

Pavement Standards for Local Roads and Streets (rev. 13July2016)

The subject of municipal street standards came to light as an important issue through the FPO customer survey conducted in 2005. Customers indicated a need to improve their standard designs and specifications to obtain better performance and economy from their pavements.

As a result, to provide guidance to local governments on asphalt pavement designs and specifications, FPO has developed a chart of typical designs and mix type selections that is included in this document. This guide has been updated to implement changes made in the ODOT 2016 Construction and Material Specifications.

On the chart street categories are identified by four alternative measures: average daily traffic, # of heavy trucks per day, 20-year design ESALs, and a verbal description. These are intended to aid the users in determining the appropriate classification for their application. The rest of the chart gives typical pavement build-ups and mix type specifications for two subgrade conditions; poor soil conditions and good soil and drainage conditions.

Most local governments allow developers to choose the pavement type for their development based on the agencies' standard, equivalent treatments. Several years ago, the City of Columbus conducted an extensive engineering evaluation to update its street standards to improve performance and economy. The results of Columbus' engineering are included in the chart published here for the lower traffic categories of pavements. The Columbus-derived sections are designed to have extra strength to account for the fact that construction loads are likely the heaviest loads to which these categories of pavement will ever be exposed.

For the higher traffic and load categories of pavements, generally accepted design methods, including the AASHTO and Asphalt Institute design methods, were used to develop the pavement structural sections. The normal designs were based on a 20 year design life. The perpetual pavement design is based on in-exhaustible structural fatigue life under the heaviest legal loads.

The mix types suggested for the heavier traffic applications are for highly rut-resistant materials needed in the typical urban arterial application; where heavy trucks stop, start and turn. Where these conditions are not present more economical materials can be specified. And, we must add our usual disclaimer: "if your present material specifications are giving you satisfactory results, there is really no need to change anything."

The mix types referenced in the chart are standard ODOT specification items that could also be used in maintenance and rehabilitation projects. However, there is another class of mixes (Thinlays) that are formulated specifically for thin-lift pavement preservation applications. For more information on Thinlay mixes refer to the FPO pavement preservation guidance documents.

Local agencies could adopt the suggested standards with confidence in obtaining well performing pavements. As noted in the chart foot notes, for larger projects a specific project design based upon a thorough soils investigation may produce a more economical solution than these, conservative, default designs.



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Flexible Pavements of Ohio (FPO) is an association representing the interests of the asphalt paving industry in the state of Ohio to federal, state and local governments, private industry and other construction organizations. FPO supports active educational, technical and outreach programs designed to improve and advance quality asphalt construction.

Municipal Standard Pavement Designs (Rev. 13July2016)

| Average Daily Traffic | # heavy trucks/day | ESALs (20 year design) | Typical Application | Typical Pavement Build-up, Poor Soil note 1 | Typical Pavement Build-up, Good Soil and Drainage note 1 |
|-----------------------|--|------------------------|---|---|---|
| 0-500 | <25 | 27,500 | Minigreens streets and cul-du-sac with no future extensions | 1-1/4" 441 Type 1, PG64-22 1-1/2" 441 Type 2 3-1/4"-301 6" -304 notes 2, 3, 4, 8 | Same |
| 501-1500 | <75 | 87500 | Non through residential streets with no future extensions | 1-1/4" 441 Type 1, PG64-22 1-1/2" 441 Type 2 3-3/4"-301 6" -304 notes 2, 3, 4, 8 | Same |
| 1501-3500 | <175 | 192,500 | Through or connecting residential streets | 1-1/4" 441 Type 1, PG64-22 1-1/2" 441 Type 2 5-1/4"-302 6" -304 notes, 3, 4, 8 | 1-1/4" 441 Type 1, PG64-22 1-1/2" 441 Type 2 4-1/4"-302 6" -304 notes 3, 4, 8 |
| <20000 | <1000 | 1.5m | Arterial Streets | 1-1/2" 442 12.5mm Type A (446) APP (PG76-22M) 2-1/2" 442 19mm Type A (446) APP (PG76-22M) 5"-302 6" -304 notes 3, 4, 5, 6, 7, 8 | 1-1/2" 442 12.5mm Type A (446) APP (PG76-22M) 2-1/2" 442 19mm Type A (446) APP (PG76-22M) 4"-302 6" -304 notes 3, 4, 5, 6, 7, 8 |
| N/A | <2000 | 4m | Heavy Industrial streets | 1-1/2" 442 12.5mm Type A (446) APP (PG76-22M) 2-1/2" 442 19mm Type A (446) APP (PG76-22M) 7"-302 6" -304 notes 3, 4, 5, 6, 7, 8 | 1-1/2" 442 12.5mm Type A (446) APP (PG76-22M) 2-1/2" 442 19mm Type A (446) APP (PG76-22M) 6"-302 6" -304 notes 3, 4, 5, 6, 7, 8 |
| N/A | Designed for the heaviest legal trucks | N/A (Perpetual) | Perpetual Pavement | 1-1/2" 442 12.5mm Type A (446) APP (PG76-22M) 2-1/2" 442 19mm Type A (446) APP (PG76-22M) 9"-302 6" -304 notes 3, 4, 5, 6, 7, 8 | 1-1/2" 442 12.5mm Type A (446) APP (PG76-22M) 2-1/2" 442 19mm Type A (446) APP (PG76-22M) 8"-302 6" -304 notes 3, 4, 5, 6, 7, 8 |

Notes:

1- Soil support poor, CBR=3; good, CBR = 7, good drainage means both surface and subsurface drainage is provided.

2 – From City of Columbus standards

3 - All binder grades are the ODOT default grade in the specification item, except where noted. ("M" designates polymer modified binder)

4 - If agency preference is to use full-depth asphalt on the subgrade delete the 6" crushed aggregate base (Item 304) and increase the asphalt base thickness by 2".

5 – These surface and intermediate courses are intended to provide 4 inches depth of highly rut-resistant materials. The specification default binder grades must be revised to PG 76-22M as an "as per plan" (APP) item. If extreme high stress conditions warrant, the binder grade may be further increased to PG 88-22M. If high stress conditions (starting, stopping, turning heavy vehicles) are not present, use more economical materials and course thickness: 1-1/2" 442, 12.5mm, Type B; 1-3/4" 442, 19mm, Type B, show acceptance as 446 or 448 as preferred and increase the thickness of the 302 course accordingly.

6 - These pavement build-ups are intended for new construction of substantial quantity. Not all of these materials are feasible or practical for production in small quantities. There are alternatives for small quantities that can provide adequate rutting resistance. Consult your producer for recommendations.

7 - Larger, heavier traffic projects can economically benefit from and should receive a detailed soil and traffic analysis and a specific pavement design.

8 - All specification references are to ODOT, 2016 Construction and Material Specifications. Acceptance will normally be per item 448 except where noted.