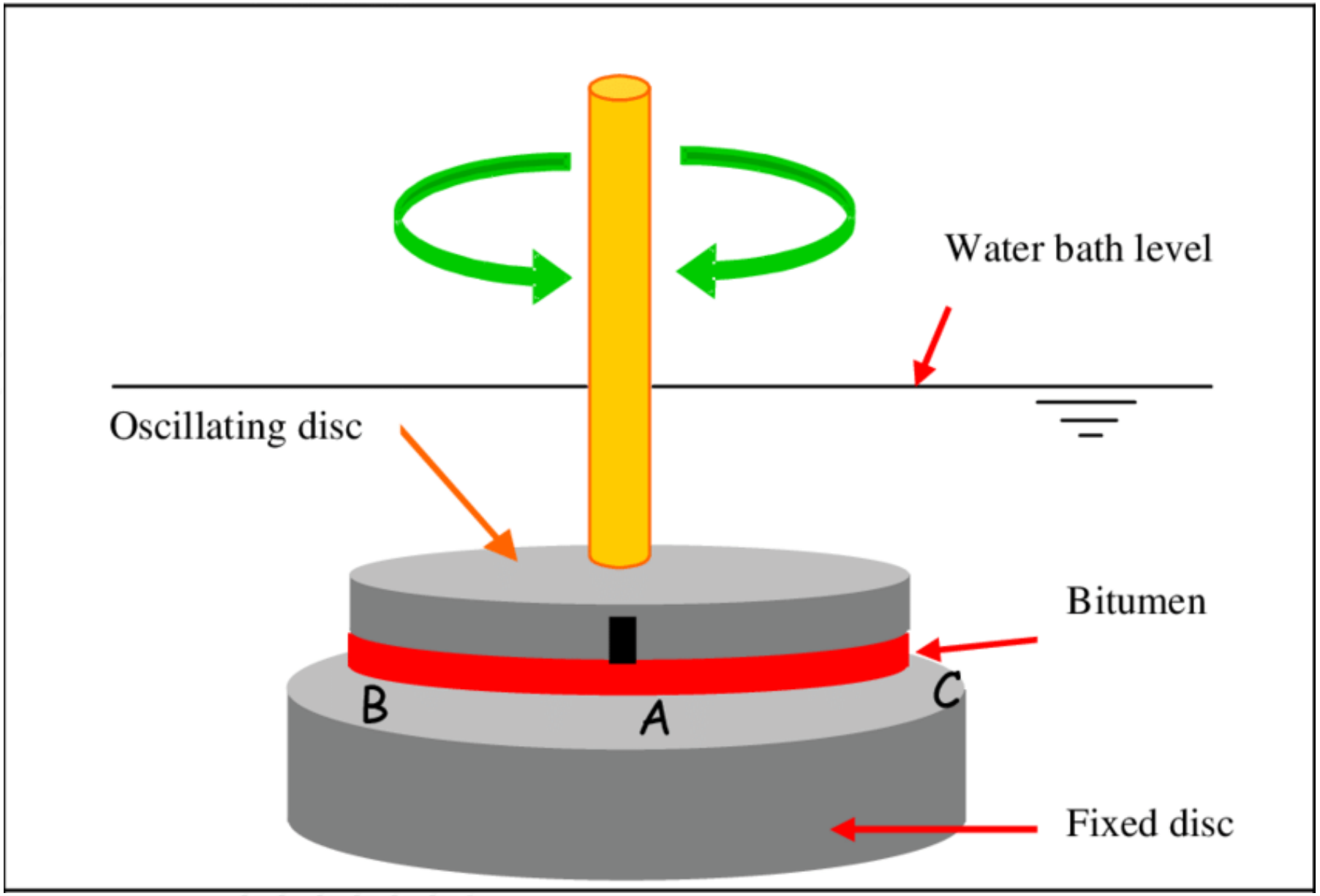
Styrene-Butadiene-Styrene is a block copolymer ( $C_8H_8 - C_4H_6 - C_8H_8$ ), SBS = $C_{20}H_{22}$

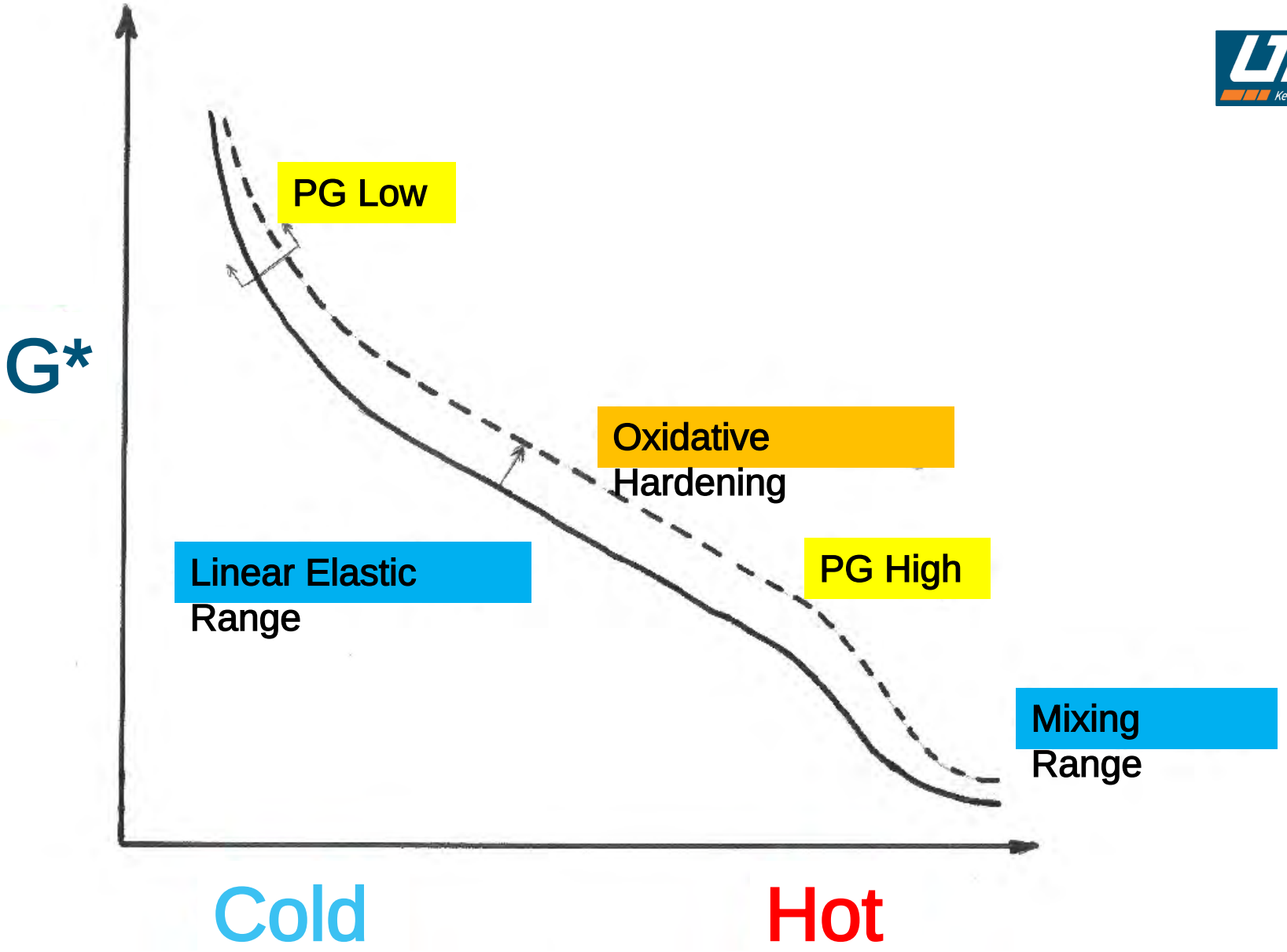

Asphalt component
Polymer
Asphalt-Polymer mix

Dynamic Shear Rheometer, (DSR)

Gives us G* and the Phase Angle

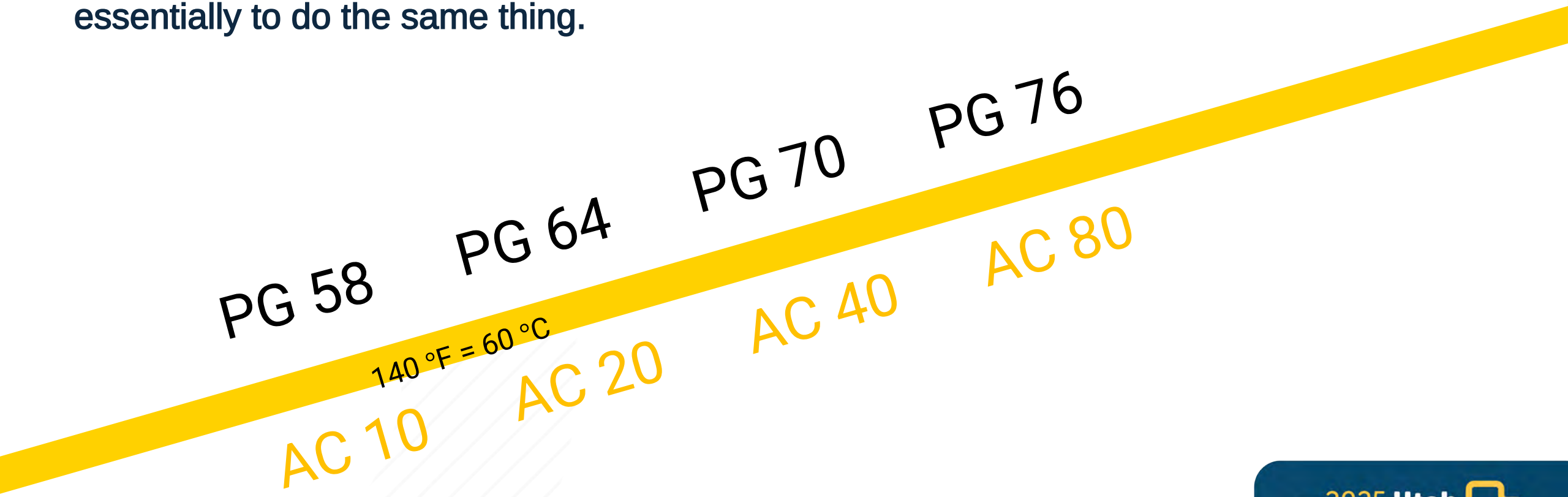



Water bath level
Oscillating disc
Bitumen
B
A
C
Fixed disc


G*
PG Low
Oxidative
Hardening
Linear Elastic
Range
PG High
Mixing
Range
Cold
Hot

AC grading system, absolute viscosity doubled from grade to grade at 140 °F.

PG grades change 6°C with 1.0 kPa G* requirement held constant. It was set up to essentially to do the same thing.

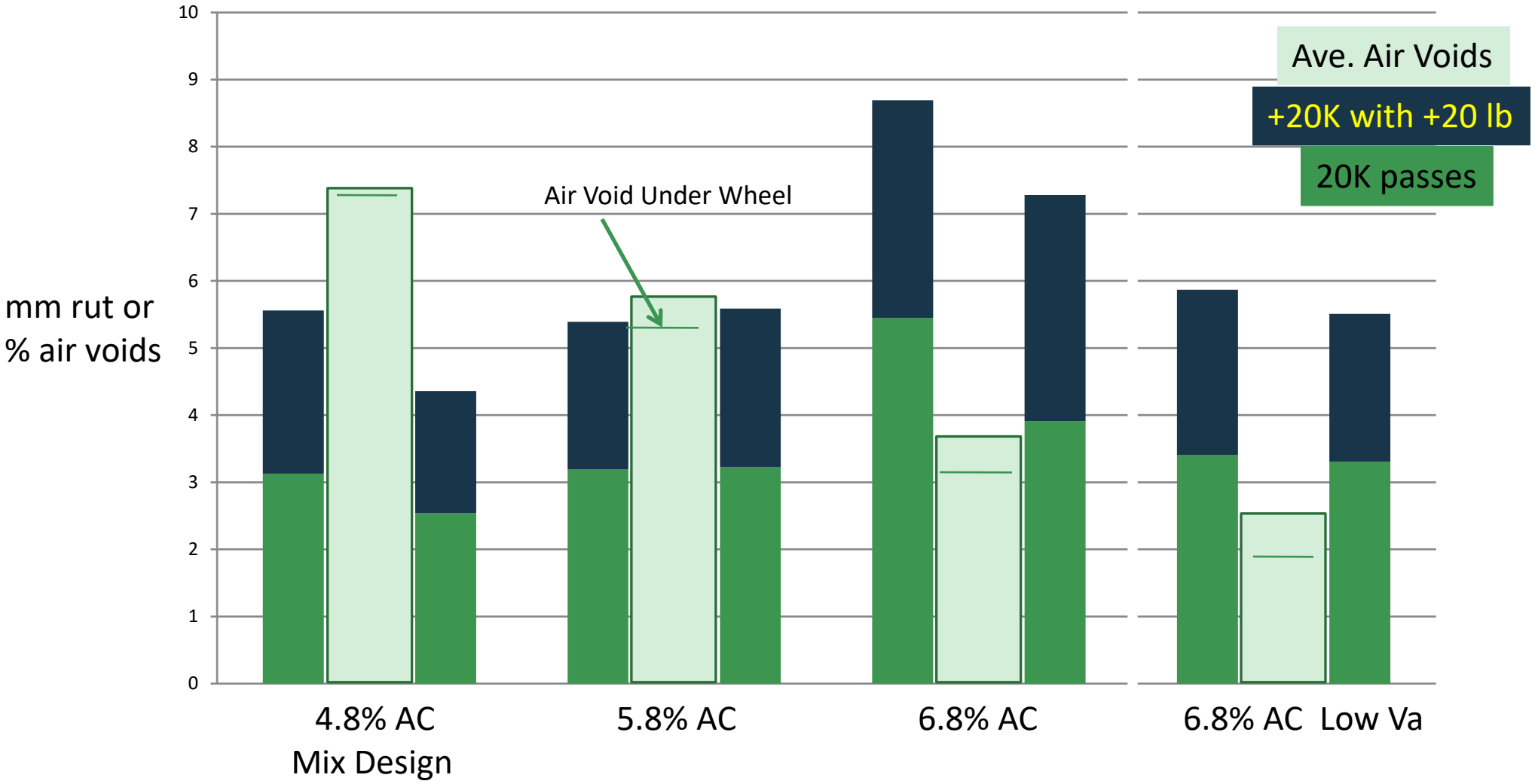





This is ≈14 days after coins were placed.

# Double Hamburg Test

PG 76-34





# Staker Plant Test Strip

June 2, 2021

UDOT Keeping Utah Moving

2025 Utah Transportation Conference

# Skid Testing Results

- British Pendulum Test (AASHTO T-278)
- Existing Pavement
  - **41** average skid number
- New Pavement
  - **53** average skid number



**TABLE 1 Volume Reduction to 15°C**

| Observed Temperature, °C | Volume Correction[A,B] Factor to 15°C | | Observed Temperature, °C | Volume Correction[A,B] Fac to + 50°C to 15°C | |
|---|---|---|---|---|---|
| | A | B | | A | |
| 0 | 1.0095 | 1.0108 | 25.0 | 0.9937 | 0.9 |
| 0.5 | 1.0092 | 1.0104 | 25.5 | 0.9934 | 0.9 |
| 1.0 | 1.0088 | 1.0101 | 26.0 | 0.9931 | 0.9 |
| 1.5 | 1.0085 | 1.0097 | 26.5 | 0.9928 | 0.9 |
| 2.0 | 1.0082 | 1.0094 | 27.0 | 0.9925 | 0.9 |
| 2.5 | 1.0079 | 1.0090 | 27.5 | 0.9922 | 0.9 |
| 3.0 | 1.0076 | 1.0086 | 28.0 | 0.9918 | 0.9 |
| 3.5 | 1.0073 | 1.0083 | 28.5 | 0.9915 | 0.9 |
| 4.0 | 1.0069 | 1.0079 | 29.0 | 0.9912 | 0.9 |
| 4.5 | 1.0066 | 1.0076 | 29.5 | 0.9909 | 0.9 |
| 5.0 | 1.0063 | 1.0072 | 30.0 | 0.9906 | 0.9 |
| 5.5 | 1.0060 | 1.0068 | 30.5 | 0.9903 | 0.9 |
| 6.0 | 1.0057 | 1.0065 | 31.0 | 0.9900 | 0.9 |
| 6.5 | 1.0054 | 1.0061 | 31.5 | 0.9897 | 0.9 |
| 7.0 | 1.0050 | 1.0057 | 32.0 | 0.9893 | 0.9 |
| 7.5 | 1.0047 | 1.0054 | 32.5 | 0.9890 | 0.9 |
| 8.0 | 1.0044 | 1.0050 | 33.0 | 0.9887 | 0.9 |
| 8.5 | 1.0041 | 1.0047 | 33.5 | 0.9884 | 0.9 |
| 9.0 | 1.0038 | 1.0043 | 34.0 | 0.9881 | 0.9 |
| 9.5 | 1.0035 | 1.0039 | 34.5 | 0.9878 | 0.9 |
| 10.0 | 1.0031 | 1.0036 | 35.0 | 0.9875 | 0.9 |
| 10.5 | 1.0028 | 1.0032 | 35.5 | 0.9872 | 0.9 |
| 11.0 | 1.0025 | 1.0029 | 36.0 | 0.9869 | 0.9 |
| 11.5 | 1.0022 | 1.0025 | 36.5 | 0.9865 | 0.9 |
| 12.0 | 1.0019 | 1.0022 | 37.0 | 0.9862 | 0.9 |
| 12.5 | 1.0016 | 1.0018 | 37.5 | 0.9859 | 0.9 |
| 13.0 | 1.0013 | 1.0014 | 38.0 | 0.9856 | 0.9 |
| 13.5 | 1.0009 | 1.0011 | 38.5 | 0.9853 | 0.9 |
| 14.0 | 1.0006 | 1.0007 | 39.0 | 0.9850 | 0.9 |
| 14.5 | 1.0003 | 1.0004 | 39.5 | 0.9847 | 0.9 |
| 15.0 | 1.0000 | 1.0000 | 40.0 | 0.9844 | 0.9 |
| 15.5 | 0.9997 | 0.9996 | 40.5 | 0.9841 | 0.9 |
| 16.0 | 0.9994 | 0.9993 | 41.0 | 0.9837 | 0.9 |
| 16.5 | 0.9991 | 0.9989 | 41.5 | 0.9834 | 0.9 |
| 17.0 | 0.9987 | 0.9986 | 42.0 | 0.9831 | 0.9 |
| 17.5 | 0.9984 | 0.9982 | 42.5 | 0.9828 | 0.9 |
| 18.0 | 0.9981 | 0.9979 | 43.0 | 0.9825 | 0.9 |
| 18.5 | 0.9978 | 0.9975 | 43.5 | 0.9822 | 0.9 |
| 19.0 | 0.9975 | 0.9971 | 44.0 | 0.9819 | 0.9 |

How much can the binder increase in volume with hot weather?

Let the VMA be 15 percent,
And the Air voids 2 percent,
Then we have 13 percent effective binder volume.

Take binder from 25°C
To 60°C (realistic limit for a mix)
13*1.0225=13.29%

(1/0.9937) = 1.0063 @ 25° C
(1/0.9720) = 1.0288 @ 60° C
1.0288-0.0063 = 1.0225 from 25 to 60° C

**TABLE 1 *Continued***

| Observed Temperature, °C | Volume Correction[A,B] Factor to 15°C | | Observed Temperature, °C | Volume Correction[A,B] Factor to 15°C |
|---|---|---|---|---|
| | A | B | | A |
| 50.0 | 0.9782 | 0.9752 | 75.0 | 0.9628 |
| 50.5 | 0.9779 | 0.9748 | 75.5 | 0.9625 |
| 51.0 | 0.9775 | 0.9745 | 76.0 | 0.9622 |
| 51.5 | 0.9772 | 0.9741 | 76.5 | 0.9619 |
| 52.0 | 0.9769 | 0.9738 | 77.0 | 0.9616 |
| 52.5 | 0.9766 | 0.9734 | 77.5 | 0.9613 |
| 53.0 | 0.9763 | 0.9731 | 78.0 | 0.9609 |
| 53.5 | 0.9760 | 0.9727 | 78.5 | 0.9606 |
| 54.0 | 0.9757 | 0.9724 | 79.0 | 0.9603 |
| 54.5 | 0.9754 | 0.9720 | 79.5 | 0.9600 |
| 55.0 | 0.9751 | 0.9717 | 80.0 | 0.9597 |
| 55.5 | 0.9748 | 0.9713 | 80.5 | 0.9594 |
| 56.0 | 0.9745 | 0.9710 | 81.0 | 0.9591 |
| 56.5 | 0.9741 | 0.9706 | 81.5 | 0.9588 |
| 57.0 | 0.9738 | 0.9703 | 82.0 | 0.9585 |
| 57.5 | 0.9735 | 0.9699 | 82.5 | 0.9582 |
| 58.0 | 0.9732 | 0.9696 | 83.0 | 0.9579 |
| 58.5 | 0.9729 | 0.9692 | 83.5 | 0.9576 |
| 59.0 | 0.9726 | 0.9689 | 84.0 | 0.9573 |
| 59.5 | 0.9723 | 0.9685 | 84.5 | 0.9570 |
| 60.0 | 0.9720 | 0.9682 | 85.0 | 0.9567 |
| 60.5 | 0.9717 | 0.9678 | 85.5 | 0.9564 |
| 61.0 | 0.9714 | 0.9675 | 86.0 | 0.9561 |
| 61.5 | 0.9711 | 0.9671 | 86.5 | 0.9558 |
| 62.0 | 0.9708 | 0.9668 | 87.0 | 0.9555 |
| 62.5 | 0.9704 | 0.9664 | 87.5 | 0.9552 |
| 63.0 | 0.9701 | 0.9661 | 88.0 | 0.9549 |
| 63.5 | 0.9698 | 0.9658 | 88.5 | 0.9546 |
| 64.0 | 0.9695 | 0.9654 | 89.0 | 0.9542 |
| 64.5 | 0.9692 | 0.9651 | 89.5 | 0.9539 |
| 65.0 | 0.9689 | 0.9647 | 90.0 | 0.9536 |
| 65.5 | 0.9686 | 0.9644 | 90.5 | 0.9533 |
| 66.0 | 0.9683 | 0.9640 | 91.0 | 0.9530 |
| 66.5 | 0.9680 | 0.9637 | 91.5 | 0.9527 |
| 67.0 | 0.9677 | 0.9633 | 92.0 | 0.9524 |
| 67.5 | 0.9674 | 0.9630 | 92.5 | 0.9521 |
| 68.0 | 0.9671 | 0.9626 | 93.0 | 0.9518 |
| 68.5 | 0.9668 | 0.9623 | 93.5 | 0.9515 |
| 69.0 | 0.9665 | 0.9619 | 94.0 | 0.9512 |
| 69.5 | 0.9661 | 0.9616 | 94.5 | 0.9509 |
| 70.0 | 0.9658 | 0.9612 | 95.0 | 0.9506 |
| 70.5 | 0.9655 | 0.9609 | 95.5 | 0.9503 |
| 71.0 | 0.9652 | 0.9605 | 96.0 | 0.9500 |
| 71.5 | 0.9649 | 0.9602 | 96.5 | 0.9597 |
| 72.0 | 0.9646 | 0.9599 | 97.0 | 0.9494 |
| 72.5 | 0.9643 | 0.9595 | 97.5 | 0.9491 |
| 73.0 | 0.9640 | 0.9592 | 98.0 | 0.9488 |
| 73.5 | 0.9637 | 0.9588 | 98.5 | 0.9485 |
| 74.0 | 0.9634 | 0.9585 | 99.0 | 0.9482 |
| 74.5 | 0.9631 | 0.9581 | 99.5 | 0.9479 |

[A]Use column A factors for asphalts with density at 15°C of 966 kg/m³ or higher.

# Specific Heat, Time to Cool Down/Heat Up

- Water:  4.187 kJ/Kg°C
- Liquid asphalt:  2.176 kJ/ Kg°C
- Solid asphalt binder:  1.675 kJ/ Kg°C
- Gravel:  0.84 to 0.92 kJ/Kg°C
- Sand:  0.67 to 0.84 kJ/Kg°C

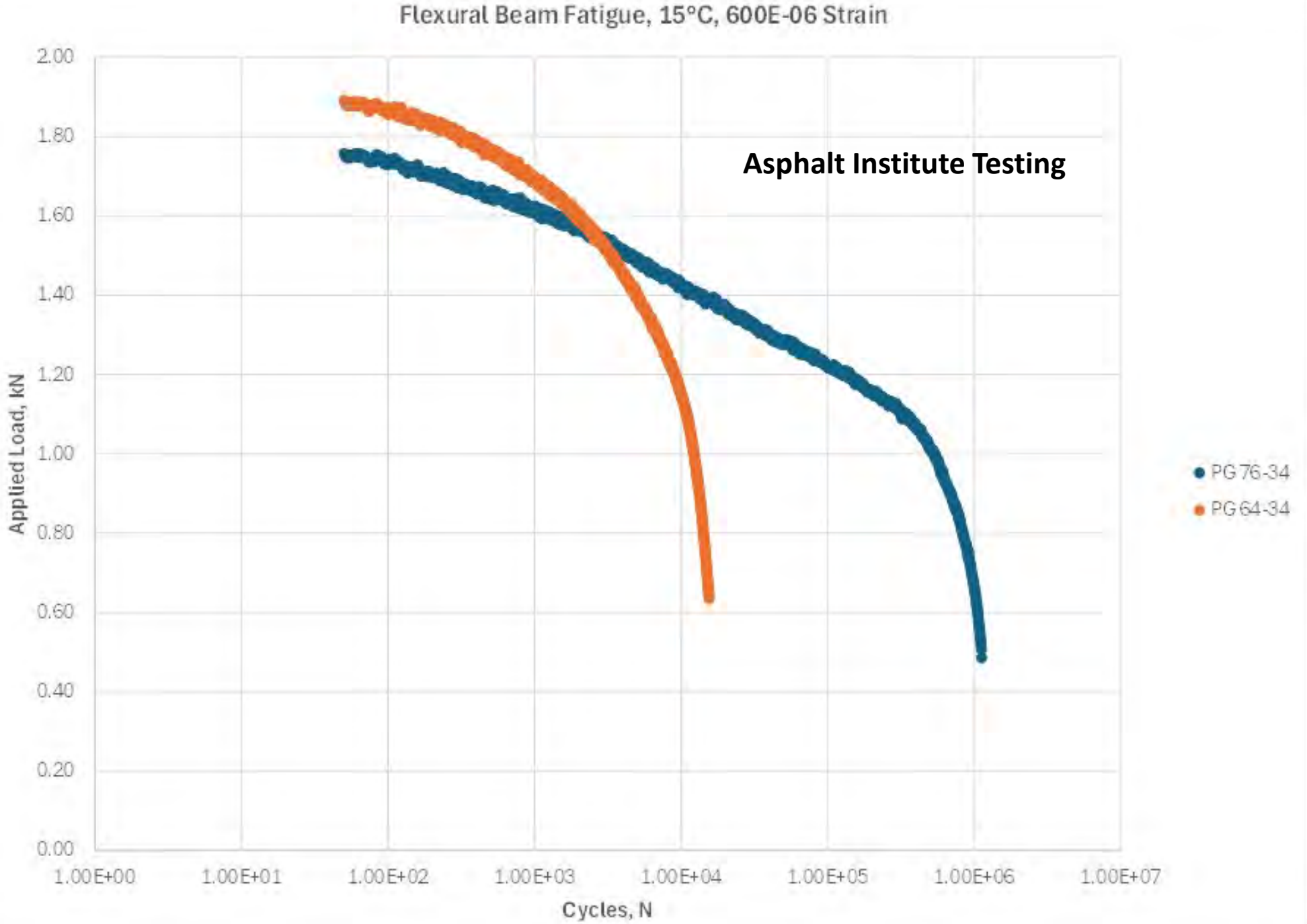




# AI Beam Fatigue Testing

asphalt institute

| Mixture | Specimen | Air Voids (%) | Strain (με) | Flexural Modulus at 50 cycles, MPa | Cycles to Failure ($N_f$) Cycles*Modulus (AASHTO T321) |
|---|---|---|---|---|---|
| | | | | Test Data | Test Data |
| PG 64-34 - Typical Mix | 1 | 7.7 | 300 | 7,491 | 1,199,504 |
| | 2 | 7.1 | 400 | 7,879 | 162,013 |
| | 3 | 6.9 | 475 | 7,542 | 171,958 |
| | 4 | 6.8 | 525 | 7,482 | 23,894 |
| | 5 | 7.4 | 600 | 7,360 | 12,162 |
| PG 76-34 - HiMod Mix | 1 | 4.2 | 475 | 6,104 | 7,817,272 |
| | 2 | 3.8 | 525 | 6,320 | 1,200,843 |
| | 3 | 3.9 | 600 | 5,882 | 913,716 |
| | 4 | 4.0 | 675 | 5,655 | 276,589 |
| | 5 | 4.3 | 750 | 5,030 | 20,180 |


Flexural Beam Fatigue, 15°C, 600E-06 Strain
Asphalt Institute Testing
Applied Load, kN
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
1.00E+00
1.00E+01
1.00E+02
1.00E+03
1.00E+04
1.00E+05
1.00E+06
1.00E+07
Cycles, N
PG 76-34
PG 64-34

# UDOT Mix Design Summaries

**PG76-34**

| | Project | CTIndex | Hamburg (mm) |
|---|---|---|---|
| **2023** | SR-196; MP 24 to I-80 | 563.6 | 6.24 |
| | SR-196; MP 24 to I-80 | 596.0 | 3.40 |
| | I-80 at Echo and Wanship Bridge Preservation | 762.9 | 6.36 |
| **2024** | US-6 Improvements in Spanish Fork | 1531.7 | 3.54 |
| | SR-276; SR-95 N Wash to Park & SR-95 MP 34-41 | - | 5.08 |
| | SR-162 & SR-262 Safety and Energy Corridor Project | - | 5.53 |
| | US-89; Passing Lanes Near Buckskin Wash | - | 2.45 |
| | SR-171; 700 W. to State Street | - | 4.99 |
| | US-40; Duchesne W City Limits to Antelope Creek | - | 4.16 |
| | US-6; Tucker to Soldier Summit | 1243.3 | 6.24 |
| | I-80; MP 41 to MP 50 | 376.6 | 3.01 |
| **2025** | SR-30; SR-23 to SR-252 | 378.2 | 2.38 |
| | I-15; Shepard Ln Intchg & Ped Overpass | 891.3 | 5.45 |
| | SR-36 SB; Sunset Ln to Stansbury Pkwy | 575.0 | 6.98 |
| | SR-162 & SR-262 Safety and Energy Corridor Project | - | 4.26 |
| | SR-209; Bangerter Highway to Redwood Rd. | 822.6 | 7.36 |
| | SR-30; SR-252 to US-91 | 704.9 | 8.08 |
| | US-6; Grassy Trail Creek to Icelander | - | 4.16 |
| | SR-257; Cattle Guard to MP 61 | 998.6 | 7.73 |
| | I-80; MP 131.4 to 134.0 | 960.5 | 8.08 |
| | I-80; Kimball's Junction to US-40 | 426.5 | 4.60 |
| | I-80; Kimball's Junction to US-40 | 499.7 | 4.56 |

**PG64-34**

| | Project | CTIndex | Hamburg (mm) |
|---|---|---|---|
| **2023** | US-91, 3200 S, & 2000 W Intersection Realignment | 255.6 | 7.09 |
| | US-89; Farmington to I-84 | 214.7 | 4.44 |
| | 500 West; 3300 South to 3900 South | 226.8 | 3.94 |
| | US-40 Connector Road | 263.8 | 5.00 |
| | I-80; 1300 E to 2300 E and I-215; 3300 S to 4500 S | 68.4 | 4.66 |
| | PG Interchange Area Capacity Improvements | 63.0 | 5.88 |
| | SR-114; US-89 to Geneva Road | 170.0 | 6.10 |
| | SR-68: 6200 South to I-215 | 250.2 | 5.47 |
| | 3300 South and 900 West | 155.8 | 4.71 |
| | I-80; Emory to Castle Rock | 168.2 | 5.19 |
| | US-40 and SR-121 Pavement Preservation | - | 4.84 |
| | US-40 and SR-121 Pavement Preservation | - | 3.98 |
| | US-189; SR-113 Charleston to US-40 Heber | 123.9 | 3.96 |
| | SR-264; Electric Lake Boat Ramp to SR-96 | 153.8 | 4.73 |
| | US-6; SR-55 to 100 W Wellington | - | 3.83 |
| | Heber City Bypass - Cemetery Section B | 199.0 | 6.50 |
| **2024** | 4700 South; 4000 West to 5600 West | 194.5 | 4.83 |
| | SR-177, West Davis Hwy; I-15 & SR-67 to SR-193 | - | 4.40 |
| | I-15; SR-97 (5600 South), widening of 5600 South | 57.5 | 4.78 |
| | I-15; SR-97 (5600 South), widening of 5600 South | 114.2 | 3.44 |
| | US-6 Improvements in Spanish Fork | 63.0 | 5.88 |
| | PG Interchange Area Capacity Improvements | 118.4 | 4.73 |
| | PG Interchange Area Capacity Improvements | 55.5 | 3.17 |
| | PG Interchange Area Capacity Improvements | 55.5 | 3.17 |
| | SR-9; East Zion Roundabout & Improvements | - | 7.14 |
| | SR-7; Airport Pkwy to Sand Hollow Rd | - | 5.38 |
| | Cottonwood Wash Bridge Replacement (0C 301) | - | 4.48 |
| | I-70; Sinbad to Brake Test | - | 5.47 |
| | I-70; Sinbad to Brake Test | - | 5.04 |
| | Springville/Spanish Fork Interchange Phase 1 | 248.2 | 4.96 |
| | SR-132; Canyon EB Passing Lane Connection | 176.0 | 5.90 |
| | US-89; SR-12 to Panguitch | - | 6.42 |
| | SR-24; Hanksville Airport to I-70 | - | 4.48 |
| **2025** | Riverton - 13400 So Bike Lanes; 2700 W to 3200 W | 198.6 | 3.79 |
| | I-15; SR-97 (5600 South), widening of 5600 South | 153.0 | 3.56 |
| | BFP: Holladay City Bridge Replacement 035131D | 190.5 | 7.31 |
| | Parkway Blvd (2700 S); MVC to 6400 West | 54.2 | 3.18 |
| | Parkway Blvd (2700 S); MVC to 6400 West | - | 4.06 |
| | SR-273; US-89 to I-15 | 160.0 | 3.72 |
| | Undercrossing in Saratoga at Redwood Rd & MP 25.1 | 266.1 | 4.48 |
| | SR-186; North Temple to 400 S | 184.9 | 4.24 |
| | Bangerter Highway South Interchanges | 230.4 | 7.73 |
| | I-80; Kimball's Junction to US-40 | 153.8 | 6.16 |

**PG76-34**

| | Project | CTIndex | Hamburg (mm) |
|---|---|---|---|
| **2023** | SR-196; MP 24 to I-80 | 563.6 | 6.24 |
| | SR-196; MP 24 to I-80 | 596.0 | 3.40 |
| | I-80 at Echo and Wanship Bridge Preservation | 762.9 | 6.36 |
| **2024** | US-6 Improvements in Spanish Fork | 1531.7 | 3.54 |
| | SR-276; SR-95 N Wash to Park & SR-95 MP 34-41 | - | 5.08 |
| | SR-162 & SR-262 Safety and Energy Corridor Project | - | 5.53 |
| | US-89; Passing Lanes Near Buckskin Wash | - | 2.45 |
| | SR-171; 700 W. to State Street | - | 4.99 |
| | US-40; Duchesne W City Limits to Antelope Creek | - | 4.16 |
| | US-6; Tucker to Soldier Summit | 1243.3 | 6.24 |
| | I-80; MP 41 to MP 50 | 376.6 | 3.01 |
| **2025** | SR-30; SR-23 to SR-252 | 378.2 | 2.38 |
| | I-15; Shepard Ln Intchg & Ped Overpass | 891.3 | 5.45 |
| | SR-36 SB; Sunset Ln to Stansbury Pkwy | 575.0 | 6.98 |
| | SR-162 & SR-262 Safety and Energy Corridor Project | - | 4.26 |
| | SR-209; Bangerter Highway to Redwood Rd. | 822.6 | 7.36 |
| | SR-30; SR-252 to US-91 | 704.9 | 8.08 |
| | US-6; Grassy Trail Creek to Icelander | - | 4.16 |
| | SR-257; Cattle Guard to MP 61 | 998.6 | 7.73 |
| | I-80; MP 131.4 to 134.0 | 960.5 | 8.08 |
| | I-80; Kimball's Junction to US-40 | 426.5 | 4.60 |
| | I-80; Kimball's Junction to US-40 | 499.7 | 4.56 |

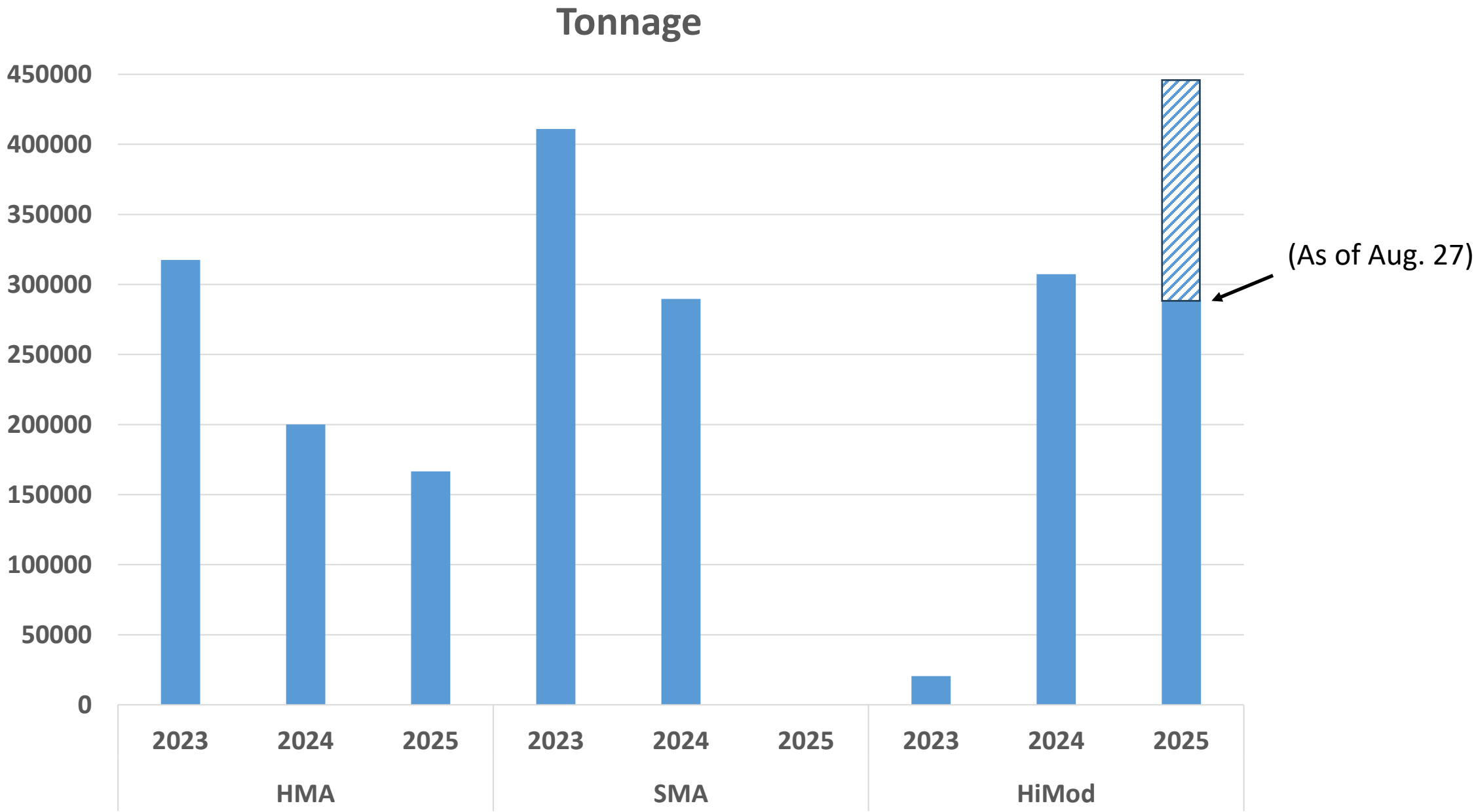
# UDOT Mix Design Summaries (HiMod)

## PG 76-34 Performance: Higher Cracking Durability Without Increased Rutting

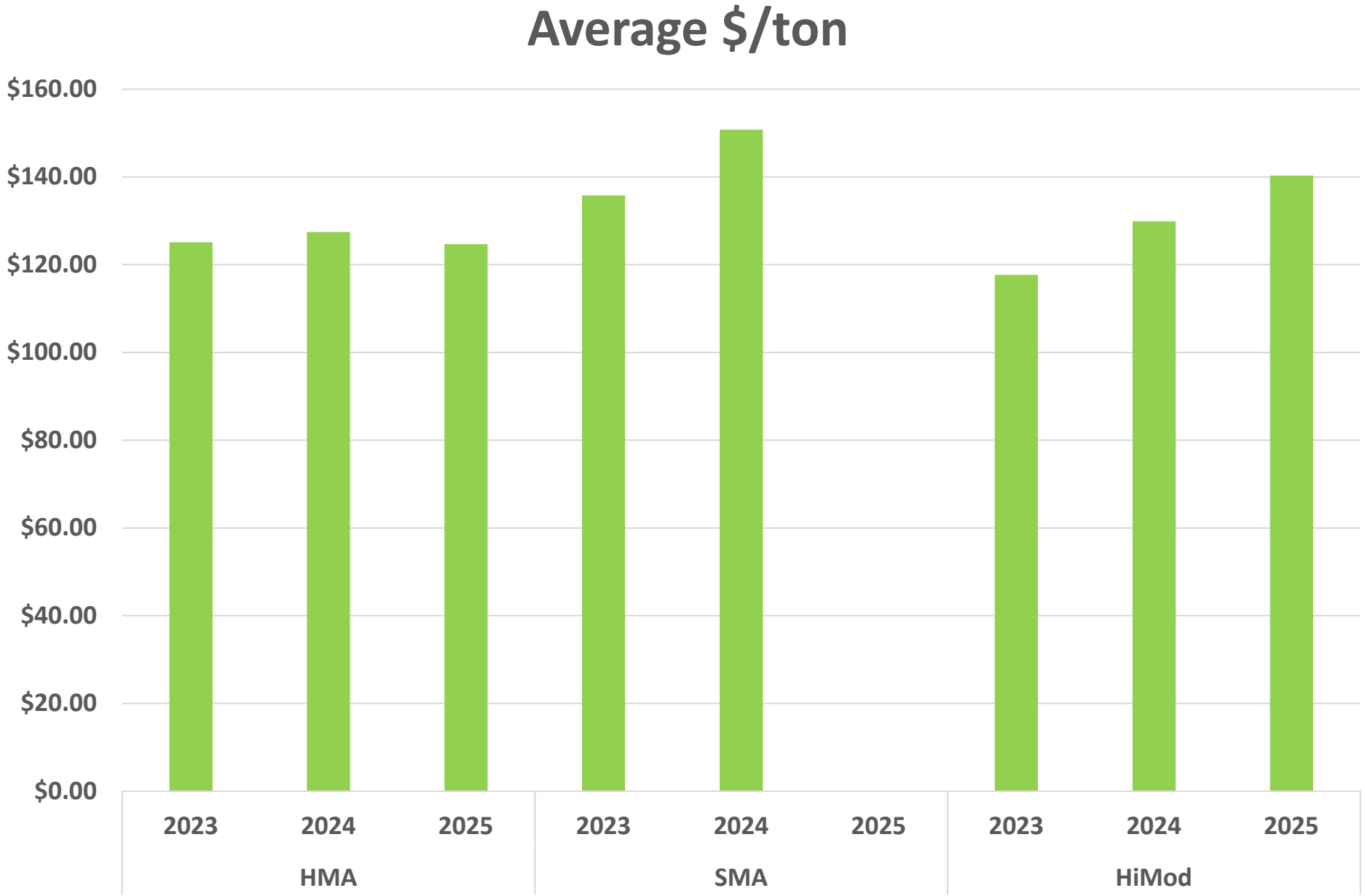
- **PG 76-34 demonstrates improved cracking resistance without a rutting penalty:**
  - **CT Index increased significantly across projects**
  - **Average Hamburg rutting depth remains consistent with PG 64-34**
- **Performance contradicts the traditional cracking-rutting tradeoff**

| Mix Design Data | PG76-34 | PG64-34 |
|---|---|---|
| CT Index Range | 377-1532 (avg ~755) | 54-266 (avg ~161) |
| Hamburg Rutting Depth Range (mm) | 2.4-8.1 (avg ~5.2) | 3.2-7.7 (avg ~4.9) |

# Utah Mixture Trends (Highway Only)



# Utah Mixture Trends (Highway Only)



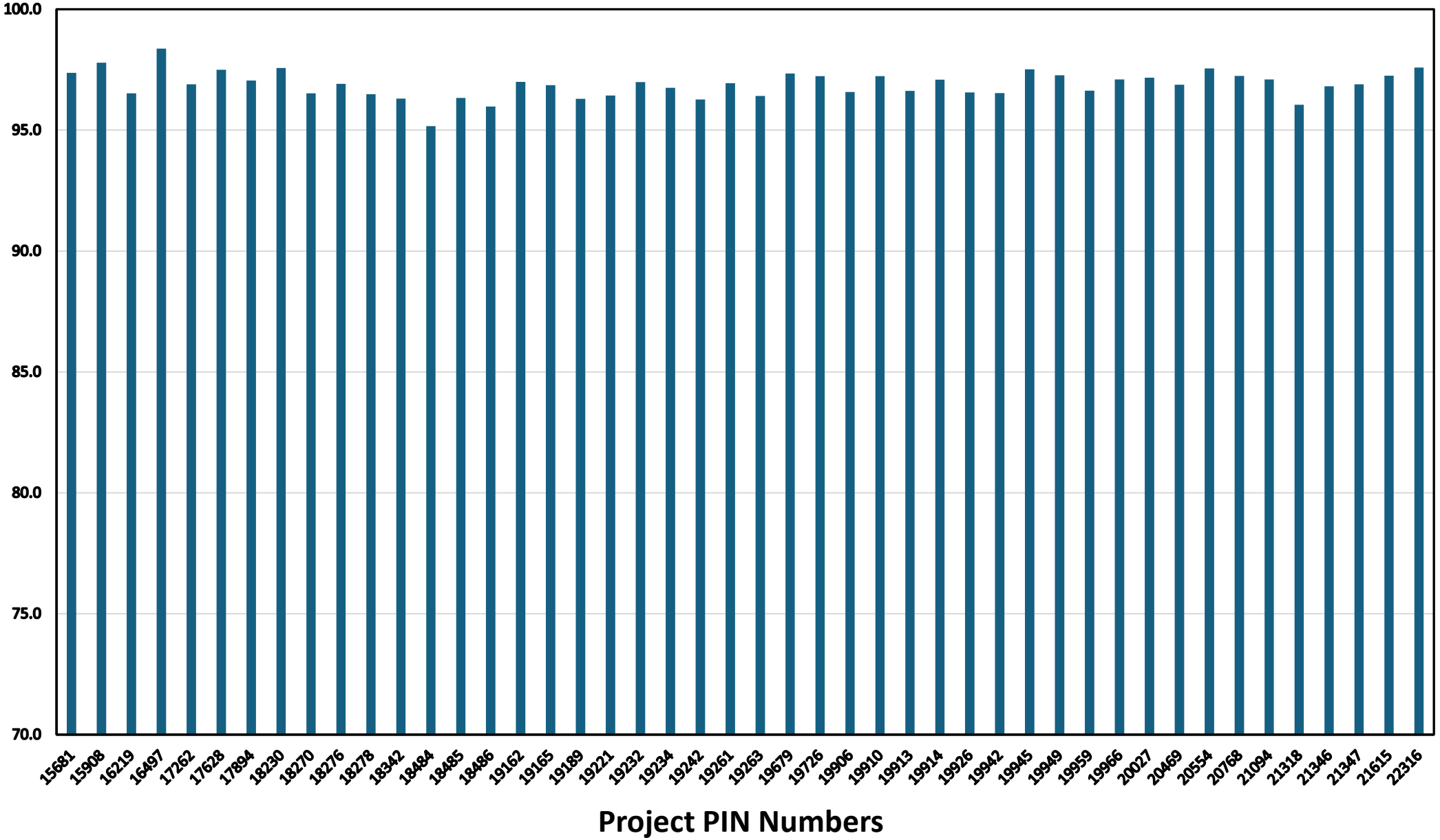
| Pin | Recent HiMod Projects Page 1 | Project Number | Average Mat Density |
|---|---|---|---|
| 15681 | SR-30; SR-23 to SR-252 | F-0030(69)102 | 97.4 |
| 15908 | 1300 East; 2100 South to Southern City Boundary | F-2076(2)4 | 97.8 |
| 16219 | SR-196; MP 24 to I-80 | F-0196(7)24 | 96.5 |
| 16497 | US-6 Improvements in Spanish Fork | F-0006(230)174 | 98.4 |
| 17262 | SR-276; SR-95 N Wash to Park & SR-95 MP 34-41 | F-R499(457) | 96.9 |
| 17628 | SR-36 SB; Sunset Ln to Stansbury Pkwy | S-0036(50)61 | 97.5 |
| 17894 | SR-162 & SR-262 Safety and Energy Corridor Project | F-R499(367) | 97.1 |
| 18230 | US-89; Passing Lanes Near Buckskin Wash | S-0089(572)35 | 97.6 |
| 18270 | I-80; Stillmans Bridge to SR-65 | F-I80-3(213)129 | 96.5 |
| 18276 | SR-171; 700 W. to State Street | F-0171(72)9 | 96.9 |
| 18278 | SR-173; 4800 W. to Bangerter Hwy | F-0173(42)4 | 96.5 |
| 18342 | US-191 Realignment near Simplot | F-0191(194)365 | 96.3 |
| 18484 | SR-243; US-89 to Beaver Mountain | S-0243(1)0 | 95.2 |
| 18485 | SR-200; SR-61 to Idaho | S-0200(1)0 | 96.3 |
| 18486 | SR-81; SR-30 to Fielding | S-0081(2)0 | 96.0 |
| 19162 | US-40; Duchesne W City Limits to Antelope Creek | F-0040(224)86 | 97.0 |
| 19165 | SR-35 & SR-87 Pavement Preservation | F-0035(14)45 | 96.9 |
| 19189 | SR-35; MP 0 to 12.35 | F-0035(13)0 | 96.3 |
| 19221 | US-89; Kanab Creek Bridge to MP 72.355 | F-0089(603)69 | 96.4 |
| 19232 | SR-190; Pavement Preservation | F-0190(29)2 | 97.0 |
| 19234 | SR-209; Bangerter Highway to Redwood Rd. | F-0209(58)8 | 96.8 |
| 19242 | US-89; 9400 S. to I-215 | F-0089(319)367 | 96.3 |
| 19261 | SR-106; 1700 South to US-89 | F-0106(31)5 | 96.9 |
| 19263 | SR-30; SR-252 to US-91 | F-0030(86)110 | 96.4 |

| Pin | Recent HiMod Projects Page 2 | Project Number | Average Mat Density | |
|---|---|---|---|---|
| 19679 | Cougar Lane; Niagara Way to Kearns High Drive | F-2146(1)8 | 97.3 | |
| 19726 | Cottonwood Wash Bridge Replacement (0C 301) | F-0095(18)115 | 97.2 | |
| 19906 | US-6; Tucker to Soldier Summit | F-0006(245)204 | 96.6 | |
| 19910 | I-15; Arizona State Line to Cottonwood Creek | F-I15-1(142)0 | 97.2 | |
| 19913 | US-191; Dry Valley to Hatch Wash | F-0191(206)89 | 96.6 | |
| 19914 | US-6; Grassy Trail Creek to Icelander | F-0006(252)222 | 97.1 | |
| 19926 | SR-257; Cattle Guard to MP 61 | F-0257(8)46 | 96.6 | |
| 19942 | I-80; MP 41 to MP 50 | F-I80-2(82)41 | 96.5 | |
| 19945 | SR-186; North Temple to 400 S. | F-0186(50)2 | 97.5 | |
| 19949 | SR-201; 900 W to State Street | F-0201(58)17 | 97.3 | |
| 19959 | US-40; Antelope Creek to to Pole Line Rd | F-0040(232)97 | 96.6 | |
| 19966 | SR-28; I-15 S of Nephi to I-15 N of Nephi | F-0028(19)38 | 97.1 | |
| 20027 | SR-175; Pavement Restoration at Various Locations | F-R299(439) | 97.2 | |
| 20469 | US-40; I-80 to SR-248 | F-0040(219)0 | 96.9 | |
| 20554 | Ramps on I-215; State, Fashion | F-R299(458) | 97.6 | |
| 20768 | SR-96; Clear Creek to MP 18.0 | S-0096(8)0 | 97.2 | |
| 21094 | US-191; Improvements North of Summit | S-0191(212)272 | 97.1 | |
| 21318 | US-89; SR-204 to SR-134 | F-0089(595)417 | 96.1 | |
| 21346 | I-80; MP 131.4 to 134.0 | F-I80-3(216)131 | 96.8 | |
| 21347 | I-80; Kimball's Junction to US-40 | F-I80-4(184)143 | 96.9 | |
| 21615 | I-80; Parley's Way Ramps | F-I80-1(70)0 | 97.3 | |
| 22316 | I-80; MP 53-55 Pavement Repairs | F-I80-2(84)53 | 97.6 | |
| | | | | |
| | **Overall Project Average Density from Cores:** | | **96.9** | |

# HiMod Project Average Mat Densities

Ave Density
96.9% Gmm

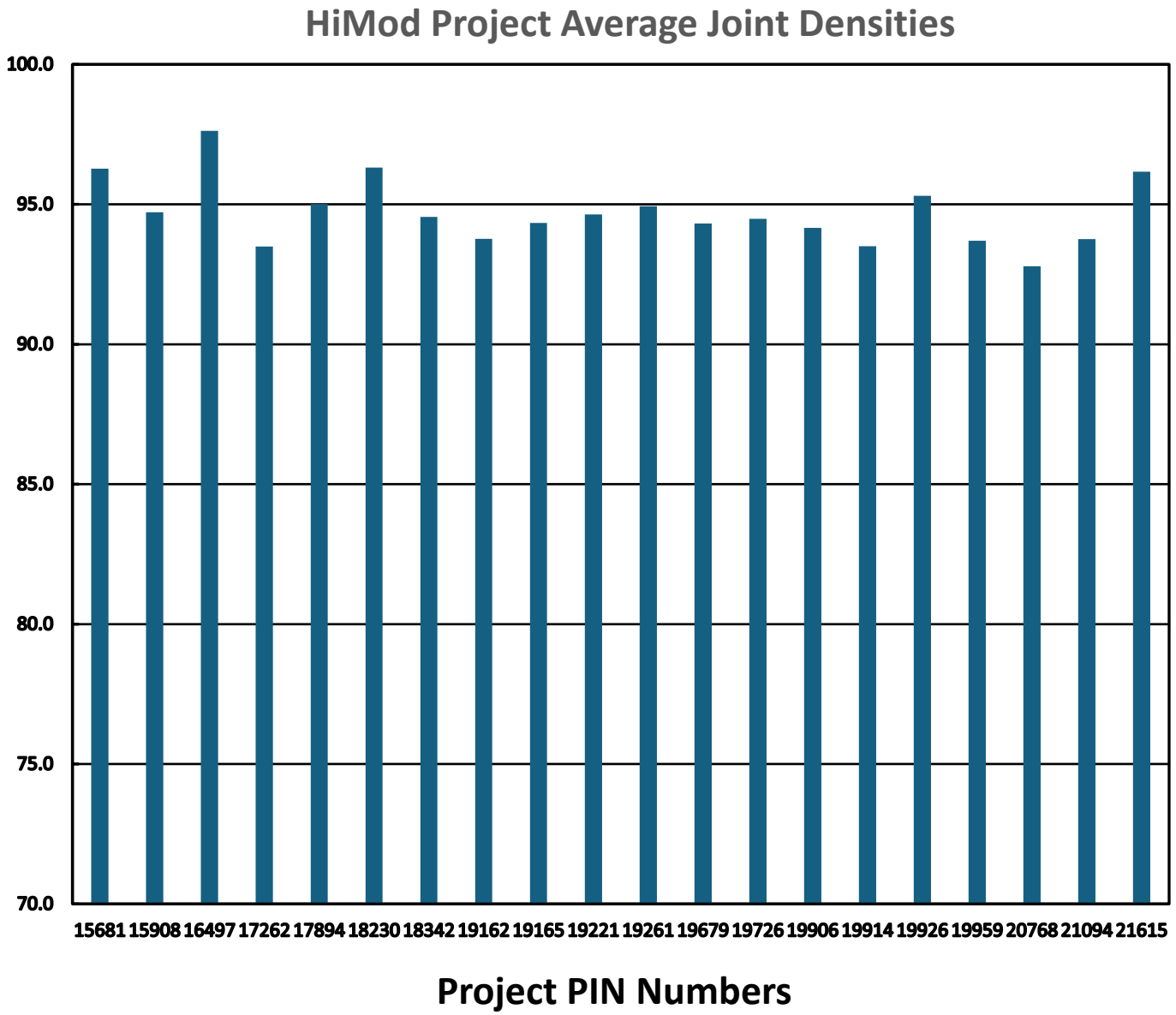
High: 98.4%
Low: 95.2
Std: 0.55




LTDOT Keeping Utah Moving

Ave Joint Density
94.7% Gmm

High: 97.6%
Low:  92.8
Std:  1.2

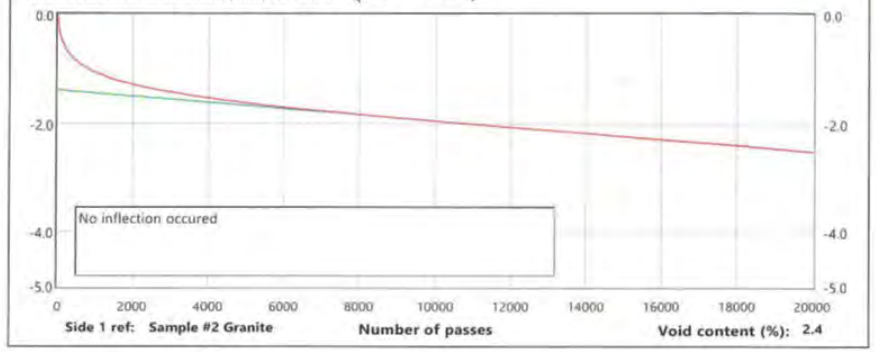


# Hamburg Wheel-Tracker Test Results

| | | | |
|---|---|---|---|
| UDOT 990 2015 | | Date sampled: | 11/4/2025 |
| Date/time of test: | 11/4/2025 6:06 AM | Job number: | PIN 15689 |
| Laboratory number: | Central Materials 47 | Project number: | N/A |
| Project name: | Granite I-215 | Project Engineer: | N/A |
| Submitted by: | Julian | Threshold: | 50% |

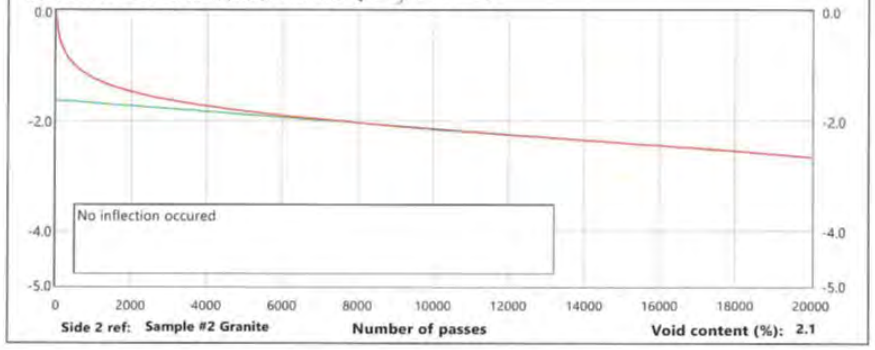
Sample #2 42"

Utah 990 2015 calculation (mm) for Side 1 (Left Side)




Side 1 ref: Sample #2 Granite | Number of passes | Void content (%): 2.4

Utah 990 2015 calculation (mm) for Side 2 (Right Side)




Side 2 ref: Sample #2 Granite | Number of passes | Void content (%): 2.1

Rut depths (mm)

| Pass No. | Side 1 | Side 2 |
|---|---|---|
| 5000 | -1.62 | -1.82 |
| 10000 | -1.95 | -2.15 |
| 15000 | -2.24 | -2.40 |
| 20000 | -2.52 | -2.66 |
| | | |
| | | |
| | | |

| | |
|---|---|
| Mix type: | HMHMA 62 mm |
| Asphalt grade: | 76-34 |
| HMA production: | Field |
| Compaction method: | Slab |
| Mix source: | |
| Test temperature (°C): | 54.0 |
| Mix Depth (mm): | 42.00 |

Signature .....

Report version V1.4.0


UDOT
Central Labs
Sample 2 Left
Granite I-215
76-34 Peak
Air Voids: 2.5
Rut Depth: 2.52
UDOT
Central Labs
Sample 2 Right
Granite I-215
76-34 Peak
Air Voids: 2.1
Rut Depth: 2.66


HiMod, thin lift
I-80, MP 41 to 50
August 2024