MEMORANDUM

DEPARTMENT OF HIGHWAYS
4201 East Arkansas Ave.
Denver, Colorado 80222

IR 70 - 3(160)
Floyd Hill - West
(Hidden Valley Interchange)

DATE: January 25, 1988

TO: K. Koulter / Vinay Patel, JR Engineering Ltd.

FROM: Frank Abel / John M. Deland, JMD Staff Materials Branch
J. White JW

SUBJECT: Final Foundation Report: Structure F-15-CQ

The proposed bridge is located at Station 21+84 and will replace the existing structure F-15-D which carries the Hidden Valley service road over Clear Creek. Test borings were completed by the Division with a C.M.E. drill rig on January 11, 1988. Subsurface conditions and foundation design were discussed with Mr. Patel of JR Engineering on January 22, 1988.

GEOLOGY:

The structure site is located in the Clear Creek valley which has been steeply cut into the PreCambrian core of the Front range. The topography of the area is mountainous. Subsurface materials consist of 16.5 to 20.7 feet of mostly alluvial gravelly sand with scattered cobbles, covering a bedrock of foliated metamorphic gneiss. Foliation orientation, on average, strikes S 70° E and dips northwardly 42°. The bedrock is commonly jointed; the joint system consists predominantly of foliation jointing with other sporadic normal and diagonal joint sets. The water table is assumed to be at the existing creek level.

RECOMMENDATIONS

As we understand, integral abutments are proposed; therefore, it is recommended that abutments be placed on steel H-piles. An allowable bearing of 9 ksi times the cross-sectional area of the

H-pile will be obtained with 12 or 14 inch piles driven into bedrock to the approximate tip elevation of 7275 feet at Abutment 1 and 7283 feet at Abutment 2. All piling should be driven as end bearing piles and reinforcing tips (Pruyn Point HP 75750 or equivalent) should be used due to the cobbles and possible presence of boulders in the overburden.

JLW/Reviewed by Nelson Chou MC by JBG

cc: McOllough - Peterson (District I)
Yowell (District I)
Audino (Staff Bridge - Field Pack)
Hydraulics Unit
Abel
Gilmore

A:\FLOYD.1

Colorado Department of Highways
FOUNDATION BORING LOG

Project: IR 70-3(160)
Project Name: Floyd Hill West
Location: Hidden Valley ovr ClCk
Str. # F-15-CQ Bent: Abut 1
Route: Access* County: Clear Crk.
Date Drilled: 01/08/88
*Rd - I-70

Top Hole Elevation: 7298.5' Station: 222+16, 106' Lt.

Geologist: White/DeLand Foreman: Wachsmann Boring #: 4-70-18

Elev	Depth	Description of Material		BPF*	Remarks
7298.5	0.0 -20.7	Gravelly sand with scattered cobbles, rounded to subangular, fairly			CME 75 3" Wireline
		sorted, compact to dense, alluvial, timber fragments 8.0' to 12.0'.			with water. Circ. loss
					at 3'.
7290.3	8.2 - 9.7	Wood fragments.			
7285.3	13.2-14.7	Gravelly sand; very coarse to medium grained,	14/10/18	28	
		moderately sorted, alluvial.			
7280.3	18.2-19.7	As above.	14/25/30	55	
7277.8	20.7-~~3~~2.2	Bedrock: Gneiss; dark gray to cream/white, foliation dipping 10° to 35°			
		in places slightly weathered, some fractures along foliation planes.			
7277.8	20.7-23.2	As above.			REC 100% RQD 88%
7275.3	23.2-28.2	As above.			REC 100% RQD 85%
7270.3	28.2-33.2	As above.			REC 100% RQD 90%
7265.3	33.2	T.D.			

*Standard Penetration Test (AASHTO T 206-74)

Water level upon completion Drilled w/water Elev. _____ Date _____ Time _____
Water level (24 hrs.) _____ Elev. _____ Date _____ Time _____

...NT OF TRANSPORTATION
...M NO. 126
...RCH 1992

AS CONSTRUCTED			
NO REVISIONS ☐	REVISED ☐	VOID ☐	

FED. ROAD REGION	DIVISION	PROJ. NO.	SHEET NO.	SHEET TOTALS
VIII	COLO.	IR 070-3(154)	6	

STA. 215+37.49 BEGIN IR 070-3(154)=
61.8' LT OF STA. 215+37.49 ON I 70-3(4)250
M.P. 242.883 (APPROX)

Δ = 14°00'01" Rt
Dc = 4°00'00"
Tc = 175.88'
Lc = 350.01'
Rc = 1432.39'
V = 55 mph
e = 0.043, 0.020 ft/ft

STA. 105+69.23 END NW RAMP=
STA. 200+00.00 BEGIN NE RAMP EQUATION

Proposed Bridge Site

Δ = 24°21'32" Rt
Dc = 7°00'00"
Tc = 176.66'
Lc = 347.98'
Rc = 818.51'
V = 40 mph
e = 0.028, 0.067 ft/ft

PI 102+96.97
105
200
PCC 201+27.32
PI 203+03.98
PI 204+75.30
205
S.76°49'17"E.
98.39'
127.32'
N.89°10'42"E.
121.09'
212
S.80°37'36"E.
474.47'
PC 101+21.09
PI 210+71.10
F-15-BP
S.80°37'36"E.
F-15-BI
F-15-BQ
F-15-BJ
222
S.54°52'36"E.
S.52°27'45"E.
598.79'
STA. 100+00.00 BEGIN NW RAMP
TS 218+62.97
SC 220+62.97
CS 227+21.30
ST 229+21.30

Δ = 25°45'00" Rt
θs = 3°00'00" Rt
Ts = 536.73'
Es = 50.15'
Ls = 200.00'
LT = 133.35'
ST = 66.68'
Δc = 19°45'00" Rt
Dc = 3°00'00"
Tc = 332.47'
Lc = 658.33'
Rc = 1909.86'

N

ORIG. SCALE: 1"=50'

PLAN	
SURVEYED	DATE
PLOTTED	
DRAWN	BY
CHECKED	
TMOSS FILE NO.	STR. NOTATIONS CH.

04-15-94 REGION I::AUR16P::E:\86019\DESIGN\PLAN\DESIGN.DWG