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8/18/08

To Whom It May Concern,

Subject:

I have reviewed the structural concerns of the culvert bridge and I have determined the following conclusion:

Code Requirement.....IBC 2003

Site information

Bridge location.....St Louis County

Structure information

Culvert diameter.....108"
Height of backfill over culvert (not inc. asphalt).....4'-0"
Thickness of pavement.....0'-6"
Approach characteristics.....flat, from both sides

Applied loads

Dead load weight of soil.....110 lbs/cu ft.
Live load from axle of H20 vehicle.....32,000 lbs

Calculate dead load of soil applied to culvert

Depth of cover over culvert (in inches).....48"
Dead load weight of soil (in lb/cu inch) 110/1728.....0.0637 lb/cu in.
Soil weight applied to culvert 48x.0637.....3.0576 psi

Calculate live load applied to culvert from H20 axle

Axle weight.....32,000 lbs
Load per tire 32,000/2.....16,000 lbs
Tire contact area (standard area calculation) 20x10.....200 sq in
Calculate surface pressure 16,000/200.....80 psi
Calculate spread area @ 48" depth w/45deg angle 106x116.....12,296 sq in
Live load applied to culvert 16,000/12,296..... 1.3013 psi

Total load applied to culvert from H20 axle

Live and dead load applied to
culvert from H20 axle is 1.3013+3.0576.....4.3589 psi

Conclusion:

See exhibit 1 table 7.8
-Hahn Construction has informed us that the Thompson Culvert Company installed the pipe and constructed the bridge to H20 specifications.

-Per the "Corrugated Steel Pipe Design Manual" a 108 inch diameter pipe with a minimum soil cover of 4 feet can withstand an axle load of 75,000 pounds.

-Actual design load for a H20 bridge assembly is 32,000 pounds.

-Allowable design load for this bridge assembly is 75,000 pounds.

- Per table 7.8. the height of the soil cover over the culvert allows this assembly to exceeds H20 bridge specifications.

If you have any questions related to this report please contact me.
Thomas J. Huneke, P.E. 19552
Prepared by Ryan K. Holdener