

404-LVT (Low Volume Traffic)

A new 404 specification for
your lightly traveled roads

404-LVT Asphalt Concrete

The 404-LVT specification has been designed to provide a mix rich in asphalt binder, fine textured, and non-restrictive in aggregate shape; this facilitates attaining mix density, flexibility, and resilience and allows placement in a thin layer for economy.

These are necessary properties for ensuring longevity and successful mix performance on low volume roadways where oxidation and cracking are the primary pavement distresses and high deformation resistance is not a concern.

Since 404-LVT is a recipe mix it should only be used for routes having $ADT < 2,500$.

404 History

- A recipe mix provided by ODOT
- A staple of ODOT specs from 1965 until 2002
- A favorite for lower volume roads, still specified by some local agencies
- Loved for its fine texture and high binder content
- Abandoned by ODOT for contractor designed mixes and stouter mixes more capable of resisting deformation

Renewed interest in thin overlays

- Federal/state emphasis on preventive maintenance
- Decreasing revenue, increasing cost
- Desire for a longer lasting, more cost effective alternative to surface treatments with better functional characteristics and serviceability

Advantages of finer mix

- Finer mixes are less permeable at given densities – greater durability
- Finer mixes are easier to compact to higher densities and produce tighter joints
- In general, finer-graded mixes provided the greatest longevity – OU research

404-LVT material Characteristics

- A finer texture and grading than 448, Type 1
- 72% passing the #4 vs 45-57 for 448, T-1
- Narrower gradation limits for a more consistent texture
- Higher asphalt content vs 448, T-1, 6.2 to 6.4% depending on aggregate type vs 5.8 typ. For 448 – binder content can be adjusted as needed, contractor gets paid for what is directed or used

Where to use 404-LVT

- Low volume traffic < 2500 ADT
- Where a 1 in. thick surface course can be placed (place a variable-depth intermediate course where profile or crown are excessive)
- No unrepaired structural damage
- No appreciable rutting (< ¼ inch)
- Sufficient pavement structural capacity to last the life of the 404-LVT overlay.

404-LVT performance

- Fayette County Engineer - cites improved texture
- City of Cincinnati - likes - costs more per cy
- Muskingum County Engineer – reported on his experience at 2011 FPO Annual EXPO
- Following slides from that presentation that can be found at

<http://www.flexiblepavements.org/sites/www.flexiblepavements.org/files/events/conferences/Davis.pdf>

404-LVT Asphalt Concrete

MCEO
Asphalt Comparison

Asphalt Concrete Material

A	448 Asphalt Concrete, Type 1 Medium, PG76-22 GTR (Ground Tire Rubber Asphalt)
B	448 Asphalt Concrete, Type 1 & 2, Surface Course, PG 64-22
C	441 Asphalt Concrete, Type 1 Medium, PG 70-22M, Polymer Asphalt Binder
D	404 LV (Low volume) Asphalt Concrete, PG 64-22

*Type awarded

Year Improved	Project	Asphalt	Thickness (in.)	Tons Bid	Cost per ton
2005	Various Rds	B*	1.50	18,449.00	\$36.50
2006	Various Rds	B*	1.50	11,308.00	\$47.00
2007	Various Rds	B	1.50	9,464.00	\$51.50
2007	Various Rds	C*	1.25	7,874.00	\$59.25
2007	MUS-CR87	B*	3.00	5,342.00	\$50.00
2007	MUS-CR408	B*	3.00	12,258.00	\$52.00
2008	Various Rds	B	1.50	20,178.00	\$55.75
2008	Various Rds	C*	1.25	16,790.00	\$65.00
2008	MUS-CR7	B*	3.00	10,112.00	\$56.00
2009	Various Rds	B	1.50	19,394.00	\$63.50
2009	Various Rds	C*	1.25	16,135.00	\$73.75
2009	MUS-CR500	A*	2.00	8,068.00	\$85.75
2010	Various Rds	D*	1.00	19,842.00	\$69.00

Asphalt Concrete

- A high percentage (64%) of Muskingum County asphalt roadways are less than 1,000 ADT.
- MCEO was looking for an asphalt material with similar durability as 441-Polymer but could be applied at more tons per mile.
- 441-Polymer can be applied to roads with less than 1,000 ADT, but it is not as cost effective than the asphalt used in 2010 by MCEO.....

404-LVT Asphalt Concrete

- Muskingum County – 2010 Costs

Type	PG	Cost per Ton	Thickness (in.)	Tons per Mile	Cost per Mile
448	6422	\$64.00	1.50	977.78	\$62,577.92
441	7022	\$74.00	1.25	814.81	\$60,295.94
404	6422	\$69.00	1.00	651.85	\$44,977.65

*Width = 20'

*1 mile

*Conversion Factor = 2

404-LVT Asphalt Concrete

- It's all about the numbers...
 - 404-LVT is in line to make a large return in comparison to Type 448 at an increased thickness.
 - Roads suited for the 404-LVT will allow entities to stretch their funding and add more mileage annually.
 - The reasoning for this is.....

404-LVT Asphalt Concrete

- The roads with 2,500 ADT or less can stand up against rutting and surface wear.
- Restoring ride quality
- Improving safety
 - Increase skid resistance and resist aggregate delamination.

404-LVT Specification

- Find a PDF of the spec at <http://www.flexiblepavements.org/sites/www.flexiblepavements.org/files/404lvtspecification-rev8nov2010.pdf>
- Get the informational brochure at <http://www.flexiblepavements.org/sites/www.flexiblepavements.org/files/404lvtbrochure.pdf>
- Contact FPO for guidance and a MSWord file

Questions?



www.flexiblepavements.org