

GROUND

ENGINEERING

July 3, 2018

Subject: Alternative Asphalt Sections,
Northwest Open Space Park Improvements,
Northglenn, Colorado

Job No. 17-3034

Matthew Whipple
DHM Design
900 S. Broadway, Suite 300
Denver, Colorado 80209

Dear Mr. Whipple:

GROUND Engineering Consultants, Inc. (GROUND) previously performed a subsurface exploration program to develop geotechnical parameters for design of improvements to the City of Northglenn's Northwest Open Space park. Our findings and conclusions were presented in a report dated June 23, 2017.¹ The report included flexible pavement sections for new parking areas and drive lanes, and a concrete section for areas subject to heavy vehicle traffic, including fire lanes.

We understand that now the City is considering placing a flexible wearing course or a wearing course constructed of asphalt millings on the heavy vehicle routes / fire lane at the park. A composite flexible section and an asphalt millings section are provided below.

Reference is made to GROUND's June 23, 2017, report for a description of the site surface and subsurface conditions, our general geotechnical findings and conclusions, and the limitations on our services, that also apply to the geotechnical information provided herein. We consider all parameters and considerations in that report not specifically superseded herein to remain valid.

¹ GROUND Engineering Consultants, Inc., 2017, *Geotechnical Evaluation, Northglenn Northwest Open Space Park Improvements, Northglenn, Colorado*, Job No. 17-3034, prepared for DHM Design, dated June 23.

Using the same traffic and subgrade parameters, etc., that were outlined in our June 23, 2017, report, a composite flexible section consisting of **5 inches** of asphalt over **11 inches** of CDOT Class 6 Aggregate Base Course is numerically equivalent to the rigid section provided in that report. (The aggregate base course should be compacted properly in accordance with the criteria provided in the *Project Earthwork* section of GROUND's June 23, 2017, report.) In our experience, however, such a section will not perform as well as a rigid pavement, particularly in areas of high turning stresses or prolonged static loading, and additional maintenance costs should be anticipated by the City.

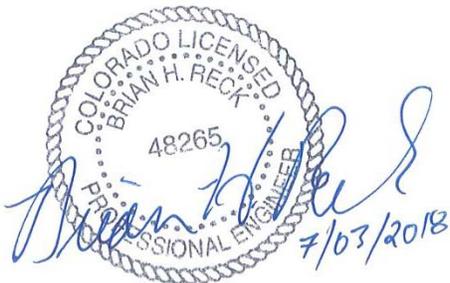
If an asphalt millings wearing course is selected, then the millings should be graded to meeting the criteria of CDOT Class 5 or Class 6 Aggregate Base Course. At least **14 inches** of properly compacted asphalt millings should be placed as the wearing course. It should be noted that this section is not intended to support fire truck outriggers without cribbing or similar measures.

The millings comprising such a wearing course will be displaced and rutted under the loads imposed by heavy vehicles. Therefore, regular maintenance including re-grading and application of additional aggregate should be implemented to ensure proper drainage, repair distressed/damaged areas, and re-establish grades. If water infiltrates these areas, additional rutting and other distress, including a reduction in capacity, will result, requiring additional maintenance.

We trust that this provided the information that you needed at this time. If you have any questions, please contact this office.

Sincerely,

GROUND Engineering Consultants, Inc.

A circular professional engineer seal for Brian H. Reck, Colorado License 48265, dated 7/03/2018. The seal contains the text "COLORADO LICENSED", "BRIAN H. RECK", "48265", and "PROFESSIONAL ENGINEER". There is a handwritten signature in blue ink over the seal and the date "7/03/2018" written in blue ink to the right of the seal.

Brian H. Reck, P.G., C.E.G., P.E.