

# What you should know about **CONCRETE PAVEMENT**

[www.rmcao.org](http://www.rmcao.org)

## VALUE

### **Concrete Will Save You Money**

Concrete is a competitive material when compared to equivalent asphalt cross sections. With the increased costs of liquid asphalt, concrete not only competes on life cycle cost, but also on a first cost basis. Concrete has been shown to be an excellent alternative when contracts are opened with alternative bidding clauses.

### **Noise Control**

Sound level is primarily a function of the surface finish, not the material it is constructed from. Many types of concrete pavement surface textures have been developed to reduce concrete pavement noise-related problems. The concrete pavement textures shown to the right all produce different noise levels and different frequency spectrums (tones).

## SAFETY

### **Increased Visibility**

Concrete is naturally brighter and more reflective than flexible pavement. This requires less energy to illuminate comparable areas, which is good for the environment, pedestrian safety, and can save on street lighting costs.

### **No Rutting**

Concrete under normal use will not rut, so there is significantly lower risk of water accumulating in ruts and causing hydroplaning.

### **Superior Traction**

Concrete surfaces can be textured to provide skid resistant surfaces that are needed to allow safe vehicle breaking action and directional stability. This textured surface also improves drainage.

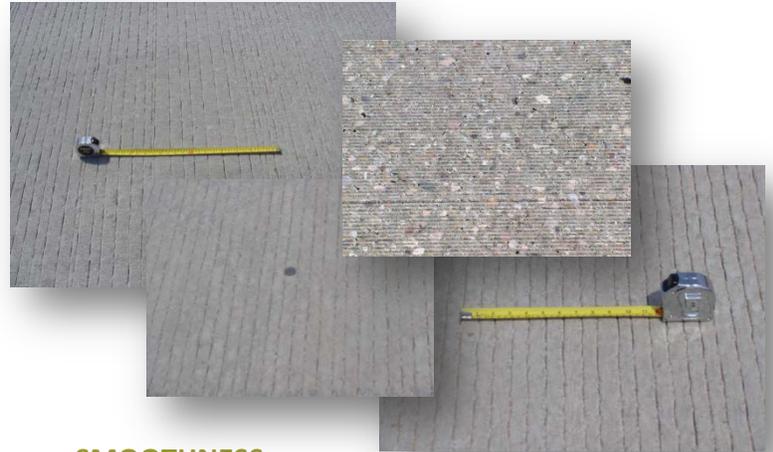
## DURABILITY

### **Continues to Gain Strength**

After its first month in place, concrete continues to slowly gain 10 percent in strength during its life.

### **Minimal Maintenance Requirements**

Concrete pavements provide long-term value because they will frequently outlast their design life expectancy and traffic loads.



## SMOOTHNESS

### **Specifying Road Characteristics**

Technology in today's road design and placement equipment allow for owners to specify the ride characteristics of their concrete road. Any future road cut repairs when finished properly, can be completed quickly without affecting ride quality.

### **Smoother for Longer**

The rigidity of concrete pavements allows it to keep its smooth riding surface long after construction.

### **Longer Lasting Roads**

Concrete can withstand even the heaviest traffic loads, without the worry of ruts, shoving or washboard effects that are common with flexible pavements. Also, concrete roads will offer forgiveness when future traffic expectancy is underestimated.

### **Utility Cuts – No Problem**

If utility cut operations are carried out properly there will be minimal impact on the pavement's functional serviceability, ride quality, and lifespan. Experience has shown that it is best to repair or restore concrete pavements with concrete. Proper utility cut restorations, constructed even with the surrounding pavement, provide a smooth transition that can withstand traffic loads without future settlement. ACPA has published a step-by-step guide for making a utility cut in concrete pavement.



## VERSATILITY

### **Variable Design**

Concrete pavements can be designed for any load and traffic for streets and roads, parking lots, intersections and entrances.

### **Fast-Track Concrete**

Concrete pavement can be open to traffic in as little as 5 hours.

**FREE ACCESS - LOG ON TO [www.CANPav.com](http://www.CANPav.com) TODAY**

### **What is CANPav™?**



CANPav™ is a free, safe, secure website where users can quickly determine the cost advantages of using concrete as the paving materials for municipal streets & roads and commercial parking lots.

Users access the CANPav™ website to create their own account. Once you login you immediately have the ability to conduct comparisons with complete control over the pavement cross-sections and the construction cost inputs. CANPav can evaluate both initial cost as well as life cycle cost for a 50 year analysis period.

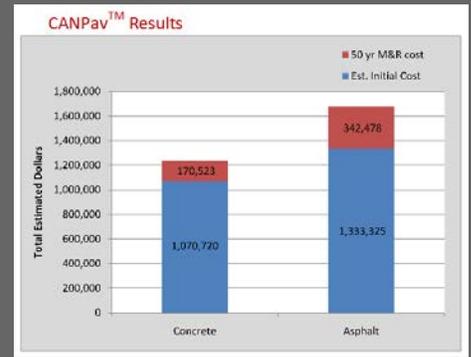
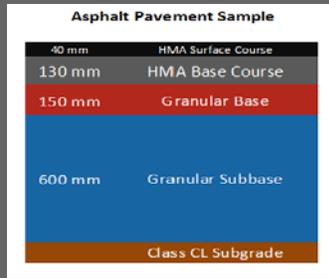
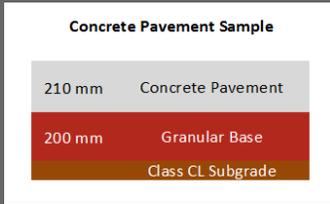
# PAVEMENT PROPERTIES

1. 2% traffic growth per year
2. Tied shoulder or widened slab
3. Concrete Modulus of Rupture (MR) = 5.6 MPa
4. Concrete Modulus of Elasticity (E) = 29,600 MPa
5. Concrete Compressive Strength = 32 MPa (CSA Exposure Class C-2)

6. Subgrade: Class CL, Low Plasticity Clay  
Repr. Resilient Modulus: 30 MPa  
Equivalent CBR: 3  
Liquid Limit: 30  
Plasticity Index: 20

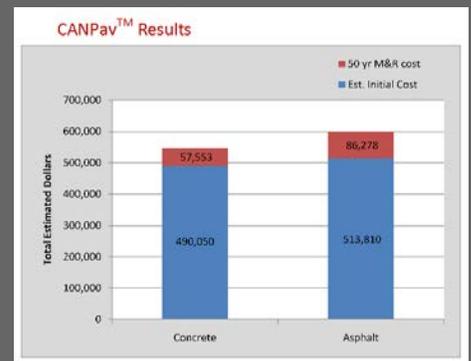
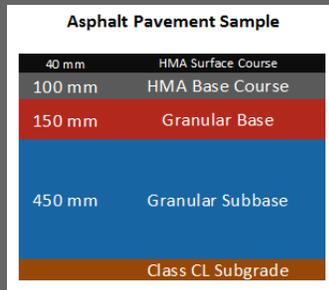
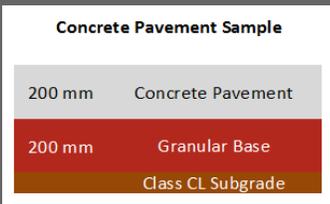
## MAJOR ARTERIAL MUNICIPAL ROAD

1. 4 lane major arterial municipal road
2. AADTT = 7,500 trucks/day (two-way)
3. 32M dowels at 300mm c/c along transverse joint



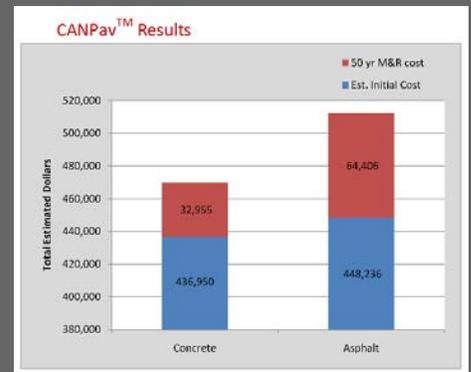
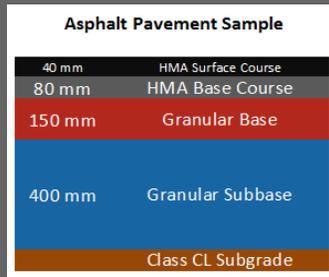
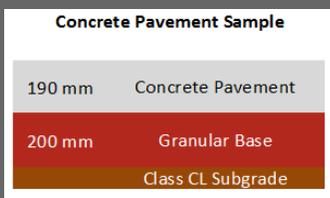
## MINOR ARTERIAL MUNICIPAL ROAD

1. 2 lane collector municipal road
2. AADTT ≈1500 trucks/day (two way)
3. 32M dowels at 300mm c/c along transverse joint



## COLLECTOR MUNICIPAL ROAD

1. 2 lane collector municipal road
2. ADTT = 500 trucks/day (two-way)
3. No Dowels



Concrete Pavement sample cross-sections were taken with permission from Applied Research Associates Inc. report entitled: [“Methodology for the Development of Equivalent Pavement Structural Design Matrix for Municipal Roads”](#).

Cost comparisons were completed using CANPav™ [[www.canpav.com](http://www.canpav.com)]. CANPav™ is a free, safe, secure website where users can quickly compare the Initial Construction and Maintenance & Rehabilitation costs of concrete and asphalt pavement cross sections.

Life Cycle cost comparison using Applied Research Associates Inc. repair tables. Pavements were designed to have an initial design life of 25 years. At the end of the design life the pavements were expected to require rehabilitation to extend the life out to a 50 years analysis period. Fifty years was chosen in order to require at least one major rehabilitation activity for all pavement types.

### References:

1. All Concrete Isn't Created Equal – American Concrete Pavement Association (QD002P)
2. Why is concrete such a great pavement choice? – 2008, American Concrete Pavement Association.
3. Durable Concrete Pavement – American Concrete Pavement Association (PL602P)
4. Methodology for the Development of Equivalent Pavement Structural Design Matrix for Municipal Roads - 2011, Applied Research Associates Inc.



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