



September 10, 2002

EARTH ENGINEERING
CONSULTANTS, INC.Chateau Development Company
310 Lashley Street
Suite 107
Longmont, Colorado 80501**APPROVED**By: DCJ Date: 9-10-02

Attn: Mr. Doug Barkus

City of Fort Collins
Engineering DepartmentRe: Recommended Pavement Sections
Brookfield - Phase 1 Pavements (East)
Fort Collins, Colorado
EEC Project No. 1025015J

Mr. Barkus:

Our subsurface exploration report for a portion of the roadway subgrades in Phase 1 of the Westchase development in Fort Collins, Colorado was submitted to your attention on August 28, 2002. Based on that report, the City of Fort Collins Engineering Department has provided estimated traffic loadings for the identified streets. The streets evaluated, along with the estimated traffic loads, are indicated on the attached summary.

Pavement section recommendations are provided in this report based on the traffic loadings provided by the City of Fort Collins Engineering Department and remolded subgrade strength characteristics. A Hveem R-value test was completed on a representative sample of the roadway subgrades for use in the pavement design. An R-value less than 5 was determined in laboratory testing. A Hveem stabilometer R-value of 5 was used for the rough graded pavement subgrades. Using the American Association of State Highway and Transportation Officials (AASHTO) correlation, that R-value corresponds to a resilient modulus value of 3775. The resilient modulus value of 3775 was used in the pavement evaluation.

The AASHTO design guidelines for pavement design were used to evaluate recommended pavement sections for this project. Recommended pavement sections based on that evaluation are provided on the attached summary. Other sections could be considered; however, City of Fort Collins standards require the use of a composite section.

CENTRE FOR ADVANCED TECHNOLOGY
2301 RESEARCH BOULEVARD, SUITE 104
FORT COLLINS, COLORADO 80526
(970) 224-1522 (FAX) 224-4564

Earth Engineering Consultants, Inc.

EEC Project No. 1025015J
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The asphaltic concrete used as the surface course in the pavement area should be consistent with City of Fort Collins classification for Grading S or SX for the local drives; Grading S should be used for collector roadways. The aggregate base should be consistent with Colorado Department of Transportation requirements for Class 5 or Class 6 base.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we can be of further service to you in any other way, please do not hesitate to contact us.

Very truly yours,
Earth Engineering Consultants, Inc.



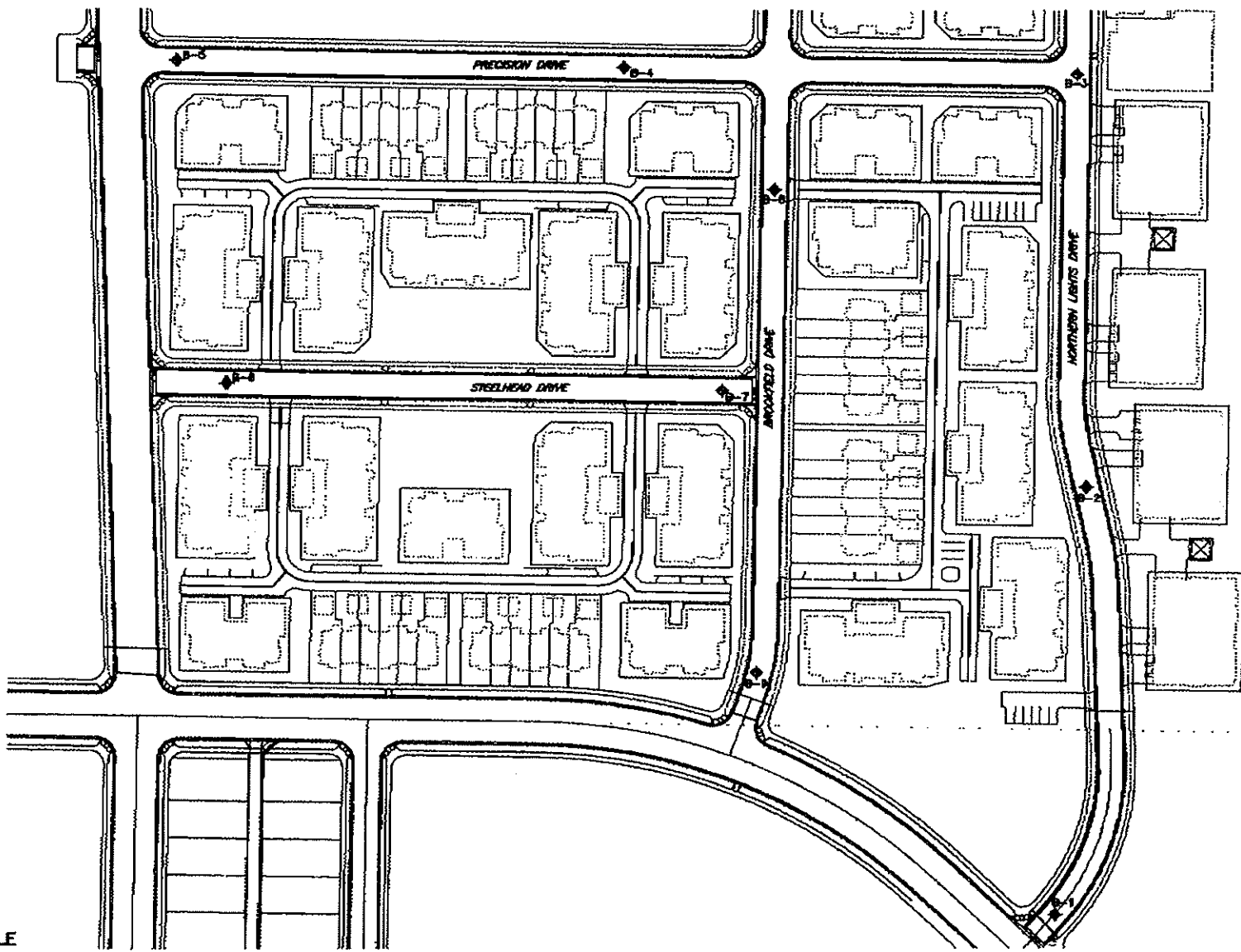
Wolf von Carlowitz, P.E.
Project Engineer

Reviewed by:



Lester L. Litton, P.E.
Principal Engineer

cc: Rick Richter - City of Fort Collins (3)



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NOT TO SCALE

BORING LOCATION DIAGRAM
 BROOKFIELD - PHASE I PAVEMENTS (EAST)
 EEC PROJECT # 1025015J AUGUST 2002

EARTH ENGINEERING CONSULTANTS, INC.
RECOMMENDED PAVEMENT SECTIONS

Roadway	Northern Lights Drive	Brookfield Drive	Steelhead and Precision Drives
Traffic Load 18-Kip EDLA	30	20	15
Classification	Local Connector	Local Connector	Local
Design Structural Number	3.05	2.87	2.60
Section A – Composite			
Asphalt Surface	5 in.	4½ in.	4½ in.
Aggregate Base	8 in.	8 in.	6 in.
Section Structural Number	(3.08)	(2.86)	(2.64)

Project: Pavement Recommendations
Brookfield - Phase I Pavements (East)
Fort Collins, Colorado

EEC Project No: 1025015J

Date: September 2002



March 9, 2004

Chateau Development Company
12050 Pecos Street, Suite 100
Westminster, Colorado 80234

Attn: Mr. Doug Barkus

Re: Subsurface Exploration Report – Pavement Subgrade
Brookfield - Phase II Pavements
Fort Collins, Colorado
EEC Project No. 1025015B

Mr. Barkus:

Our subsurface exploration report for a portion of the roadway subgrades in Phase II of the Brookfield development in Fort Collins, Colorado was submitted to your attention on February 23, 2004. Based on that report, the City of Fort Collins Engineering Department has provided estimated traffic loadings for the identified streets. The streets evaluated, along with the estimated traffic loads, are indicated on the attached summary.

Pavement section recommendations are provided in this report based on the traffic loadings provided by the City of Fort Collins Engineering Department and remolded subgrade strength characteristics. A Hveem R-value test was completed on a representative sample of the roadway subgrades for use in the pavement design. An R-value less than 5 was previously determined in laboratory testing and used for the rough graded pavement subgrades. Using the American Association of State Highway and Transportation Officials (AASHTO) correlation, that R-value corresponds to a resilient modulus value of 3775. The resilient modulus value of 3775 was used in the pavement evaluation.

The AASHTO design guidelines for pavement design were used to evaluate recommended pavement sections for this project. Recommended pavement sections based on that evaluation are provided on the attached summary. Other sections could be considered; however, City of Fort Collins standards require the use of a composite section.

Earth Engineering Consultants, Inc.

EEC Project No. 1025015B
March 9, 2004
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The asphaltic concrete used as the surface course in the pavement area should be consistent with City of Fort Collins classification for Grading S or SX for the local drives; Grading S should be used for collector roadways. Grading SG asphaltic concrete will be required for the bottom lift in asphalt sections greater than 4 inches. The aggregate base should be consistent with Colorado Department of Transportation requirements for Class 5 or Class 6 base.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we can be of further service to you in any other way, please do not hesitate to contact us.

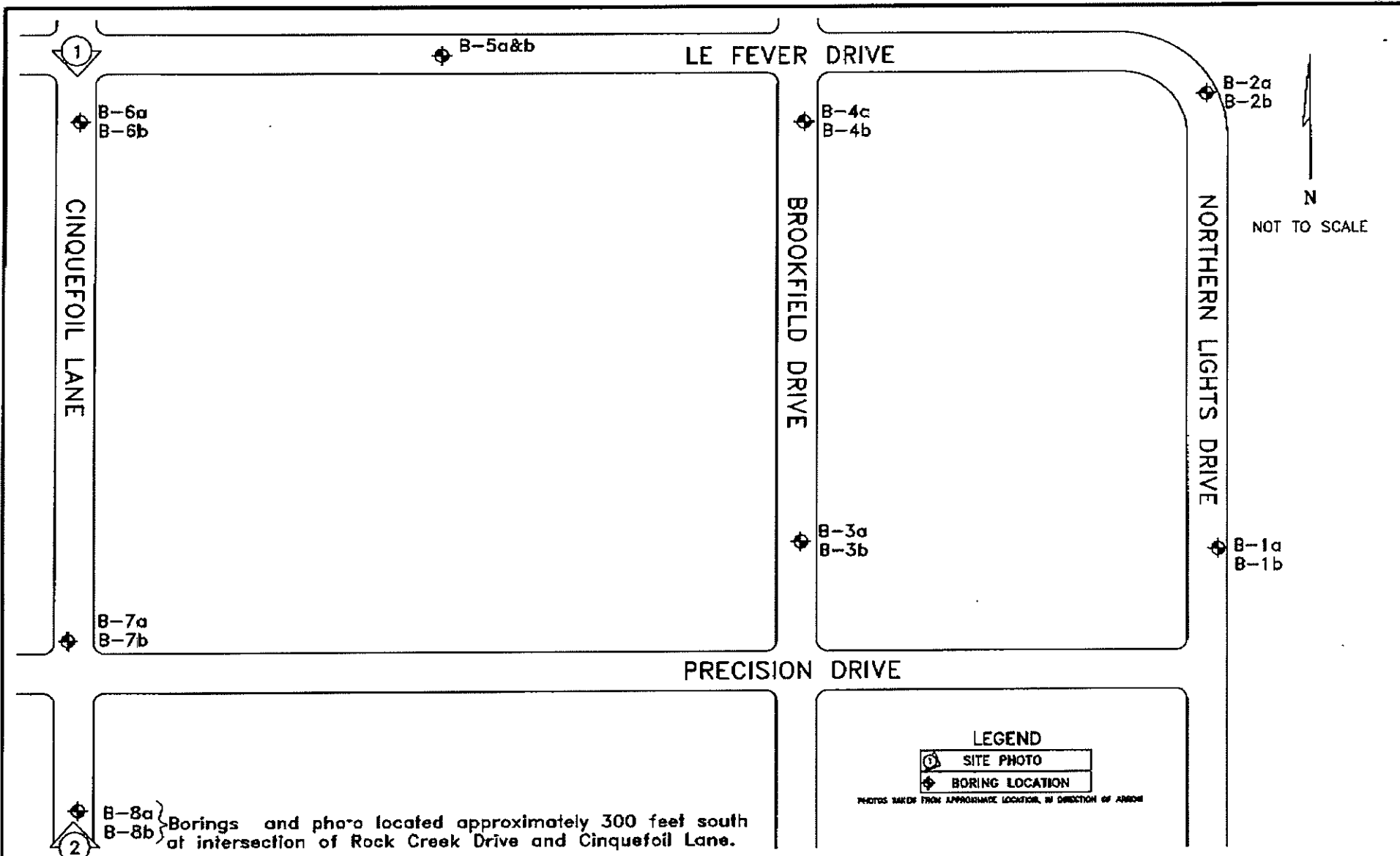
Very truly yours,
Earth Engineering Consultants, Inc.

Reviewed by:

Wolf von Carlowitz, P.E.
Project Engineer

Lester L. Litton, P.E.
Principal Engineer

cc: Rick Richter - City of Fort Collins (4)



BORING LOCATION DIAGRAM
BROOKFIELD PHASE II PAVEMENTS
 EEC PROJECT # 1025015B FEBRUARY 2004

EARTH ENGINEERING CONSULTANTS, INC.
RECOMMENDED PAVEMENT SECTIONS

Roadway	Cinquefoil Lane and Northern Lights Drive	Brookfield and Le Fever Drives	Precision Drive
Traffic Load 18-Kip EDLA	30	20	15
Classification	Local Connector	Local Connector	Local
Design Structural Number	3.05	2.87	2.60
Section A – Composite			
Asphalt Surface (S or SX)	2 in.	2 in.	4 in.
Asphalt Base (SG)	3 in.	3 in.	-
Aggregate Base	8 in.	6 in.	8 in.
Section Structural Number	(3.08)	(2.86)	(2.64)

Project: Pavement Recommendations
Brookfield - Phase II Pavements
Fort Collins, Colorado

EEC Project No: 1025015B

Date: March 2004

March 10, 2004

Chateau Development Company
12050 Pecos Street
Suite 100
Westminster, Colorado 80234

Attn: Mr. Tom Iskiyan

Re: Pavement Section Constructability
Brookfield - Phase II Pavements
Fort Collins, Colorado
EEC Project No. 1025015B

Mr. Iskiyan:

Our subsurface exploration report for a portion of the roadway subgrades in Phase II of the Brookfield development in Fort Collins, Colorado was submitted to your attention on February 23, 2004. At this time we understand updated section construction criteria has been incorporated into the new City of Fort Collins Design Standards. The purpose of this letter is to outline the new design criteria and provide updated pavement section recommendations for the Brookfield development.

Based on current City of Fort Collins Design and Construction Standards, the min/max lift thicknesses for grading SX asphaltic concrete are 1½/2½ inches. The min/max lift thicknesses for grading S asphaltic concrete are 2/3½ inches. The min/max lift thicknesses for grading SG asphaltic concrete are 3/5 inches. In addition, the maximum thickness of grading S or SX permitted as a surface layer is 4 inches. Therefore, it is not permissible to construct a 4½-inch grading S or SX section. Modifications to the pavement section recommendations developed for the Brookfield development are outlined on the attached summary.

Earth Engineering Consultants, Inc.

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We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we can be of further service to you in any other way, please do not hesitate to contact us.

Very truly yours,
Earth Engineering Consultants, Inc.

Reviewed by:

Wolf von Carlowitz, P.E.
Senior Project Engineer

Lester L. Litton, P.E.
Principal Engineer

EARTH ENGINEERING CONSULTANTS, INC.
 RECOMMENDED PAVEMENT SECTIONS

Roadway	Cinquefoil Lane and Northern Lights Drive	Brookfield and Le Fever Drives	Precision and Steelhead Drives
Traffic Load 18-Kip EDLA	30	20	15
Classification	Local Connector	Local Connector	Local
Design Structural Number	3.05	2.87	2.60
Section A – Composite			
Asphalt Surface (S or SX)	2 in.	2 in.	4 in.
Asphalt Base (SG)	3 in.	3 in.	-
Aggregate Base	8 in.	6 in.	8 in.
Section Structural Number	(3.08)	(2.86)	(2.64)

Project: Pavement Recommendations
 Brookfield - Phase II Pavements
 Fort Collins, Colorado

EEC Project No: 1025015B

Date: March 2004