

CPR: REBUILT TO LAST

A Progressive Concrete Pavement Preservation Strategy Improves City Streets in Minneapolis

>>> CONCRETE PAVEMENT PRESERVATION TECHNIQUES

THE INEVITABLE FREEZE-THAW season in Minneapolis leads to pavement damage every spring, creating a cycle of pothole repair and deterioration that the city is eager to escape. With 155 miles of residential concrete streets built between 1961 and 1976, city officials realized that that most of the pavements were structurally sound and would be able to provide many additional years of service life if rehabilitated using concrete pavement preservation (CPP) techniques. CPP targets and repairs areas of distress within otherwise sound concrete pavements. In 2017, Minneapolis instituted its Concrete Street Rehabilitation Program, with CPP as the basis.

CPP FOR RESIDENTIAL STREETS

CPP has long been used on deteriorated highways, but it also offers an alternative to asphalt overlays when rehabilitating city streets constructed of concrete. It is a sustainable approach because it reuses existing materials rather than requiring large quantities of natural resources such as aggregate and bituminous oil. When diamond grinding and/or grooving are included, CPP can also improve a pavement's surface friction and enhance safety. The work can be performed in small areas and at off-peak hours, with the repairs often lasting for decades.

Techniques include:

- Slab stabilization
- Full-depth repair
- Partial-depth repair
- Dowel bar retrofit
- Cross-stitching longitudinal cracks or joints
- Conventional diamond grinding (CDG)
- Joint and crack resealing

Execution of Work

The Minneapolis Department of Public Works used a criteria-based system with a focus on racial and economic equity to determine their distribution of funding. To prioritize pavement sections for improvement, considerations include pave-



ment age and condition, work history, planned utility work and best practice pavement management strategies. The program's goal is to rehabilitate 3-4 miles of concrete streets per year.

Work is performed by both city personnel and contractors to contain costs while still addressing specialized construction needs. City forces are well-equipped to do some of the repairs, while in other locations, contractors are needed to perform skilled work such as full or partial depth repair.

Preconstruction assessments (site visits with stakeholders at various stages of planning and construction) and Indefinite Delivery/Indefinite Quantity (IDIQ) contracting also bring efficiency to the program's projects. IDIQ contracts outline overall project completion goals (usually quantified in number of years) and a minimum/maximum dollar amount for the overall contract.

During construction, individual task orders are executed. Each task order has a minimum dollar amount, which prevents situations in which the contractor would have to mobilize to service overly small work areas. The contracting method allows owners flexibility in performing work while

TEAM MEMBERS

- Concrete Paving Association of Minnesota (Advisor)
- Interstate Improvement, Inc. (Prime Contractor)
- PCi Roads (Partial Depth Repair Contractor)
- Interstate Improvement, Inc. (Grinding Contractor)

dealing with ever-changing budget restraints.

2017 and 2018 projects for the rehabilitation program were within Minneapolis' Waite Park neighborhood. Annual special assessments of approximately \$400,000.00 were adopted. In total, approximately \$2,600,000 was for concrete repairs, \$500,000 for diamond grinding and the rest for incidentals.

Minneapolis's renewed pavements are expected to last another 25 years, making the total lifespan of the concrete streets 65-70 years. With only one major preservation cycle during that timeframe, this translates into a very low annual cost for concrete city streets.