

ITEM 404LVT (Low Volume Traffic) ASPHALT CONCRETE

Revised June 5, 2015

Notes to Designers:

Here's what's new in this latest revision of 404LVT

This revised specification includes the following changes: Higher asphalt binder contents for both gravel and limestone mixture formulations; adjusted minimum virgin binder contents; a single level of reclaimed asphalt pavement (20% max.); incorporation of binder type PG58-28; binder adjustment when aggregate absorption is 4 percent or greater.

Select binder grade based on the following considerations.

Use PG58-28 binder to improve resistance to paving aging and cracking. Otherwise, use binder grade 64-22.

Why 404LVT was developed

404LVT was developed for use in low volume traffic applications as an alternative to chip sealing and microsurfacing to provide longer service life between treatments, better economy, and motorist satisfaction. It is a 1-inch thick asphalt overlay that corrects minor surface distresses, provides increase to pavement strength, enhances ride comfort, and improves road profile and driver safety. (Note: A variable-depth intermediate course is recommended where profile or crown are excessive.) 404LVT can be furnished as either a hot mix asphalt or warm mix asphalt product. A 404LVT pavement surface is smooth, eliminates dust, is free of loose stone chips, and is quiet and completely reusable into new asphalt pavement.

404LVT has been designed to be rich in asphalt binder, fine-textured, and includes a minimum of 50% of the virgin fine aggregate to be natural sand to facilitate mix density, flexibility, and resilience. These are necessary properties for ensuring longevity and successful mix performance on low volume roadways where oxidation and cracking are the primary pavement distresses. Since 404LVT is a recipe mix it should only be used for roads and parking facilities where heavy, slow moving trucks do not frequent. Do not use in conditions known to be "high stress" pavement areas.

Owners are provided a mechanism (in Table 1, Note 2) to increase (or decrease) binder content if mix appearance deems such necessary. Compensation for binder increases and decreases is provided in Section .22, Acceptance and Basis of Payment. Section .22 includes a pay adjustment mechanism to encourage the contractor to furnish mix having a binder content that closely matches the job mix formula. Mix having binder content below the job mix formula, but within specification tolerances, will receive a pay adjustment commensurate to the deviation from the mix formulation in Table 1. No adjustment is made for binder content in excess of the job mix formula so as to not create an incentive for over-asphalting.

Agencies are requested to contact Flexible Pavements of Ohio for additional guidance and to obtain the most current specification in an MSWord file. Contact Flexible Pavements of Ohio at 1-888-4HOT MIX (446-8649) or info@flexiblepavements.org

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404LVT.01 Description.

This work consists of constructing a 1-inch thick surface course or variable depth intermediate course of aggregate and asphalt binder for use in low volume traffic applications.

Mix aggregate and asphalt binder in a central plant and spread and compact on a prepared surface according to these specifications and in reasonably close conformity with the lines, grades and typical sections shown on the plans or established by the Engineer.

All specification references herein are to the Ohio Department of Transportation, 2013 Construction & Materials Specifications.

The requirements of specification 401 do not apply except where noted.

Asphalt concrete mix pavement thickness shown on the plans or stated in the proposal is for exclusive use in calculating the weight required to be placed per unit of surface area.

Section .22 includes a pay adjustment mechanism for mix that deviates from the job mix formula. Mix having binder content below the job mix formula, but within specification tolerances, will receive an adjustment commensurate to the amount of lacking binder. No payment is made for binder content in excess of the job mix formula.

404LVT.02 Composition.

Establish a Job Mix Formula (JMF) by combining coarse aggregate, fine aggregate, reclaimed asphalt pavement (RAP) and asphalt binder in proportions that result in an asphalt mixture meeting the blend limits in Table 1. Note: a minimum of 50% of the virgin fine aggregate must be natural sand, 703.05

Table 1

Mixture Proportions		
Sieve	Total Percent Passing	
1/2 inch	100	
3/8 inch	90 to 100	
No. 4	72	
No. 8	42 to 60	
No. 16	27 to 45	
No. 50	10 to 22	
No. 200	0 to 8	
Total binder content (% by weight of mix):	Gravel coarse aggregate: 6.6 ^{1,2} Limestone coarse aggregate: 6.8 ^{1,2} Gravel/Limestone coarse aggregate blends: 6.7 ^{1,2} Slag aggregate blends: as determined by Marshall mix design process; medium traffic; binder content selection at 2.5% air voids. Note 1: Increase binder content 0.2% for coarse aggregate having absorption ≥ 4.0 Note 2: The engineer may adjust binder content. Compensation will be made according to 404LVT.22	
Virgin binder min. (% by weight of mix):	Gravel coarse aggregate: 5.6 Limestone coarse aggregate: 5.8	
Traffic volume (ADT):	2500 max.	
Binder Grades:	PG58-28	PG64-22
Limits for Reclaimed Asphalt Pavement (% by weight of mix):	20 max.	10 max.

404LVT.021 Quality Control

Ensure quality control personnel, testing devices, and facilities meet the requirements of Supplement 1041. Meet the requirements of Item 403 except 403.04 and 403.05.

Calibrate asphalt content nuclear gauges according to Supplement 1043.

Perform quality control testing according to the frequency provided in Table 2.
Obtain mix samples at the mixing plant.

Table 2

Quality Control Testing Schedule		
Daily Frequency	Tests	Sample Type
Within first 100 tons	binder content, gradation	completed mix
Each 400 tons thereafter	binder content, gradation	completed mix

During production investigate and correct variation from the JMF, as shown by the quality control analysis, of plus or minus 4 percent passing the No. 4 sieve or plus or minus 0.3 percent binder.

If variation exceeds the limits in Table 3 immediately cease production until the cause for variation is determined and corrections made. Notify the Engineer.

Table 3

Deviation from the Design		
Mix Characteristic	From the Design	Range
Binder Content	± 0.5 percent	1.0
No. 4 Sieve	± 6 percent	12

404LVT.03 Materials. Furnish materials conforming to Table 4.

Table 4

Material	Specification
Asphalt binder	702.01
Aggregate	703.05 ³
Mineral filler	703.07
Polymer	702.14

Note 3: Do not apply the gradation requirements for fine aggregate.

404LVT.04 Use of Reclaimed Asphalt Pavement

Process recycled asphalt pavement such that it passes a 9/16-inch sieve and when incorporated ensures a one-half inch maximum aggregate size.

404LVT.05 Mixing Plants. Apply the requirements of 401.05

404LVT.06 Weather Limitations. Apply the requirements of 401.06

404LVT.07 Notification. Apply the requirements of 401.07

404LVT.08 Asphalt Binder Preparation. Apply the requirements of 401.08

404LVT.09 Aggregate Preparation. Apply the requirements of 401.09

404LVT.10 Mixing. Apply the requirements of 401.10 Asphalt mixtures may be produced using the warm mix asphalt method according to 402.09

404LVT.11 Hauling. Apply the requirements of 401.11

404LVT.12 Spreading Equipment. Apply the requirements of 401.12

404LVT.13 Rollers. Apply the requirements of 401.13

404LVT.14 Conditioning Existing Surface. Apply the requirements of 401.14

404LVT.15 Spreading and Finishing.

Ensure spreading operations result in a mat texture that is uniform and free of deficiencies such as tears, drags or other blemishes. Remove and replace areas of deficient mat texture.

Apply the requirements of 401.15

404LVT.16 Compaction. Apply the requirements of 401.16

404LVT.17 Joints. Apply the requirements of 401.17

404LVT.18 Asphalt Binder Compatibility. Apply the requirements of 401.18

404LVT.19 Spreading and Surface Tolerances. Apply the requirements of 401.19

404LVT.20 Asphalt Binder Price Adjustment. Apply the requirements of ODOT proposal note 534

404LVT.21 Method of Measurement. Apply the requirements of 401.21

404LVT.22 Acceptance and Basis of Payment. Apply the requirements of 401.22

Acceptance for gradation and binder content will be based upon the mean of the results of all required quality control tests performed during a day's production.

The pavement owner is responsible for verification testing according to 403.06.

Production will be considered acceptable if the tolerances shown in Table 3 are not exceeded and the remaining sieves do not exceed the limits of the applicable specifications.

In the event material does not meet these requirements but that reasonably acceptable material has been produced, the Engineer will make a determination if the deficient work will be accepted and remain in place. If accepted, payment will equal 90 percent of the bid item cost for deviations related to aggregate gradation; 70 percent for binder deviations.

Payment for accepted quantities, complete in place, will be based on the following formula: $CY \times [Unit\ Price + 2BI(B_{ADJUST} - BC)]$

Where CY = cubic yards of asphalt concrete

Unit Price = unit price bid for the item

BC = Binder Correction factor.

$$BC = B_{JMF} - B_{ACTUAL} \text{ if } B_{JMF} > B_{ACTUAL}$$

$$BC = 0 \text{ if } B_{JMF} < B_{ACTUAL}$$

B_{ACTUAL} = Mean binder content of material placed, excluding deficient material removed or accepted at reduced pay

$B_{ADJUST} = (\%) \text{ binder adjustment (Table 1, Note 2)}$

$B_{BID} = \text{specified binder content (\%)} + (\%) \text{ binder added for absorptive aggregate (Table 1, Note 1)}$

$B_{JMF} = B_{BID} + B_{ADJUST}$

BI = Bidding Index

Pay Items	Unit	Description
404LVT	Cubic Yard	404LVT, Asphalt Concrete, PG 58-28
404LVT	Cubic Yard	404LVT, Asphalt Concrete, PG 64-22