REPORT

PAVEMENT REPLACEMENT AND BRIDGES
REHABILITATION OVER WABASH RIVER AND SR 63
CRAWFORDSVILLE DISTRICT, VIGO COUNTY, IN
DESIGNATION NO. 9709060
PROJECT NO. IM-70-1
K & S PROJECT NO. 7030

Indiana Department of Transportation
Division of Materials and Tests
120 S. Shortridge Road
Indianapolis, IN 46219-0389

K&S

EXECUTIVE SUMMARY

Pavement Replacement and Bridges Rehabilitation over Wabash River and SR 63
Crawfordsville District, Vigo County, Indiana
Designation No. 9709060, Project No. IM-70-1
Bridge File No. I-70-5-4613B

Subsurface Conditions

Bridge on I-70 over Wabash River: Borings on the abutments encountered fill materials and mostly cohesionless gravelly sand/sandy gravel. The borings on the west flood plain encountered predominately cohesionless sandy soils with upper strata of cohesive clayey soils with occasional organics. The remainder borings encountered (borings in the river and the borings on the east flood plain) mostly cohesionless soils.

In the abutment borings, the groundwater levels were observed at a depth of 9.8 m and 11.6 m, respectively. In borings on the west flood plain (TB-2 through TB-6), the 24-hour water levels were observed to range from 1.8 m to 1.2 m. Borings TB-7 and TB-8 were located in the Wabash River. In borings on the east flood plain, the 24-hour groundwater levels ranged from 1.37 m to 2.6 m.

Bridge on I-70 over SR 63: Underlying the fill materials, borings encountered mostly medium dense to dense and very dense cohesionless soils.

In the abutment borings, the 24-hour water levels were observed at 20.4 m and 19.5 m, respectively. In remainder borings, the groundwater level ranged from 6.1 m to 13.7 m.

Roadway Conditions: Underlying the surficial asphalt and concrete, Roadway borings encountered fill materials consisting of medium dense to dense cohesionless sand and gravel fill and stiff to very stiff and hard loamy fill soils.

No groundwater was encountered in the roadway borings.

Bridge Foundations

Bridge on I-70 over Wabash River: The piles for the bridge structure are designed for a capacity of 40 tons. It is recommended to use 14-inch-diameter Steel Encased Concrete (SEC) piles with a shell thickness of 0.25 inches, for the support of the proposed twin bridge structure. The pile material should be of Grade 3 Steel. Based on the information available from the soil borings and our understanding of the project, we recommend that the piles be driven to medium dense to dense, occasionally very dense gravelly sand/sandy gravel. Based on the analysis, the piles be driven to approximate estimated elevations shown in the following table.

Bent No.	Boring No.	Bottom of Pile Cap Elevation (m)	Estimated Pile Tip Elevations (m)	Plan Length (m)
Bent No.1 (West Abutment)	TB-1	145.8 / 144.5	15 L 129.8	13.7
Pier #2	TB-1	135.67	22.37 129.8 113.6	see p 11 13.1
Pier #3	TB-2	134.0	20.7 113.6	12.0
Pier #4	TB-2	132.44	19.1 113.6	8.5
Pier #5	TB-3	132.76	16.8 116.3	8.5
Pier #6	TB-3	132.7	16.7 116.30	10.1
Pier #7	TB-4	131.28	20.0 111.60	8.0

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Bent No.	Boring No.	Bottom of Pile Cap Elevation (m)	Estimated Pile Tip Elevations (m)	Plan L (m)
Pier #8	TB-4	131.28	20.0 111.60	10.1
Pier #9	TB-5	132.51	~~17~~ 16.8 116.0	10.2
Pier #10	TB-5	132.67	17 116.0	9.0
Pier#11	TB-6	132.55	17.8 115.0	9.3
Pier #12	TB-7	132.7	16.3 116.7	9.0
Pier#13	TB-7	132.8	16.4 116.7	9.0
Pier#14	TB-7	132.6	16.2 116.7	8.1
Pier#15	TB-8	132.7	19.5 113.5	9.0
Pier#16	TB-8	132.6	19.4 113.5	9.3
Pier #17	TB-9	132.57	20.8 112.5	8.0
Pier#18	TB-9	132.61	20.4 112.5	9.0
Pier #19	TB-10	134.3	22.3 112.26	9.0
Pier#20	TB-10	134.3	22.3 112.26	9.0
Pier#21	TB-11	134.08	20.48 113.6	9.0
Bent#22 (East Abutment)	TB-12	147.24 146.0	16.47 130.8	13.7

Based on the communication received from United Consultants, Indianapolis, the scour elevation for a flood of 100 years (Q_{100}) is 131.82 m.

Bridge on I-70 over SR 63:

The piles for the bridge structure are designed for a capacity of 40 tons. We recommend to use 14-inch-diameter Steel Encased Concrete (S.E.C.) piles with a shell thickness of 0.25 inches, for the support of the proposed addition to the twin bridge structure. The pile material should be of Grade 3 Steel. Based on the information available from the soil borings and our understanding of the project, we recommend that the piles be driven to medium dense to dense, occasionally very dense gravelly sand/sandy gravel. We estimate the desired pile capacities can be developed at the approximate elevations presented in the following table.

Bent No.	Boring No.	Bottom of Pile Cap Elevation (m)	Estimated Pile Tip Elevations (m)	Plan Length
Bent No.1 (West Abutment)	TB-13	156.29 155.3	19 136.3	20 m
Pier #2	TB-14	146.28 146.0	9.6 136.4	6.5 m
Pier #3	TB-14	148.0 147.7 ~~148.5~~	12.1 136.4	6.5
Pier #4	TB-15	147.96 147.7	10.1 136.6	6.5
Pier #5	TB-15	148.0 147.2	10.4 136.6	6.5 m

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Bent No.	Boring No.	Bottom of Pile Cap Elevation (m)	Estimated Pile Tip Elevations (m)		
Pier #6	TB-15	147.95	147.7 ~~148.4~~	10.1	136.6	6.5 m
Pier #7	TB-16	148.15	147.9 ~~148.7~~	10.7	137.5	6.5 m
Pier #8	TB-16	147.75	147.5	10.3	137.5	6.5 m
Bent#9 (East Abutment)	TB-17	156.20	155.2	11.5	144.0	20 m

Pavement Considerations

Based on INDOT Subgrade Treatment Recommendations, 'Type IA' subgrade treatment is recommended. A resilient modulus value of 6,000 psi is recommended for use in pavement design .

Subsurface drains will be required for the I-70 roadway. Filter fabric is not required.

Based on the site plans and profiles, the maximum fill height to raise the existing grade to the desired elevation would be approximately 1 m. Benching would be required on the embankment slopes, which are at 1V:2H or steeper.

It is also expected that the settlement of bearing soils would be within the tolerable limits and the slope of the embankment would be stable.

Do not consider this summary separate from the entire text of this report, with all the conclusions and qualifications mentioned herein. Details of our analysis and recommendations are discussed in the following sections and in the Appendix of this report.

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1. INTRODUCTION

1.1 Project Identification and Description

It was proposed to add a lane to the north of the east bound lanes and a lane to the south of west bound lanes of the two bridges on I-70 over Wabash River and over SR 63. The project also involves pavement replacement between the bridges. Project begins at Station 8+485.00; ends at Station 10+162.00 along Line "A," an approximate length of 1.68 Kilometers. Project Location Plan is shown on Plate 1. The project was designated with No. 9709060 and was identified as Project No. IM-70-1. The details of the project are described as follows:

- **Bridge on I-70 over Wabash River**

  - The length of the proposed bridge will be approximately 612.75 meters out-to-out with end bents located at approximate Stations 8+654.021 and 9+266.770.
  - The bridge will have 21 spans of varying lengths, with two 3.6-meter-wide travel lanes and 3.0-m-wide shoulders on either side.
  - There is a skew of the structure at an angle of 14^0.
  - The low water elevation of the flow line is approximately 136.5 m (436.8 feet) at the bridge location.
  - Based on the communication with the United Consultants, Indianapolis, the scour elevation for a flood for 100 years (Q_{100}) is 131.8 m (432.4 feet).

- **Bridge on I-70 over SR 63**

  - The length of the proposed bridge will be approximately 140.8 meters out-to-out with end bents located at approximate Stations 9+955.22 and 10+096.024.
  - The bridge will have 8 spans of varying lengths, with two 3.6-meter-wide travel lanes and 3.0-m-wide shoulders on either side.

■ **ROADWAY (I-70)**

- Would be reconstructed at a higher vertical alignment with modern safety standards.
- Would have two 3.6-meter-wide travel lanes in each direction, and, 3.6-meter-wide shoulders in each direction.
- Proposed embankments would have 2:1 side slopes.
- There will be an incidental construction on the west of the proposed alignment from station 8+455 to 8+485 and on the east of the alignment from station 10+096.024 to 10+287.0.

■ **PIPE STRUCTURES (Structure Nos. 100 through 108)**

- Several pipe structures are proposed for drainage.

1.2 Scope of Service and Procedures

The general purpose of the geotechnical exploration was to provide recommendations with regard to soil and groundwater conditions at the project site to aid in the design and construction of the additions to the bridges, and road improvements. The scope of our services for this project was as follows:

- Perform twelve (12) structure borings to depths of approximately 17.2 m to 27.4 m (55 feet to 90 feet) below existing grade at the specified locations of bridge abutments and at alternate pier locations for the bridge over Wabash River. Also perform five (5) structure borings to depths of 21.3 m to 27.4 m (70 feet to 90 feet) below the existing grade at the specified bridge abutments and at alternate pier locations for the bridge over SR 63.
- The project also includes performing twelve (12) roadway borings at the specified locations along the center lines of the existing four lanes (two west bound and two east bound lanes) of I-70 roadway to depths of approximately 2.28 m (7.5 feet) below existing grade for the roadway. Obtain soil samples according to INDOT specifications.

- Perform appropriate laboratory tests and visual classification according to current INDOT specifications.

- Prepare a report which provides our recommendations with regard to bridge structure foundations, cut and fill requirements and pavement design considerations as well as potential groundwater problems.

The scope of services did not include an environmental assessment for determining the presence or absence of wetlands or hazardous or toxic materials in the soil, surface water, groundwater, or air on or below, or around this site. Any statement in this report or on the boring logs regarding odors, colors, and unusual or suspicious items or conditions are strictly for the informational purposes.

2. GENERAL SITE CONDITIONS

2.1 USDA Soil Survey & General Geology

The Soil Conservation Services Soil Survey of Vigo County, Indiana, classifies the soils as the Genesee – Petrolia – Armiesburg association. Genesee – Petrolia – Armiesburg association consists of well-drained and poorly drained, deep, medium-textured and moderately fine textured, nearly level soils on bottom lands.

The unconsolidated materials beneath the site locations are listed from most to least coverage area, identified as: 1) Shoals silt loam, 0 to 2 percent slopes (Sh) occurs on bottom lands, wetness and flooding are limitations; 2) Borrow pits (Bp) areas where native soil has been removed to various depths for use as construction fill material, typical limitations are erosion and sedimentation; 3) Petrolia silty clay loam, 0 to 2 percent slopes (Pe) occurs on broad bottom lands, flooding and wetness are major limitations; and 4) Genesee fine sandy loam, sandy variant, 0 to 2 percent slopes (Gf), on bottom lands, located adjacent the Wabash River, and other major streams, flooding is a major limitation.

According to the Indiana Geological Survey, the bedrock in the area of the site is located more than 30.5 m (100 feet) below the surface elevation and is identified as the Carbondale Group. The Carbondale Group ranges from 79.3 m to 143.3 m (260 feet to 470 feet) in thickness and consists of shale and sandstone, including thin beds of limestone, clay and coal.

According to the Terre Haute, Indiana – Vigo County Quadrangle Topographic Map (USGS 1993), the site has ground surface elevations ranging from approximately 137.2 m (450 feet) on the north of the Wabash River to approximately 149.4 m (490 feet) on the south based on National Geodetic Vertical Datum (NGVD). Regional groundwater flow is presumed to be to the north toward the Wabash River. However, factors such as surface and/or bedrock topography, as well as local bodies of water, may influence local groundwater flow direction in the area of the site.

At the project site, the soils consisted of predominately cohesionless soils with intermediate strata of cohesive soils. A detailed description of the materials at the site is presented in the section 4.1 under "General Subsurface Conditions".

2.2 Topography of the Area

Based on the proposed road plans, the elevations along the proposed alignment of the bridge additions range from 145.869 m (478.45 feet) at Station 8+455 to 157.429 m (516.367 feet) at Station 10+096.024.

3. INVESTIGATION PROCEDURES

3.1 Field Investigation

A field check was made by the representatives of K & S Engineers, Inc. (K & S), to establish boring locations for the purpose of obtaining soil information from the site and developing recommendations to aid in design of the bridges additions and roadway improvements. Twelve (12) structure borings for the additions of bridge over Wabash River and five (5) structure borings for the additions of bridge over SR 63, were drilled at the specified locations. Twelve (12) borings for the reconstruction of roadway at the project site were performed at the specified locations. To distinguish the roadway borings from the structure borings, the roadway borings are identified with a prefix 'RB-SG' and the structure borings with 'TB.'

Borings TB-1 and TB-12 were located on the west and east abutments of the bridge over Wabash River. Borings TB-2 through TB-6 were located on the west flood plain of the Wabash River. Borings TB-1 through TB-6 and TB-12 were drilled by K & S. A K & S field representative was on site during drilling operations to assist in logging the boring. Due to the unavailability of equipment for drilling in the Wabash River, K & S subcontracted drilling work for Borings TB-7 and TB-8 in the Wabash River and for Borings TB-9 through TB-11, to ATC Associates Inc.(ATC), of Indianapolis. A K & S field representative was on site during drilling operations by ATC.

Traffic control including flagmen was observed to provide a safe working environment for our field crews during our field operations. Upon completion of drilling the structure borings, a PVC pipe was installed in the borings for observing 24-hour water level readings in the structure borings. The borings were backfilled subsequently. Due to the location of roadway borings on the center lines of the traffic lanes, four (4) sounding were performed on the shoulders (north and south shoulders of west bound lanes, and north and south shoulders of east bound lanes) of the traffic lanes for observing the 24-hour water level readings in the roadway borings.

The subsurface soil samples were recovered using split-spoon sampling procedure in general accordance with ASTM Standard D 1586/AASHTO T-206. Results of the subsurface exploration showing the materials encountered, natural moisture content of cohesive soils, groundwater level readings and other pertinent observations made during the drilling operations are included on the boring logs in the Appendix.

3.1.1 Problems Encountered During Drilling for Structure Borings

In Borings TB-1 and TB-12, fill materials were observed to a depth of approximately 7.62 m (25 feet). Therefore, it was decided to extend the borings to a depth of 27.4 m (90 feet).

In Boring TB-2, at a depth of approximately 17.7 m (58 feet), wet, dense gravel, possibly with cobbles and boulders, was observed. In Boring TB-4, from a depth of 15.9 m (52 feet) to 21.3 m (70 feet), wet, dense to medium dense, gravelly sand was observed. In the stratum of gravel and sandy gravel, relatively a high blow count and relatively poor sample recovery were observed in the boring. The presence of dense materials prevented the advancement of drill bit below a depth of 17.7 m (58 feet) in Boring TB-2 and below a depth of 21.3 m (70 feet) in Boring TB-4. The withdrawal of drill rods was difficult because the rods were jamming in the dense materials or between dense boulders.

Similar difficulties were encountered by the drilling crew from ATC in Borings TB-7 and TB-8. Boring TB-7 was terminated at a depth of 23.8 m (78 feet). While drilling TB-8, the boring could not be advanced further below a depth of 16.8 m (55 feet). The boring was relocated to a distance of 3.05 m (10 feet) south and augered through to a depth of 16.8 m (55 feet). From a depth of 16.8 m (55 feet) to 19.8 m (65 feet), two samples were collected and because of the problems, the boring was terminated at a depth of 19.8 m (65 feet).

3.2 Laboratory Testing

The purpose of the laboratory investigation was to determine the classification and physical properties of the soils encountered on the project. The classification tests included grain-size analyses and determination of Atterberg Limits. In addition to these tests, natural moisture content and pocket penetrometer tests were performed on all cohesive soil samples. On a few select samples, p_H values were determined in accordance with AASHTO standard T 289-91. A summary of classification tests is presented in Table 1 and the results of all laboratory tests are included in Table 2 in the appendix.

4. RESULTS OF FIELD INVESTIGATION

4.1 General Subsurface Conditions

Structure Borings TB-1 through TB-12: Borings on the abutments (TB-1 and TB-2) encountered fill materials and mostly cohesionless gravelly sand/sandy gravel. The borings on the west flood plain encountered predominately cohesionless sandy soils with upper strata of cohesive clayey soils with occasional organics. The remainder borings encountered (borings in the River and the borings on the east flood plain) mostly cohesionless soils. The various subsurface materials observed in these borings are described below.

Borings TB-1 and TB-12 encountered fill materials consisting of medium stiff to very stiff cohesive and loose and medium dense cohesionless loamy soils to a depth of approximately 8.23 m (27 feet) and 6.7 m (22 feet), respectively. Underlying the fill materials, soft silty loam was observed to a depth of approximately 10.67 m(35 feet) in Boring TB-1, grading into medium dense to dense and very dense gravelly sand/sandy gravel and sand to the termination depth of 27.4 m (90 feet). In Boring TB-12, the fill materials were underlain by medium dense to loose sandy loam to a depth of approximately 9.45 m (31 feet) and stiff and very soft silty clay loam to a depth of approximately 12.8 m (42 feet). The loamy soils graded into medium dense sand extending at least to the boring termination depth of 27.4 m (90 feet) in Boring TB-12.

The upper strata in the west flood plain consisted of mostly very soft to soft clayey soils with occasional organics. Loss on Ignition (LOI) for the organic soils ranged from 3.1% to 5%. The results for the moisture and the organic contents are also presented in Table 2 of the Appendix. The soft soils graded into very loose to loose sandy soils and medium dense to dense and very dense sandy soils extending to the corresponding borings termination depths. The SPT values in the medium dense to very dense sandy soils ranged from 12 bpf to 50 blows per 4 inches.

The depth of water was 1 m (3 feet) and 1.52 m(5 feet) during the drilling of Borings TB-7 and TB-8, respectively. Loose gravelly sand was observed at the bottom of the river. The gravelly sand stratum was interbedded with very soft silty loam in Boring TB-8 from a depth of 2.43 m (8 feet) to 3.35 m (11 feet). Underlying the loose gravelly sand stratum, both borings encountered mostly medium dense to dense and very dense cohesionless soils.

The upper strata in the borings (TB-9 through TB-11) on the east flood plain consisted of very soft to soft and medium stiff to stiff loamy soils to varying depths. Underlying the relatively less stiff soils, all borings on the east flood plain encountered very loose to loose and medium dense to dense cohesionless soils extending to the corresponding boring termination depths.

Structure Borings TB-13 through TB-17: Underlying the fill materials, borings encountered medium dense to dense and very dense sandy soils. The various subsurface materials observed in these borings are described below.

In Boring TB-13, the fill was observed to a depth of approximately 18.3 m (60 feet). The fill consisted of mostly cohesionless soils with the SPT values ranging from 6 bpf to 58 bpf, indicating varying density conditions. In Boring TB-17, loose to medium dense sandy loam fill was observed to a depth of approximately 7.0 m (23 feet). In Borings TB-14 and TB-15, medium dense sand and slag fill was observed at the surface extending to a depth of approximately 2.44 m (8 feet). Topsoil and soft to medium stiff sandy loam was observed at the surface in Boring TB-16. Underlying the fill and surficial materials, all borings encountered mostly medium dense to dense and very dense cohesionless soils consisting of sandy gravel/gravelly sand and sand, extending to the corresponding borings termination depths.

Roadway Borings RB-SG-1 through RB-SG-12: Borings RB-SG-1 through RB-SG-12 were drilled along the proposed alignment of I-70. Surficial asphalt was underlain by a course of concrete in all borings. After coring through asphalt and concrete, borings were performed at the proposed locations.

West Bound Lanes: Borings RB-SG-1, RB-SG-5 and RB-SG-9 were located on the west bound right lanes of I-70 and Borings RB-SG-3, RB-SG-7 and RB-SG-11 were drilled on the west bound left lanes of I-70.

East Bound Lanes: Borings RB-SG-2, RB-SG-6 and RB-SG-10 were located on the east bound right lanes of I-70 and Borings RB-SG-4, RB-SG-8 and RB-SG-12 were drilled on the east bound left lanes of I-70.

Underlying the surficial asphalt and concrete, borings encountered fill materials consisting of medium dense to dense cohesionless sand and gravel, and, stiff to very stiff and hard loamy fill soils.

Typed soil boring logs are appended to this report. The soil profiles described above are generalized descriptions of the conditions encountered at the boring locations. The individual boring logs should be consulted for specific information. The stratification depths shown on the boring logs are intended to indicate a zone of transition from one soil type to another, not to indicate exact depths of change from one soil type to another. Soil conditions may vary between boring locations from those conditions noted on the logs.

4.2 Groundwater Conditions

Groundwater level observations were made during and upon completion of the drilling and sampling operations and after 24 hours of completion of the drilling.

Bridge on I-70 over Wabash River: In the abutment Borings TB-1 and TB-12, the groundwater levels were observed at a depth of 9.8 m (32 feet) and 11.6 m (38 feet), respectively. In borings on the west flood plain (TB-2 through TB-6), the 24-hour water levels were observed to range from 1.2 m (4 feet) to 1.8 m (6 feet). Borings TB-7 and TB-8 were located in the Wabash River. In borings on the east floor plain, the 24-hour groundwater levels ranged from 1.37 m (4.5 feet) to 2.6 m (8.5 feet).

Bridge on I-70 over SR 63: In the abutment Borings TB-13 and TB-17, the 24-hour water level was observed at 20.4 m (67 feet) and 19.5 m (64 feet), respectively. In Borings TB-14, TB-15 and TB-16, the groundwater level ranged from 6.1 m (20 feet) to 13.7 m (45 feet).

Roadway Borings: No groundwater was observed in the soundings for the roadway.

However, it should be noted that the groundwater levels are subject to seasonal and long-term variations in response to climatic conditions and man-made influences. At the site, the groundwater levels will also fluctuate in response to the variation of the water levels in Wabash River.

5. ANALYSES AND RECOMMENDATIONS

5.1 Bridge Foundation on I-70 over Wabash River

The piles for the bridge structure are designed for a capacity of 40 tons. We recommend to use 14-inch-diameter Steel Encased Concrete (S.E.C.) piles with a shell thickness of 0.25 inches (6.3 mm), for the support of the proposed addition to the twin bridge structure. The pile material should be of Grade 3 Steel. Based on the information available from the soil borings and our understanding of the project, we recommend that the piles be driven to medium dense to dense, occasionally very dense gravelly sand/sandy gravel. We estimate the desired pile capacities can be developed at the approximate elevations presented in the following table.

Bent No.	Boring No.	Ground Elevation m (feet)	Bottom of Pile Cap Elevation m (feet)	Estimated Pile Tip Elevations m(feet)
Bent No.1 (West Abutment)	TB-1	147.16 (482.8)	145.8 (478.34)	129.8 (425.8)
Pier #2	TB-2	138.76 (455.3)	135.61 (444.8)	113.6 (372.7)
Pier #3	TB-2	138.76 (455.3)	134.0 (439.61)	113.6 (372.7)
Pier #4	TB-2	138.76 (455.3)	132.44 (434.42)	113.6 (372.7)
Pier #5	TB-3	138.26 (453.6)	132.76 (435.44)	116.3 (381.5)
Pier #6	TB-3	138.26 (453.6)	132.7 (434.88)	116.3 (381.5)
Pier #7	TB-4	138.76 (455.3)	131.28 (430.59)	111.6 (366.1)
Pier #8	TB-4	138.76 (455.3)	132.57 (434.83)	111.6 (366.1)
Pier #9	TB-5	140.17 (459.9)	132.51 (434.63)	116.0 (380.4)
Pier #10	TB-5	140.17 (459.9)	132.67 (435.17)	116.0 (380.4)
Pier#11	TB-6	140.36 (460.5)	132.55 (434.75)	115.0 (377.3)
Pier #12	TB-7	139.56 (457.9)	132.7 (435.24)	116.7 (383.4)
Pier#13	TB-7	139.56 (457.9)	132.8 (435.61)	116.7 (383.4)
Pier#14	TB-7	139.56 (457.9)	132.6 (435.09)	116.7 (383.4)

Bent No.	Boring No.	Ground Elevation m (feet)	Bottom of Pile Cap Elevation m (feet)	Estimated Pile Tip Elevations m(feet)
Pier#15	TB-8	139.4 (457.2)	132.7 (435.37)	113.4 (371.8)
Pier#16	TB-8	139.4 (457.2)	132.6 (435.06)	113.4 (371.8)
Pier #17	TB-9	140.76 (461.8)	132.57 (434.83)	112.5 (369.2)
Pier#18	TB-9	140.76 (461.8)	132.61 (434.95)	112.5 (369.2)
Pier #19	TB-10	139.96 (459.2)	134.35 (440.66)	112.26 (368.2)
Pier#20	TB-10	139.96 (459.2)	134.23 (440.27)	112.26 (368.2)
Pier#21	TB-11	140.26 (460.2)	134.08 (439.78)	113.6 (372.77)
Bent#22 (East Abutment)	TB-12	148.36 (486.8)	147.24 (482.96)	130.8 (429.0)

A computer program "DRIVEN," developed and verified by FHWA, was used to estimate load bearing capacities of steel pipe piles. Computer output of the results is attached to this report as a supplement (DRIVEN Output for Bridge Pile Foundation). A generalized soil profile is presented on Plate-3.

The axial pile capacity is estimated from the ultimate static pile capacity using a factor of safety of 2.5. It is assumed that the pile top is embedded into the pile cap (pier bottom). The elevations of pile tops would be below the existing ground elevations and are chosen from the construction plans prepared in 1961, before the construction of the bridge. The distance from the ground to the top of pile is also an input parameter in the DRIVEN analysis. The thicknesses of fill materials in the abutment borings, (i.e., 8.23 m (27 feet) in Boring TB-1 and 6.4 m (21 feet) in Boring TB-12), are not considered in the analyses for the evaluations of skin friction.

Based on the communication we received from United Consultants, Indianapolis, the scour elevation for a flood of 100 years (Q_{100}) is 131.82 m (432.4 feet). In the estimation of the pile capacity, the scour depth is considered for the bents in the flood plains and also in the Wabash River (Bent # 2 through Bent # 21). Borings TB-2 through TB-11 were located in the flood plain. The scour due to a flood would be a long term, contraction scour. Therefore, the contribution from the effective overburden over the scour depth would be negligible. A summary of pile loading conditions is presented in the following table.

Summary of Pile Loading Conditions for Bridge on I -70 over Wabash River

Bents	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Design load (tons)	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Factor of safety	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Factored design load (tons)	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Friction in scour zone (tons)	N/A	4.5	4.5	4.5	1.5	1.5	0	0	2.5	2.5	1.7	4.7	4.7	4.7	2.5	2.5	2.8	2.8	7.0	7.0	6.0	N/A
Down drag friction (tons)*	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0
Ultimate load (tons)	100	105	105	105	102	102	100	100	103	103	102	105	105	105	103	103	103	103	107	107	106	100
Testing method	by Formula, Std. Spec. 701																					

5.1.1 Bridge Foundation on I-70 over SR 63

The piles for the bridge structure are designed for a capacity of 40 tons. We recommend to use 14-inch-diameter Steel Encased Concrete (S.E.C.) piles with a shell thickness of 0.25 inches (6.3 mm), for the support of the proposed addition to the twin bridge structure. The pile material should be of Grade 3 Steel. The pile material should be of Grade 3 Steel. Based on the information available from the soil borings and our understanding of the project, we recommend that the piles be driven to medium dense to dense, occasionally very dense gravelly sand/sandy gravel. We estimate the desired pile capacities can be developed at the approximate elevations presented in the following table.

Bent No.	Boring No.	Ground Elevation m (feet)	Bottom of Pile Cap Elevation m (feet)	Estimated Pile Tip Elevations m(feet)
Bent No.1 (West Abutment)	TB-13	157.46 (516.6)	156.29 (512.63)	136.3 (447.0)
Pier #2	TB-14	149.56 (490.7)	146.28 (479.81)	136.4 (447.37)
Pier #3	TB-14	149.56 (490.7)	148.0 (485.46)	136.4 (447.37)
Pier #4	TB-15	149.36 (490.0)	147.96 (485.34)	136.6 (448.0)
Pier #5	TB-15	149.36 (490.0)	148.0 (485.46)	136.6 (448.0)
Pier #6	TB-15	149.36 (490.0)	147.95 (485.29)	136.6 (448.0)
Pier #7	TB-16	149.66 (491.0)	148.15 (485.93)	137.5 (451.0)
Pier #8	TB-16	149.66 (491.0)	147.75 (484.63)	137.5 (451.0)
Bent#9 (East Abutment)	TB-17	157.46 (516.6)	156.20 (512.34)	144.0 (472.3)

A computer program "DRIVEN," developed and verified by FHWA, was used to estimate load bearing capacities of steel pipe piles. Computer output of the results is attached to this report as a supplement (DRIVEN Output for Bridge Pile Foundation). A generalized soil profile is presented on Plate-4.

The axial pile capacity is estimated from the ultimate static pile capacity using a factor of safety of 2.5. It is assumed that the pile top is embedded into the pile cap (pier bottom) and the pile top elevation

shown above is from the bottom of the pier bottom. The elevations of pile tops would be below the existing ground elevations and are chosen from the construction plans prepared in 1961, before the construction of the bridge. The distance from the ground to the top of pile is also an input parameter in the DRIVEN analysis. A summary of pile loading conditions is presented in the following table.

Summary of Pile Loading Conditions for Bridge on I-70 over SR 63

Bent	1	2	3	4	5	6	7	8	9
Design load (tons)	40	40	40	40	40	40	40	40	40
Factor of safety	2.5			2.5			2.5		
Factored design load (tons)	100	100	100	100	100	100	100	100	100
Friction in scour zone (tons)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Down drag friction (tons)	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0
Ultimate load (tons)	100	100	100	100	100	100	100	100	100
Testing method	by Formula, Std. Spec. 701								

5.2 Summary of Pavement and Subgrade Conditions

It was proposed to replace the pavement (I-70) near between the bridge over Wabash River and the bridge over SR 63. The roadway would be constructed at a higher vertical alignment with modern safety standards from the existing grade. The roadway would have two 3.6-meter travel lanes in each direction, and, 3.6-meter-wide shoulders in each direction.

Borings RB-SG-1 through RB-SG-12 were drilled along the proposed alignment of I-70. A description of the subgrade conditions at the locations of the borings is presented in the Section 4.1 under "General Subsurface Conditions."

From the split spoon samples, classification tests on select soil samples and natural moisture content tests on all cohesive samples were performed. The surficial soil at the site, i.e. below asphalt and concrete, is cohesive soils consisting of stiff to very stiff loamy soils and cohesionless soil consisting of sandy loam soils. A CBR test was performed on the cohesive loamy soils and the results are presented in the Appendix.

5.2.1 Pavement Design Considerations

Based on the road plans provided for the project, the average annual daily traffic (A.A.D.T.) on I-70 would be approximately 25,810 vehicles per day (VPD) in 2003 and projected to be approximately 35,850 VPD by Year 2023. Based on the information of AADT and the current INDOT specifications for the existing subgrade soils, 'Type IA' subgrade treatment is recommended. Based on test results, a resilient modulus value of 6,000 psi is recommended for use in pavement design.

5.3 Subsurface Drains Recommendations

Subsurface drains will be required for the I-70 roadway. Filter fabric is not required.

5.4 Settlement and Slope Stability Considerations

Based on the information obtained from the boring logs, the bearing soils are suitable for the reconstruction of the pavement with the subgrade treatment as discussed in Section 5.2.1. It is also expected that the settlement of bearing soils would be within the tolerable limits and the slope of the embankment would be stable.

6. CONSTRUCTION CONSIDERATIONS

6.1 Subgrade Preparation

Recommendations for subgrade treatment are presented in the Section 5.2.1 of this report. If any undercutting of the soils is to be performed, the undercut areas should then be brought back to desired grade with engineered fill such as "B" Borrow compacted to a minimum of 95 percent of maximum dry density obtained in accordance with AASHTO T-99 and INDOT Specifications. After the engineered fill or "B" Borrow is placed, additional subgrade treatment can be completed, if needed.

Based on the site plans and profiles, the maximum fill height to raise the existing grade to the desired elevation would be approximately 1.5 m (4.9 feet) at Station 10+220. Minimal cut may be required during the construction of the roadway.

Proofrolling of the existing ground surface should be performed in accordance with INDOT Standard Specifications, Section 203.26 within all areas where new fill will be placed. If soft soils are observed during the proofrolling operations, the soils be removed and replaced with engineered fill.

6.2 Fill Placement and Compaction

Engineered fill used on this project should be approved, environmentally clean material, free of lumps, frozen soil, wood, roots, topsoil, or other deleterious material. The engineered fill should meet the requirement of borrow as specified in Section 203.08, INDOT 1999 Standard Specifications. Depending on the time of construction, some aeration, or moisture conditioning of the fill material may be required. Benching would be required on the embankment slopes, which are at 1V:2H or steeper.

Fill materials should be placed in lift thicknesses (loose) not to exceed 8 inches, and compacted to the required density as specified in the latest INDOT Standard Specifications. A vibratory roller should be used to compact the granular soils.

6.3 Erosion Control

Cohesionless, granular material should not be used on the embankment slopes, or within 12 inches of

the required finished surfaces of slopes. The material required to encase the embankment should be non-erodible material free from clods, debris and stones, and suitable for sustaining vegetation. Finished slopes should be seeded or sodded for erosion control. If seeded, the slope should be protected temporarily to allow the seeds to germinate properly.

6.4 Excavations

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope or bench the sides of all the excavations as required to maintain the stability of the excavation sides and bottom. All excavations should comply with applicable local, state and federal regulations including the current OSHA Excavation and Trench Safety Standards. Construction site safety generally is the sole responsibility of the Contractor, who shall also be responsible for the means, methods and sequencing of construction operations. We are providing this information solely as a service to our client. Under no circumstances should the information provided herein be interpreted to mean that K & S Engineers, Inc., is assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

In no case should slope height, slope inclination or excavation depth, including utility trench excavation depth exceed those specified in local, state and federal safety regulations. Specifically, the current OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926 should be followed. We understand these regulations are being strictly enforced and if they are not closely followed, the Owner and Contractor could be liable for substantial penalties.

7. LIMITATIONS

The conclusions and recommendations presented in this report are based upon the assumption that the subsurface conditions do not deviate appreciably from those disclosed by the borings. These conclusions and recommendations are also based upon the premise of competent field engineering, monitoring and testing during construction.

If, during construction, subsurface conditions different from those encountered in the exploratory borings are observed or appear to be present beneath excavations, we should be advised at once so that we can review these conditions and reconsider our recommendations where necessary.

This report was prepared for the exclusive use of the owner, architect, and engineer for evaluating the design of the project as it relates to the geotechnical aspects discussed herein.

Very truly yours,
K & S Engineers, Inc.

Annaji Chillarige, Ph.D.
Project Engineer

Padmakar Srivastava, Ph.D., P.E.
Project Engineer

Dibakar Sundi, P.E.
Senior Engineer

Pavement Replacement and Bridges Rehabilitation over Wabash River and SR 63
Crawfordsville District, Vigo County, Indiana
Designation No. 9709060
Bridge File No. I-70-5-4613B
Project No. IM-70-1
K & S Project No. 7956

APPENDIX

1. Plate 1: Project Location Plan
2. Plate 2A: Locations of Structure Borings for Bridge on I-70 over Wabash River

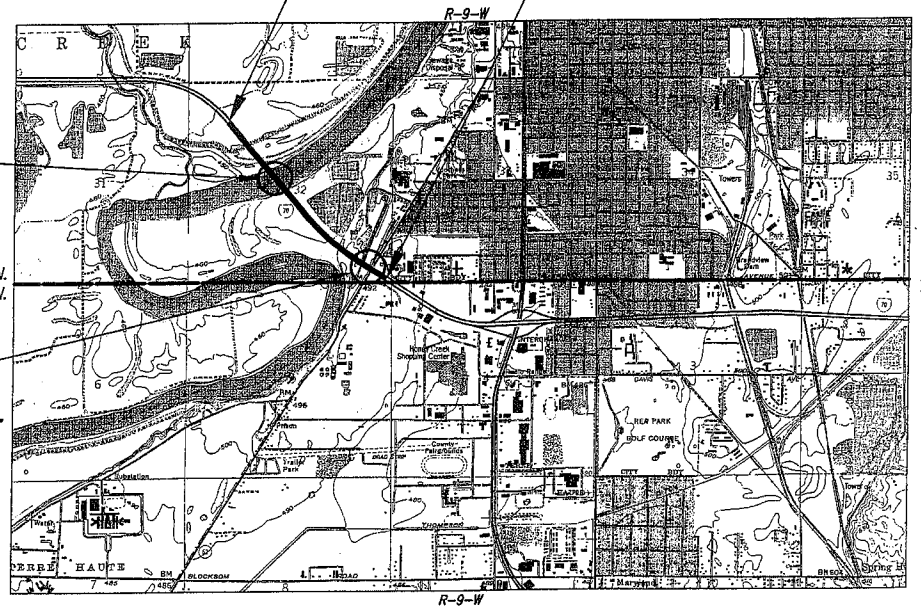
   Plate 2B: Locations of Structure Borings for Bridge on I-70 over SR 63
3. Plate 3: Generalized Subsurface Profile - Bridge over Wabash River
4. Plate 4: Generalized Subsurface Profile - Bridge over SR 63
4. Boring Logs TB-1 through TB-17, RB-SG-1 through RB-SG-12
5. Table 1 - Summary of Classification Test Results
6. Table 2- Summary of Special Laboratory Test Results
7. Figures 1 through 12: Grain Size Distribution Curves
8. Standard Proctor Density and CBR Test Results
9. Results from 'DRIVEN'

BEGIN PROJECT IM-70-1( )
STA. 8+485.000 "A"

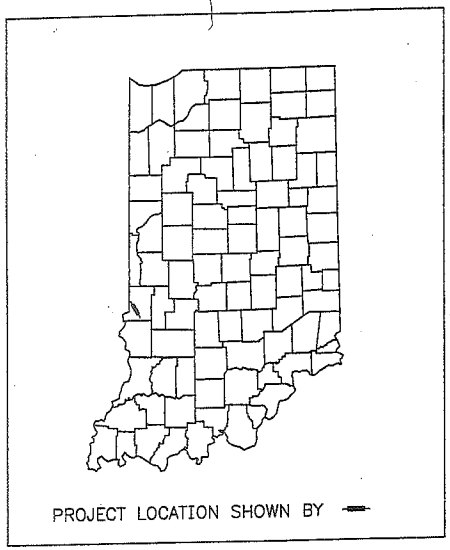
END PROJECT IM-70-1( )
STA. 10+162.000 "A"

Bridge File: I-70-5-4613B
Bridge Rehabilitation
Des. No. 9709050
Paving Exception:
8+654.021 "A" to 9+266.770 "A"
To Be Built In Construction
With Road Contract

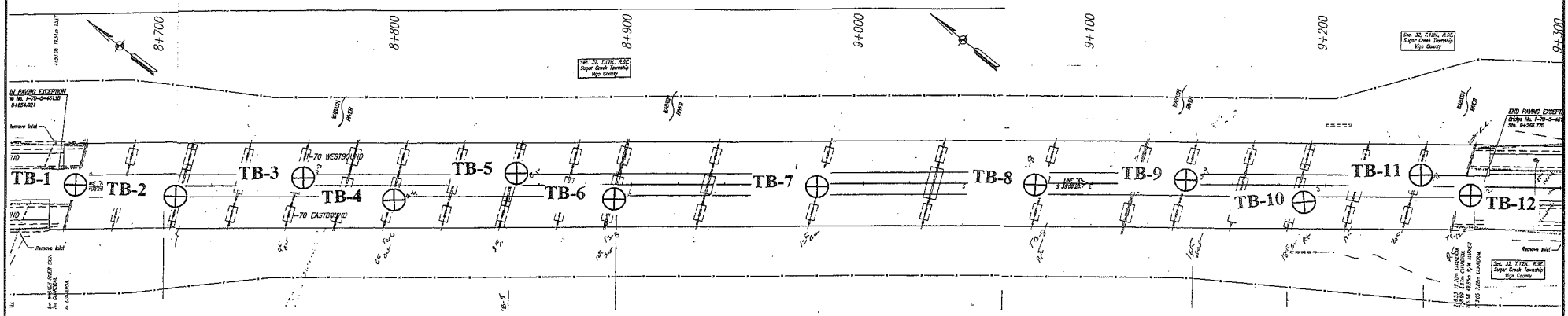
Bridge File: I-70-6-2297C
Bridge Rehabilitation
Des. No. 9709061
Paving Exception:
9+955.220 "A" to 10+096.024 "A"
To Be Built In Combination
With Road Project



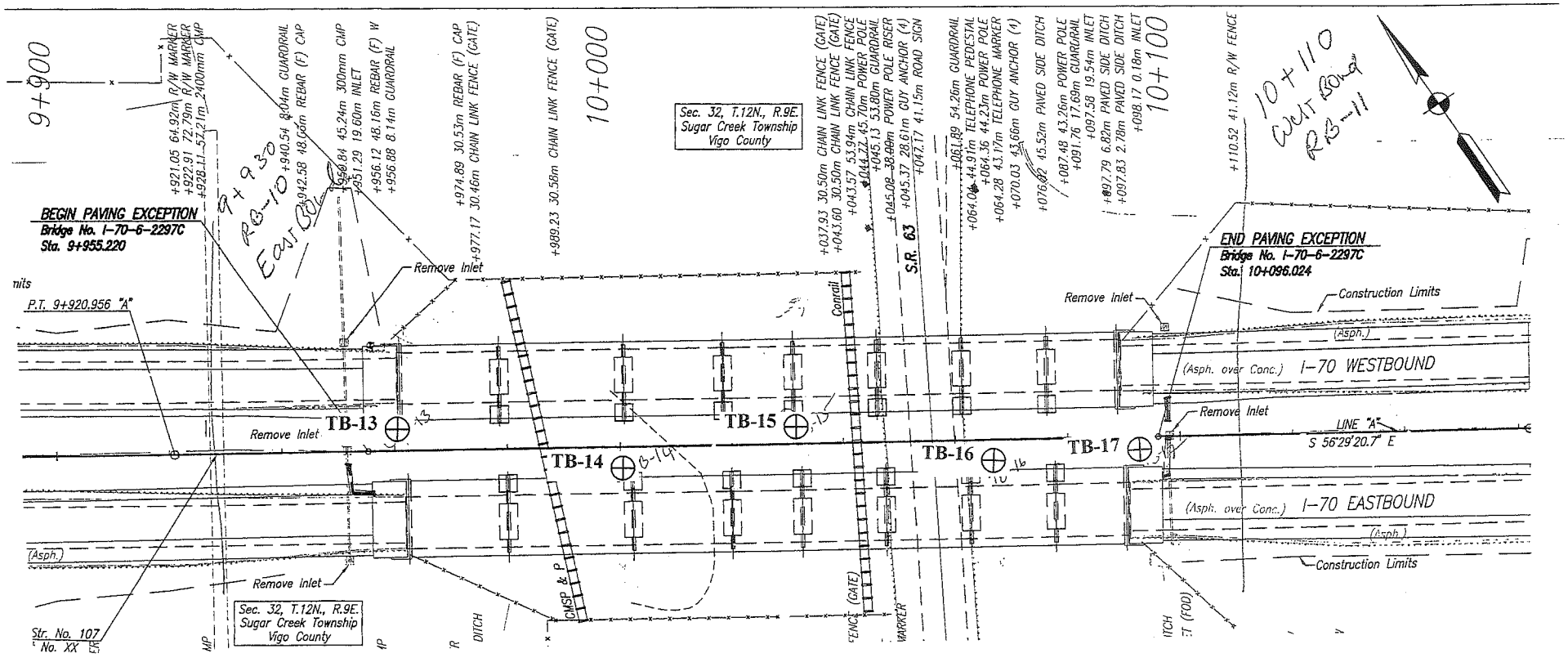
VIGO COUNTY
LOCATION MAP



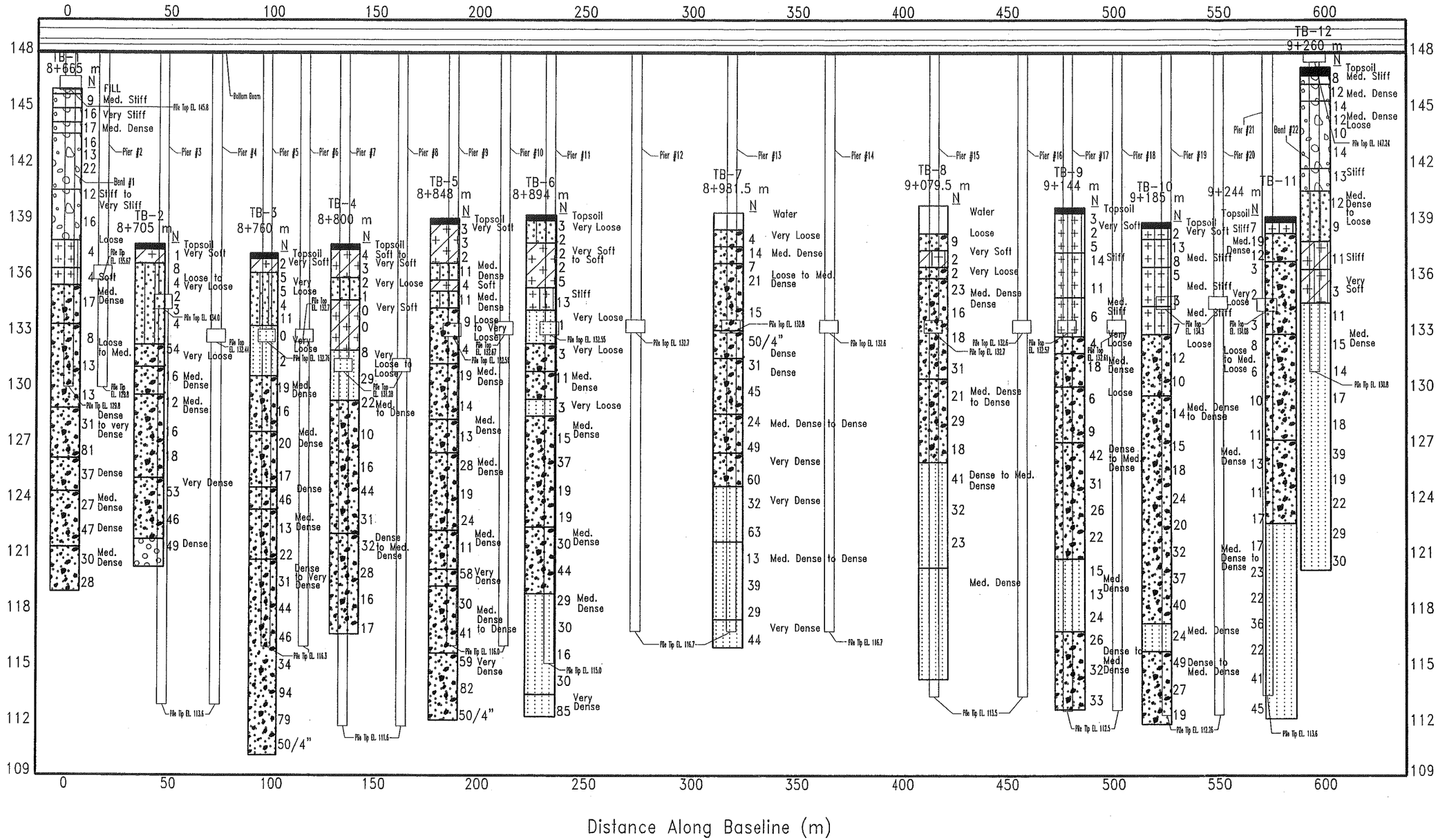
K & S ENGINEERS, INC. SOIL TESTING AND FOUNDATION CONSULTANTS	N	Date: 11-1-05	**PLATE - 1**
Road Reconstruction and Bridge Rehabilitation on I-70 **Sugar Creek Township, Vigo County** **Designation No. 9709060, Project No. IM-70-1 ( ); Bridge File No. I-70-5-4613B**		Scale: Not to Scale	**File No. 7956**
		ROAD RECONSTRUCTION AND BRIDGES REHABILITATION ON I-70	



K & S ENGINEERS, INC. SOIL TESTING AND FOUNDATION CONSULTANTS		Date: 1-30-06	**PLATE – 2A**
Road Reconstruction and Bridge Rehabilitation on I-70 **Sugar Creek Township, Vigo County** **Designation No. 9709060, Project No. IM-70-1 ( ); Bridge File No. I-70-5-4613B**		Scale: Not to Scale	**File No. 7956**
		⊕ **APPROXIMATE LOCATIONS OF STRUCTURE BORINGS – BRIDGE OVER WABASH RIVER**	



K & S ENGINEERS, INC. SOIL TESTING AND FOUNDATION CONSULTANTS		Date: 1-30-06	**PLATE – 2B**
Road Reconstruction and Bridge Rehabilitation on I-70 **Sugar Creek Township, Vigo County** **Designation No. 9709060, Project No. IM-70-1 ( ); Bridge File No. I-70-5-4613B**		Scale: Not to Scale	**File No. 7956**
		⊕ **APPROXIMATE LOCATIONS OF STRUCTURE BORINGS – BRIDGE OVER SR 63**	



K & S Engineers
9715 Kennedy Avenue
Highland, IN
Telephone: 219-924-5231
Fax: 219-924-5271

LEGEND

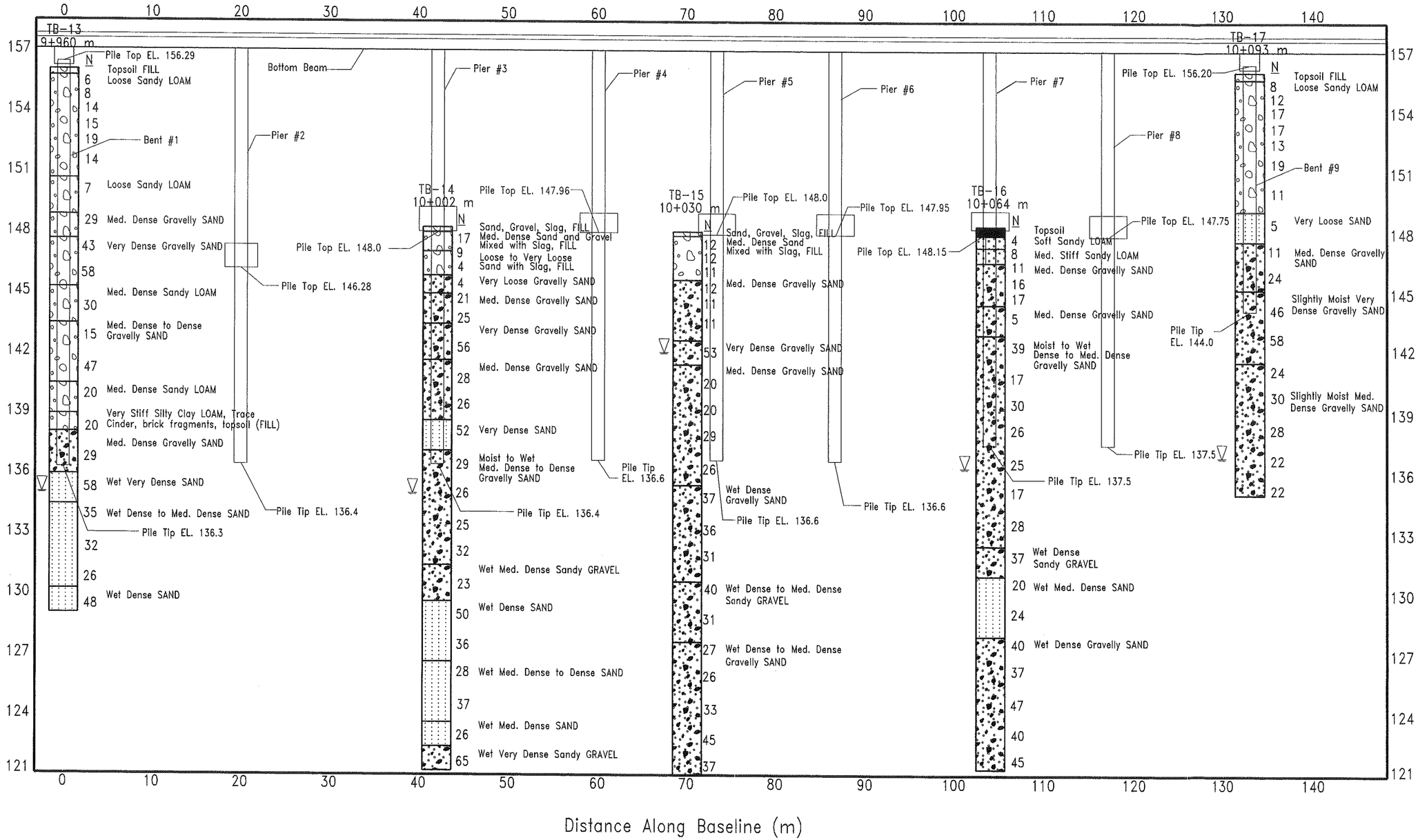
- FILL
- SAND
- Gravelly SAND/Sandy GRAVEL
- Silty LOAM
- Clay LOAM
- Sandy LOAM

Plate No. 3

Bridge Rehabilitation on I-70 Over Wabash River and SR 63
Vigo County, Terre Haute, Indiana

Project Number: IM-70-1

SIMPLE FENCE 7956.GPJ 1/26/06



SIMPLE FENCE 7956.GPJ 1/26/06

K & S Engineers
9715 Kennedy Avenue
Highland, IN
Telephone: 219-924-5231
Fax: 219-924-5271

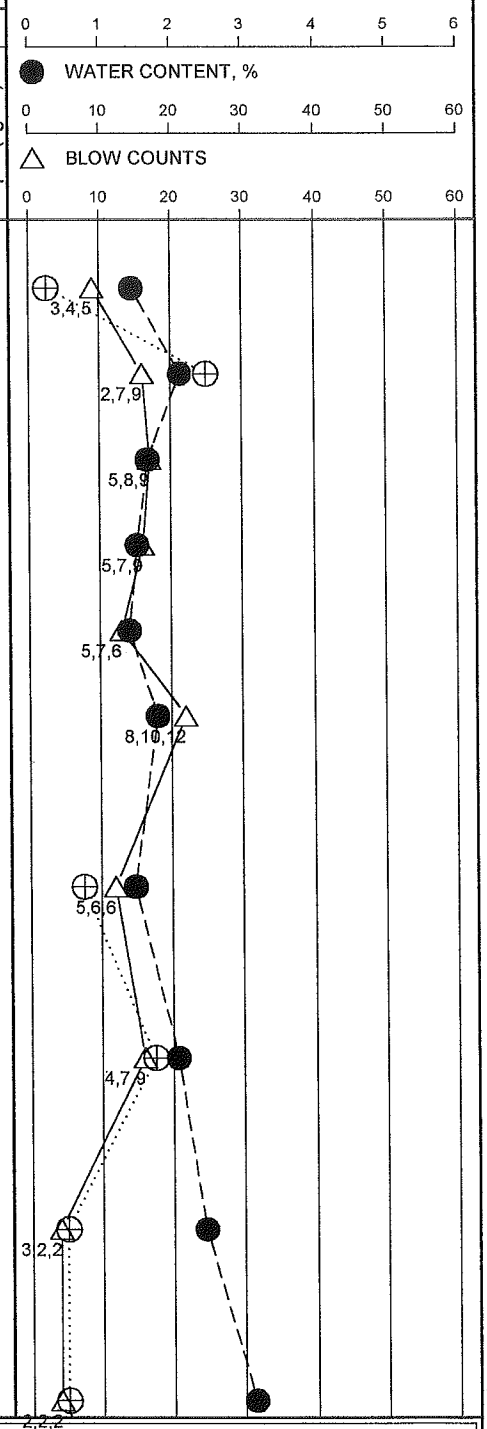
Plate No. 4

Bridge Rehabilitation on I-70 Over Wabash River and SR 63
Vigo County, Terre Haute, Indiana

Project Number: IM-70-1

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-1**	DES. NO. **9709060**
PROJECT NAME	**Bridge Rehabilitation on I-70 Over Wabash River and SR 63**		PROJECT NO. **IM-70-I**
SITE LOCATION	**Vigo County, Terre Haute, Indiana**	STRUCTURE NUMBER **I-70-5-4613B** STATION **8+665 m**	OFFSET **6.62 m (21.7') Lt. Line A**
BORING STARTED **12-9-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER, TONS/FT^2
BORING COMPLETED **12-12-05**	FOREMAN **Ruben Perez**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2
SURFACE ELEVATION **482.8 ft (147.16 m) USC & GS**			● WATER CONTENT, %
			△ BLOW COUNTS

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	RECOVERY	NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
1.0		Fill (Visual)					
3.5		Gray-Brown, slightly moist, medium stiff, Sandy Loam, Lab. No. 7956-1, A-4 (1), Fill	2.5			1	
6.0		Gray-Brown, slightly moist, very stiff, Sandy Loam, Lab. No. 7956-1, A-4, Fill	5.0			2	
8.0		Brown-Gray, slightly moist, medium dense, Silty Loam, Lab. No. 7956-2, A-4 (0), Fill	7.5			3	
		Brown-Gray, slightly moist, medium dense, Silty Loam, Lab. No. 7956-2, A-4, Fill	10.0			4	
			12.5			5	
			15.0			6	
18.0			17.5				
		Gray-Dark brown, slightly moist, stiff to very stiff, Silty Loam, Lab. No. 7956-3, A-4, Fill	20.0			7	
			22.5				
			25.0			8	
27.0							
		Gray, slightly moist, soft, Silty Loam, Lab. No. 7956-3, A-4	27.5				
			30.0			9	
32.0							
		Brown, slightly moist, Soft, Silty Loam, Lab. No. 7956-3, A-4 (5)	32.5				
35.0			35.0			10	



▽ WATER LEVEL WHILE DRILLING 11.7 m (38.5 feet)

▼ WATER LEVEL 9.8 m (32.0 feet) after 72 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 1-31-06

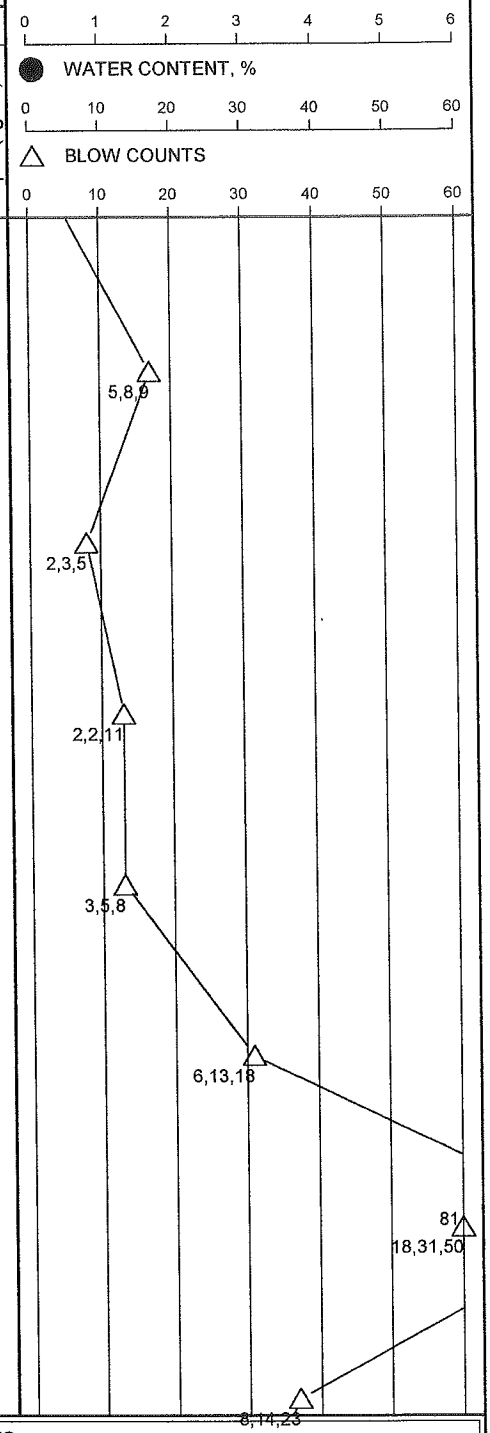
CLIENT **INDOT**		LOG OF BORING NUMBER **TB-1**	DES. NO. **9709060**
PROJECT NAME	**Bridge Rehabilitation on I-70 Over Wabash River and SR 63**		PROJECT NO. **IM-70-I**
SITE LOCATION	**Vigo County, Terre Haute, Indiana**	STRUCTURE NUMBER **I-70-5-4613B** STATION **8+665 m**	OFFSET **6.62 m (21.7') Lt. Line A**
BORING STARTED **12-9-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	
BORING COMPLETED **12-12-05**	FOREMAN **Ruben Perez**		

SURFACE ELEVATION **482.8 ft (147.16 m) USC & GS**

STRATA DEPTH (METERS)	STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL
			Brown, wet, medium dense, Gravelly Sand, Lab. No. 7956, A-1-b
42.0			Brown, wet, loose to medium dense, Gravelly Sand, Lab. No. 7956, A-1-b
57.0			Brown, wet, dense to very dense, Gravelly Sand, Lab. No. 7956, A-1-b
66.0			Brown, wet, dense, Gravelly Sand, Lab. No. 7956, A-1-b

SAMPLE

DEPTH (FEET)	TYPE	RECOVERY	NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
37.5				
40.0			11	
42.5				
45.0			12	
47.5				
50.0			13	
52.5				
55.0			14	
57.5				
60.0			15	
62.5				
65.0			16	
67.5				
70.0			17	



▽ WATER LEVEL WHILE DRILLING 11.7 m (38.5 feet)

▼ WATER LEVEL 9.8 m (32.0 feet) after 72 hours

REMARKS

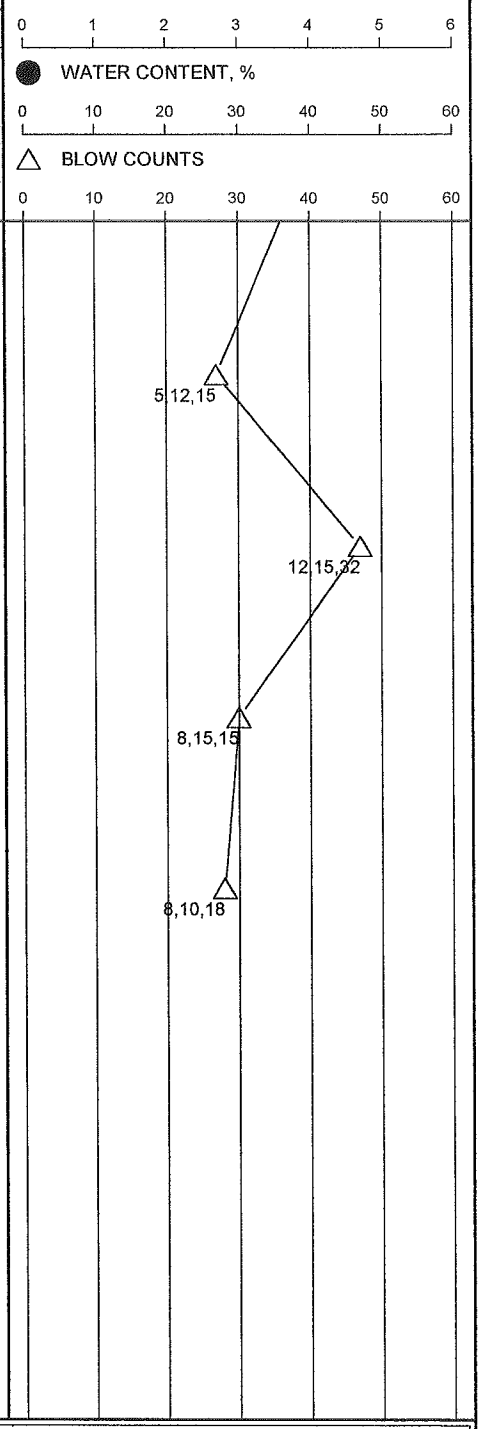
SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-1**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **8+665 m**	OFFSET **6.62 m (21.7') Lt. Line A**
BORING STARTED **12-9-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-12-05**	FOREMAN **Ruben Perez**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2
SURFACE ELEVATION **482.8 ft (147.16 m) USC & GS**			● WATER CONTENT, %
			△ BLOW COUNTS

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
72.0 (22)		Brown, wet, medium dense to dense, Gravelly Sand, Lab. No. 7956, A-1-b	72.5				
			75.0			18	
(23)			77.5				
(24)			80.0			19	
82.0 (25)		Brown, wet, medium dense, Gravelly Sand, Lab. No. 7956, A-1-b	82.5				
(26)			85.0			20	
			87.5				
(27) 90.0		END OF BORING @ 27.4 m (90 feet)	90.0			21	



▽ WATER LEVEL WHILE DRILLING 11.7 m (38.5 feet)

▼ WATER LEVEL 9.8 m (32.0 feet) after 72 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 1-31-06

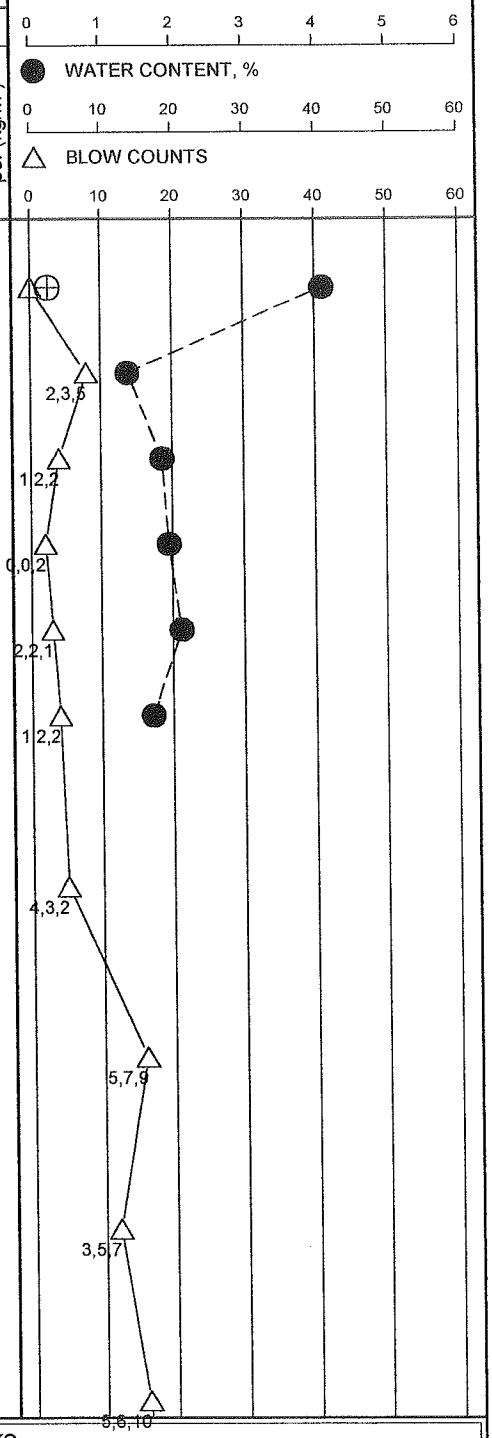
CLIENT **INDOT**		LOG OF BORING NUMBER **TB-2**	DES. NO. **9709060**
PROJECT NAME	**Bridge Rehabilitation on I-70 Over Wabash River and SR 63**		PROJECT NO. **IM-70-I**
SITE LOCATION	**Vigo County, Terre Haute, Indiana**	STRUCTURE NUMBER **I-70-5-4613B** STATION **8+705 m**	OFFSET **7.62 m (25') Rt. Line A**
BORING STARTED **12-15-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	
BORING COMPLETED **12-19-05**	FOREMAN **Ruben Perez**		

SURFACE ELEVATION **455.3 ft (138.76 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL
1.0		Topsoil (Visual)
3.5		Gray, moist, very soft, Silty Clay with trace of organics, Lab. No. 7956-4, A-7-6 (LOI = 6.2%)
18.0		Gray, slightly moist, loose to very loose, Sandy Loam, Lab. No. 7956-10, A-4
22.0		Brown, wet, very loose, Gravelly Sand, Lab. No. 7956-5, A-1-b
27.0		Brown, wet, medium dense, Gravelly Sand, Lab. No. 7956-5, A-1-b
		Brown, wet, medium dense, Sandy Gravel, Lab. No. 7956-7, A-1-a

SAMPLE

DEPTH (FEET)	TYPE	RECOVERY	NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
2.5			1	
5.0			2	
7.5			3	
10.0			4	
12.5			5	
15.0			6	
17.5				
20.0			7	
22.5				
25.0			8	
27.5				
30.0			9	
32.5				
35.0			10	



WATER LEVEL WHILE DRILLING 4.11 m(13.5 feet)

WATER LEVEL 1.8 m (6.0 feet) after 24 hours

REMARKS
Difficulty in drilling through Dense Gravel @ 17.7 m (58 feet)

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

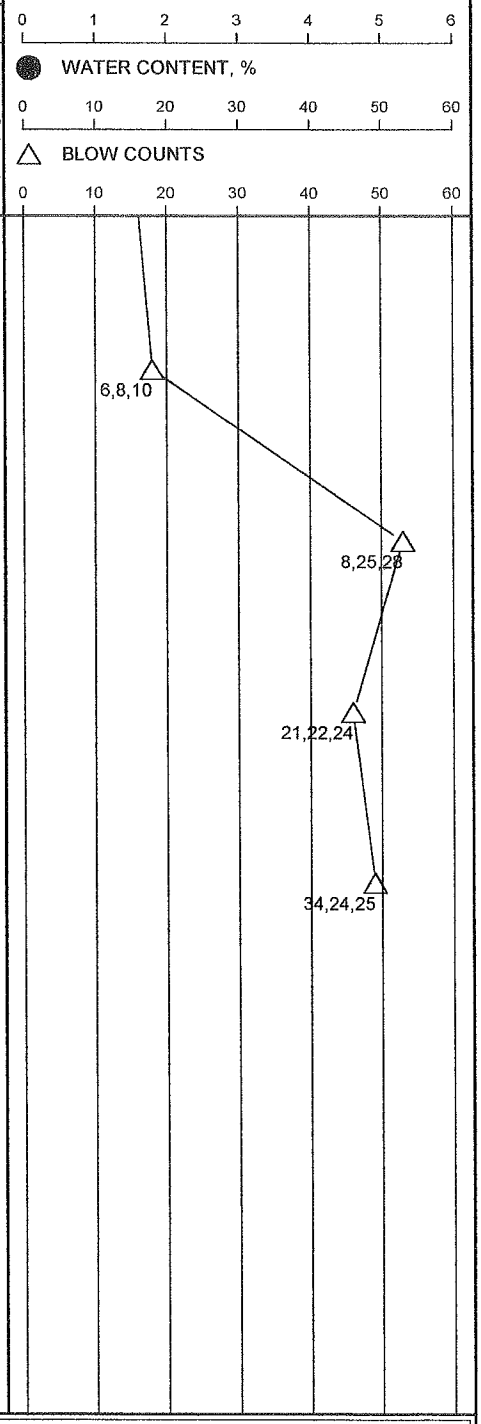
CLIENT **INDOT**		LOG OF BORING NUMBER **TB-2**	DES. NO. **9709060**
PROJECT NAME	**Bridge Rehabilitation on I-70 Over Wabash River and SR 63**		PROJECT NO. **IM-70-I**
SITE LOCATION	**Vigo County, Terre Haute, Indiana**	STRUCTURE NUMBER **I-70-5-4613B** STATION **8+705 m**	OFFSET **7.62 m (25') Rt. Line A**
BORING STARTED **12-15-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-19-05**	FOREMAN **Ruben Perez**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2

SURFACE ELEVATION **455.3 ft (138.76 m) USC & GS**

STRATA DEPTH (METERS)	STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
11			(Cont'd..) Brown, wet, medium dense, Sandy Gravel, Lab. No. 7956-7, A-1-a	37.5				
12				40.0			11	
	42.0		Brown, wet, very dense to dense, Gravelly Sand, Lab. No. 7956-5, A-1-b	42.5				
13				45.0			12	
14				47.5				
15				50.0			13	
16	53.0		Brown, wet, dense, Gravel (Visual)	52.5				
17				55.0			14	
	58.0			57.5				

END OF BORING @ 17.7 m (58 Feet)

Original Boring was terminated at 17.7 m (58 feet) due to the difficulties while drilling through dense Gravel. Based on the soil Conditions in Boring TB-3, it is assumed that similar soil conditions exist to a depth of 24.1 m (85 feet) in this boring, for the DRIVEN analsyis purposes.



▽ WATER LEVEL WHILE DRILLING 4.11 m(13.5 feet)

▼ WATER LEVEL 1.8 m (6.0 feet) after 24 hours

REMARKS
Difficulty in drilling through Dense Gravel @ 17.7 m (58 feet)

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

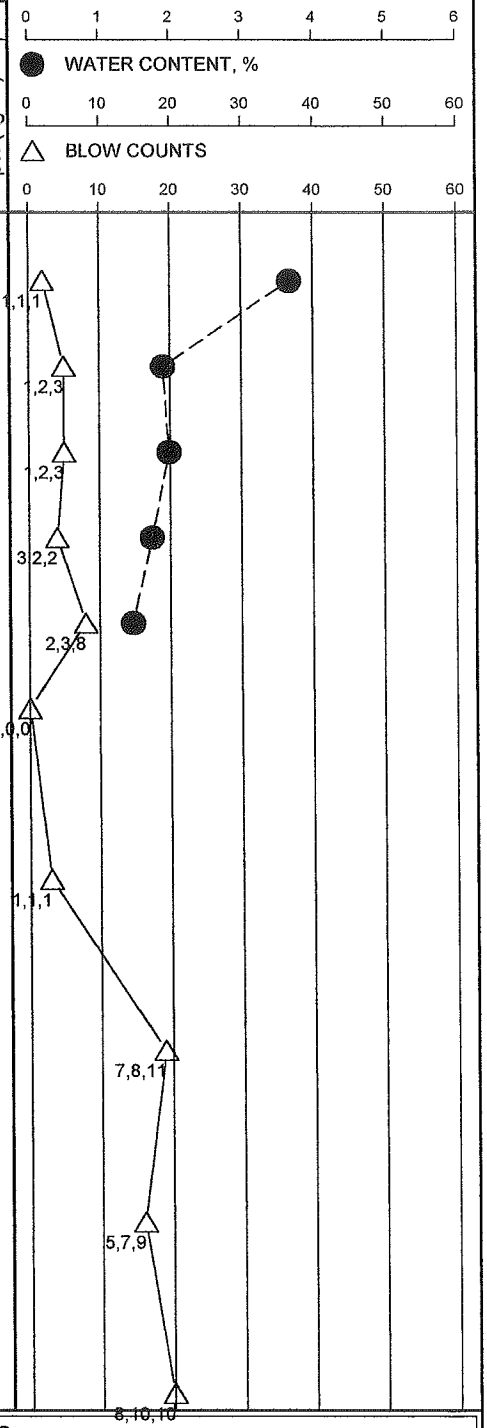
CLIENT **INDOT**		LOG OF BORING NUMBER **TB-3**	DES. NO. **9709060**
PROJECT NAME	**Bridge Rehabilitation on I-70 Over Wabash River and SR 63**		PROJECT NO. **IM-70-I**
SITE LOCATION	**Vigo County, Terre Haute, Indiana**	STRUCTURE NUMBER **I-70-5-4613B** STATION **8+760 m**	OFFSET **7.62 m (25') Lt. Line A**
BORING STARTED **12-23-05**	RIG **CME 850**	FILE NUMBER **7956**	
BORING COMPLETED **12-23-05**	FOREMAN **Ruben Perez**		

SURFACE ELEVATION **453.6 ft (138.26 m) USC & GS**

STRATA DEPTH (METERS)	STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL
1.0			Topsoil (Visual)
3.5			Gray, moist, very soft, Silty Clay with trace of organics, Lab No. 7956-4, A-7-6 (LOI = 4.1 %)
			Gray, slightly moist, very loose to medium dense, Sandy Loam, Lab No. 7956-10, A-4
13.0			Gray-brown, wet, very loose, Sand, Lab No. 7956-8, A-3
22.0			Brown, wet, medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b
32.0			Brown, wet, medium dense, Sandy Gravel, Lab No. 7956-7, A-1-a

SAMPLE

DEPTH (FEET)	TYPE	RECOVERY	NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
2.5			1	
5.0			2	
7.5			3	
10.0			4	
12.5			5	
15.0			6	
17.5				
20.0			7	
22.5				
25.0			8	
27.5				
30.0			9	
32.5				
35.0			10	



WATER LEVEL WHILE DRILLING 4.11 m (13.5 feet)

WATER LEVEL 1.7 m (5.5 feet) after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

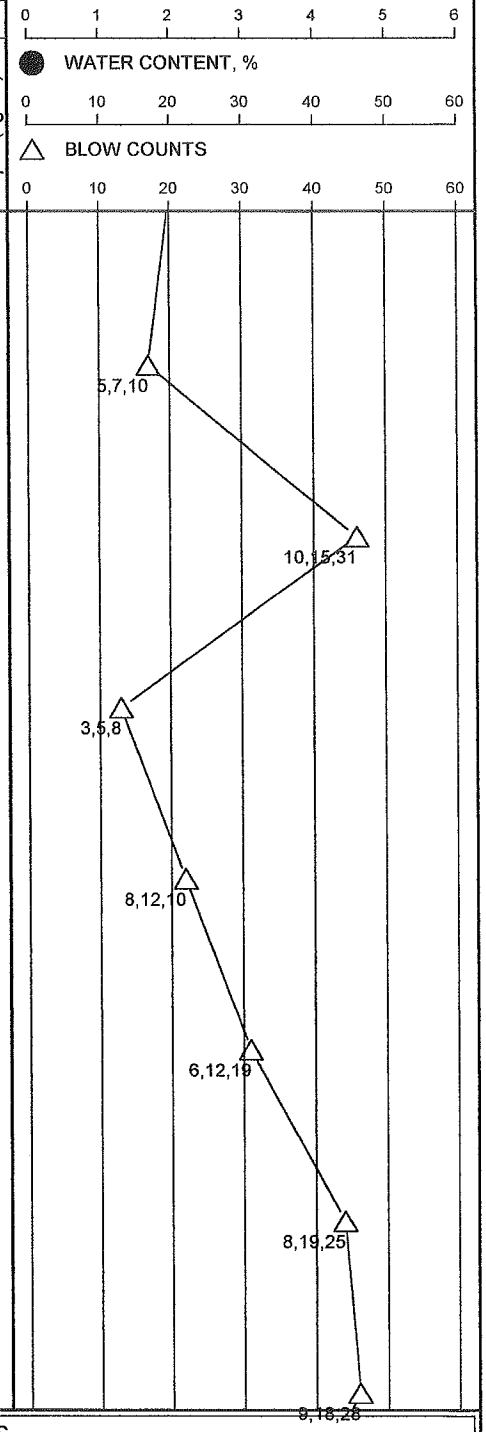
BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-3**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **8+760 m** OFFSET **7.62 m (25') Lt. Line A**	
BORING STARTED **12-23-05**	RIG **CME 850**	FILE NUMBER **7956**	
BORING COMPLETED **12-23-05**	FOREMAN **Ruben Perez**		

SURFACE ELEVATION **453.6 ft (138.26 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL
		(Cont'd..) Brown, wet, medium dense, Sandy Gravel, Lab No. 7956-7, A-1-a
42.0		Brown, wet, dense, Sandy Gravel, Lab No. 7956-7, A-1-a
46.0		Brown, wet, medium dense, Sandy Gravel, Lab No. 7956-7, A-1-a
55.0		Brown, wet, dense to very dense, Gravelly Sand, Lab No. 7956-5, A-1-b

DEPTH (FEET)	SAMPLE TYPE	RECOVERY	NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
37.5				
40.0			11	
42.5				
45.0			12	
47.5				
50.0			13	
52.5				
55.0			14	
57.5				
60.0			15	
62.5				
65.0			16	
67.5				
70.0			17	



WATER LEVEL WHILE DRILLING 4.11 m (13.5 feet)

WATER LEVEL 1.7 m (5.5 feet) after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

PL - PLASTIC LIMIT | LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-3**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B**	STATION **8+760 m** OFFSET **7.62 m (25') Lt. Line A**
BORING STARTED **12-23-05**	RIG **CME 850**	FILE NUMBER **7956**	
BORING COMPLETED **12-23-05**	FOREMAN **Ruben Perez**		

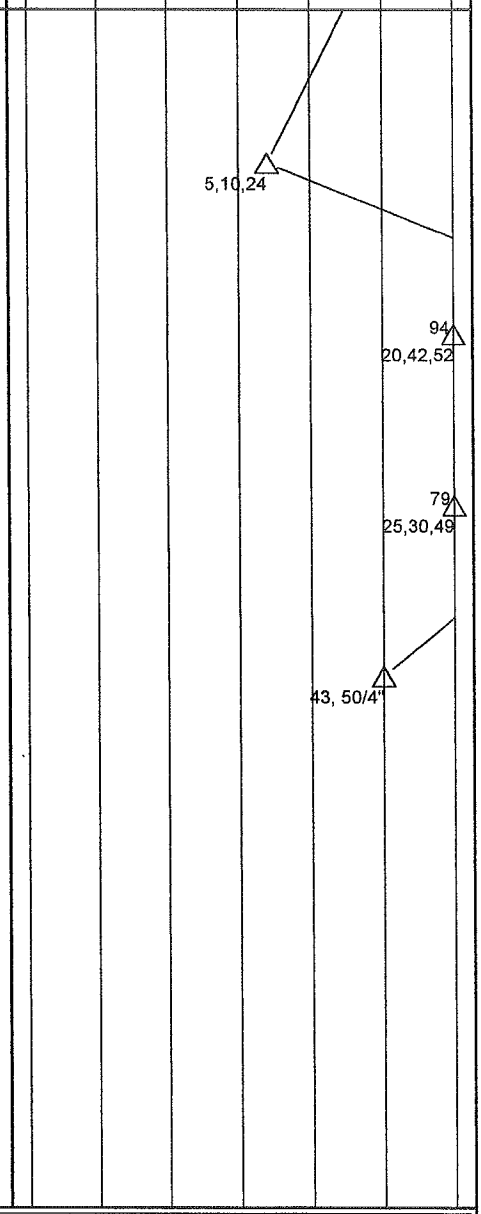
SURFACE ELEVATION **453.6 ft (138.26 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
22		(Cont'd..) Brown, wet, dense to very dense, Gravelly Sand, Lab No. 7956-5, A-1-b	72.5				
			75.0			18	
23			77.5				
24			80.0			19	
25			82.5				
26			85.0			20	
27			87.5				
90.0		END OF BORING @ 27.4 m (90.0 feet)	90.0			21	

CALIBRATED PENETROMETER,TONS/FT²
UNCONFINED COMPRESSIVE STRENGTH, TONS/FT²
0 1 2 3 4 5 6

WATER CONTENT, %
0 10 20 30 40 50 60

BLOW COUNTS
0 10 20 30 40 50 60



WATER LEVEL WHILE DRILLING 4.11 m (13.5 feet)
WATER LEVEL 1.7 m (5.5 feet) after 24 hours

REMARKS

SPLIT SPOON SHELBY TUBE AUGER ROCK CORE
+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

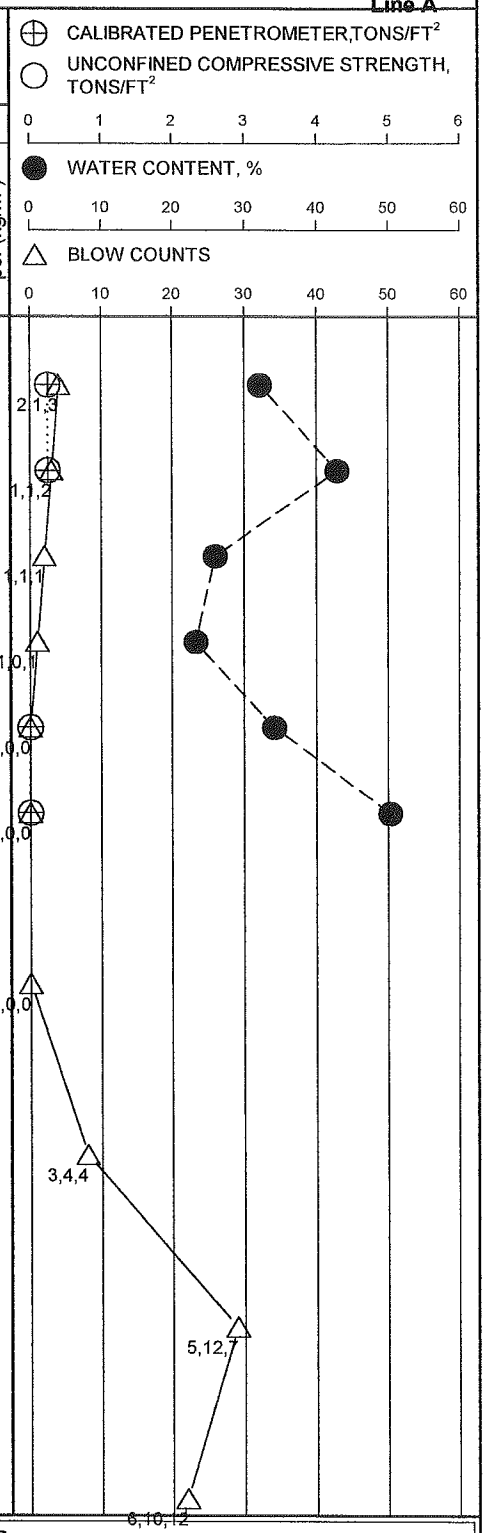
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-4**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **8+800**	OFFSET **7.62 m (25') Rt. Line A**
BORING STARTED **12-22-05**	RIG **CME 850**	FILE NUMBER **7956**	
BORING COMPLETED **12-23-05**	FOREMAN **Ruben Perez**		

SURFACE ELEVATION **455.3 ft (138.76 m) USC & GS**

STRATA DEPTH (METERS)	STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
	1.0		Topsoil (Visual)					
			Brown-gray, slightly moist, soft to very soft, Silty Clay, Lab No. 7956-4, A-7-6 (LOI = 4.2%)	2.5			1	
				5.0			2	
	6.0		Gray, moist, very loose, Sandy Loam, Lab No. 7956-10, A-4	7.5			3	
	10.0		Gray, slightly moist, very soft, Silty Clay with trace of organics (LOI = 4.5%), Lab No. 7956-4, A-7-6	10.0			4	
				12.5			5	
				15.0			6	
				17.5				
	19.0		Gray, wet, very loose to loose, Sand, Lab No. 7956-8, A-3	20.0			7	
				22.5				
				25.0			8	
	28.0		Brown, wet, medium dense to dense, Sandy Gravel, Lab No. 7956-7, A-1-a	27.5				
				30.0			9	
				32.5				
				35.0			10	



▽ WATER LEVEL WHILE DRILLING 2.13 m (7 feet)

▼ WATER LEVEL 1.5 m (5 feet) after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

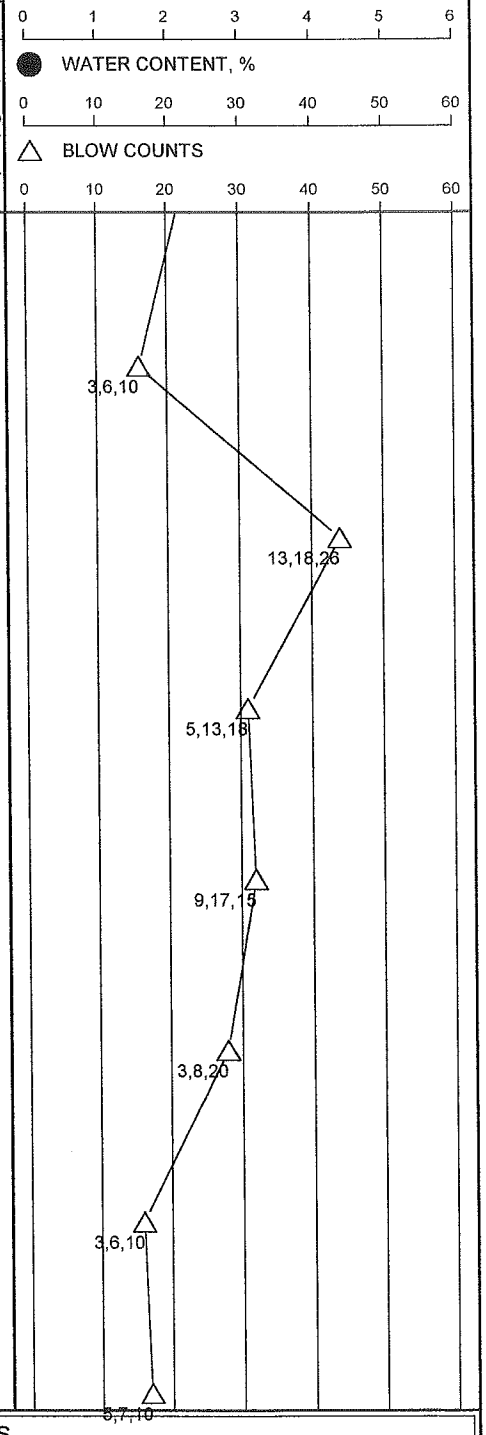
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 1-31-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-4**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **8+800**	OFFSET **7.62 m (25') Rt. Line A**
BORING STARTED **12-22-05**	RIG **CME 850**	FILE NUMBER **7956**	
BORING COMPLETED **12-23-05**	FOREMAN **Ruben Perez**		

SURFACE ELEVATION **455.3 ft (138.76 m) USC & GS**

STRATA DEPTH (METERS)	STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
11			(Cont'd..) Brown, wet, medium dense to dense, Sandy Gravel, Lab No. 7956-7, A-1-a	37.5				
12				40.0			11	
13				42.5				
14				45.0			12	
15				47.5				
	52.0			50.0			13	
16			Brown, wet, dense to medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b	52.5				
17				55.0			14	
18				57.5				
19				60.0			15	
20				62.5				
21			END OF BORING @ 21.3 m (70 feet)	65.0			16	
	70.0			67.5				
				70.0			17	



WATER LEVEL WHILE DRILLING 2.13 m (7 feet)

WATER LEVEL 1.5 m (5 feet) after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 1-31-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-4**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **8+800**	OFFSET **7.62 m (25') Rt. Line A**
BORING STARTED **12-22-05**	RIG **CME 850**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-23-05**	FOREMAN **Ruben Perez**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2
SURFACE ELEVATION **455.3 ft (138.76 m) USC & GS**			0 1 2 3 4 5 6
			● WATER CONTENT, %
			0 10 20 30 40 50 60
			△ BLOW COUNTS
			0 10 20 30 40 50 60

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
		Original Boring was terminated at 21.3 m (70 feet) due to the difficulties while drilling through medium dense to dense Gravelly sand. Based on the soil Conditions in Boring TB-5, it is assumed that similar soil conditions exist to a depth of 27.4 m (90 feet) in this boring also.					

▽ WATER LEVEL WHILE DRILLING 2.13 m (7 feet)

▼ WATER LEVEL 1.5 m (5 feet) after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

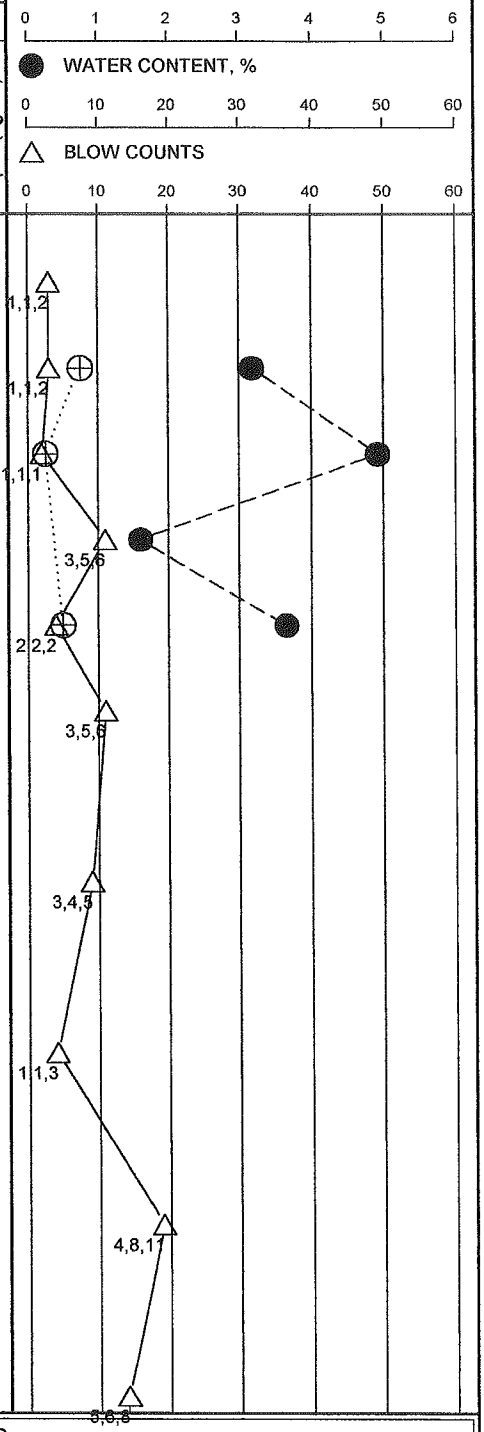
CLIENT **INDOT**		LOG OF BORING NUMBER **TB-5**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **8+848 m**	OFFSET **7.62 m (25') Lt. Line A**
BORING STARTED **12-22-05**	RIG **CME 850**	FILE NUMBER **7956**	
BORING COMPLETED **12-22-05**	FOREMAN **Ruben Perez**		

SURFACE ELEVATION **459.9 ft (140.17 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL
1.0		Topsoil (Visual)
		Gray, slightly moist, very soft, Silty Clay with trace of organics, Lab No. 7956-4, A-7-6
		- LOI = 4.3%
8.0		Gray, moist, medium dense, Sandy Loam, Lab No. 7956-10, A-4
11.0		Gray, slightly moist, soft, Silty Clay with trace of organics, Lab No. 7956-4, A-7-6 (LOI = 4.1%)
13.0		Gray, moist, medium dense, Sandy Loam, Lab No. 7956-10, A-4
16.0		Brown, wet, loose to very loose, Gravelly Sand, Lab No. 7956-5, A-1-b
26.0		Brown, wet, medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b

SAMPLE

DEPTH (FEET)	TYPE	RECOVERY	NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
2.5			1	
5.0			2	
7.5			3	
10.0			4	
12.5			5	
15.0			6	
17.5				
20.0			7	
22.5				
25.0			8	
27.5				
30.0			9	
32.5				
35.0			10	



▽ WATER LEVEL WHILE DRILLING 4.9 m (16 feet)

▼ WATER LEVEL 1.5 m (5 feet) after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

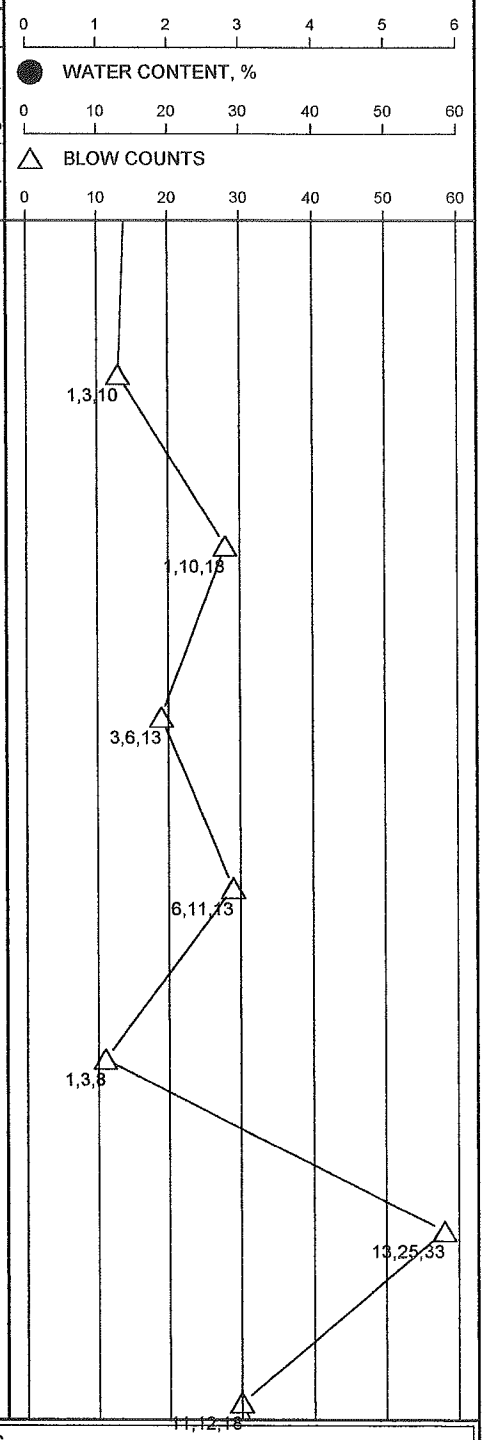
BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-5**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **8+848 m** OFFSET **7.62 m (25') Lt. Line A**	
BORING STARTED **12-22-05**	RIG **CME 850**	FILE NUMBER **7956**	
BORING COMPLETED **12-22-05**	FOREMAN **Ruben Perez**		

SURFACE ELEVATION **459.9 ft (140.17 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL
36.0		Brown, wet, medium dense, Sandy Gravel, Lab No. 7956-7, A-1-a
42.0		Brown, wet, medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b
56.0		Brown, wet, medium dense, Sandy Gravel, Lab No. 7956-5, A-1-b
63.0		Brown, wet, very dense, Sandy Gravel, Lab No. 7956-7, A-1-a
66.0		Brown, wet, medium dense to dense, Gravelly Sand, Lab No. 7956-5, A-1-b

DEPTH (FEET)	SAMPLE TYPE	RECOVERY	NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
37.5				
40.0			11	
42.5				
45.0			12	
47.5				
50.0			13	
52.5				
55.0			14	
57.5				
60.0			15	
62.5				
65.0			16	
67.5				
70.0			17	



▽ WATER LEVEL WHILE DRILLING 4.9 m (16 feet)

▼ WATER LEVEL 1.5 m (5 feet) after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

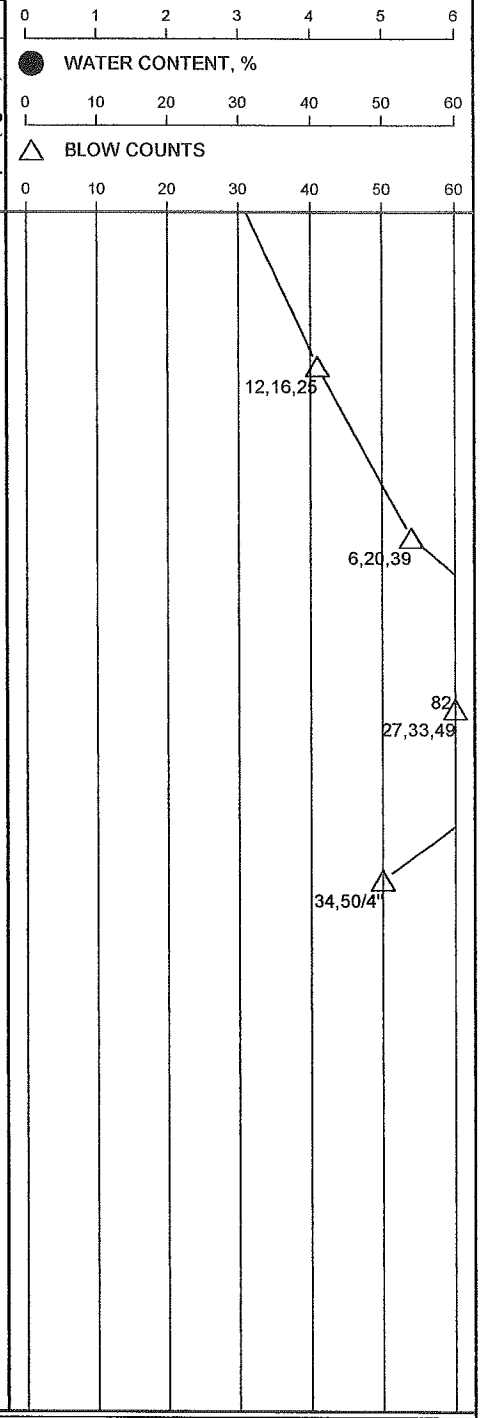
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-5**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **8+848 m** OFFSET **7.62 m (25') Lt. Line A**	
BORING STARTED **12-22-05**	RIG **CME 850**	FILE NUMBER **7956**	
BORING COMPLETED **12-22-05**	FOREMAN **Ruben Perez**		

SURFACE ELEVATION **459.9 ft (140.17 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
22		(cont'd..) Brown, wet, medium dense to dense, Gravelly Sand, Lab No. 7956-5, A-1-b	72.5				
			75.0			18	
23							
78.0			77.5				
24		Brown, wet, very dense, Gravelly Sand, Lab No. 7956-5, A-1-b				19	
			80.0				
25			82.5				
						20	
26			85.0				
			87.5				
27						21	
90.0		END OF BORING @ 27.4 m (90 feet)	90.0				



WATER LEVEL WHILE DRILLING 4.9 m (16 feet)

WATER LEVEL 1.5 m (5 feet) after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

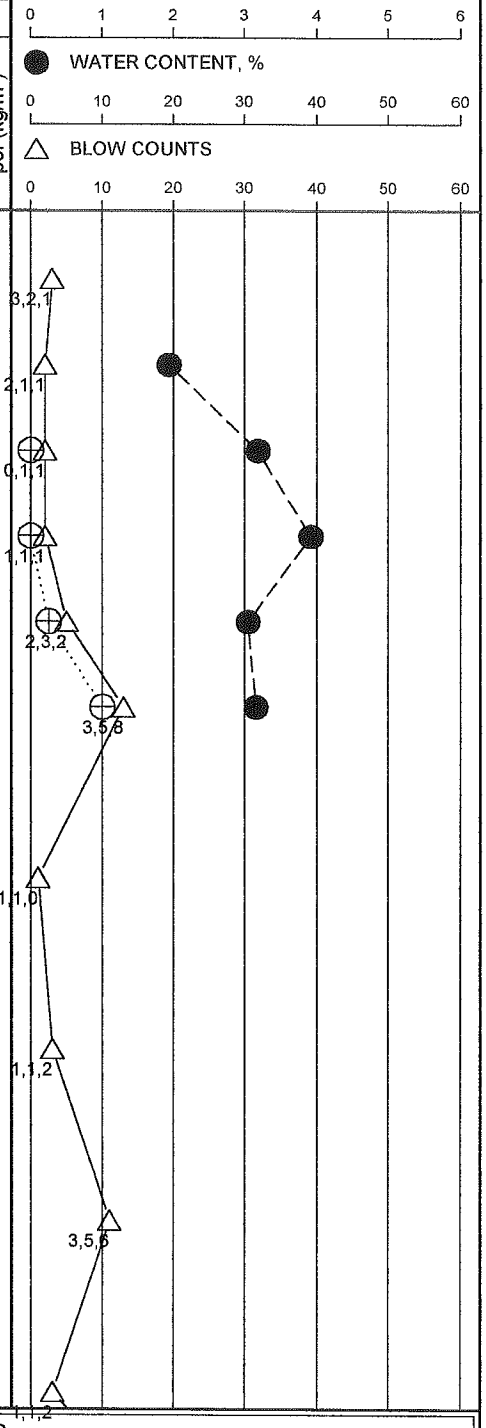
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-6**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **8+894 m**	OFFSET **7.62 m (25') Rt. Line A**
BORING STARTED **12-17-05**	RIG **CME 850**	FILE NUMBER **7956**	
BORING COMPLETED **12-19-05**	FOREMAN **Ruben Perez**		

SURFACE ELEVATION **460.5 ft (140.36 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
1.0		Topsoil (Visual)					
1 / 5.0		Gray, slightly moist, very loose, Sandy Loam, Lab No. 7956-10, A-4	2.5			1	
2 / 13.0		Gray, moist, very soft to soft, Silty Clay with trace of organics (LOI = 3.2%), Lab No. 7956-4, A-7-6	5.0, 7.5, 10.0, 12.5			2, 3, 4, 5	
4 / 17.0		Gray, moist, stiff, Silty Loam with trace of organics, Lab No. 7956-3, A-4 (LOI = 5%)	15.0			6	
6 / 23.0		Dark gray, wet, very loose, Sand, Lab No. 7956-8, A-3	17.5, 20.0, 22.5			7	
7 / 28.0		Gray-brown, wet, very loose, Gravelly Sand, Lab no. 7956-5, A-1-b	25.0, 27.5			8	
9 / 33.0		Brown, wet, medium dense, Sandy Gravel, Lab No. 7956-7, A-1-a	30.0, 32.5			9	
10		Brown, wet, very loose, Sand, Lab No. 7956-8, A-3	35.0			10	



WATER LEVEL WHILE DRILLING 6.4 m (21 feet)

WATER LEVEL 1.2 m (4 feet) after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

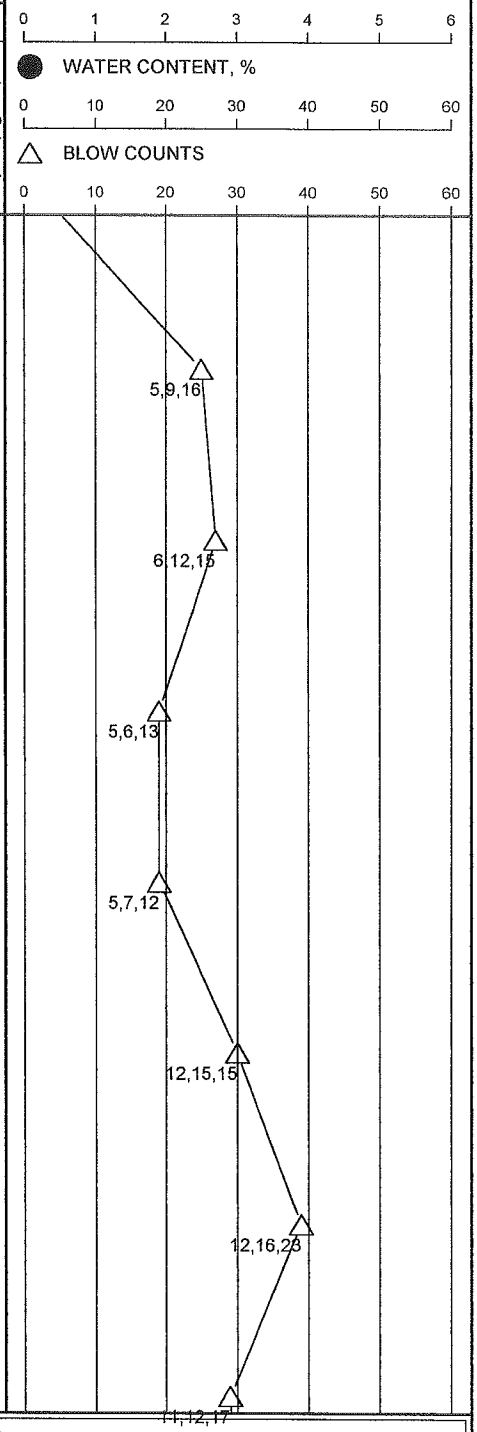
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 1-31-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-6**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **8+894 m**	OFFSET **7.62 m (25') Rt. Line A**
BORING STARTED **12-17-05**	RIG **CME 850**	FILE NUMBER **7956**	
BORING COMPLETED **12-19-05**	FOREMAN **Ruben Perez**		

SURFACE ELEVATION **460.5 ft (140.36 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
36.0							
11		Brown, wet, medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b	37.5				
12			40.0			11	
13			42.5				
14			45.0			12	
15			47.5				
16			50.0			13	
17			52.5				
56.0			55.0			14	
18		Brown, wet, medium dense, Sand, Lab No. 7956-7, A-1-a	57.5				
19			60.0			15	
20			62.5				
68.0			65.0			16	
21		Brown, wet, medium dense, Sand, Lab No. 7956-8, A-3	67.5				
			70.0			17	



WATER LEVEL WHILE DRILLING 6.4 m (21 feet)

WATER LEVEL 1.2 m (4 feet) after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

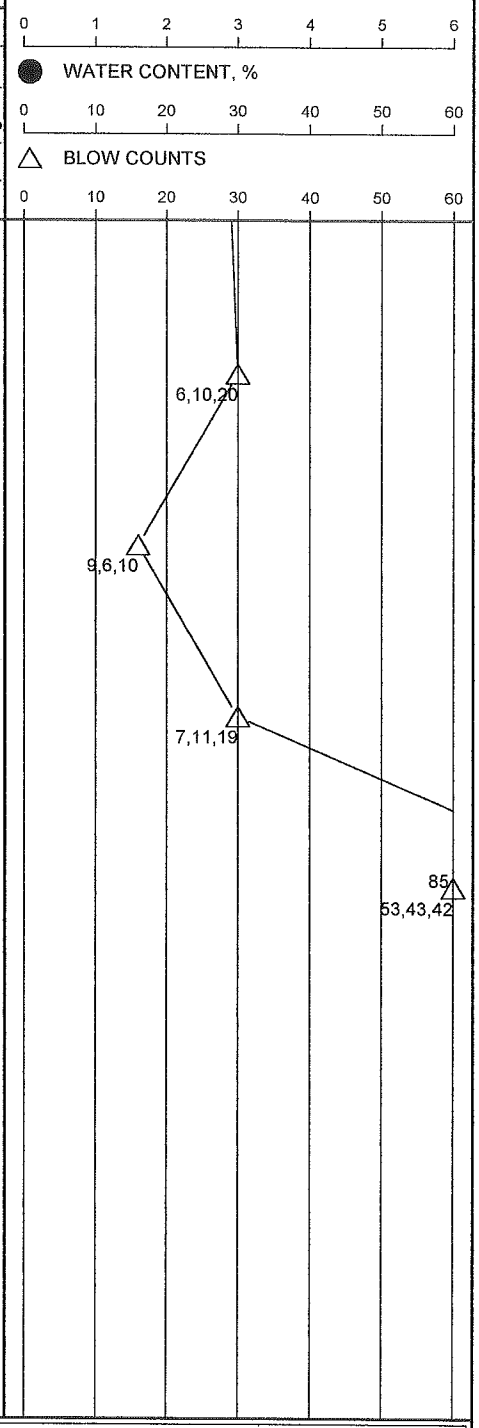
+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-6**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **8+894 m**	OFFSET **7.62 m (25') Rt. Line A**
BORING STARTED **12-17-05**	RIG **CME 850**	FILE NUMBER **7956**	
BORING COMPLETED **12-19-05**	FOREMAN **Ruben Perez**		

SURFACE ELEVATION **460.5 ft (140.36 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
22		(Cont'd..) Brown, wet, medium dense, Sand, Lab No. 7956-8, A-3	72.5				
			75.0			18	
23							
			77.5				
24			80.0			19	
25			82.5				
26			85.0			20	
86.0		Brown, wet, very dense, Sand, Lab No. 7956-8, A-3					
27			87.5				
90.0		END OF BORING @ 27.4 m (90 feet)	90.0			21	



WATER LEVEL WHILE DRILLING 6.4 m (21 feet)

WATER LEVEL 1.2 m (4 feet) after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

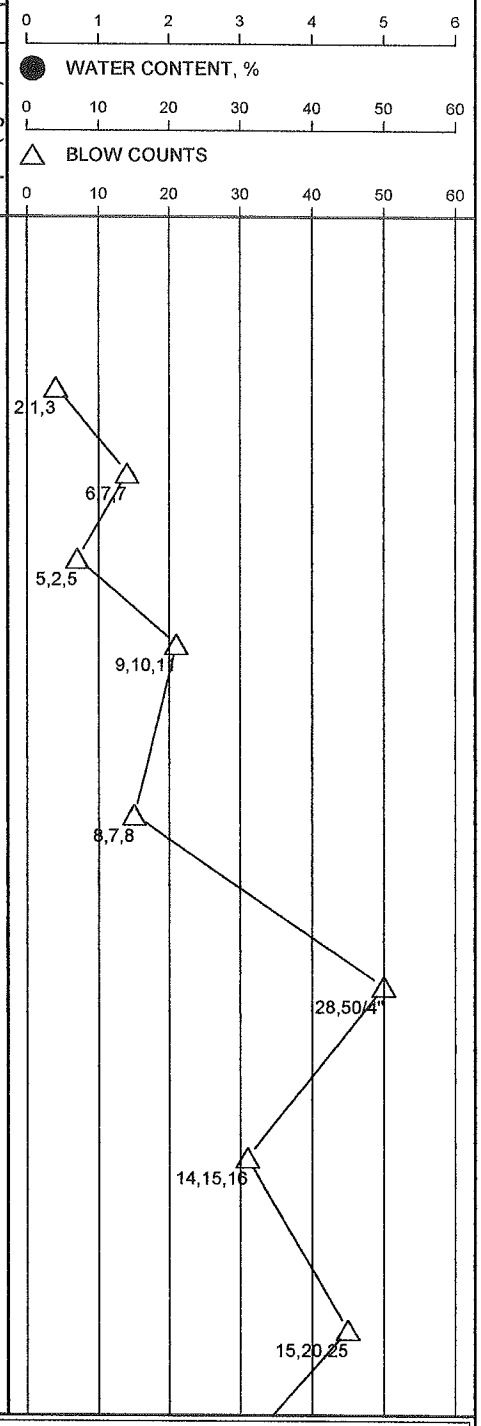
+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 1-31-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-7**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **8+981.5 m** OFFSET **0 m C/L Line A**	
BORING STARTED **12-6-05**	RIG **CME 45**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-10-05**	FOREMAN **C. Carroll**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2
SURFACE ELEVATION **460.9 ft (140.48 m) USC & GS**			● WATER CONTENT, %
			△ BLOW COUNTS

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	RECOVERY	NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
		Water					
3.0			2.5				
1		Brown, wet, very loose, Gravelly Sand, Lab No. 7956-5, A-1-b	5.0			1	
6.0							
2		Gray-brown, wet, medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b	7.5			2	
9.0							
3		Gray-brown, wet, loose to medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b	10.0			3	
4			12.5			4	
			15.0				
5			17.5			5	
6			20.0				
21.0							
7		Brown, wet, dense, Gravelly Sand, Lab No. 7956-5, A-1-b	22.5			6	
			25.0				
26.0							
8		Brown, wet, dense, Gravelly Sand, Lab No. 7956-5, A-1-b	27.5			7	
9			30.0				
10			32.5			8	
			35.0				



REMARKS
This Boring was drilled by ATC, Inc., Indianapolis

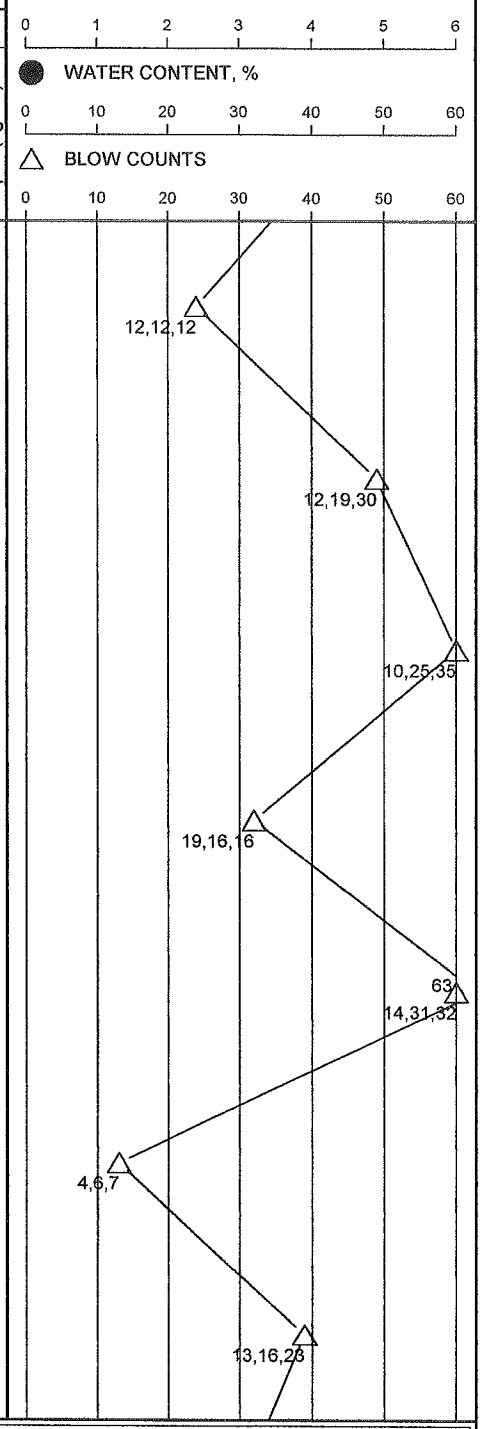
SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE
+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-7**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **8+981.5 m** OFFSET **0 m C/L Line A**	
BORING STARTED **12-6-05**	RIG **CME 45**	FILE NUMBER **7956**	
BORING COMPLETED **12-10-05**	FOREMAN **C. Carroll**		
SURFACE ELEVATION **460.9 ft (140.48 m) USC & GS**			

STRATA DEPTH (METERS)	STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
11	36.0		Brown, wet, medium dense to dense, Gravelly Sand, Lab No. 7956-5, A-1-b	37.5			9	
12				40.0				
13	43.0		Brown, wet, very dense, Gravelly Sand, Lab No. 7956-5, A-1-b	42.5			10	
14				45.0				
	49.0			47.5			11	
15			Brown, wet, dense to very dense, Sand, Lab No. 7956-8, A-3	50.0				
16				52.5			12	
17				55.0				
	59.0			57.5			13	
18			Brown, wet, medium dense to dense, Sand, Lab No. 7956-8, A-3	60.0				
19				62.5			14	
20				65.0				
21				67.5			15	
				70.0				



REMARKS
This Boring was drilled by ATC, Inc., Indianapolis

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE
+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

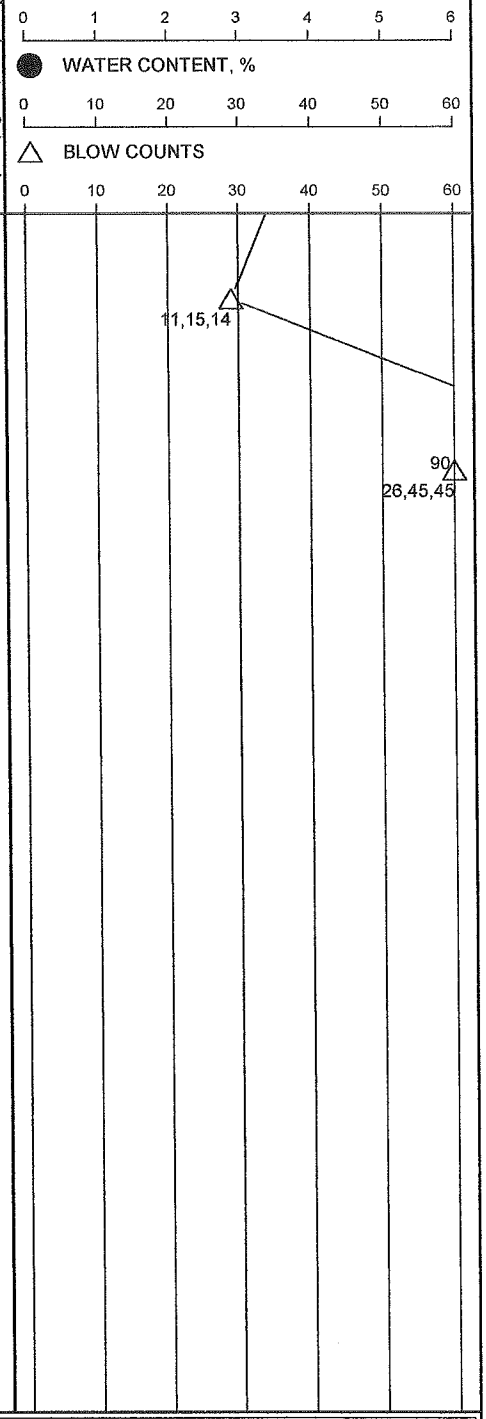
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-7**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **8+981.5 m** OFFSET **0 m C/L Line A**	
BORING STARTED **12-6-05**	RIG **CME 45**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-10-05**	FOREMAN **C. Carroll**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2

SURFACE ELEVATION **460.9 ft (140.48 m) USC & GS**

STRATA DEPTH (METERS)	STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
22	73.0			72.5			16	
			Brown, wet, very dense, Sand, Lab No. 7956-8, A-3	75.0				
23	78.0			77.5			17	
			END OF BORING @ 23.8 m (78 feet)					



REMARKS
This Boring was drilled by ATC, Inc., Indianapolis

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE
+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

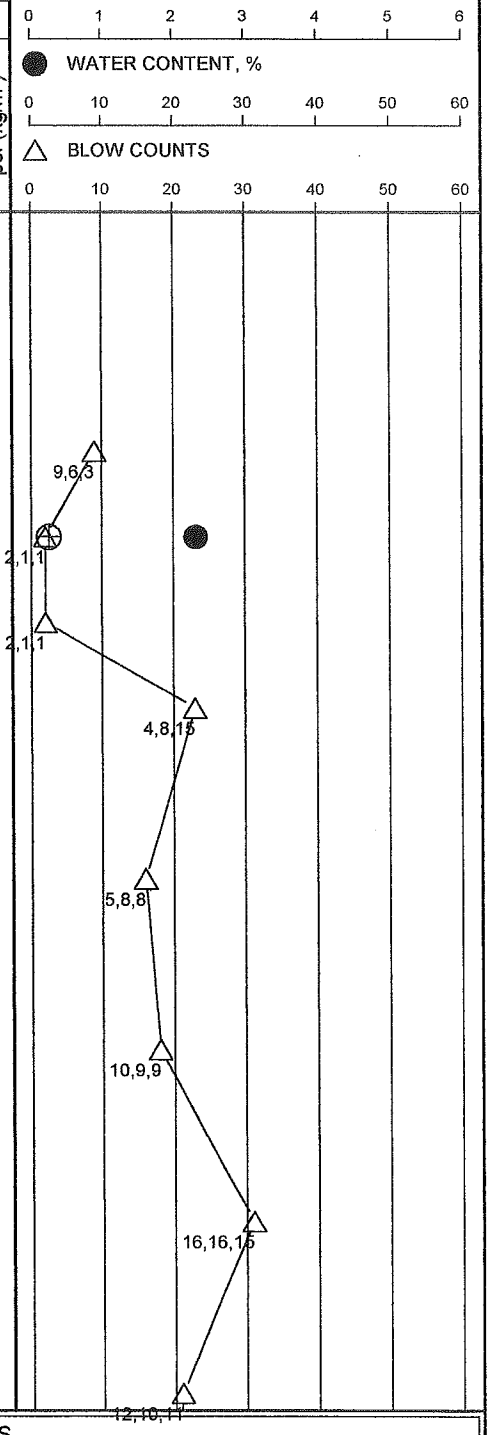
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-8**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **9+079.5 m** OFFSET **0 m C/L Line A**	
BORING STARTED **1-10-06**	RIG **CME 45**	FILE NUMBER **7956**	
BORING COMPLETED **1-10-06**	FOREMAN **C. Carroll**		

SURFACE ELEVATION **462.2 ft (140.89 m) USC & GS**

STRATA DEPTH (METERS)	STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
			Water	2.5				
1.5	5.0		Brown, wet, loose, Gravelly Sand, Lab No. 7956-5, A-1-b	5.0				
2.5	8.0		Gray, moist, very soft, Silty Clay Loam, Lab No. 7956-11, A-6	7.5			1	
3.5	11.0		Brown, wet, very loose, Gravelly Sand, Lab No. 7956-5, A-1-b	10.0			2	
4.0	13.0		Gray-brown, wet, medium dense to dense, Gravelly Sand, Lab No. 7956-5, A-1-b	12.5			3	
				15.0			4	
				17.5				
				20.0			5	
				22.5				
				25.0			6	
				27.5				
				30.0			7	
9.5	31.0		Brown, wet, medium dense, Sandy Gravel, Lab No. 7956-7, A-1-a	32.5				
				35.0			8	



REMARKS
This Boring was drilled by ATC, Inc., Indianapolis

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE
+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

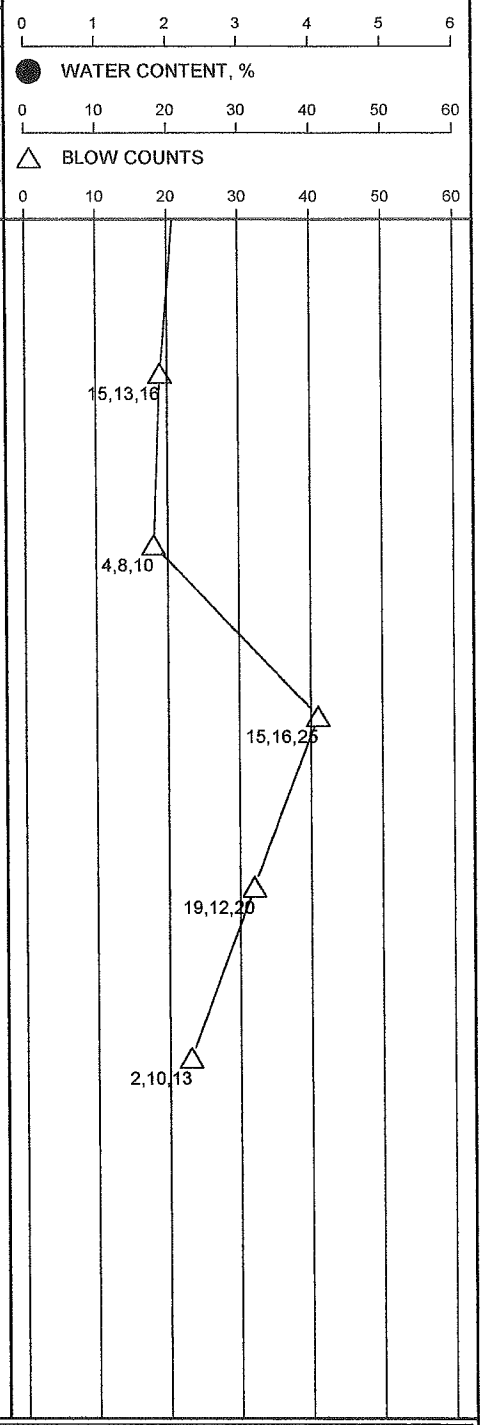
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-8**	DES. NO. **9709060**
PROJECT NAME	**Bridge Rehabilitation on I-70 Over Wabash River and SR 63**		PROJECT NO. **IM-70-I**
SITE LOCATION	**Vigo County, Terre Haute, Indiana**	STRUCTURE NUMBER **I-70-5-4613B** STATION **9+079.5 m** OFFSET **0 m C/L Line A**	
BORING STARTED **1-10-06**	RIG **CME 45**	FILE NUMBER **7956**	
BORING COMPLETED **1-10-06**	FOREMAN **C. Carroll**		

SURFACE ELEVATION **462.2 ft (140.89 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
11		(Cont'd..) Gray-brown, wet, medium dense, Sandy Gravel, Lab No. 7956-7, A-1-a	37.5				
12			40.0			9	
13			42.5			10	
14 (46.0)			45.0				
		Brown, wet, dense to medium dense, Sand, Lab No. 7956-8, A-3	47.5			11	
15			50.0				
16			52.5			12	
17			55.0				
			57.5			13	
18			60.0				
19			62.5			14	
20 (65.0)		Brown, wet, medium dense, Sand, Lab No. 7956-8, A-3	65.0				
21			67.5				
			70.0				



REMARKS
This Boring was drilled by ATC, Inc., Indianapolis

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE
+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-8**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **9+079.5 m** OFFSET **0 m C/L Line A**	
BORING STARTED **1-10-06**	RIG **CME 45**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **1-10-06**	FOREMAN **C. Carroll**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2
SURFACE ELEVATION **462.2 ft (140.89 m) USC & GS**			0 1 2 3 4 5 6

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)	● WATER CONTENT, % (0 10 20 30 40 50 60)	△ BLOW COUNTS (0 10 20 30 40 50 60)
22		(Cont'd).. Brown, wet, medium dense, Sand, Lab No. 7956-8, A-3	72.5						
23			75.0						
24			77.5						
25			80.0						
85.0			82.5						
		END OF BORING @ 25.9 m (85 feet)	85.0						

Original Boring was terminated at 19.8 m (65 feet) due to the difficulties while drilling through medium dense to dense sand. Based on the soil Conditions in Boring TB-7, it is assumed that similar soil conditions exist to a depth of 25.9 m (85 feet) in this boring also.

REMARKS
This Boring was drilled by ATC, Inc., Indianapolis

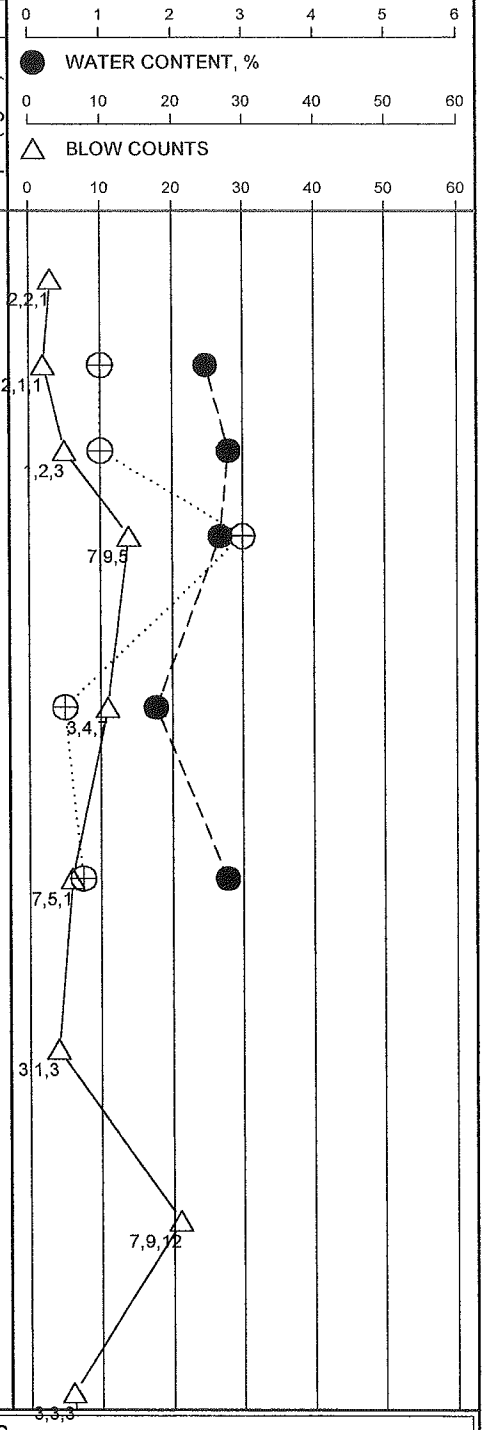
/ SPLIT SPOON ■ SHELBY TUBE A AUGER ▨ ROCK CORE
+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-9**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **9+144 m**	OFFSET **7.62 m (25') Lt. Line A**
BORING STARTED **12-6-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	
BORING COMPLETED **12-6-05**	FOREMAN **W. Bates**		

SURFACE ELEVATION **461.8 ft (140.76 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
1.0		Topsoil (Visual)					
		Dark brown-dark gray, slightly moist, very soft to soft, Silty Loam, Lab No. 7956-6, A-6(7)	2.5			1	
			5.0			2	
8.0			7.5			3	
		Gray, slightly moist, stiff, Silty Loam, Lab No. 7956-6, A-6	10.0			4	
			12.5				
			15.0			5	
16.0		Gray, slightly moist, medium stiff, Silty Loam, Lab No. 7956-6, A-6	17.5				
			20.0			6	
23.0			22.5				
		Brown-gray, wet, very loose, Gravelly Sand, Lab No. 7956-5, A-1-b	25.0			7	
26.0		Brown, wet, medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b	27.5				
			30.0			8	
32.0		Brown, wet, loose, Gravelly Sand, Lab No. 7956-5, A-1-b	32.5				
			35.0			9	



▽ WATER LEVEL WHILE DRILLING 7.0 m (23.0 feet)

▼ WATER LEVEL 3.7 feet (12.0 feet) at completion

▼ WATER LEVEL 1.37 m (4.5 feet) after 24 hours

SPLIT SPOON ■ SHELBY TUBE A AUGER ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

REMARKS

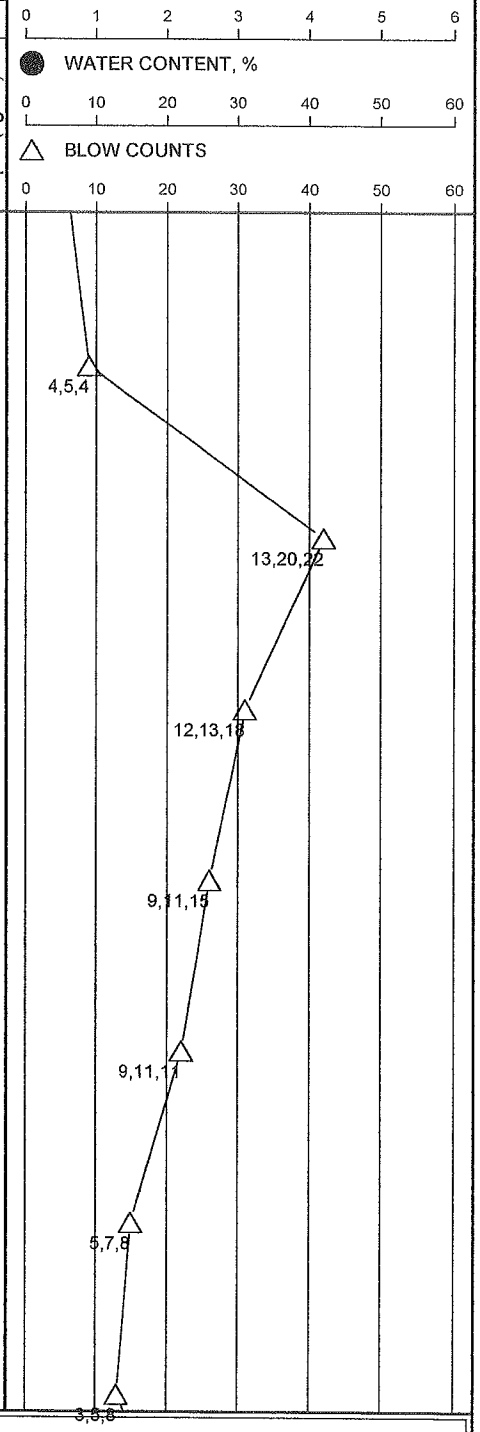
This Boring was drilled by ATC, Inc., Indianapolis

K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 1-31-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-9**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **9+144 m** OFFSET **7.62 m (25') Lt. Line A**	
BORING STARTED **12-6-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	
BORING COMPLETED **12-6-05**	FOREMAN **W. Bates**		
SURFACE ELEVATION **461.8 ft (140.76 m) USC & GS**			

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
11		(Cont'd..) Brown, wet, loose, Gravelly Sand, Lab No. 7956-5, A-1-b	37.5				
12			40.0			10	
42.0							
13		Brown, wet, dense to medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b	42.5				
			45.0			11	
14			47.5				
15			50.0			12	
16			52.5				
			55.0			13	
17			57.5				
18			60.0			14	
19			62.5				
63.0		Gray-brown, wet, medium dense, Sand, Lab No. 7956-8, A-3					
			65.0			15	
20			67.5				
21			70.0			16	



WATER LEVEL WHILE DRILLING 7.0 m (23.0 feet)
WATER LEVEL 3.7 feet (12.0 feet) at completion
WATER LEVEL 1.37 m (4.5 feet) after 24 hours

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE
+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

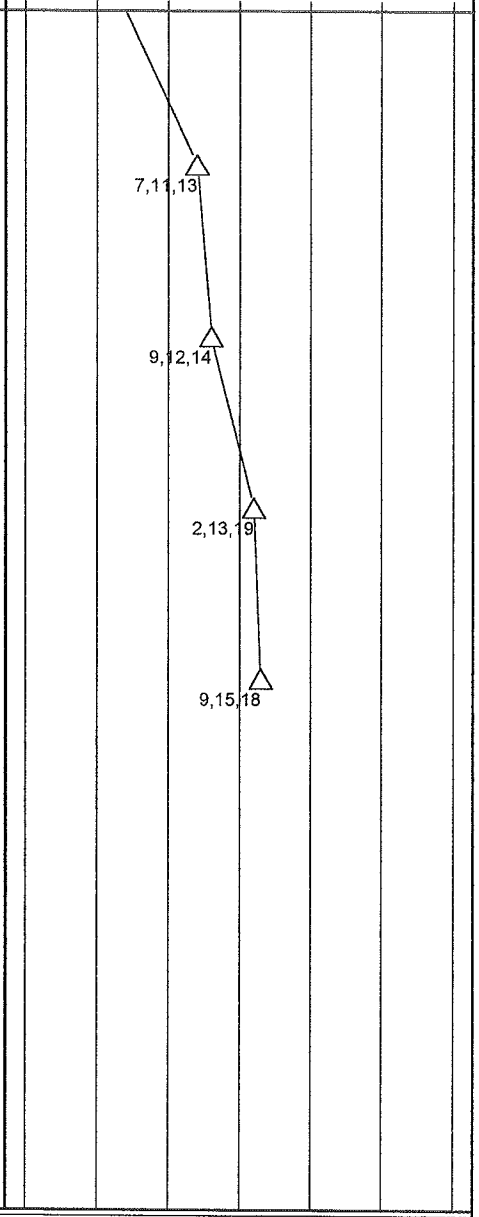
REMARKS
This Boring was drilled by ATC, Inc., Indianapolis

K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 1-31-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-9**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **9+144 m**	OFFSET **7.62 m (25') Lt. Line A**
BORING STARTED **12-6-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-6-05**	FOREMAN **W. Bates**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2
SURFACE ELEVATION **461.8 ft (140.76 m) USC & GS**			● WATER CONTENT, %
			△ BLOW COUNTS

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
22		(Cont'd..) Gray-brown, wet, medium dense, Sand, Lab No. 7956-8, A-3	72.5				
23 76.0			75.0			17	
		Brown, wet, medium dense to dense, Sandy Gravel, Lab No. 7956-7, A-1-a	77.5				
24			80.0			18	
25			82.5				
26			85.0			19	
27			87.5				
90.0		END OF BORING @ 27.4 m (90 feet) Original Boring was terminated at 27.4 m (90 feet) in while drilling through medium dense to dense sandy Gravel. But, it is assumed that similar soil conditions exist to a depth of 28.96 m (95 feet).	90.0			20	



▽ WATER LEVEL WHILE DRILLING 7.0 m (23.0 feet)
▼ WATER LEVEL 3.7 feet (12.0 feet) at completion
▼ WATER LEVEL 1.37 m (4.5 feet) after 24 hours

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE
+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

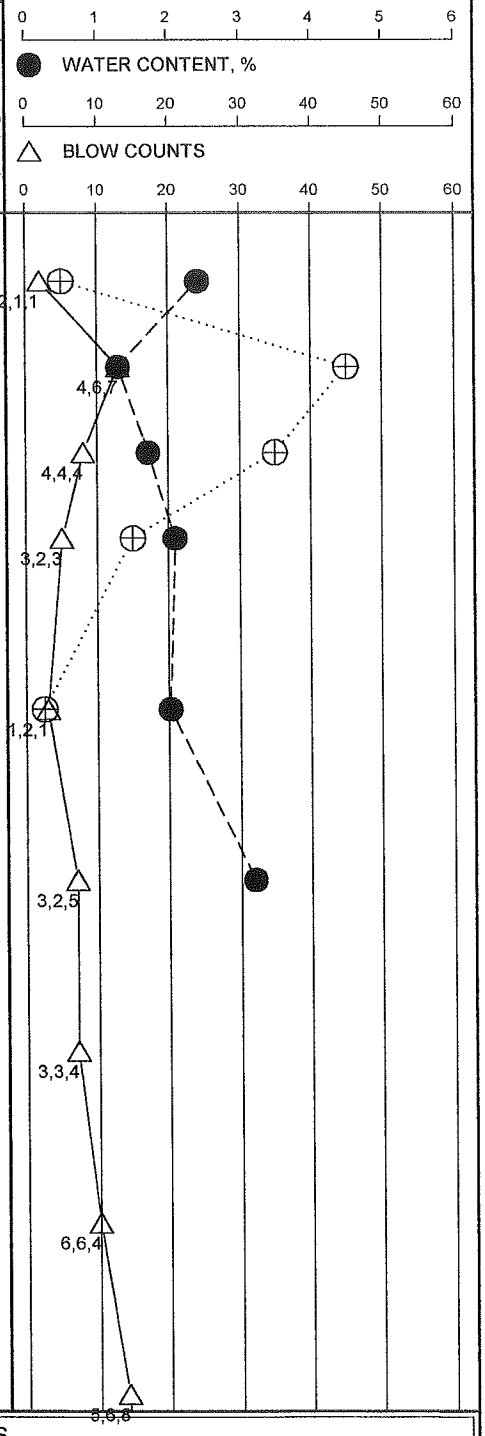
REMARKS
This Boring was drilled by ATC, Inc., Indianapolis

K & S ENGINEERS, INC.

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-10**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **9+185 m**	OFFSET **7.62 m (25') Rt.**
BORING STARTED **12-6-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	
BORING COMPLETED **12-7-05**	FOREMAN **W. Bates**		

SURFACE ELEVATION **459.2 ft (139.96 m) USC & GS**

STRATA DEPTH (METERS)	STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
	1.0		Topsoil (Visual)					
	3.0		Gray-brown, slightly moist, very soft, Silty Loam, Lab No. 7956-9, A-4	2.5			1	
1			Gray-brown, slightly moist, stiff to medium stiff, Silty Loam, Lab No. 7956-9, A-4	5.0			2	
2	8.0			7.5			3	
			Gray, slightly moist, soft to very soft, Silty Loam, Lab No. 7956-9, A-4	10.0			4	
3				12.5				
4	15.0			15.0			5	
			Brown, moist, medium stiff, Silty Loam, Lab No. 7956-9, A-4(2)	17.5				
5	20.0			20.0			6	
			Brown, wet, loose, Gravelly Sand, Lab No. 7956-5, A-1-b	22.5				
7				25.0			7	
8				27.5				
9	31.0			30.0			8	
			Brown, wet, medium dense to dense, Sandy Gravel, Lab No. 7956-7, A-1-a	32.5				
10				35.0			9	



WATER LEVEL WHILE DRILLING 5.5 m (18.0 feet)

WATER LEVEL 2.74 m (9.0 feet) at completion

WATER LEVEL 2.6 m (8.5 feet) after 24 hours

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

REMARKS

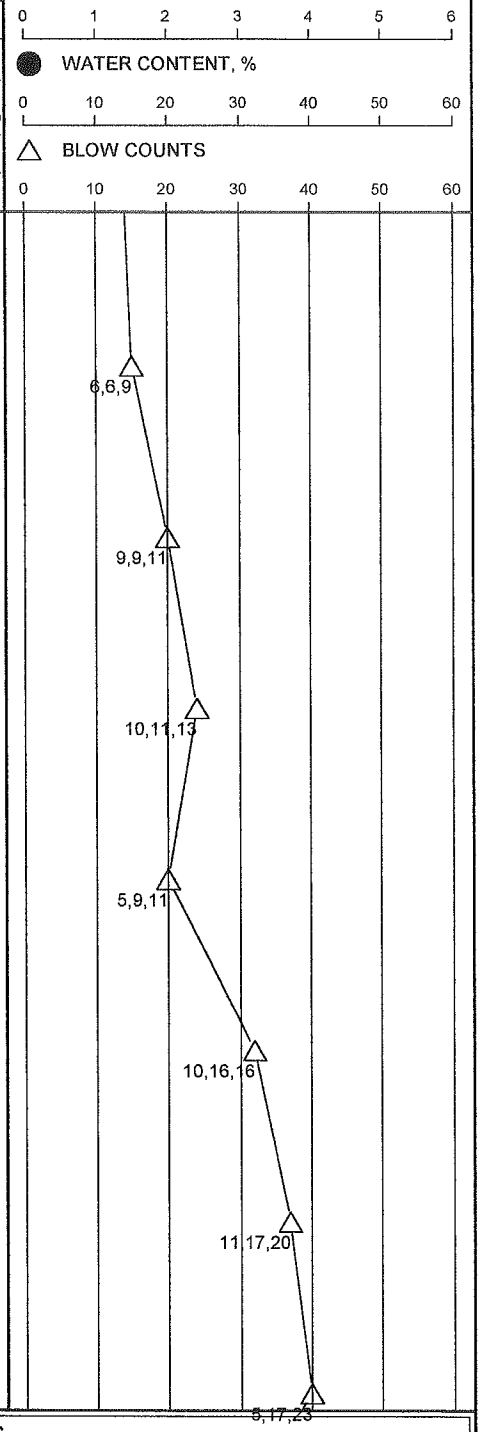
This Boring was drilled by ATC, Inc., Indianapolis

K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 1-31-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-10**	DES. NO. **9709060**
PROJECT NAME	**Bridge Rehabilitation on I-70 Over Wabash River and SR 63**		PROJECT NO. **IM-70-I**
SITE LOCATION	**Vigo County, Terre Haute, Indiana**	STRUCTURE NUMBER **I-70-5-4613B** STATION **9+185 m**	OFFSET **7.62 m (25') Rt.**
BORING STARTED **12-6-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-7-05**	FOREMAN **W. Bates**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2
SURFACE ELEVATION **459.2 ft (139.96 m) USC & GS**			

STRATA DEPTH (METERS)	STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
11			(Cont'd..) Brown, wet, medium dense to dense, Sandy Gravel, Lab No. 7956-7, A-1-a	37.5				
12				40.0			10	
13				42.5				
14				45.0			11	
15				47.5				
16				50.0			12	
17				52.5				
18				55.0			13	
19				57.5				
20				60.0			14	
21				62.5				
				65.0			15	
				67.5				
				70.0			16	



▽ WATER LEVEL WHILE DRILLING 5.5 m (18.0 feet)

▼ WATER LEVEL 2.74 m (9.0 feet) at completion

▼ WATER LEVEL 2.6 m (8.5 feet) after 24 hours

SPLIT SPOON ■ SHELBY TUBE A AUGER ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

REMARKS

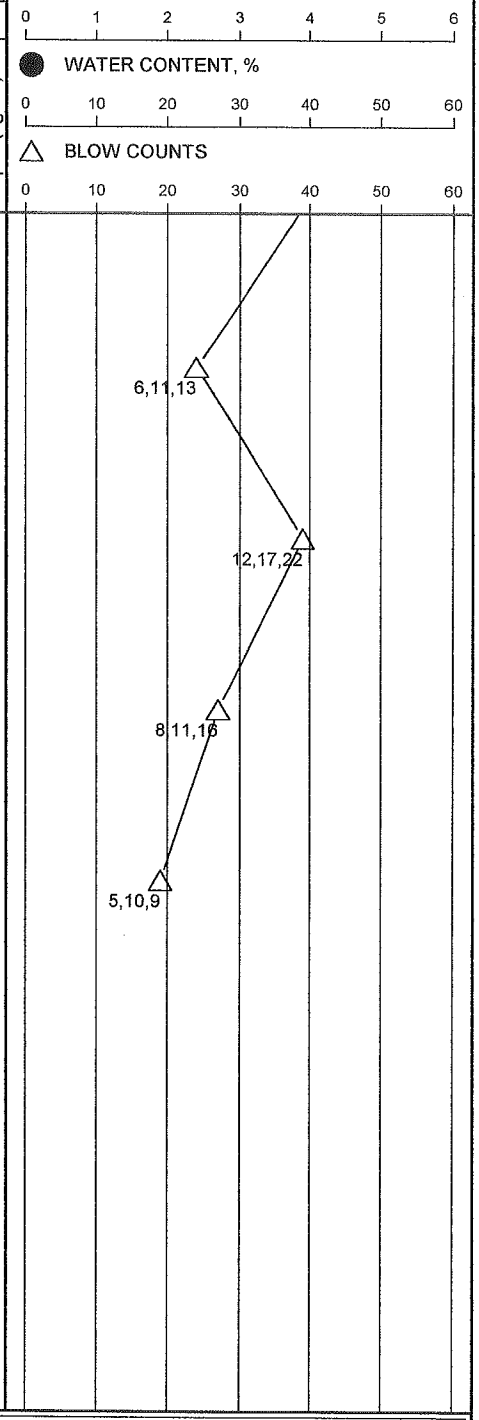
This Boring was drilled by ATC, Inc., Indianapolis

K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 1-31-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-10**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **9+185 m**	OFFSET **7.62 m (25') Rt.**
BORING STARTED **12-6-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-7-05**	FOREMAN **W. Bates**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2
SURFACE ELEVATION **459.2 ft (139.96 m) USC & GS**			● WATER CONTENT, %
			△ BLOW COUNTS

(METERS) STRATA DEPTH	(FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	RECOVERY	NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
	72.0							
22			Brown, wet, medium dense, Sand, Lab No. 7956-8, A-3	72.5				
				75.0			17	
23								
	77.0		Brown, wet, dense to medium dense, Sandy Gravel, Lab No. 7956-7, A-1-a	77.5				
24				80.0			18	
25				82.5				
26				85.0			19	
				87.5				
27								
	90.0		END OF BORING @ 27.4 m (90 feet)	90.0			20	



▽ WATER LEVEL WHILE DRILLING 5.5 m (18.0 feet)
▼ WATER LEVEL 2.74 m (9.0 feet) at completion
▼ WATER LEVEL 2.6 m (8.5 feet) after 24 hours

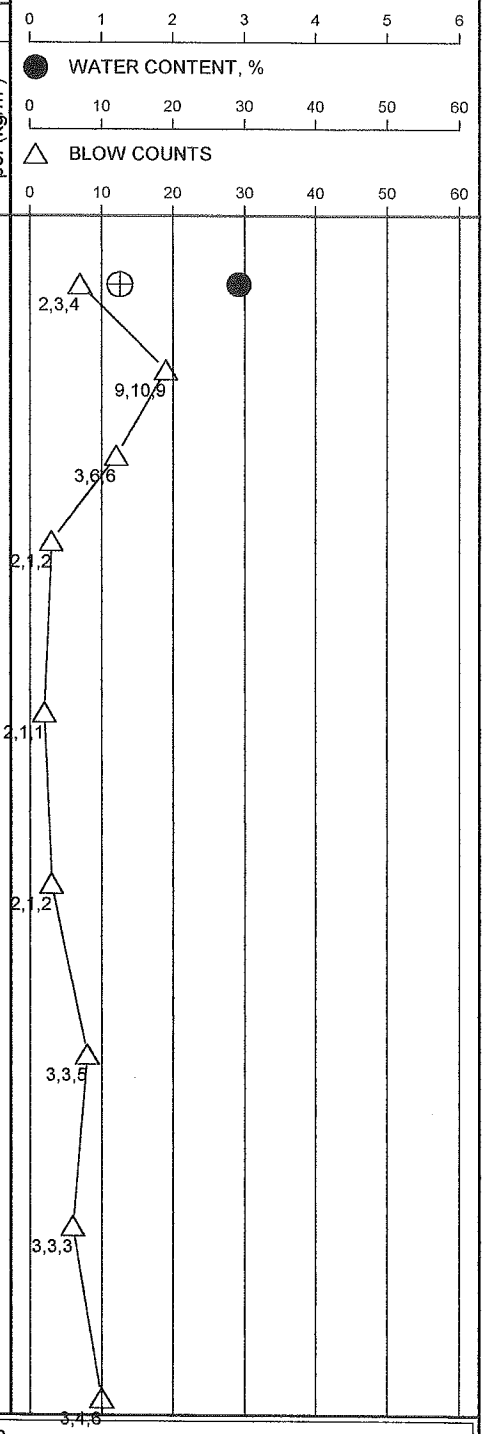
REMARKS
This Boring was drilled by ATC, Inc., Indianapolis

SPLIT SPOON ■ SHELBY TUBE A AUGER ROCK CORE
+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-11**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **9+244 m**	OFFSET **7.62 m (25') Lt.**
BORING STARTED **12-7-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-7-05**	FOREMAN **W. Bates**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2
SURFACE ELEVATION **460.2 ft (140.26 m) USC & GS**			● WATER CONTENT, %
			△ BLOW COUNTS

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
1.0		Topsoil (Visual)					
3.0		Brown-gray, slightly moist, medium stiff, Silty Loam, Lab No. 7956-9, A-4	2.5			1	
		Brown, moist, medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b	5.0			2	
8.0			7.5			3	
		Brown, wet, very loose, Gravelly Sand, Lab No. 7956-5, A-1-b	10.0			4	
			12.5				
			15.0			5	
			17.5				
21.0			20.0			6	
		Gray-brown, wet, loose to medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b	22.5				
			25.0			7	
			27.5				
			30.0			8	
			32.5				
			35.0			9	



▽ WATER LEVEL WHILE DRILLING 2.43 m (8.0 feet)

▼ WATER LEVEL 1.7 m (5.5 feet) at completion

REMARKS
This Boring was drilled by ATC, Inc., Indianapolis

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

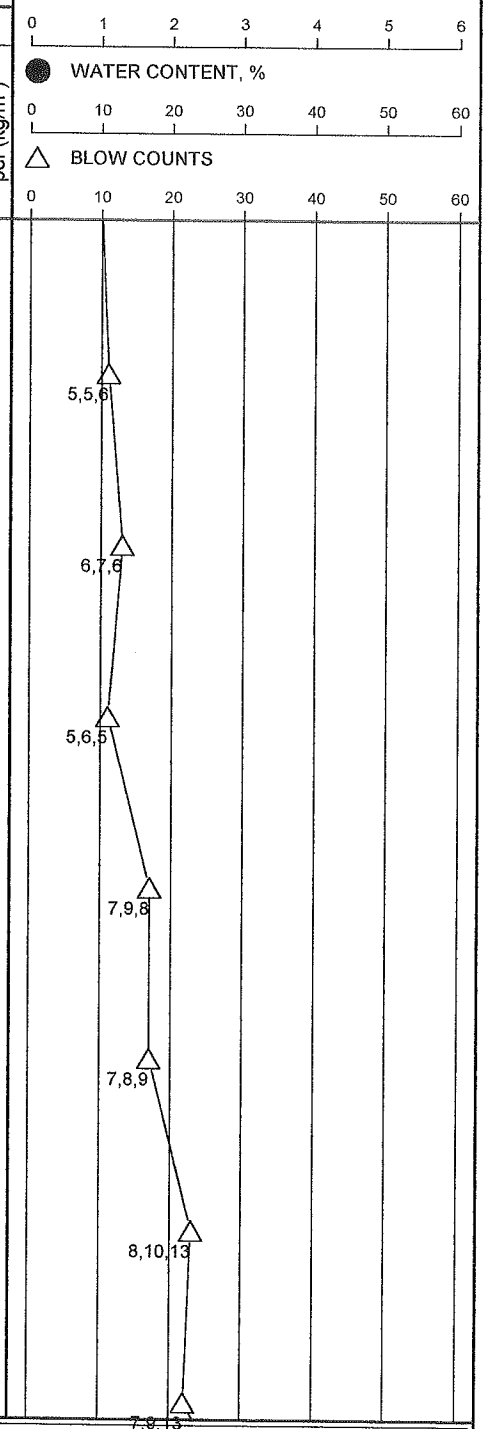
+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 1-26-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-11**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **9+244 m**	OFFSET **7.62 m (25') Lt.**
BORING STARTED **12-7-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-7-05**	FOREMAN **W. Bates**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2
SURFACE ELEVATION **460.2 ft (140.26 m) USC & GS**			● WATER CONTENT, %
			△ BLOW COUNTS

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	RECOVERY	NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
11		(Cont'd..) Gray-brown, wet, loose to medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b	37.5				
12 40.0		Brown, wet, medium dense, Sandy Gravel, Lab No. 7956-7, A-1-a	40.0			10	
13			42.5				
14			45.0			11	
			47.5				
15			50.0			12	
16			52.5				
55.0 17		Brown, wet, medium dense to dense, Sand, Lab No. 7956-8, A-3	55.0			13	
			57.5				
18			60.0			14	
19			62.5				
20			65.0			15	
			67.5				
21			70.0			16	



▽ WATER LEVEL WHILE DRILLING 2.43 m (8.0 feet)

▼ WATER LEVEL 1.7 m (5.5 feet) at completion

REMARKS
This Boring was drilled by ATC, Inc., Indianapolis

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

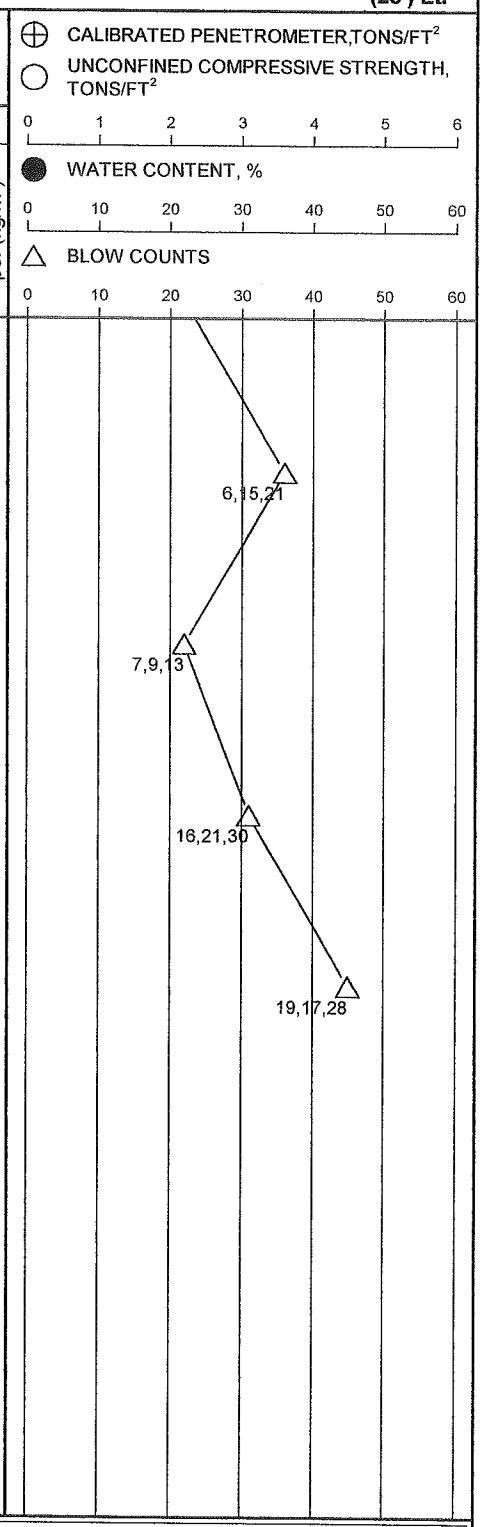
+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 1-26-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-11**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **9+244 m**	OFFSET **7.62 m (25') Lt.**
BORING STARTED **12-7-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	
BORING COMPLETED **12-7-05**	FOREMAN **W. Bates**		
SURFACE ELEVATION **460.2 ft (140.26 m) USC & GS**			

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
22		(Cont'd..) Brown, wet, medium dense to dense, Sand, Lab No. 7956-8, A-3	72.5				
			75.0			17	
23			77.5				
24			80.0			18	
25			82.5				
26			85.0			19	
27			87.5				
90.0		END OF BORING @ 27.4 m (90 feet)	90.0			20	



▽ WATER LEVEL WHILE DRILLING 2.43 m (8.0 feet)

▼ WATER LEVEL 1.7 m (5.5 feet) at completion

REMARKS
This Boring was drilled by ATC, Inc., Indianapolis

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 1-26-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-12**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **9+260 m**	OFFSET **7.62 m (25') Rt. Line A**
BORING STARTED **12-7-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-8-05**	FOREMAN **Ruben Perez**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2

SURFACE ELEVATION **486.8 ft (148.36 m) USC & GS**

STRATA DEPTH (METERS)	STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)	BLOW COUNTS
	1.5		Topsoil (Fill - Visual)						
	3.0		Gray, dark brown, slightly moist, medium stiff, sandy loam, Lab No. 7956-1, A-4, Fill	2.5			1		3,4,4
1	6.0		Gray, slightly moist, medium dense, sandy loam, Lab No. 7956-10, A-4(0), Fill	5.0			2		3,5,7
2			Gray, slightly moist, medium dense and loose, sandy loam, Lab No. 7956-10, A-4, Fill	7.5			3		3,5,9
3				10.0			4		3,5,7
4				12.5			5		3,5,5
				15.0			6		3,5,9
5	18.0			17.5					
6			Gray, slightly moist, stiff, Silty Clay Loam, Lab No. 7956-11, A-6 (16), Fill	20.0			7		3,5,8
	22.0								
7			Gray, slightly moist, medium dense to loose, Sandy Loam, Lab No. 7956-10, A-4	22.5					
				25.0			8		3,5,7
8				27.5					
9	31.0			30.0			9		3,4,5
10			Gray, slightly moist, stiff, Silty Clay Loam, Lab No. 7956-11, A-6	32.5					
				35.0			10		3,5,6

WATER CONTENT, % (0 10 20 30 40 50 60)

BLOW COUNTS (0 10 20 30 40 50 60)

▽ WATER LEVEL WHILE DRILLING 11.6 m (38 feet)

▼ WATER LEVEL 12.2 m (40.0 feet) at completion

▼ WATER LEVEL 11.6 m (38.0 feet) after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 1-26-06

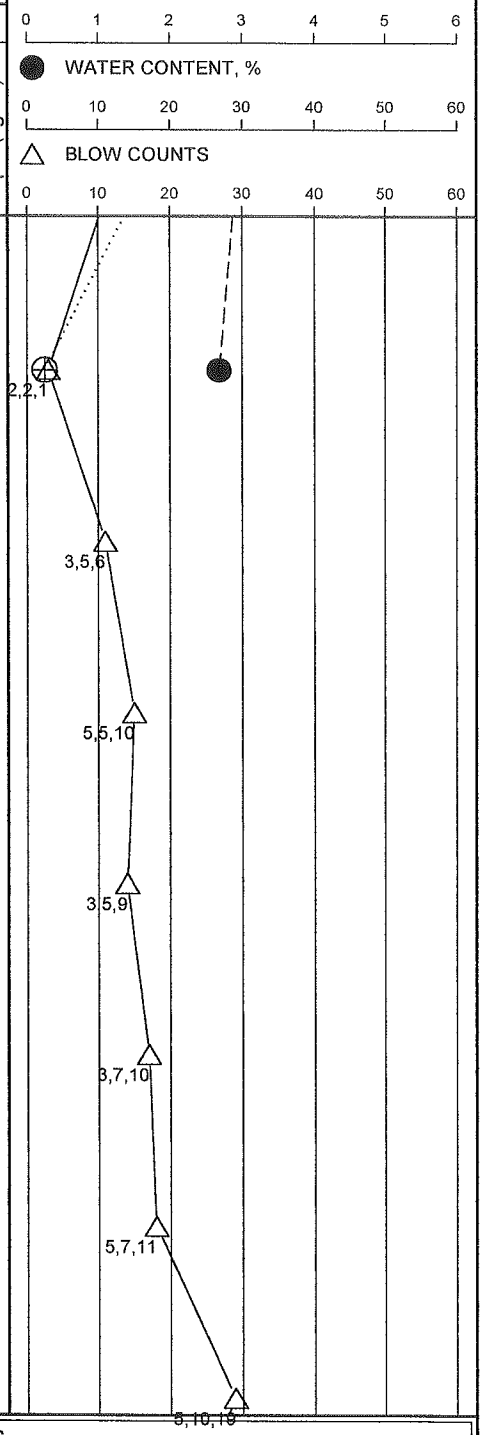
CLIENT **INDOT**		LOG OF BORING NUMBER **TB-12**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B** STATION **9+260 m**	OFFSET **7.62 m (25') Rt. Line A**
BORING STARTED **12-7-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	
BORING COMPLETED **12-8-05**	FOREMAN **Ruben Perez**		

SURFACE ELEVATION **486.8 ft (148.36 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL
36.0		Gray, moist, very soft, Silty Clay Loam, Lab No. 7956-11, A-6
42.0		Brown, wet, medium dense, Sand, Lab No. 7956-8, A-3

SAMPLE

DEPTH (FEET)	TYPE	RECOVERY	NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
37.5				
40.0			11	
42.5				
45.0			12	
47.5				
50.0			13	
52.5				
55.0			14	
57.5				
60.0			15	
62.5				
65.0			16	
67.5				
70.0			17	



WATER LEVEL WHILE DRILLING 11.6 m (38 feet)
WATER LEVEL 12.2 m (40.0 feet) at completion
WATER LEVEL 11.6 m (38.0 feet) after 24 hours

REMARKS

SPLIT SPOON SHELBY TUBE AUGER ROCK CORE
+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

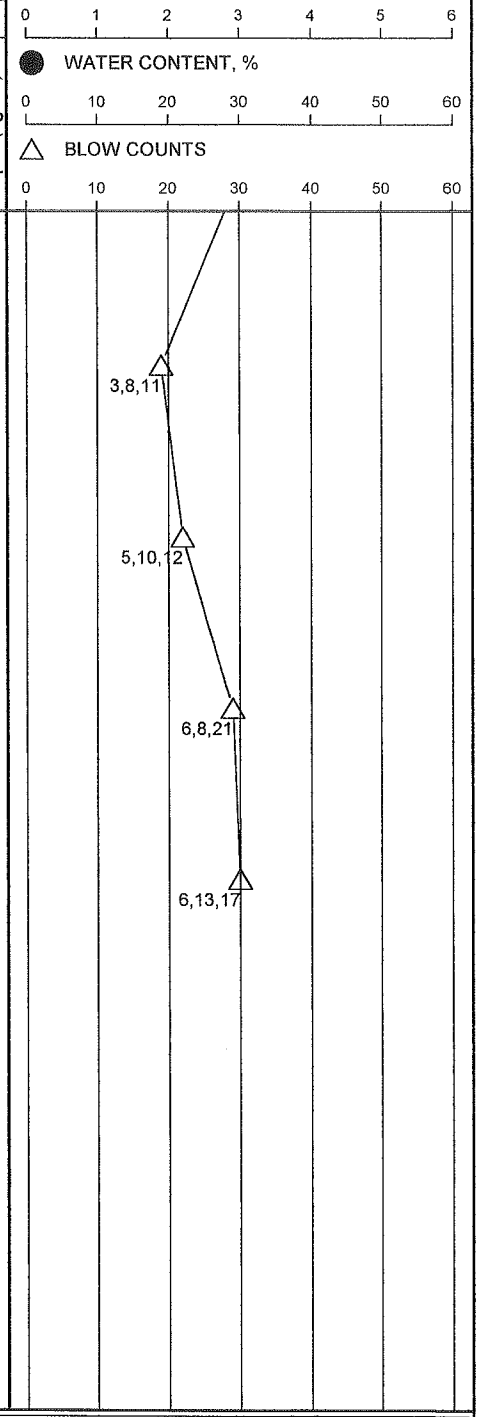
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 1-26-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-12**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-5-4613B**	STATION **9+260 m** OFFSET **7.62 m (25') Rt. Line A**
BORING STARTED **12-7-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	
BORING COMPLETED **12-8-05**	FOREMAN **Ruben Perez**		

SURFACE ELEVATION **486.8 ft (148.36 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
22		(Cont'd..) Brown, wet, medium dense, Sand, Lab No. 7956-8, A-3	72.5				
			75.0			18	
23			77.5				
24			80.0			19	
25			82.5				
26			85.0			20	
27			87.5				
90.0		END OF BORING @ 27.4 m (90 feet)	90.0			21	



WATER LEVEL WHILE DRILLING 11.6 m (38 feet)
WATER LEVEL 12.2 m (40.0 feet) at completion
WATER LEVEL 11.6 m (38.0 feet) after 24 hours

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE
PL - PLASTIC LIMIT | LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

REMARKS

K & S ENGINEERS, INC.

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-13**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-6-2297**	STATION **9+960 m** OFFSET **7.62 m (25') Lt. Line A**
BORING STARTED **12-6-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-7-05**	FOREMAN **Ruben Perez**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2
SURFACE ELEVATION **516.6 ft (157.46 m) USC & GS**			● WATER CONTENT, %
			△ BLOW COUNTS

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)	BLOW COUNTS
1.0		Topsoil (Fill)						
		Gray-brown, moist, loose to medium dense, Sandy Loam, Lab No. 7956-10,A-4 (Fill)	2.5			1		2,3,3
			5.0			2		2,3,5
			7.5			3		3,6,8,
			10.0			4		5,8,7
			12.5			5		4,8,11
			15.0			6		8,10,4
18.0			17.5					
		Dark gray, slightly moist, loose, Sandy Loam, Lab No. 7956-10, A-4 (Fill)	20.0			7		2,2,5
			22.5					
24.0								
		Gray-brown, slightly moist, medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b (Fill)	25.0			8		5,12,17
28.0			27.5					
		Brown, slightly moist, very dense, Gravelly Sand, Lab No. 7956-5, A-1-b (Fill)	30.0			9		8,18,35
			32.5					
			35.0			10		14,26,32

▽ WATER LEVEL WHILE DRILLING 21.3 m (70.0 feet)

▼ WATER LEVEL 21.3 m (70.0 feet) at completion

▼ WATER LEVEL 20.4 m (67.0 feet) after 24 hours

REMARKS

SPLIT SPOON ■ SHELBY TUBE [A] AUGER ▨ ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

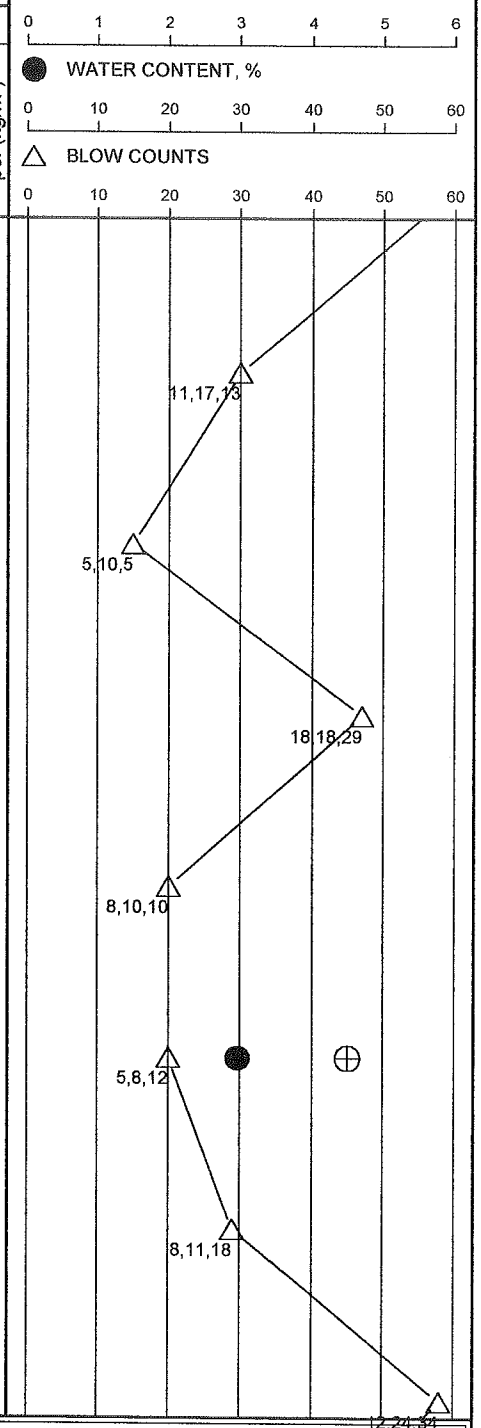
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-13**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-6-2297**	STATION **9+960 m** OFFSET **7.62 m (25') Lt. Line A**
BORING STARTED **12-6-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-7-05**	FOREMAN **Ruben Perez**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2

SURFACE ELEVATION **516.6 ft (157.46 m) USC & GS**

STRATA DEPTH (METERS)	STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
11	36.0		Gray-brown, slightly moist, medium dense, Sandy Loam, Lab No. 7956-10, A-4 (Fill) (Trace slag - Visual)	37.5				
12	40.0						11	
13	42.0		Brown-dark gray, slightly moist, medium dense to dense, Gravelly Sand, Lab No. 8956-5, A-1-b (Fill)	42.5				
14				45.0			12	
15				47.5				
	52.0			50.0			13	
16			Dark gray-brown, slightly moist, medium dense, Sandy Loam, Lab No. 7956-10, A-6 (Fill)	52.5				
17	57.0			55.0			14	
18	60.0		Dark gray, slightly moist, very stiff, Silty Clay Loam, Lab No. 7956-11, A-6 (trace roots, trace cinder, trace broken brick pieces - Fill with buried topsoil - visual)	57.5				
			Brown, slightly moist, medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b	60.0			15	
19				62.5				
20	67.0			65.0			16	
21			Brown, wet, very dense, Sand, Lab No. 7956-8, A-3	67.5				
				70.0			17	



▽ WATER LEVEL WHILE DRILLING 21.3 m (70.0 feet)

▼ WATER LEVEL 21.3 m (70.0 feet) at completion

▼ WATER LEVEL 20.4 m (67.0 feet) after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

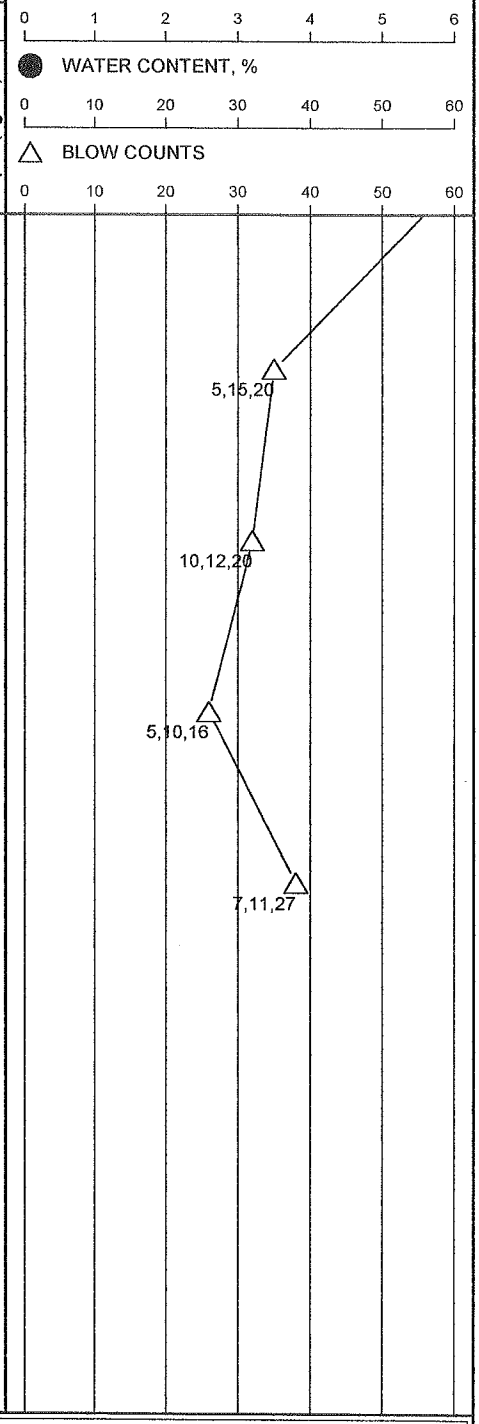
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-13**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-6-2297**	STATION **9+960 m** OFFSET **7.62 m (25') Lt. Line A**
BORING STARTED **12-6-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-7-05**	FOREMAN **Ruben Perez**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2

SURFACE ELEVATION **516.6 ft (157.46 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
72.0							
22		Brown, wet, dense to medium dense, Sand, Lab No. 7956-8, A-3	72.5				
			75.0			18	
23							
			77.5				
24			80.0			19	
25			82.5				
26			85.0			20	
86.0		Brown, wet, dense, Sand, Lab No. 7956-8, A-3					
			87.5				
27							
90.0		END OF BORING @ 27.4 m (90 feet)	90.0			21	



▽ WATER LEVEL WHILE DRILLING 21.3 m (70.0 feet)
▼ WATER LEVEL 21.3 m (70.0 feet) at completion
▼ WATER LEVEL 20.4 m (67.0 feet) after 24 hours

SPLIT SPOON ■ SHELBY TUBE A AUGER ROCK CORE
+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

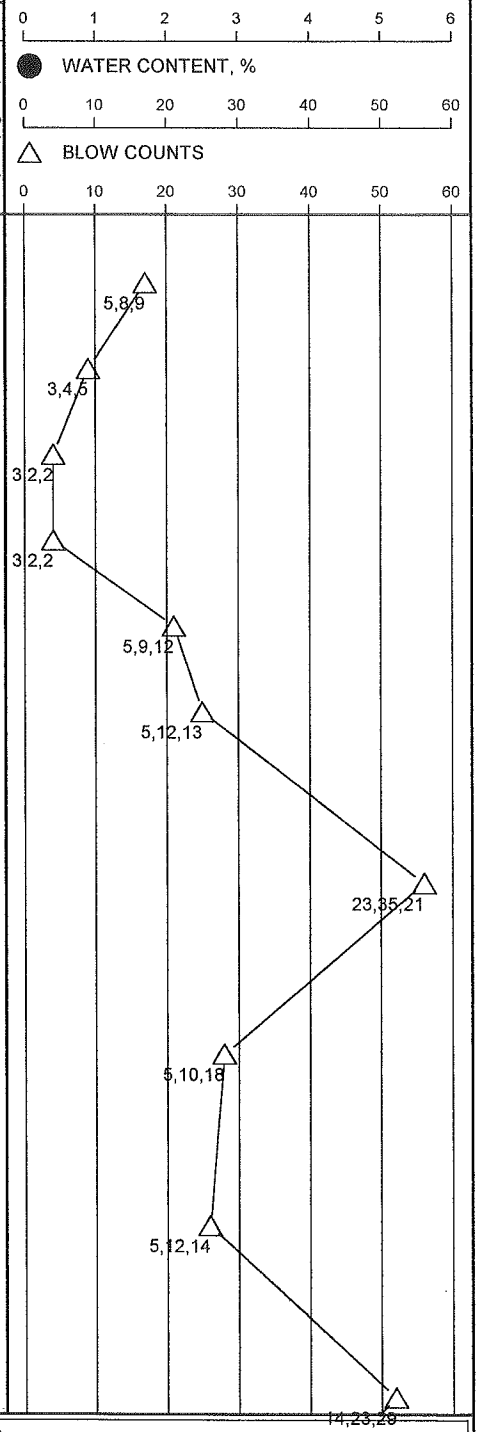
REMARKS

K & S ENGINEERS, INC.

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-14**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-6-2297**	STATION **10+002 m** OFFSET **7.62 m (25') Rt Line A**
BORING STARTED **11-30-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	
BORING COMPLETED **11-30-05**	FOREMAN **Ruben Perez**		

SURFACE ELEVATION **490.7 ft (149.56 m) USC & GS**

STRATA DEPTH (METERS)	STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
0.8	4.0		Sand and gravel mixed with slag, Fill (Visual)					
			Black, slightly moist, medium dense, sand and gravel mixed with slag, Fill (Visual)	2.5			1	
			Black-brown, slightly moist, loose to very loose, sand with slag, Fill (Visual)	5.0			2	
	8.0			7.5			3	
			Brown, slightly moist, very loose, Gravelly Sand, Lab No. 7956-5, A-1-b	10.0			4	
	11.0							
			Brown, slightly moist, medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b	12.5			5	
				15.0			6	
	16.0							
			Brown, slightly moist, very dense, Gravelly Sand, Lab No. 7956-5, A-1-b	17.5				
				20.0			7	
	22.0							
			Brown, slightly moist, medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b	22.5				
				25.0			8	
				27.5				
				30.0			9	
	32.0							
			Brown, slightly moist, very dense, Sand, Lab no. 7956-8, A-3	32.5				
				35.0			10	



WATER LEVEL WHILE DRILLING 12.7 m (41.5 feet)

WATER LEVEL 13.7 m (45.0 feet) at completion

WATER LEVEL 13.7 m (45.0 feet) after 24 hours

SPLIT SPOON SHELBY TUBE AUGER ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

REMARKS

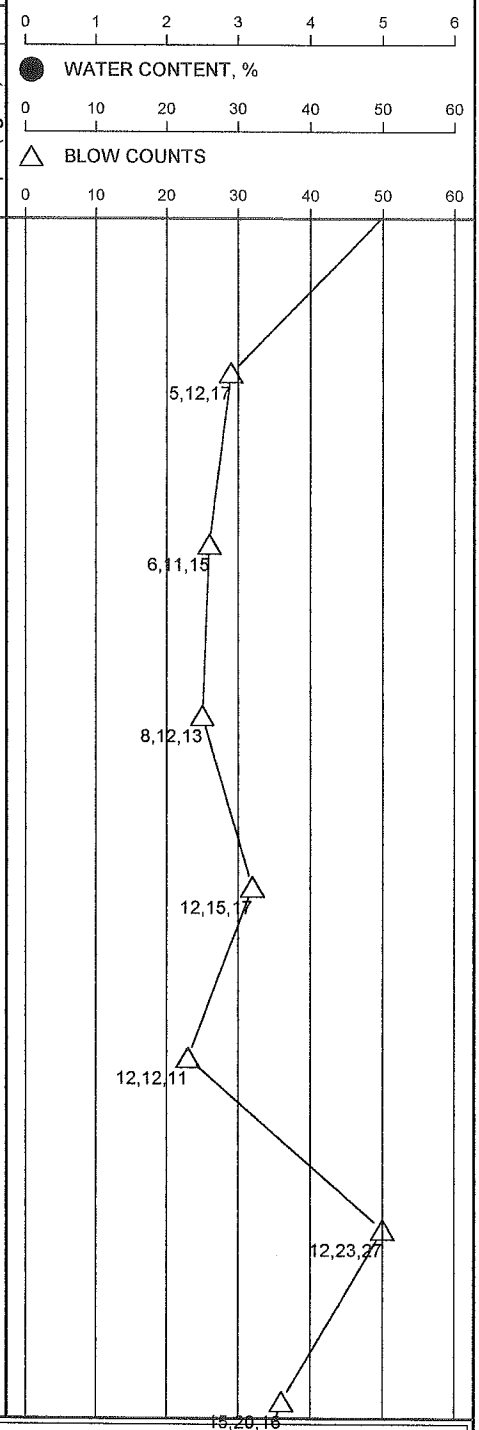
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 1-26-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-14**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-6-2297**	STATION **10+002 m** OFFSET **7.62 m (25') Rt Line A**
BORING STARTED **11-30-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **11-30-05**	FOREMAN **Ruben Perez**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2

SURFACE ELEVATION **490.7 ft (149.56 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
11 / 37.0							
		Brown, moist to wet, medium dense to dense, Gravelly Sand, Lab No. 7956-5, A-1-b	37.5				
12			40.0			11	
13			42.5				
			45.0			12	
14			47.5				
15			50.0			13	
16			52.5				
17 / 56.0			55.0			14	
		Brown, wet, medium dense, Sandy Gravel, Lab No. 7956-7, A-1-a	57.5				
18			60.0			15	
62.0							
19		Brown, wet, dense, Sand, Lab No. 7956-8, A-3	62.5				
20			65.0			16	
			67.5				
21			70.0			17	



▽ WATER LEVEL WHILE DRILLING 12.7 m (41.5 feet)

▼ WATER LEVEL 13.7 m (45.0 feet) at completion

▼ WATER LEVEL 13.7 m (45.0 feet) after 24 hours

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

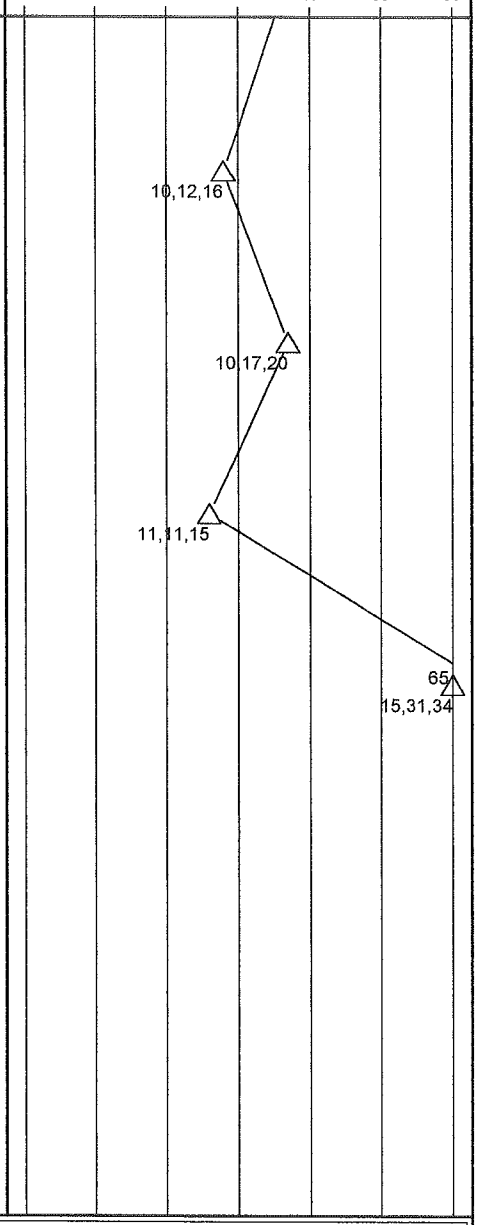
REMARKS

K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 1-26-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-14**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-6-2297**	STATION **10+002 m** OFFSET **7.62 m (25') Rt Line A**
BORING STARTED **11-30-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **11-30-05**	FOREMAN **Ruben Perez**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2
SURFACE ELEVATION **490.7 ft (149.56 m) USC & GS**			● WATER CONTENT, %
			△ BLOW COUNTS

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	RECOVERY	NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
72.0							
22		Brown, wet, medium dense to dense, Sand, Lab No. 7956-8, A-3	72.5				
						18	
23			75.0				
			77.5				
24						19	
			80.0				
82.0							
25		Brown, wet, medium dense, Sand, Lab No. 7956-8, A-3	82.5				
						20	
26			85.0				
86.0		Brown, wet, very dense, Sandy Gravel, Lab No. 7956-7, A-1-a					
			87.5				
27						21	
90.0		END OF BORING @ 27.4 M (90 feet)	90.0				



▽ WATER LEVEL WHILE DRILLING 12.7 m (41.5 feet)
▼ WATER LEVEL 13.7 m (45.0 feet) at completion
▼ WATER LEVEL 13.7 m (45.0 feet) after 24 hours

REMARKS

SPLIT SPOON ■ SHELBY TUBE [A] AUGER ▨ ROCK CORE
+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 1-26-06

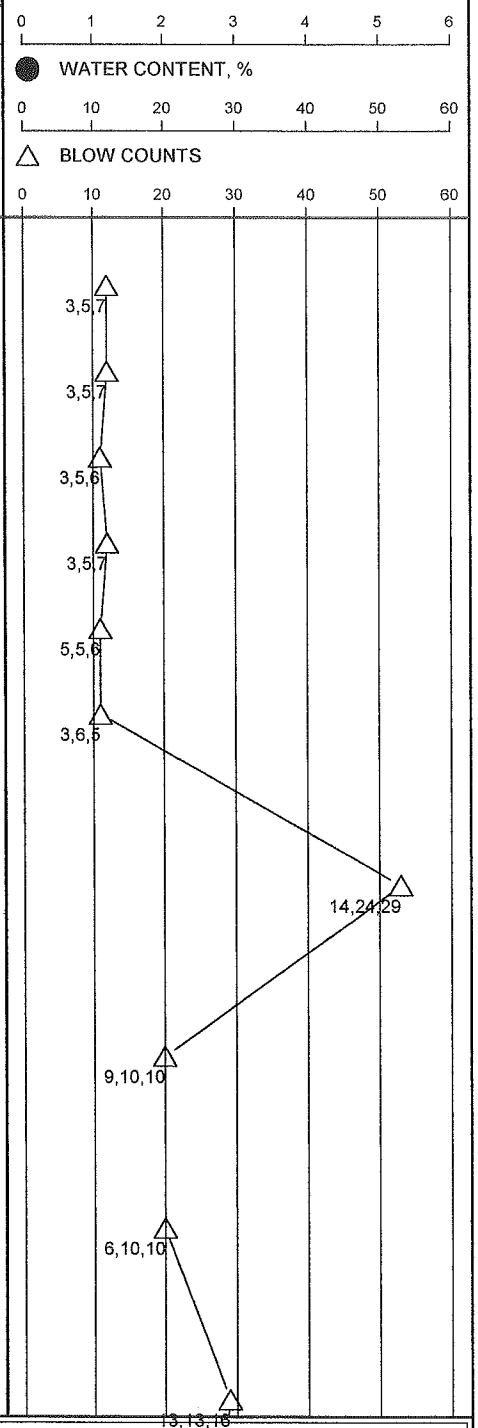
CLIENT **INDOT**		LOG OF BORING NUMBER **TB-15**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-6-2297**	STATION **10+030 m** OFFSET **7.62 m (25') Lt. Line A**
BORING STARTED **11-29-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **11-29-05**	FOREMAN **Ruben Perez**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2

SURFACE ELEVATION **490.0 ft (149.36 m) USC & GS**

STRATA DEPTH (METERS)	STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL
0.7			Sand and gravel with slag, Fill (Visual)
			Black, slightly moist, medium dense, sand, mixed with slag, Fill (Visual)
8.0			Brown, slightly moist, medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b
18.0			Brown, slightly moist, very dense, Gravelly Sand, Lab No. 7956-5, A-1-b
22.0			Brown, slightly moist, medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b

SAMPLE

DEPTH (FEET)	TYPE	RECOVERY	NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
2.5			1	
5.0			2	
7.5			3	
10.0			4	
12.5			5	
15.0			6	
17.5				
20.0			7	
22.5				
25.0			8	
27.5				
30.0			9	
32.5				
35.0			10	



▽ WATER LEVEL WHILE DRILLING 12.7 m (41.5 feet)
▼ WATER LEVEL 6.1 m (20.0 feet) at completion
▼ WATER LEVEL 6.1 m (20.0 feet) after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE
+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-15**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-6-2297**	STATION **10+030 m** OFFSET **7.62 m (25') Lt. Line A**
BORING STARTED **11-29-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **11-29-05**	FOREMAN **Ruben Perez**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2
SURFACE ELEVATION **490.0 ft (149.36 m) USC & GS**			● WATER CONTENT, %
			△ BLOW COUNTS

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)	BLOW COUNTS
11		(Cont'd..) Brown, slightly moist, medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b	37.5					
12			40.0			11		10,13,13
42.0								
13		Brown, wet, dense, Gravelly Sand, Lab No. 7956-5, A-1-b	42.5					
			45.0			12		10,16,21
14			47.5					
15			50.0			13		12,16,20
16			52.5					
			55.0			14		12,17,14
17								
58.0			57.5					
18		Brown, wet, dense to medium dense, Sandy Gravel, Lab No. 7956-7, A-1-a	60.0			15		12,15,25
19			62.5					
			65.0			16		13,15,16
20								
68.0			67.5					
21		Brown, wet, medium dense to dense, Gravelly Sand, Lab No. 7956-5, A-1-b	70.0			17		12,16,11

▽ WATER LEVEL WHILE DRILLING 12.7 m (41.5 feet)

▼ WATER LEVEL 6.1 m (20.0 feet) at completion

▼ WATER LEVEL 6.1 m (20.0 feet) after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

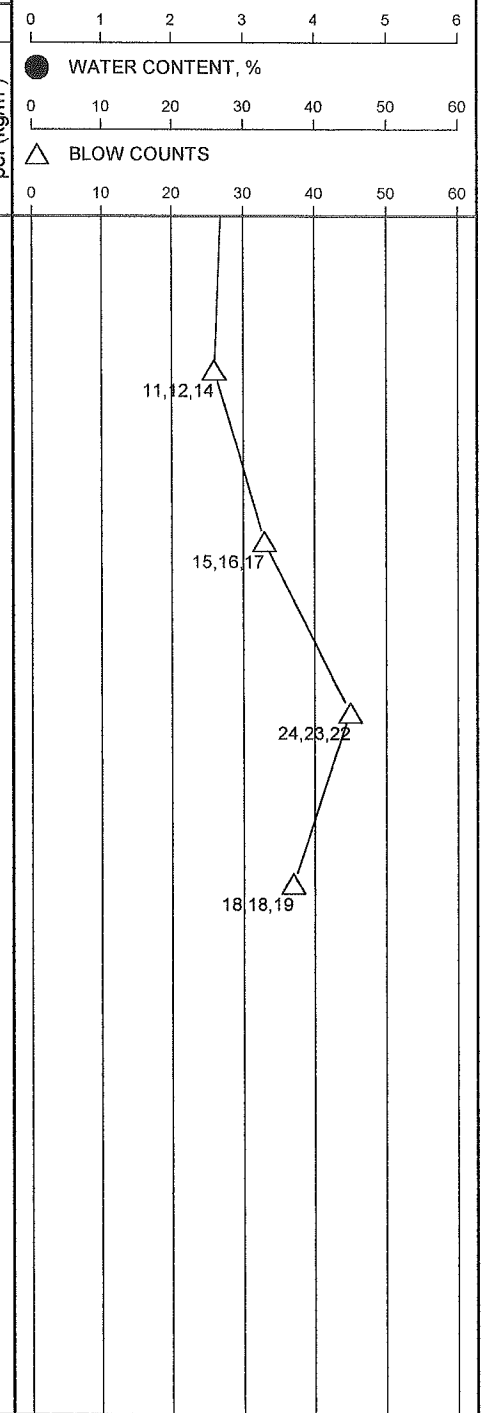
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 1-26-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-15**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-6-2297** STATION **10+030 m** OFFSET **7.62 m (25') Lt. Line A**	
BORING STARTED **11-29-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	
BORING COMPLETED **11-29-05**	FOREMAN **Ruben Perez**		
SURFACE ELEVATION **490.0 ft (149.36 m) USC & GS**			

⊕ CALIBRATED PENETROMETER, TONS/FT^2
○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2
● WATER CONTENT, %
△ BLOW COUNTS

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
22		(Cont'd..) Brown, wet, medium dense to dense, Gravelly Sand, Lab No. 7956-5, A-1-b	72.5				
			75.0			18	
23							
			77.5				
24			80.0			19	
25			82.5				
26			85.0			20	
			87.5				
27							
90.0		END OF BORING @ 27.4 m (90 feet)	90.0			21	



▽ WATER LEVEL WHILE DRILLING 12.7 m (41.5 feet)
▼ WATER LEVEL 6.1 m (20.0 feet) at completion
▼ WATER LEVEL 6.1 m (20.0 feet) after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | A AUGER | ROCK CORE
+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

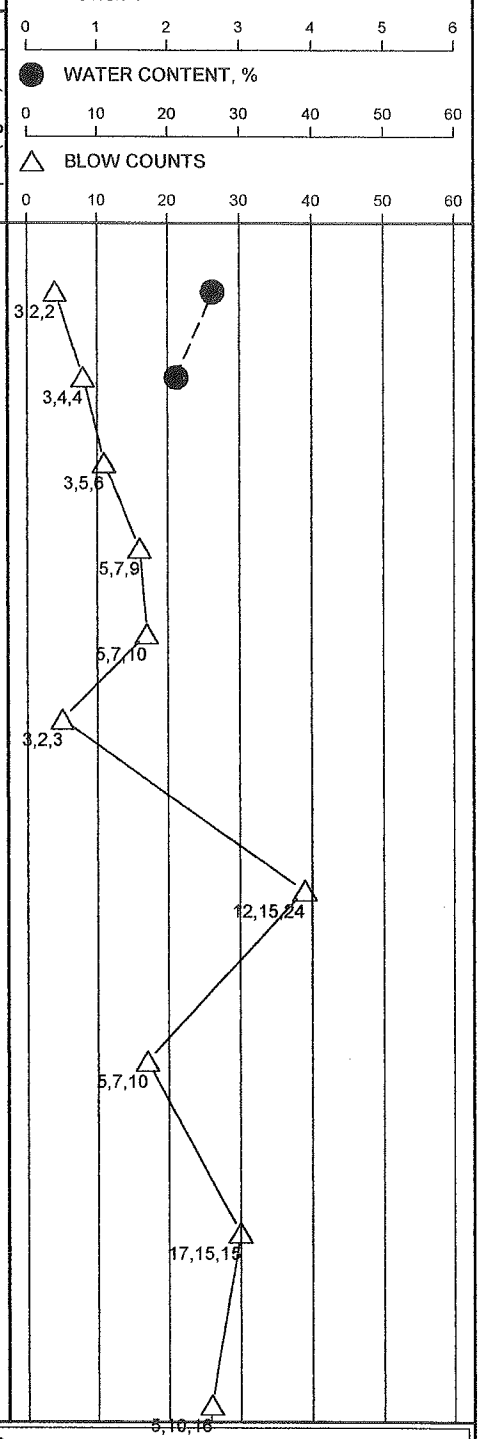
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 1-26-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-16**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-6-2297**	STATION **10+064 m** OFFSET **7.62 m (25') Rt. Line A**
BORING STARTED **12-1-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-1-05**	FOREMAN **Ruben Perez**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2

SURFACE ELEVATION **491.0 ft (149.66 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
1.5		Black sand, Topsoil (Visual)					
3.5		Black brown, slightly moist, soft, Sandy Loam, Lab No. 7956-1, A-4 (Trace roots, mixed with topsoil - Visual)	2.5			1	
6.0		Brown, slightly moist, medium stiff, Sandy Loam, Lab No. 7956-1, A-4	5.0			2	
		Brown, slightly moist, medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b	7.5			3	
			10.0			4	
13.0			12.5			5	
		Brown, slightly moist, very loose, Gravelly Sand, Lab No. 7956-5, A-1-b	15.0			6	
18.0			17.5				
		Brown, slightly moist to wet, dense to medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b	20.0			7	
			22.5				
			25.0			8	
			27.5				
			30.0			9	
			32.5				
			35.0			10	



▽ WATER LEVEL WHILE DRILLING 12.7 m (41.5 feet)
▼ WATER LEVEL 12.2 m (40.0 feet) at completion
▼ WATER LEVEL 12.2 m (40.0 feet) after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE
+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

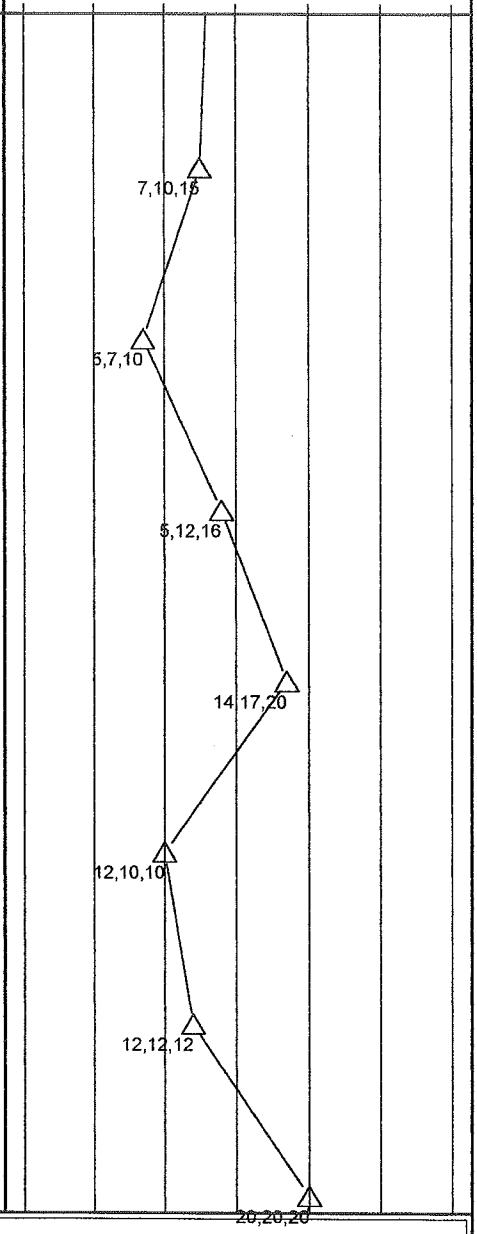
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-16**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-6-2297**	STATION **10+064 m** OFFSET **7.62 m (25') Rt. Line A**
BORING STARTED **12-1-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-1-05**	FOREMAN **Ruben Perez**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2

SURFACE ELEVATION **491.0 ft (149.66 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
11		(Cont'd..) Brown, slightly moist to wet, dense to medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b	37.5				
12			40.0			11	
13			42.5				
14			45.0			12	
15			47.5				
16			50.0			13	
53.0			52.5				
17		Brown, wet, dense, Sandy Gravel, Lab No. 7956-7, A-1-a	55.0			14	
58.0			57.5				
18		Brown, wet, medium dense, Sand, Lab No. 7956-8, A-3	60.0			15	
19			62.5				
20			65.0			16	
68.0			67.5				
21		Brown, wet, dense, Gravelly Sand, Lab No. 7956-5, A-1-b	70.0			17	



▽ WATER LEVEL WHILE DRILLING 12.7 m (41.5 feet)
▼ WATER LEVEL 12.2 m (40.0 feet) at completion
▼ WATER LEVEL 12.2 m (40.0 feet) after 24 hours

REMARKS

SPLIT SPOON ■ SHELBY TUBE A AUGER ROCK CORE
+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

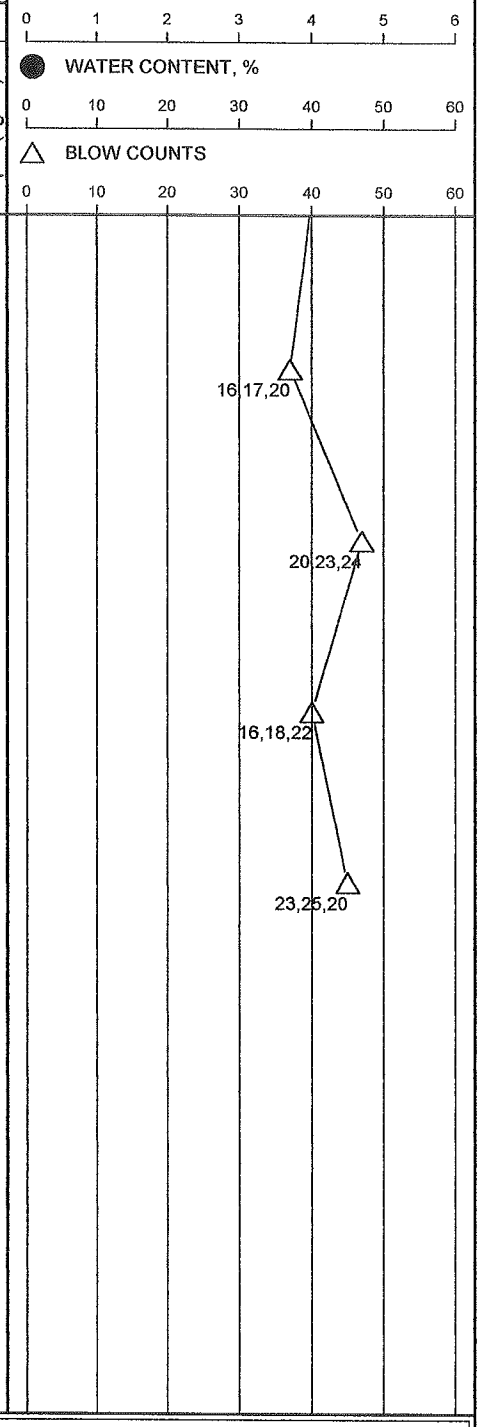
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-16**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-6-2297**	STATION **10+064 m** OFFSET **7.62 m (25') Rt. Line A**
BORING STARTED **12-1-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER, TONS/FT^2
BORING COMPLETED **12-1-05**	FOREMAN **Ruben Perez**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2

SURFACE ELEVATION **491.0 ft (149.66 m) USC & GS**

STRATA DEPTH (METERS)	STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
			(Cont'd..) Brown, wet, dense, Gravelly Sand, Lab No. 7956-5, A-1-b					
22				72.5				
				75.0			18	
23								
				77.5				
24				80.0			19	
25				82.5				
26				85.0			20	
				87.5				
27							21	
	90.0		END OF BORING @ 27.4 m (90 feet)	90.0				



▽ WATER LEVEL WHILE DRILLING 12.7 m (41.5 feet)
▼ WATER LEVEL 12.2 m (40.0 feet) at completion
▼ WATER LEVEL 12.2 m (40.0 feet) after 24 hours

SPLIT SPOON ■ SHELBY TUBE A AUGER ROCK CORE
+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

REMARKS

K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-17**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-6-2297**	STATION **10+093 m** OFFSET **7.62 m (25') Rt. Line A**
BORING STARTED **12-2-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER, TONS/FT^2
BORING COMPLETED **12-2-05**	FOREMAN **Ruben Perez**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2
SURFACE ELEVATION **516.6 ft (157.46 m) USC & GS**			● WATER CONTENT, %
			△ BLOW COUNTS

STRATA DEPTH (METERS)	STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)	BLOW COUNTS
	1.2		Topsoil (Fill)						
			Gray-brown, moist, loose to medium dense, Sandy Loam, Lab No. 7956-10, A-4, Fill	2.5			1		2,3,5
				5.0			2		5,6,6
				7.5			3		6,8,9
				10.0			4		6,8,9
				12.5			5		6,6,7
				15.0			6		5,8,11
				17.5					
				20.0			7		5,5,6
	23.0			22.5					
			Dark brown, moist, very loose, Sand, Lab No. 7956-8, A-3	25.0			8		2,2,3
	28.0			27.5					
			Brown, slightly moist, medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b	30.0			9		6,6,5
				32.5					
				35.0			10		8,11,13

WATER LEVEL WHILE DRILLING 19.4 m (63.5 feet)

WATER LEVEL 19.2 m (63.0 feet) at completion

WATER LEVEL 19.5 m (64.0 feet) after 72 hours

REMARKS

SPLIT SPOON SHELBY TUBE AUGER ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

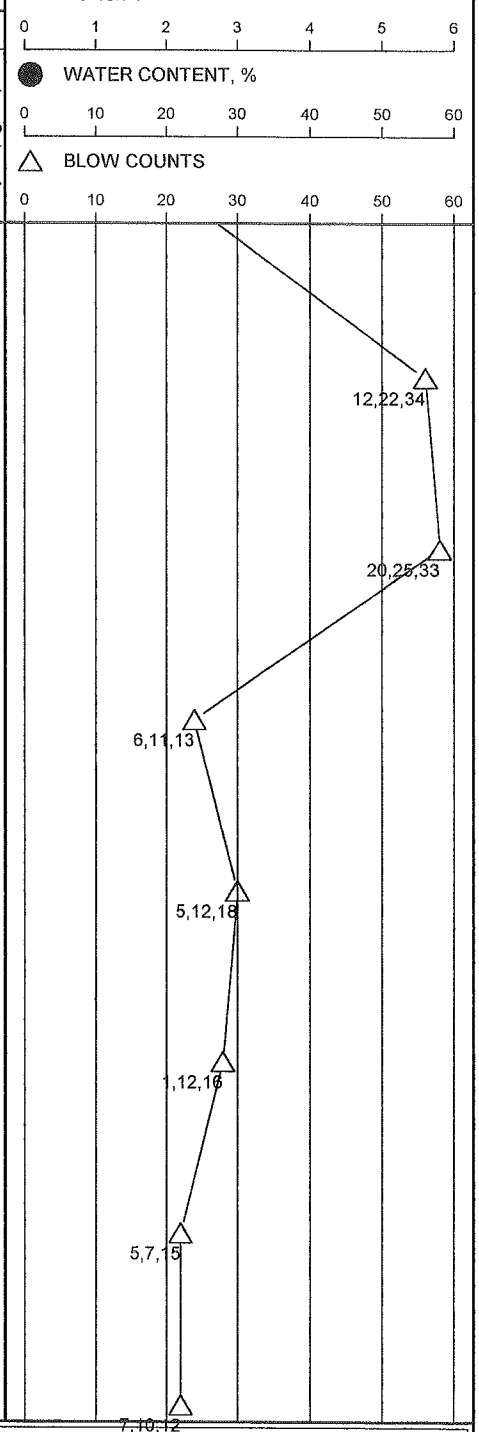
K & S ENGINEERS, INC.

CLIENT **INDOT**		LOG OF BORING NUMBER **TB-17**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER **I-70-6-2297**	STATION **10+093 m** OFFSET **7.62 m (25') Rt. Line A**
BORING STARTED **12-2-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-2-05**	FOREMAN **Ruben Perez**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2

SURFACE ELEVATION **516.6 ft (157.46 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL
36.0		Brown, slightly moist,very dense, Gravelly Sand, Lab No. 7956-5, A-1-b
48.0		Brown, slightly moist, medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b
70.0		END OF BORING @ 21.3 m (70 feet)

DEPTH (FEET)	SAMPLE TYPE	RECOVERY	NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
37.5				
40.0			11	
42.5				
45.0			12	
47.5				
50.0			13	
52.5				
55.0			14	
57.5				
60.0			15	
62.5				
65.0			16	
67.5				
			17	



▽ WATER LEVEL WHILE DRILLING 19.4 m (63.5 feet)

▼ WATER LEVEL 19.2 m (63.0 feet) at completion

▼ WATER LEVEL 19.5 m (64.0 feet) after 72 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

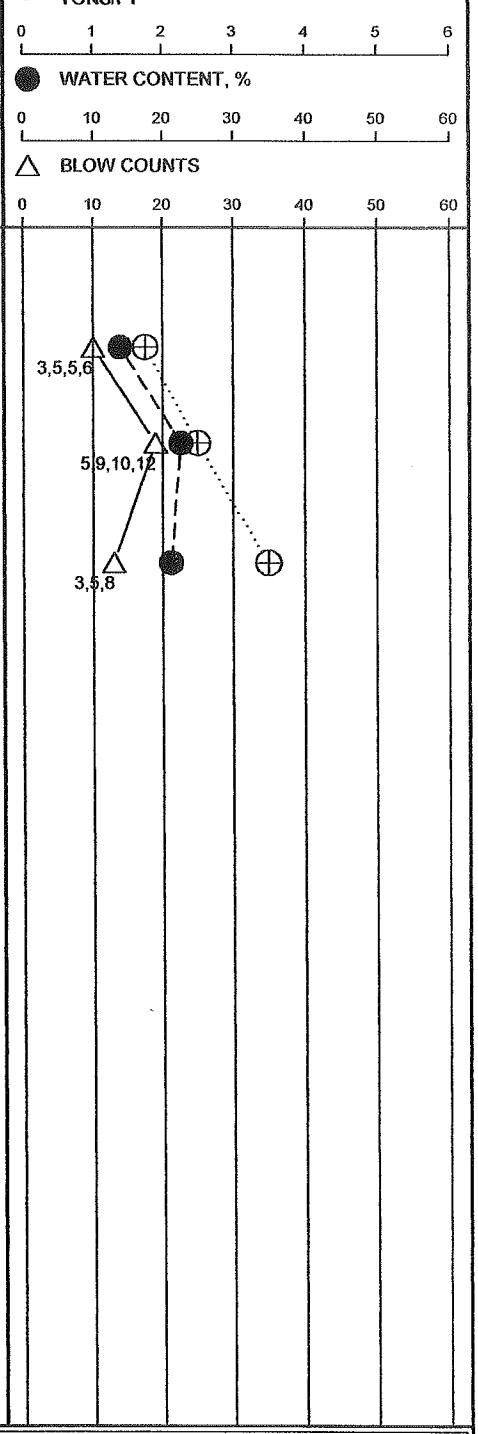
+ PL - PLASTIC LIMIT | + LL - LIQUID LIMIT | γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

CLIENT **INDOT**		LOG OF BORING NUMBER **RB-SG-1**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER	STATION **8+500 m** OFFSET **14.2 m (46.5') Lt.**
BORING STARTED **12-14-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-14-05**	FOREMAN **Ruben Perez**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2

SURFACE ELEVATION **475.6 ft (144.96 m) USC & GS**

STRATA DEPTH (METERS)	STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
	0.3		Asphalt (Visual)					
	1.3		Concrete (Visual)					
	1.8		Brown-gray, slightly moist, loose sand and gravel, Fill (Visual)					
1			Gray, slightly moist, medium stiff, Silty Loam, Lab No. 7956-3, A-4	2.5			1	
	4.0		Gray, slightly moist, very stiff to stiff, Silty Loam, Lab No. 7956-3, A-4`	5.0			2	
2							3	
	7.5		END OF BORING @ 2.3 m (7.5 feet)	7.5				



▽ WATER LEVEL WHILE DRILLING None

▼ WATER LEVEL None after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

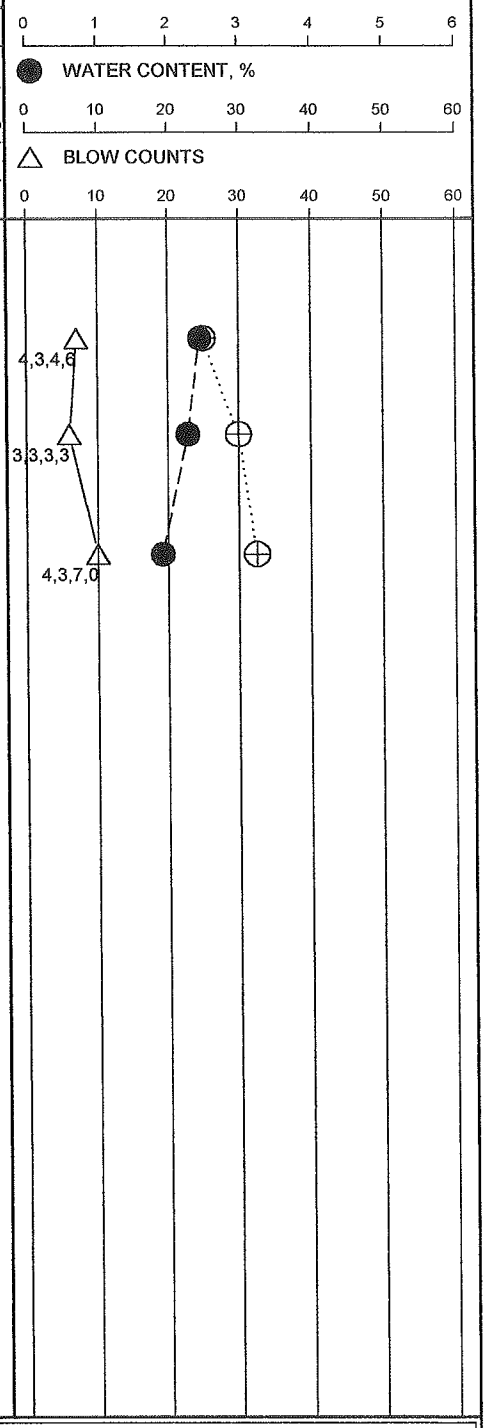
BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **RB-SG-2**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER	STATION **8+590 m** OFFSET **14.2 m (46.5') Rt.**
BORING STARTED **12-15-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER, TONS/FT^2
BORING COMPLETED **12-15-05**	FOREMAN **Carlos Sanatana**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2

SURFACE ELEVATION **475.6 ft (144.96 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
0.5		Asphalt (Visual)					
1.5		Concrete (Visual)					
		Gray-brown, moist, medium stiff, Loam, Lab No. 7956-12, A-4	2.5			1	
1 3.5		Gray, slightly moist, medium stiff, Silty Loam, Lab No. 7956-3, A-4	5.0			2	
2 7.5			7.5			3	

END OF BORING @ 2.3 c (7.5 feet)



▽ WATER LEVEL WHILE DRILLING None

▼ WATER LEVEL None after 24 hours

REMARKS

SPLIT SPOON ■ SHELBY TUBE [A] AUGER ▨ ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

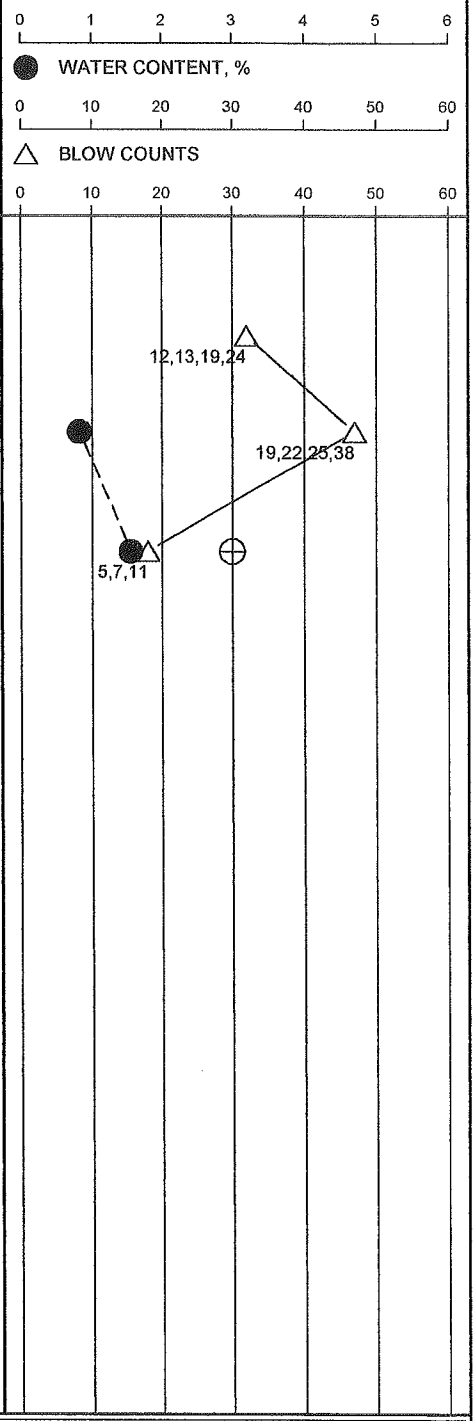
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **RB-SG-3**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER	STATION **9+300 m** OFFSET **10.6 m (35') Lt.**
BORING STARTED **12-16-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-16-05**	FOREMAN **Carlos Sanatana**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2

SURFACE ELEVATION **483.8 ft (147.46 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
0.3		Asphalt (Visual)					
1.3		Concrete (Visual)					
2.5		Brown, slightly moist, dense, sand and gravel with slag, Fill (Visual)					
1 3.5		Gray, moist, hard, Loam, Lab No. 7956-12, A-4	2.5			1	
		Gray, slightly moist, hard, Sandy Loam, Lab No. 7956-1, A-4	5.0			2	
6.0							
2 7.5		Gray, slightly moist, very stiff, Silty Loam, Lab No. 7956-3, A-4	7.5			3	
		END OF BORING @ 2.3 m (7.5 feet)					



WATER LEVEL WHILE DRILLING None

WATER LEVEL None after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

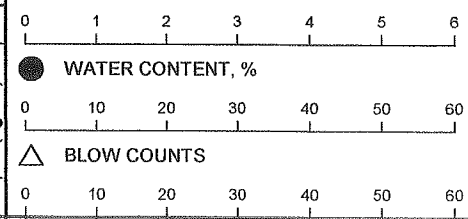
BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **RB-SG-4**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER	STATION **9+390 m** OFFSET **10.6 m (35') Rt.**
BORING STARTED **12-15-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-15-05**	FOREMAN **Carlos Sanatana**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2

SURFACE ELEVATION **485.4 ft (147.96 m) USC & GS**

STRATA DEPTH (METERS)	STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
	0.5		Asphalt (Visual)					
	1.5		Concrete (Visual)					
			Brown, slightly moist, medium dense, sand and gravel, Fill (Visual)	2.5			1	
1	3.5		Dark gray, slightly moist, very stiff, Sandy Loam, Lab No. 7956-1, A-4	5.0			2	
2	7.5			7.5			3	

END OF BORING @ 2.3 m (7.5 feet)



WATER LEVEL WHILE DRILLING None

WATER LEVEL None after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

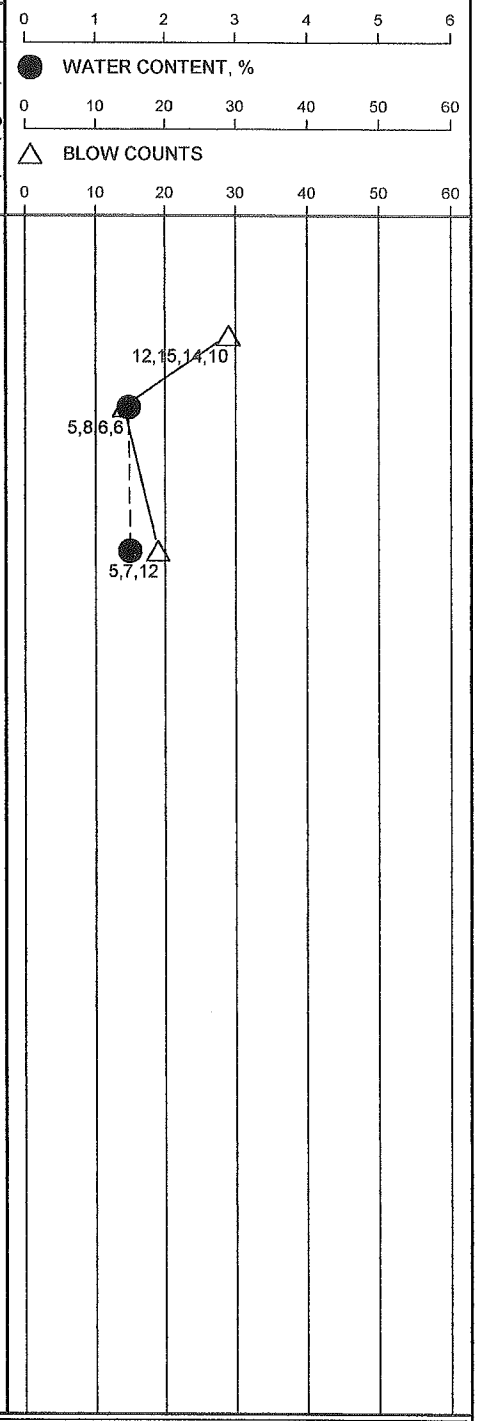
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **RB-SG-5**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER	STATION **9+480 m** OFFSET **14.2 m (46.5') Lt.**
BORING STARTED **12-13-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-13-05**	FOREMAN **Ruben Perez**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2

SURFACE ELEVATION **485.4 ft (147.96 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
0.5		Asphalt (Visual)					
1.5		Concrete (Visual)					
		Brown-gray, slightly moist, medium dense, sand and gravel, Fill (Visual)	2.5			1	
1 3.5		Gray, slightly moist, medium dense, Silty Loam, Lab No. 7956-2, A-4	5.0			2	
2 7.5			7.5			3	
		END OF BORING @ 2.3 m (7.5 feet)					



WATER LEVEL WHILE DRILLING None

WATER LEVEL None after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

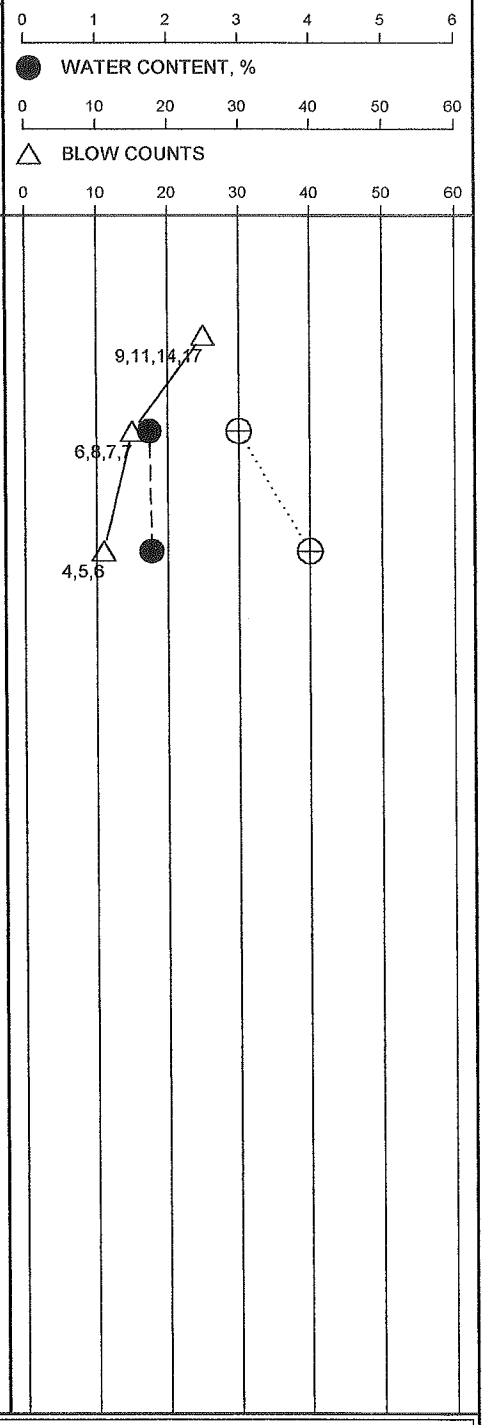
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **RB-SG-6**	DES. NO. **9709060**
PROJECT NAME	**Bridge Rehabilitation on I-70 Over Wabash River and SR 63**		PROJECT NO. **IM-70-I**
SITE LOCATION	**Vigo County, Terre Haute, Indiana**	STRUCTURE NUMBER	STATION **9+570 m** OFFSET **14.2 m (46.5') Rt.**
BORING STARTED **12-15-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-15-05**	FOREMAN **Carlos Sanatana**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2

SURFACE ELEVATION **485.4 ft (147.96 m) USC & GS**

STRATA DEPTH (METERS)	STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
	0.4		Asphalt (Visual)					
	1.3		Concrete (Visual)					
			Gray-brown, slightly moist, very stiff, Loam, Lab No. 7956-12, A-4, Fill	2.5			1	
1	4.0		Gray, slightly moist, stiff, Sandy Loam, Lab No. 7956-1, A-4	5.0			2	
2	7.5			7.5			3	
			END OF BORING @ 2.3 m (7.5 feet)					



▽ WATER LEVEL WHILE DRILLING None

▼ WATER LEVEL None after 24 hours

REMARKS

SPLIT SPOON ■ SHELBY TUBE A AUGER ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

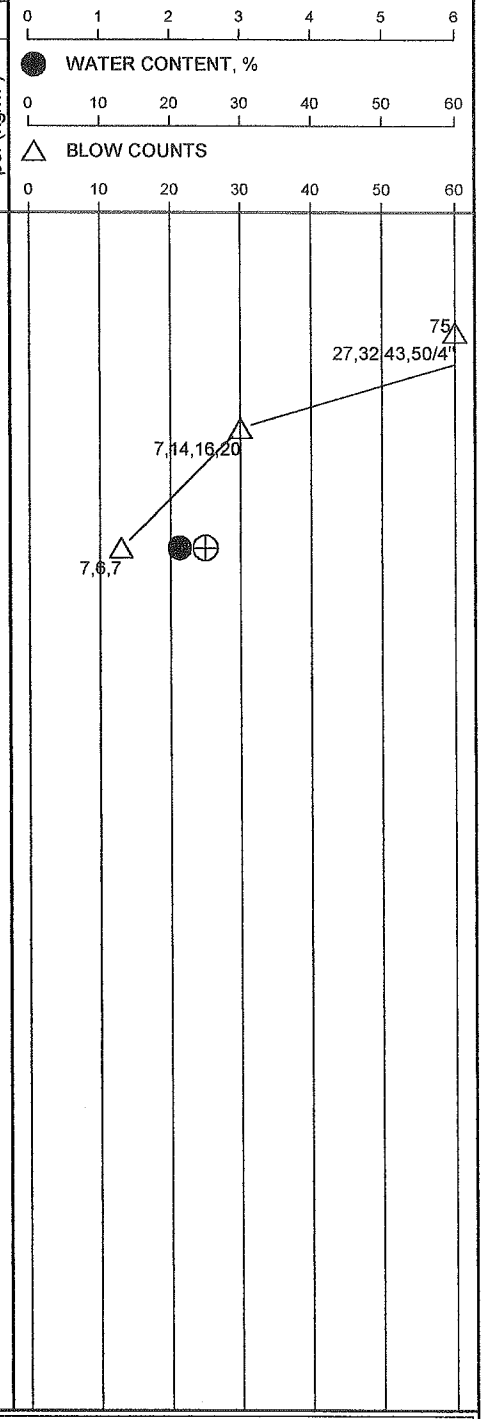
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **RB-SG-7**	DES. NO. **9709060**
PROJECT NAME	**Bridge Rehabilitation on I-70 Over Wabash River and SR 63**		PROJECT NO. **IM-70-I**
SITE LOCATION	**Vigo County, Terre Haute, Indiana**	STRUCTURE NUMBER	STATION **9+660 m** OFFSET **10.6 m (35') Lt.**
BORING STARTED **12-16-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-16-05**	FOREMAN **Carlos Sanatana**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2

SURFACE ELEVATION **495.3 ft (150.96 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
0.4		Asphalt (Visual)					
1.3		Concrete (Visual)					
1		Gray-brown, slightly moist, very dense to medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b (Fill)	2.5			1	
			5.0			2	
6.0		Gray, slightly moist, stiff, Silty Loam, Lab No. 7956-3, A-4				3	
2 7.5		END OF BORING @ 2.3 m (7.5 feet)	7.5				



▽ WATER LEVEL WHILE DRILLING None

▼ WATER LEVEL None after 24 hours

REMARKS

SPLIT SPOON ■ SHELBY TUBE A AUGER ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

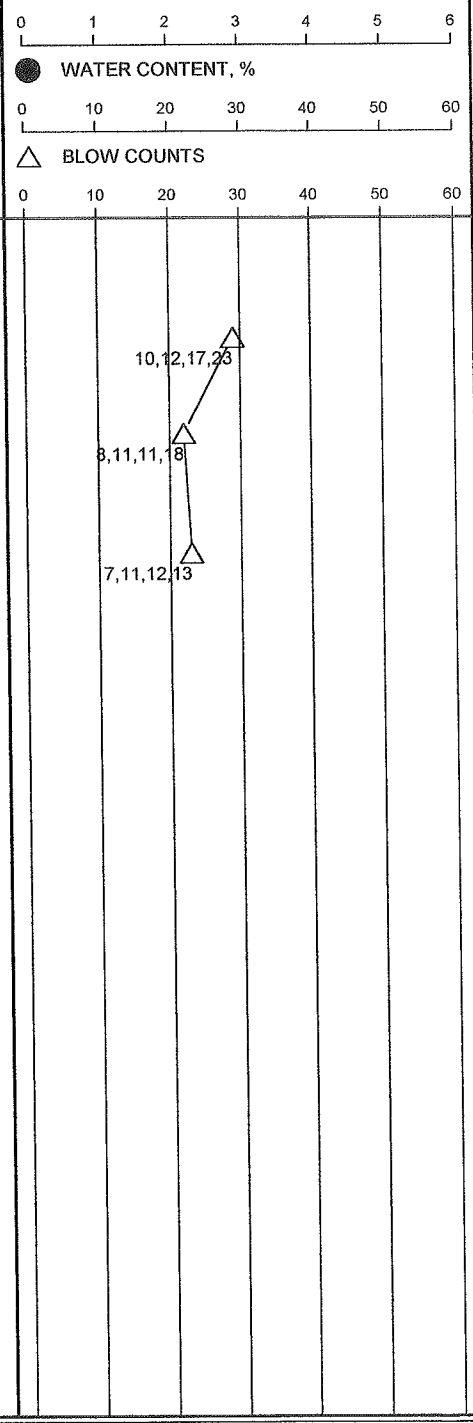
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **RB-SG-8**	DES. NO. **9709060**
PROJECT NAME	**Bridge Rehabilitation on I-70 Over Wabash River and SR 63**		PROJECT NO. **IM-70-I**
SITE LOCATION	**Vigo County, Terre Haute, Indiana**	STRUCTURE NUMBER	STATION **9+750 m** OFFSET **10.6 m (35') Rt.**
BORING STARTED **12-15-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER,TONS/FT^2
BORING COMPLETED **12-15-05**	FOREMAN **Carlos Sanatana**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2

SURFACE ELEVATION **495.3 ft (150.96 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
0.5		Asphalt (Visual)					
1.3		Concrete (Visual)					
		Brown, slightly moist, dense to medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b (Fill)	2.5			1	
1			5.0			2	
2						3	
7.5		END OF BORING @ 2.3 m (7.5 feet)	7.5				



▽ WATER LEVEL WHILE DRILLING None

▼ WATER LEVEL None after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

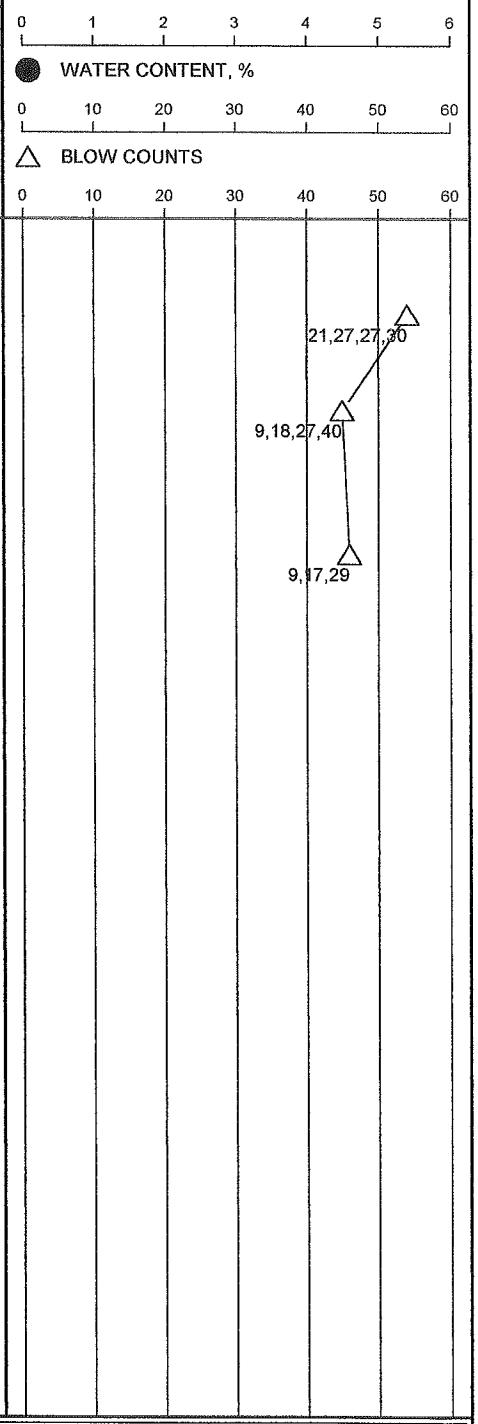
BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **RB-SG-9**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER	STATION **9+840 m** OFFSET **14.2 m (46.5') Lt.**
BORING STARTED **12-13-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER, TONS/FT^2
BORING COMPLETED **12-13-05**	FOREMAN **Ruben Perez**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2

SURFACE ELEVATION **511.7 ft (155.96 m) USC & GS**

STRATA DEPTH (METERS)	STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
0.3			Asphalt (Visual)					
1.1			Concrete (Visual)					
			Brown, slightly moist, very dense to dense, Gravelly Sand, Lab No. 7956-5, A-1-b (Fill)	2.5			1	
1							2	
				5.0				
2							3	
	7.5			7.5				

END OF BORING @ 2.3 m (7.5 feet)



▽ WATER LEVEL WHILE DRILLING None

▼ WATER LEVEL None after 24 hours

REMARKS

SPLIT SPOON ■ SHELBY TUBE A AUGER ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

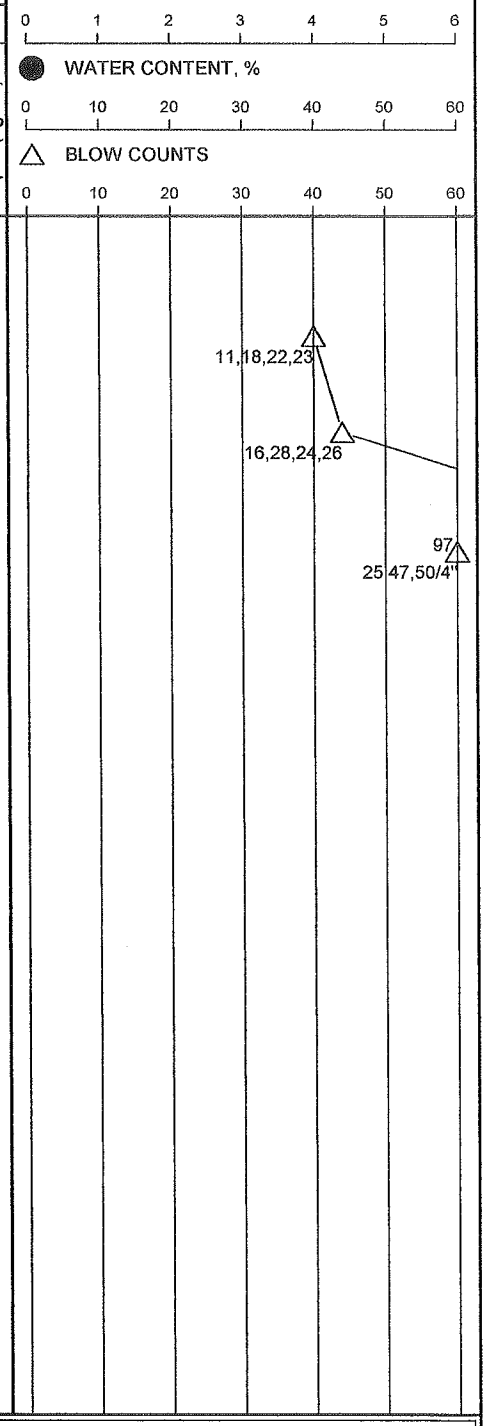
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **RB-SG-10**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER	STATION **9+930 m** OFFSET **14.2 m (46.5') Rt.**
BORING STARTED **12-15-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	
BORING COMPLETED **12-15-05**	FOREMAN **Carlos Sanatana**		

SURFACE ELEVATION **515.0 ft (156.96 m) USC & GS**

STRATA DEPTH (METERS)	STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
0.3			Asphalt (Visual)					
1.1			Concrete (Visual)					
			Brown, slightly moist, dense to very dense, Gravelly Sand, Lab No. 7956-5, A-1-b (Fill)	2.5			1	
1				5.0			2	
2							3	
	7.5		END OF BORING @ 2.3 m (7.5 feet)	7.5				



WATER LEVEL WHILE DRILLING None

WATER LEVEL None after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

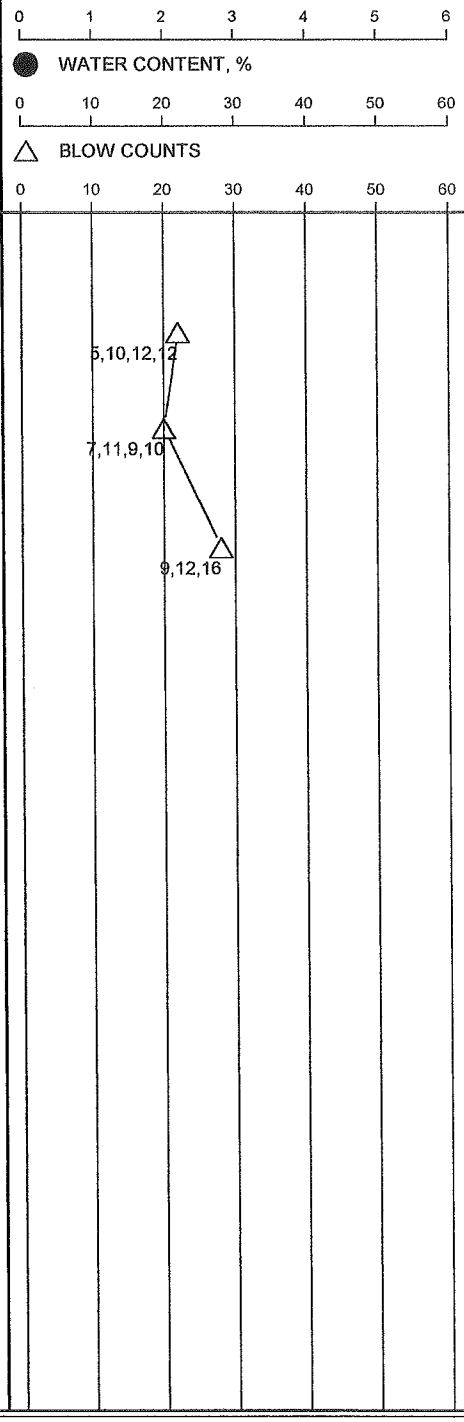
+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

CLIENT **INDOT**		LOG OF BORING NUMBER **RB-SG-11**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER	STATION **10+110 m** OFFSET **10.6 m (35') Lt.**
BORING STARTED **12-16-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	
BORING COMPLETED **12-16-05**	FOREMAN **Carlos Sanatana**		

SURFACE ELEVATION **515.0 ft (156.96 m) USC & GS**

(METERS) STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m³)
0.3		Asphalt (Visual)					
1.3		Concrete (Visual)					
		Brown, slightly moist, medium dense, Sandy Loam, Lab No. 7956-10, A-4	2.5			1	
1			5.0			2	
2						3	
7.5		END OF BORING @ 2.3 m (7.5 feet)	7.5				



WATER LEVEL WHILE DRILLING None

WATER LEVEL None after 24 hours

REMARKS

SPLIT SPOON | SHELBY TUBE | AUGER | ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

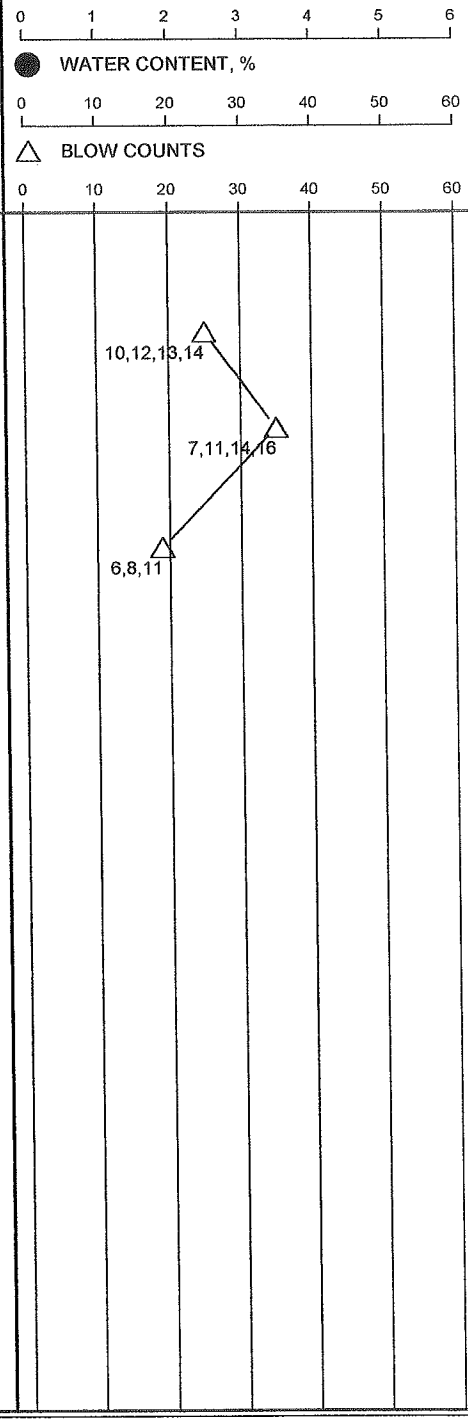
K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

CLIENT **INDOT**		LOG OF BORING NUMBER **RB-SG-12**	DES. NO. **9709060**
PROJECT NAME **Bridge Rehabilitation on I-70 Over Wabash River and SR 63**			PROJECT NO. **IM-70-I**
SITE LOCATION **Vigo County, Terre Haute, Indiana**		STRUCTURE NUMBER	STATION **10+160 m** OFFSET **10.6 m (35') Rt.**
BORING STARTED **12-15-05**	RIG **Diedrich D-50**	FILE NUMBER **7956**	⊕ CALIBRATED PENETROMETER, TONS/FT^2
BORING COMPLETED **12-15-05**	FOREMAN **Carlos Sanatana**		○ UNCONFINED COMPRESSIVE STRENGTH, TONS/FT^2

SURFACE ELEVATION **513.3 ft (156.46 m) USC & GS**

STRATA DEPTH (METERS)	STRATA DEPTH (FEET)	TEXTURAL CLASSIFICATION	DESCRIPTION OF MATERIAL	DEPTH (FEET)	SAMPLE TYPE	SAMPLE RECOVERY	SAMPLE NUMBER	DRY UNIT WEIGHT pcf (kg/m^3)
	0.5		Asphalt (Visual)					
	1.5		Concrete					
			Brown, slightly moist, medium dense, Gravelly Sand, Lab No. 7956-5, A-1-b	2.5			1	
1	3.5		Gray-brown, slightly moist, dense to medium dense, Sandy Loam, Lab No. 7956-10, A-4	5.0			2	
2	7.5		END OF BORING @ 2.3 m (7.5 feet)	7.5			3	



▽ WATER LEVEL WHILE DRILLING None

▼ WATER LEVEL None after 24 hours

REMARKS

SPLIT SPOON ■ SHELBY TUBE [A] AUGER ▨ ROCK CORE

+ PL - PLASTIC LIMIT + LL - LIQUID LIMIT γ_d - UNIT DRY WEIGHT

K & S ENGINEERS, INC.

BORING LOG 7956.GPJ 2-8-06

Pavement Replacement and Bridges Rehabilitation over Wabash River and SR 63
Crawfordsville District, Vigo County, Indiana
Designation No. 9709060
Bridge File No. I-70-5-4613B
Project No. IM-70-1
K & S Project No. 7956

TABLE 1. SUMMARY OF CLASSIFICATION TEST RESULTS

Laboratory No.	Boring No., Sample No.	Station (m)	Offset	Sample ID	Classification	% Passing			% Gravel	% Sand	% Silt	% Clay	Atterberg Limits		
						No.10	No.40	No.200					LL	PL	PI
7956-1	TB-1, SS-1	8+665	6.62 m Lt. Line A	TB-1, 1.0	Sandy Loam A-4 (1)	89.3	83.9	46.6	11.7	41.7	41.3	5.3	22	14	8
7956-2	TB-1, SS-3	8+665	6.62 m Lt. Line A	TB-1, 6	Silty Loam A-4 (0)	100	99.9	55.1	0	44.9	50.9	4.2	19	16	3
7956-3	TB-1, SS-10	8+665	6.62 m Lt. Line A	TB-1, 33.5	Silty Loam A-6 (7)	100	100	81.3	0	18.7	75.2	6.1	26	18	8
7956-4	TB-4, SS-6	8+800	7.62 m Rt. Line A	TB-4, 13.5	Silty Clay A-7-6 (30)	100	99.9	96.3	0	3.7	63.9	32.4	51	23	28
7956-5	TB-7, SS-8	8+981.5	0 m C/L Line A	TB-7, 30	Gravelly Sand A-1-b (0)	75	32.9	5.8	25	69.2	5.8		NP	NP	NP
7956-6	TB-9, SS-2	9+144	7.62 m Lt. Line A	TB-9, 3.5	Silty Loam A-6 (7)	95.8	95.1	65.2	4.2	30.6	56.8	8.4	30	16	14
7956-7	TB-9, SS-11	9+144	7.62 m Lt Line A	TB-9, 43.5	Sandy Gravel A-1-a (0)	47.5	24.7	6.7	52.5	40.7	6.7	0	NP	NP	NP
7956-8	TB-9, SS-16	9+144	7.62 m Lt. Line A	TB-1, 68.5	Sand A-3 (0)	99.2	65.3	3.7	0.8	95.5	3.7		NP	NP	NP
7956-9	TB-10, SS-6	9+185	7.62 m Rt. Line A	TB-10, 13.5	Silty Loam A-4 (2)	100	98.4	71.7	0	28.2	66.5	5.2	22	16	6
7956-10	TB-12,SS-2	9+260	7.62 m Rt. Line A	TB-12, 3.5	Sandy Loam A- 4 (0)	99.9	98.5	45.4	0.1	54.5	44.3	1.1	20	16	4
7956-11	TB-12, SS-7	9+260	7.62 m Rt. Line A	TB-12, 18.5	Silty Clay Loam A-6 (16)	100	99.8	88.5	0	11.5	66.1	22.4	37	18	19
7956-12	BULK	Close to Boring RB-SG-2			Loam A-4 (2)	94.3	86.4	53.2	5.7	41.1	45.9	7.3	23	13	10

Pavement Replacement and Bridges Rehabilitation over Wabash River and SR 63
Crawfordsville District, Vigo County, Indiana
Designation No. 9709060
Bridge File No. I-70-5-4613B
Project No. IM-70-1
K & S Project No. 7956

TABLE 2. SUMMARY OF LABORATORY TEST RESULTS

Laboratory Number	Boring No. Sample No.	Depth (Ft)	Natural Water Content (%)	FIELD PPR (tsf)	pH	Organic Content (%)
	TB-1					
7956-1	SS-1	1.0-2.5	14.5	0.25	7.7	
7956TB1SS2	SS-2	3.5-5.0	21.3	2.5		
7956-2	SS-3	6.0-7.5	16.7		7.7	
7956TB1SS4	SS-4	8.5-10.0	15.2			
7956TB1SS5	SS-5	11.0-12.5	14.1			
7956TB1SS6	SS-6	13.5-15.0	18.0			
7956TB1SS7	SS-7	18.5-20.0	14.8	0.75		
7956TB1SS8	SS-8	23.5-25.0	20.7	1.75		
7956TB1SS9	SS-9	28.5-30.0	24.6	0.25		
7956-3	SS-10	33.5-35.0	31.5	0.5	7.81	
	TB-2					
7956TB2SS1	SS-1	1.0-2.5	41.0	0.25		6.2
7956TB2SS2	SS-2	3.5-5.0	13.8			
7956TB2SS3	SS-3	6.0-7.5	18.6			
7956TB2SS4	SS-4	8.5-10.0	19.5			
7956TB2SS5	SS-5	11.0-12.5	21.2			
7956TB2SS6	SS-64	13.5-15.0	17.2			
	TB-3					
7956TB3SS1	SS-1	1.0-2.5	36.7			4.1
7956TB3SS2	SS-2	3.5-5.0	19.0			
7956TB3SS3	SS-3	6.0-7.5	19.8			
7956TB3SS4	SS-4	8.5-10.0	17.4			

Pavement Replacement and Bridges Rehabilitation over Wabash River and SR 63
Crawfordsville District, Vigo County, Indiana
Designation No. 9709060
Bridge File No. I-70-5-4613B
Project No. IM-70-1
K & S Project No. 7956

Laboratory Number	Boring No. Sample No.	Depth (Ft)	Natural Water Content (%)	FIELD PPR (tsf)	pH	Organic Content (%)
7956TB3SS5	SS-5	11.0-12.5	14.7			
	TB-4					
7956TB4SS1	SS-1	1.0-2.5	32.2	0.25		
7956TB4SS2	SS-2	3.5-5.0	42.9	0.5		4.2
7956TB4SS3	SS-3	6.0-7.5	26.0			
7956TB4SS4	SS-4	8.5-10.0	23.3			
7956TB4SS5	SS-5	11.0-12.5	34.2			
7956TB4SS6	SS-6	13.5-15.0	50.3	0.25	7.74	4.5
	TB-5					
7956TB5SS2	SS-2	3.5-5.0	31.8	0.75		
7956TB5SS3	SS-3	6.0-7.5	49.2	0.25		4.3
7956TB5SS4	SS-4	8.5-10.0	16.0	2.25		
7956TB5SS5	SS-5	11.0-12.5	36.5	0.5		4.1
	TB-6					
7956TB6SS2	SS-2	3.5-5.0	19.4			
7956TB6SS3	SS-3	6.0-7.5	31.9	0.0		
7956TB6SS4	SS-4	8.5-10.0	39.2	0.0		
7956TB6SS5	SS-5	11.0-12.5	30.5	0.25		
7956TB6SS6	SS-6	13.5-15.0	31.6	1.0		5.0
	TB-7					
7956TB7SS8	SS-8	31.5-33.0			8.71	
	TB-8					
7956TB8SS2	SS-2	8.5-10.0	23.2	0.25		

Pavement Replacement and Bridges Rehabilitation over Wabash River and SR 63
Crawfordsville District, Vigo County, Indiana
Designation No. 9709060
Bridge File No. I-70-5-4613B
Project No. IM-70-1
K & S Project No. 7956

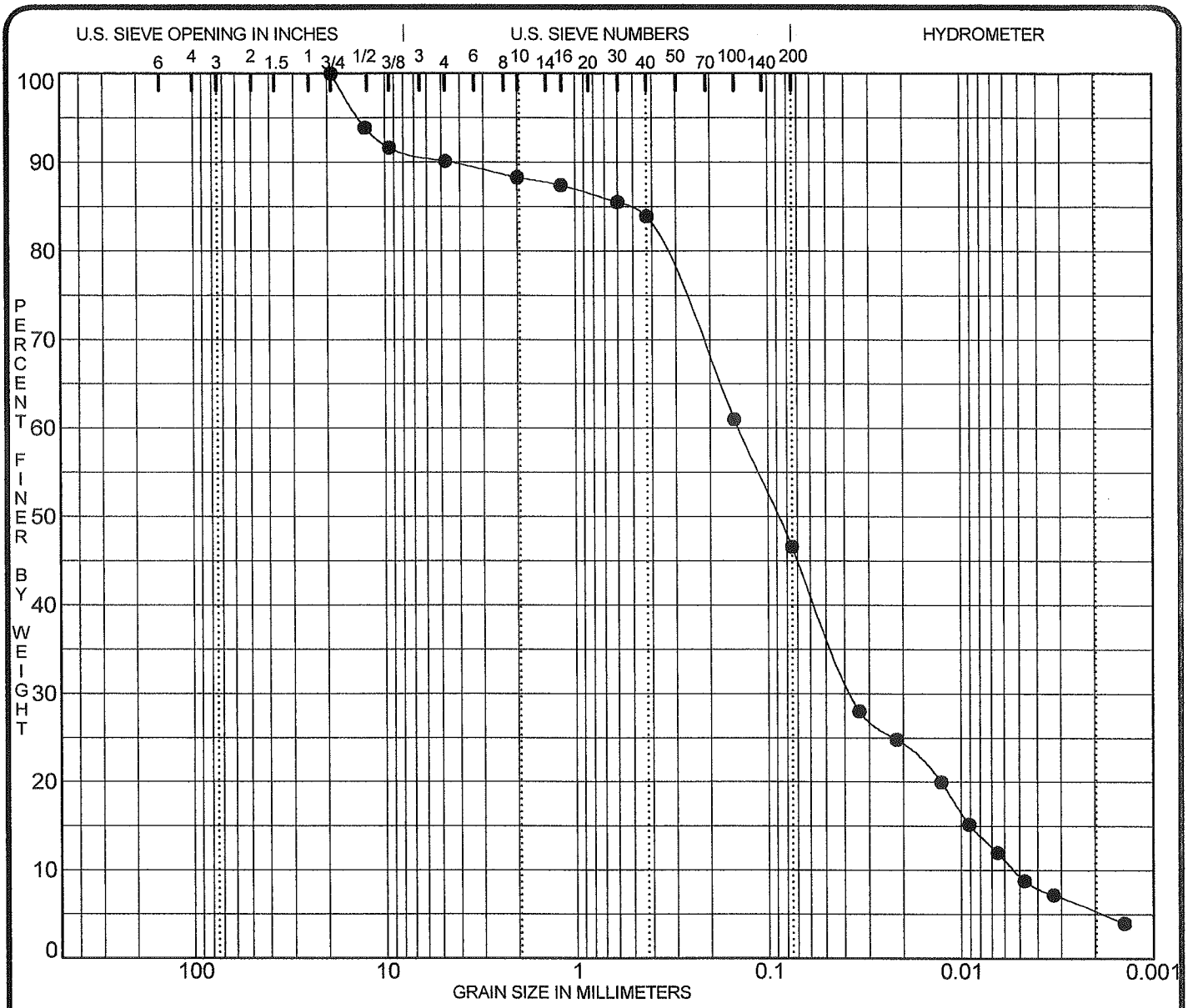
Laboratory Number	Boring No. Sample No.	Depth (Ft)	Natural Water Content (%)	FIELD PPR (tsf)	pH	Organic Content (%)
	TB-9					
7956-6	SS-2	3.5-5.0	24.7	1.0	7.42	
7956TB9SS3	SS-3	6.0-7.5	28.0	1.0		
7956TB9SS4	SS-4	8.5-10.0	26.8	3.0		
7956TB9SS5	SS-5	11.0-12.5	17.7	0.5		
7956TB9SS6	SS-6	13.5-15.0	27.8	0.75		
7956-7	SS-11	43.5-45.0			8.68	
7956-8	SS-16	68.5-70.0			8.83	
	TB-10					
7956TB10SS1	SS-1	1.0-2.5	24.1	0.5		
7956TB10SS2	SS-2	3.5-5.0	13.0	4.5		
7956TB10SS3	SS-3	6.0-7.5	17.2	3.5		
7956TB10SS4	SS-4	8.5-10.0	20.9	1.5		
7956TB10SS5	SS-5	13.5-15.0	20.2	0.25		
7956-9	SS-6	18.5-20.0	32.0	0.0	7.86	
	TB-11					
7956TB11SS1	SS-1	1.0-2.5	29.2	1.25		
	TB-12					
7956TB12SS1	SS-1	1.0-2.5	13.0	1.5		
7956TB12SS2	SS-2	3.5-5.0	15.5		7.69	
7956TB12SS3	SS-3	6.0-7.5	15.6			
7956TB12SS4	SS-4	8.5-10.0	19.7			
7956TB12SS5	SS-5	11.0-12.5	21.8			
7956TB12SS6	SS-6	13.5-15.0	18.7			

Pavement Replacement and Bridges Rehabilitation over Wabash River and SR 63
Crawfordsville District, Vigo County, Indiana
Designation No. 9709060
Bridge File No. I-70-5-4613B
Project No. IM-70-1
K & S Project No. 7956

Laboratory Number	Boring No. Sample No.	Depth (Ft)	Natural Water Content (%)	FIELD PPR (tsf)	pH	Organic Content (%)
7956TB12SS7	SS-7	18.5-20.0	21.9	4.0	7.43	
7956TB12SS10	SS-10	33.5-35.0	28.9	1.5		
7956TB12SS11	SS-11	38.5-40.0	26.8	0.25		
	TB-13					
7956TB13SS15	58.5	60.0	30.0	4.5		
	TB-16					
7956TB16SS1	SS-1	1.0-2.5	26.3			
7956TB16SS2	SS-2	3.5-5.0	21.2			
	RB-SG-1					
7956RB1SS1	SS-1	1.0-3.0	13.9	1.75		
7956RB1SS2	SS-2	3.0-5.0	22.6	2.5		
7956RB1SS3	SS-3	6.0-7.5	21.2	3.5		
	RB-SG-2					
7956RB2SS1	SS-1	1.0-3.0	24.5	2.5		
7956RB2SS2	SS-2	3.0-5.0	22.8	3.0		
7956RB2SS3	SS-3	6.0-7.5	19.2	3.25		
	RB-SG-3					
7956RB3SS2	SS-2	3.0-5.0	8.2			
7956RB3SS3	SS-3	6.0-7.5	15.5	3.0		
	RB-SG-4					
7956RB4SS2	SS-2	1.0-3.0	20.5	1.25		
7956RB4SS3	SS-3	6.0-7.5	14.4	4.5		
	RB-SG-5					
7956RB5SS2	SS-2	3.0-5.0	14.7			
7956RB5SS3	SS-3	6.0-7.5	14.9			

Pavement Replacement and Bridges Rehabilitation over Wabash River and SR 63
Crawfordsville District, Vigo County, Indiana
Designation No. 9709060
Bridge File No. I-70-5-4613B
Project No. IM-70-1
K & S Project No. 7956

Laboratory Number	Boring No. Sample No.	Depth (Ft)	Natural Water Content (%)	FIELD PPR (tsf)	pH	Organic Content (%)
	RB-SG-6					
7956RB6SS2	SS-2	3.0-5.0	17.4	3.0		
7956RB6SS3	SS-3	6.0-7.5	17.7	4.0		
	RB-SG-7					
7956RB7SS3	SS-3	6.0-7.5	21.2	2.5		
	BULK (CLOSE TO RB-SG-2)					
7956-12	BULK	1.0-3.0			8.19	



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	TB-1	1.0	Sandy Loam A-4 (1)		22	14	8	1.77	26.9

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	TB-1	1.0	19.00	0.14	0.037	0.0053	11.7	41.7	41.3	5.3

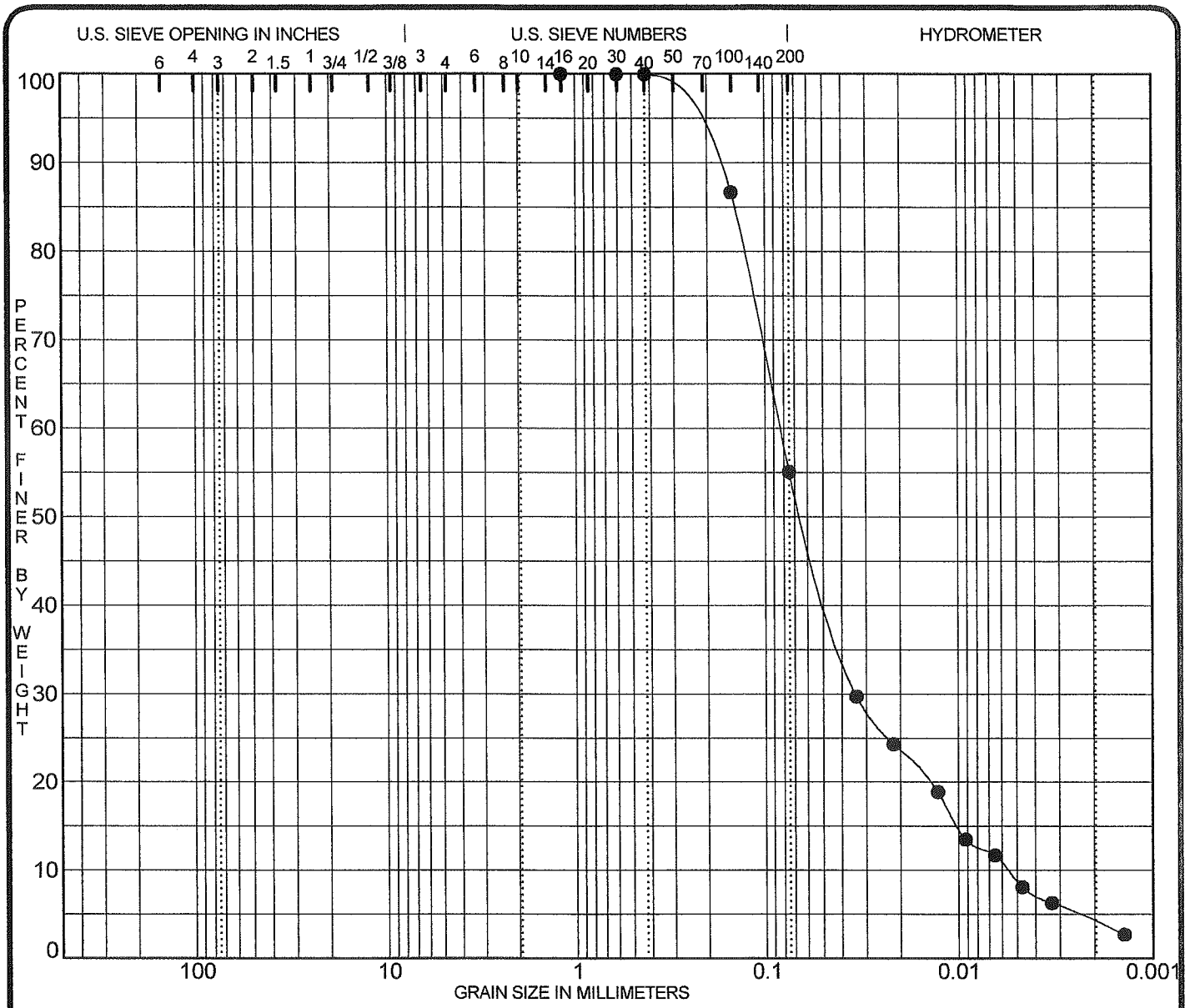
PROJECT **Bridge Rehabilitation on I-70 Over Wabash River and SR 63 - Vigo County, Terre Haute, Indiana**

DES. NO. **9709060**
PROJ. NO. **IM-70-I**
JOB NO. **7956**
DATE **1/31/06**

GRADATION CURVES

K & S ENGINEERS, INC.

Figure 1



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	TB-1	6.0	Silty Loam A-4 (0)		19	16	3	2.48	15.0

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	TB-1	6.0	1.18	0.08	0.034	0.0056	0.0	44.9	50.9	4.2

PROJECT **Bridge Rehabilitation on I-70 Over Wabash River and SR 63 - Vigo County, Terre Haute, Indiana**

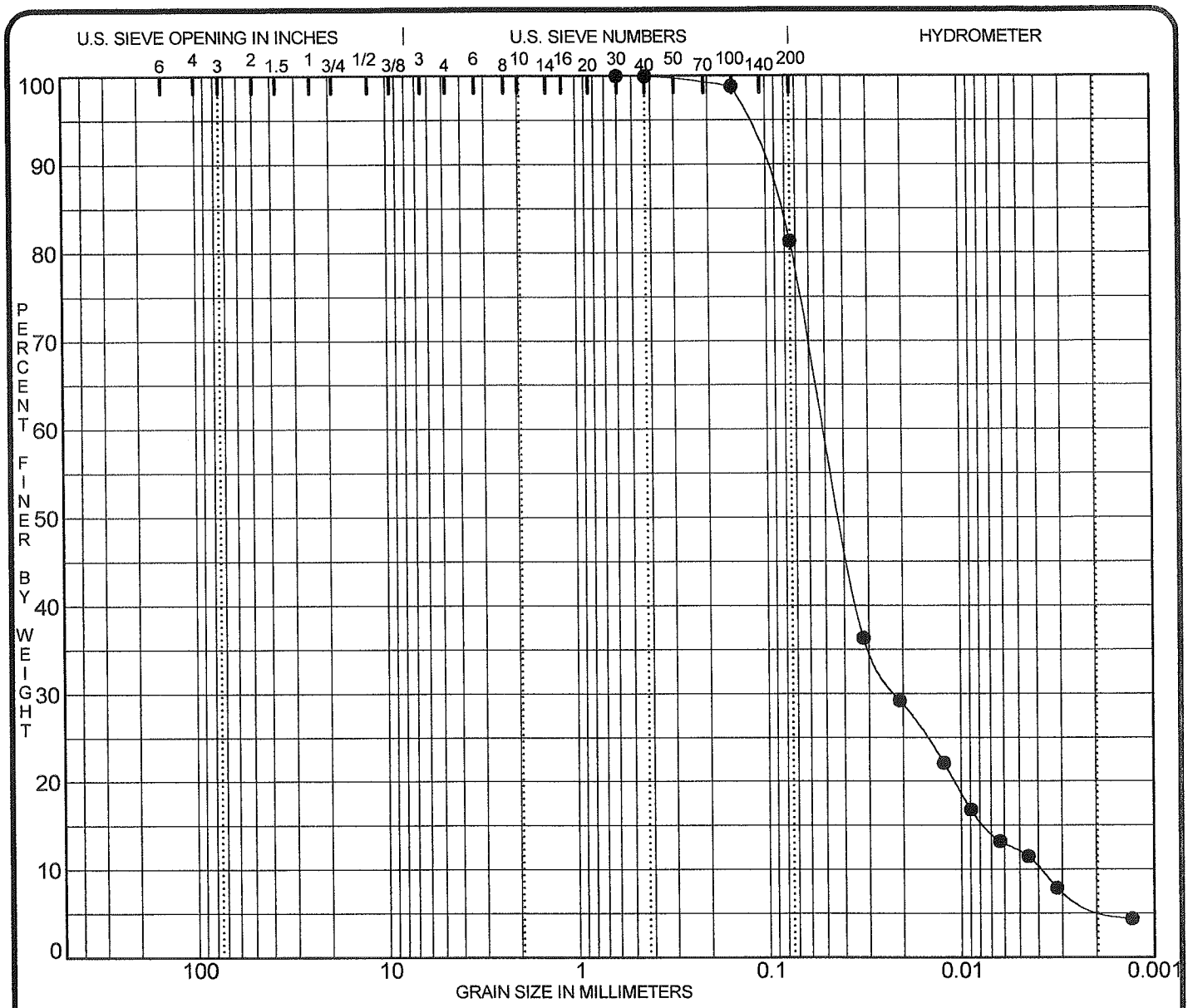
DES. NO. **9709060**
PROJ. NO. **IM-70-I**

JOB NO. **7956**
DATE **1/31/06**

GRADATION CURVES

K & S ENGINEERS, INC.

Figure 2



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	TB-1	33.5	Silty Loam A-6 (7)		26	18	8	2.44	12.8

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	TB-1	33.5	0.60	0.05	0.022	0.0039	0.0	18.7	75.2	6.1

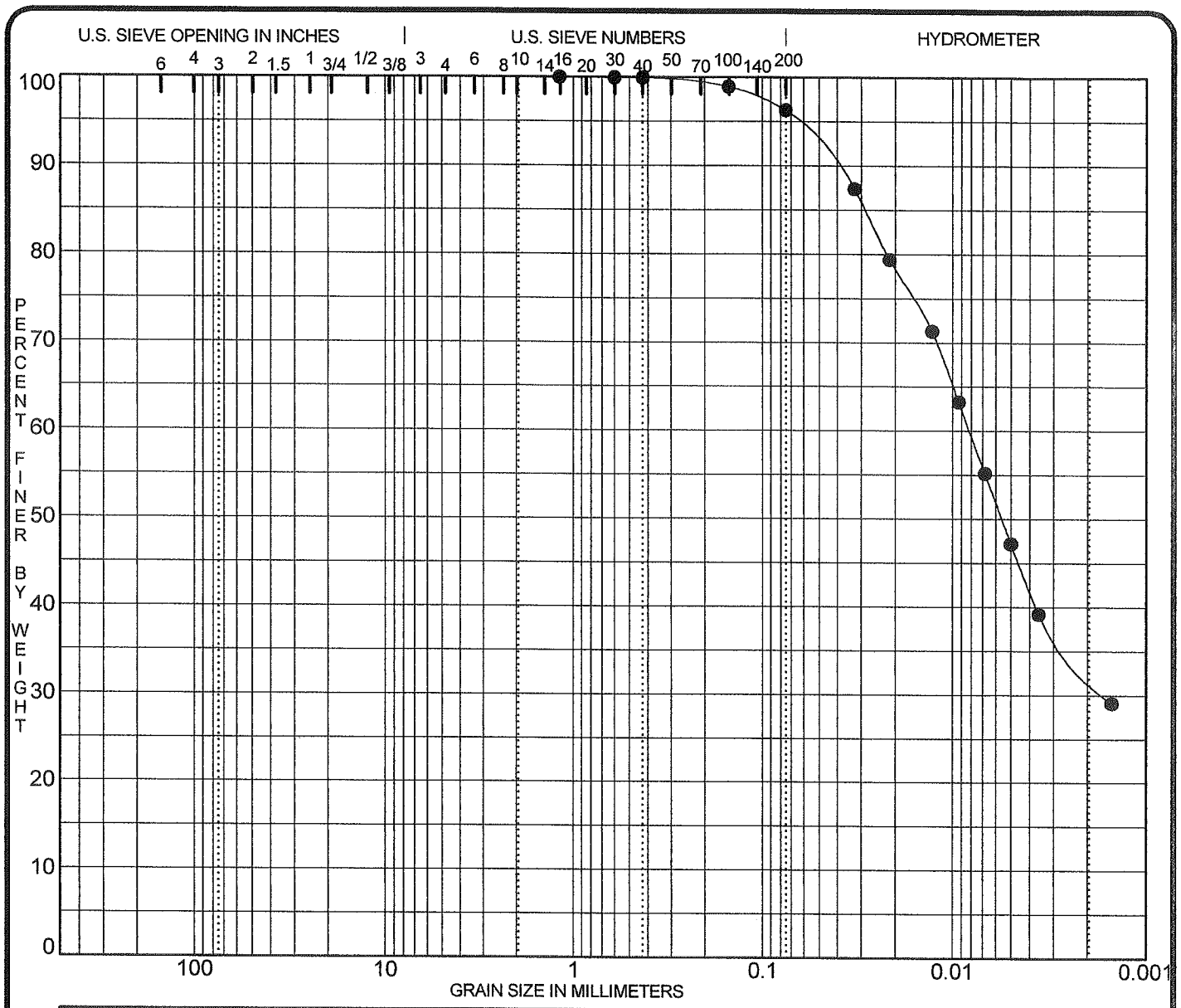
PROJECT **Bridge Rehabilitation on I-70 Over Wabash River and SR 63 - Vigo County, Terre Haute, Indiana**

DES. NO. **9709060**
PROJ. NO. **IM-70-I**
JOB NO. **7956**
DATE **1/31/06**

GRADATION CURVES

K & S ENGINEERS, INC.

Figure 3



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	TB-4	13.5	Silty Clay A-7-6 (30)		51	23	28		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	TB-4	13.5	1.18	0.01	0.002		0.0	3.7	63.9	32.4

PROJECT Bridge Rehabilitation on I-70 Over Wabash River and SR 63 - Vigo County, Terre Haute, Indiana

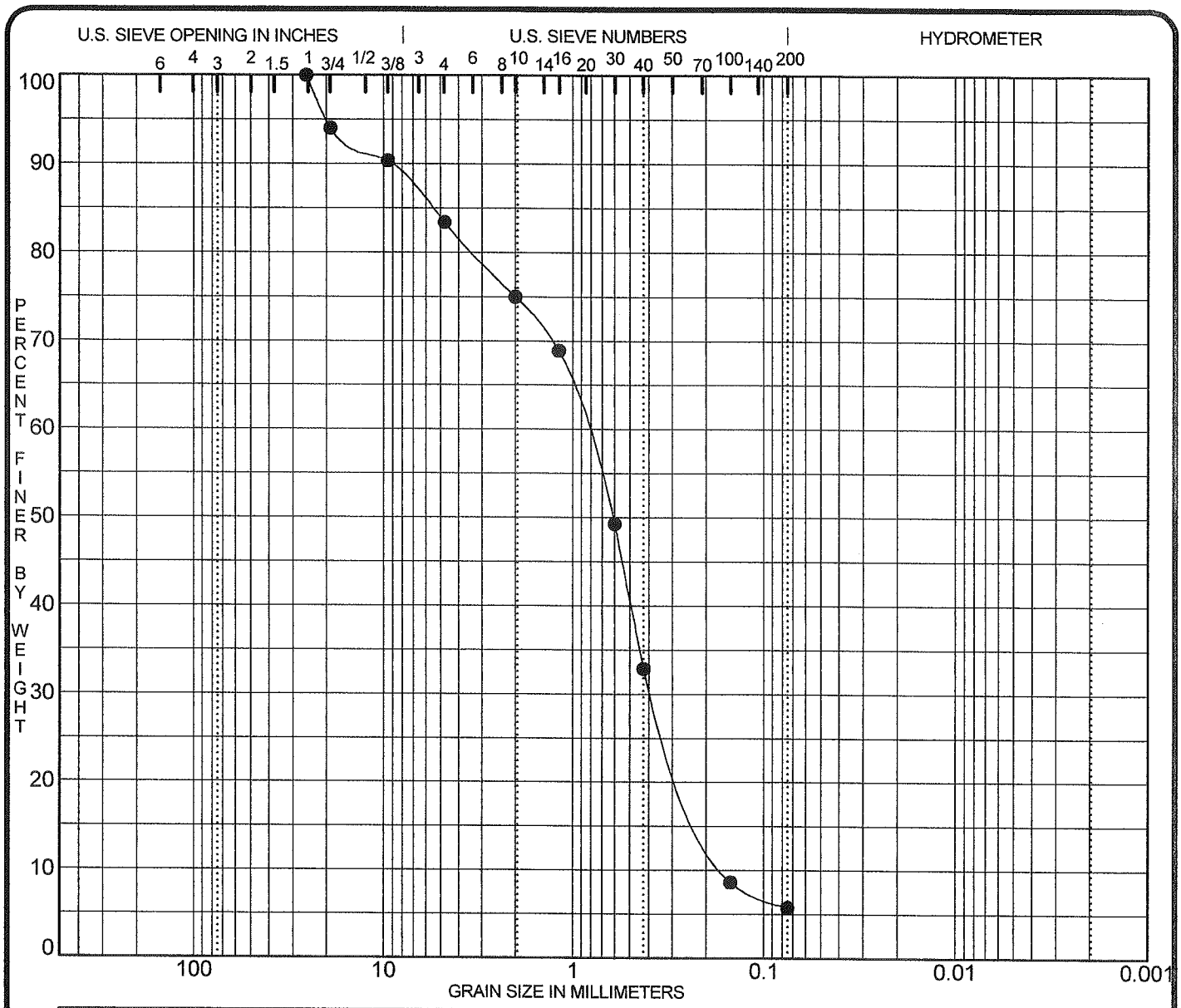
DES. NO. 9709060
PROJ. NO. IM-70-I

JOB NO. 7956
DATE 1/31/06

GRADATION CURVES

K & S ENGINEERS, INC.

Figure 4



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**TB-7**	**30.0**	**Gravelly Sand A-1-b (0)**		**NP**	**NP**	**NP**	**1.02**	**5.5**

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TB-7**	**30.0**	**25.40**	**0.87**	**0.376**	**0.1589**	**25.0**	**69.2**	**5.8**	

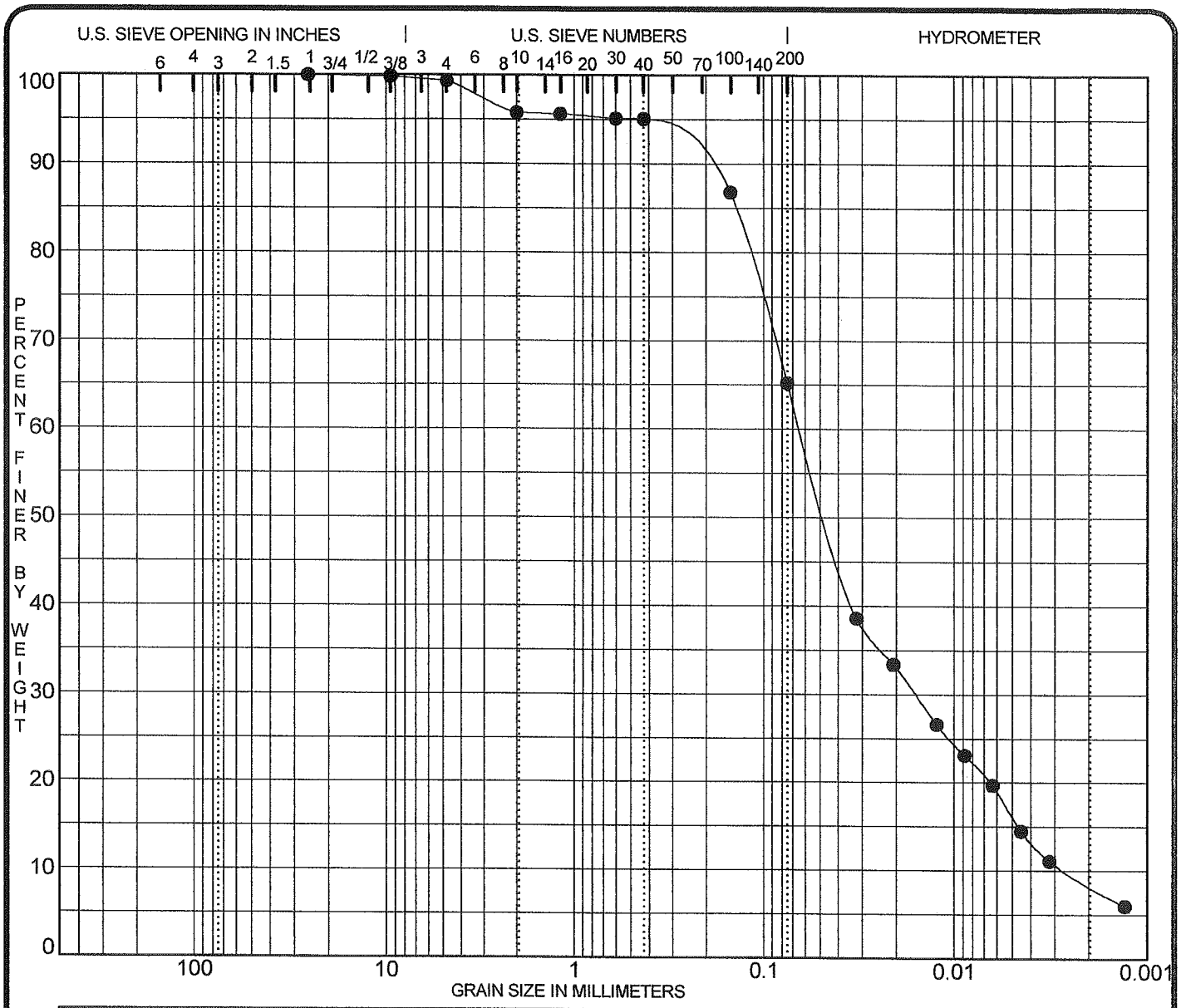
PROJECT **Bridge Rehabilitation on I-70 Over Wabash River and SR 63 - Vigo County, Terre Haute, Indiana**

DES. NO. **9709060**
PROJ. NO. **IM-70-I**
JOB NO. **7956**
DATE **1/31/06**

GRADATION CURVES

K & S ENGINEERS, INC.

Figure 5



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**TB-9**	**3.5**	**Silty Loam A-6 (7)**		**30**	**16**	**14**	**1.52**	**24.1**

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TB-9**	**3.5**	**25.40**	**0.06**	**0.016**	**0.0026**	**4.2**	**30.6**	**56.8**	**8.4**

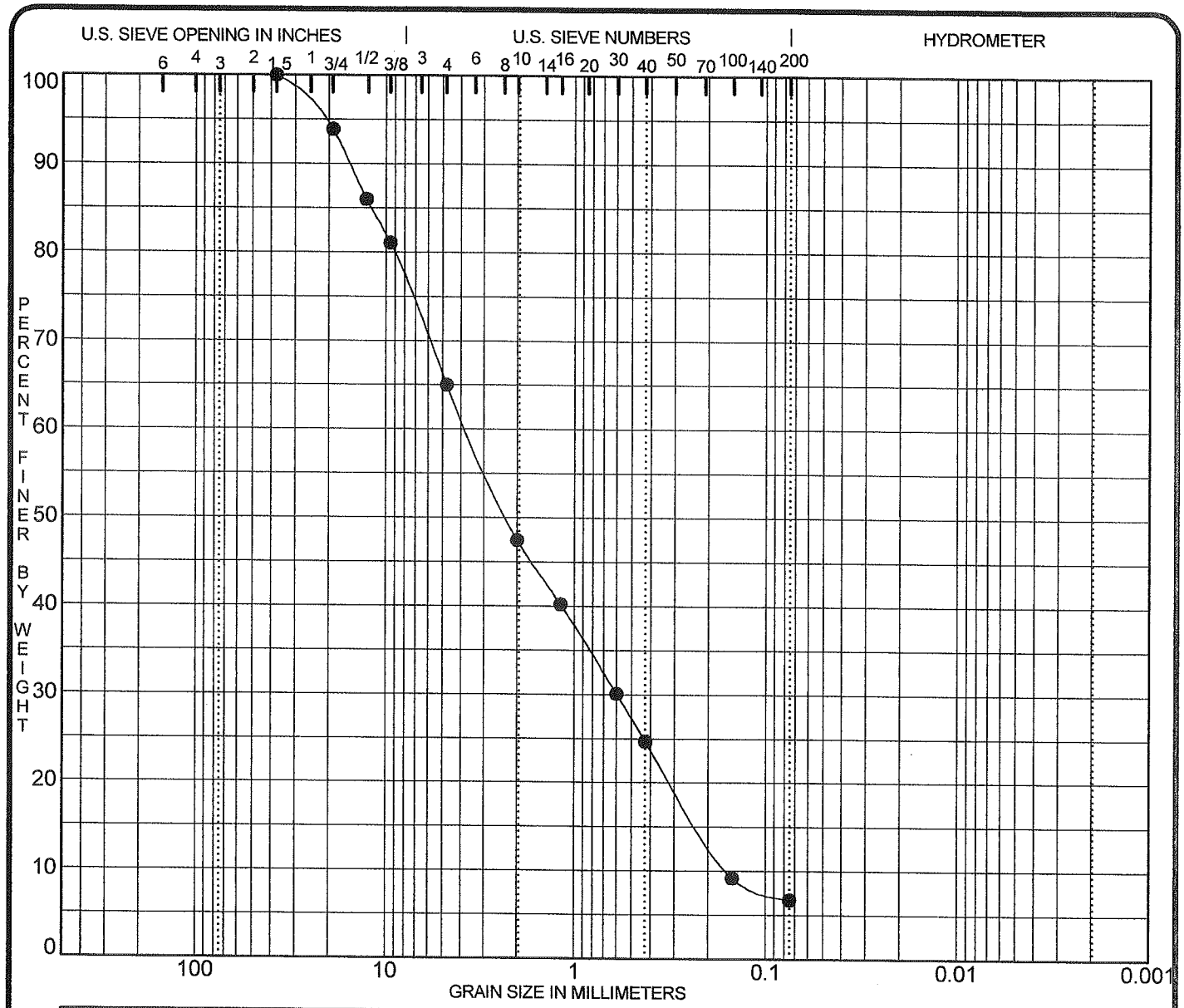
PROJECT **Bridge Rehabilitation on I-70 Over Wabash River and SR 63 - Vigo County, Terre Haute, Indiana**

DES. NO. **9709060**
PROJ. NO. **IM-70-I**
JOB NO. **7956**
DATE **1/31/06**

GRADATION CURVES

K & S ENGINEERS, INC.

Figure 6



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	TB-9	43.5	Sandy Gravel A-1-a (0)		NP	NP	NP	0.61	23.5

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	TB-9	43.5	37.50	3.71	0.596	0.1582	52.5	40.7	6.7	

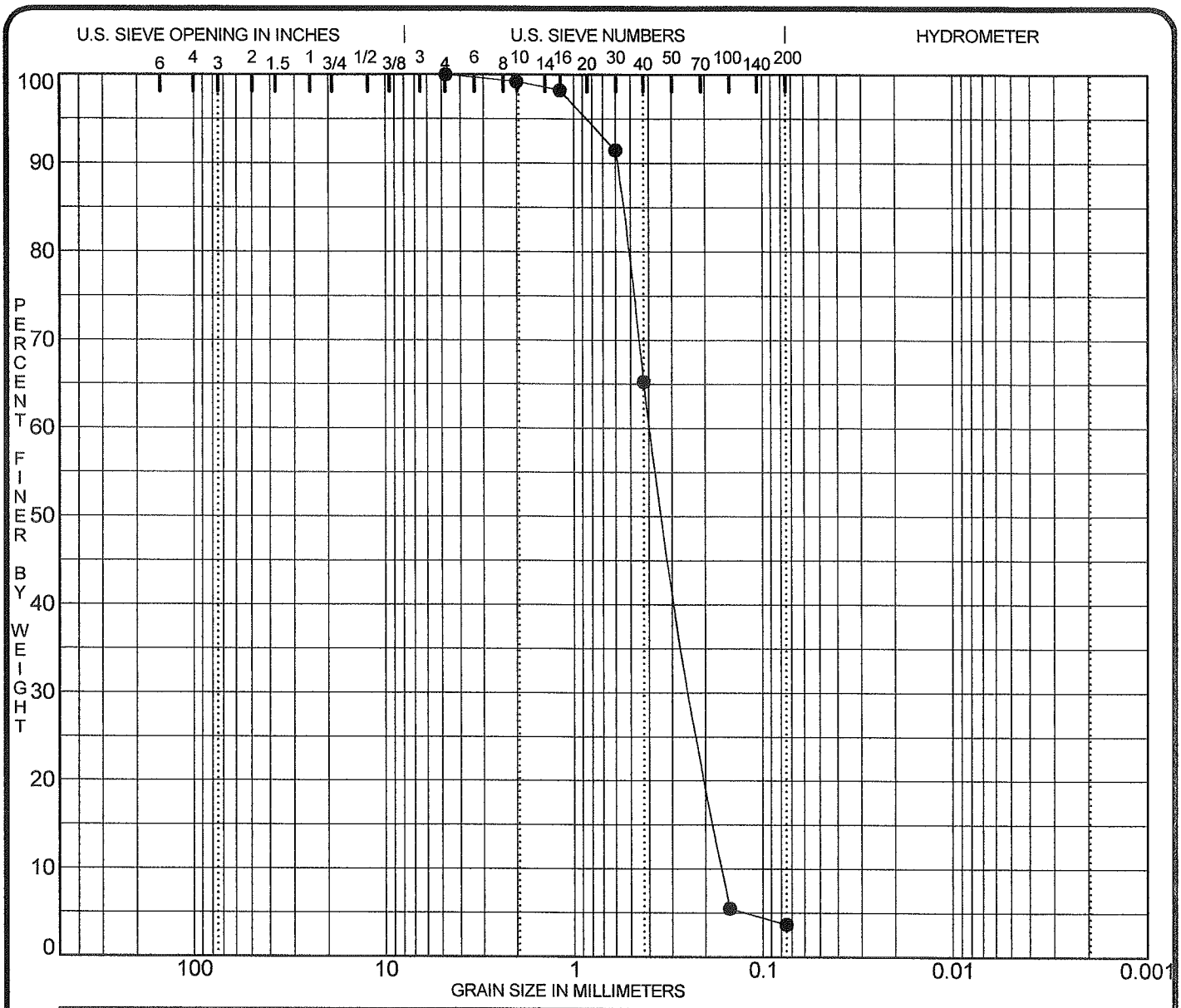
PROJECT **Bridge Rehabilitation on I-70 Over Wabash River and SR 63 - Vigo County, Terre Haute, Indiana**

DES. NO. **9709060**
PROJ. NO. **IM-70-I**
JOB NO. **7956**
DATE **1/31/06**

GRADATION CURVES

K & S ENGINEERS, INC.

Figure 7



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	TB-9	68.5	Sand A-3 (0)		NP	NP	NP	0.84	2.4

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	TB-9	68.5	4.75	0.39	0.230	0.1622	0.8	95.5	3.7	

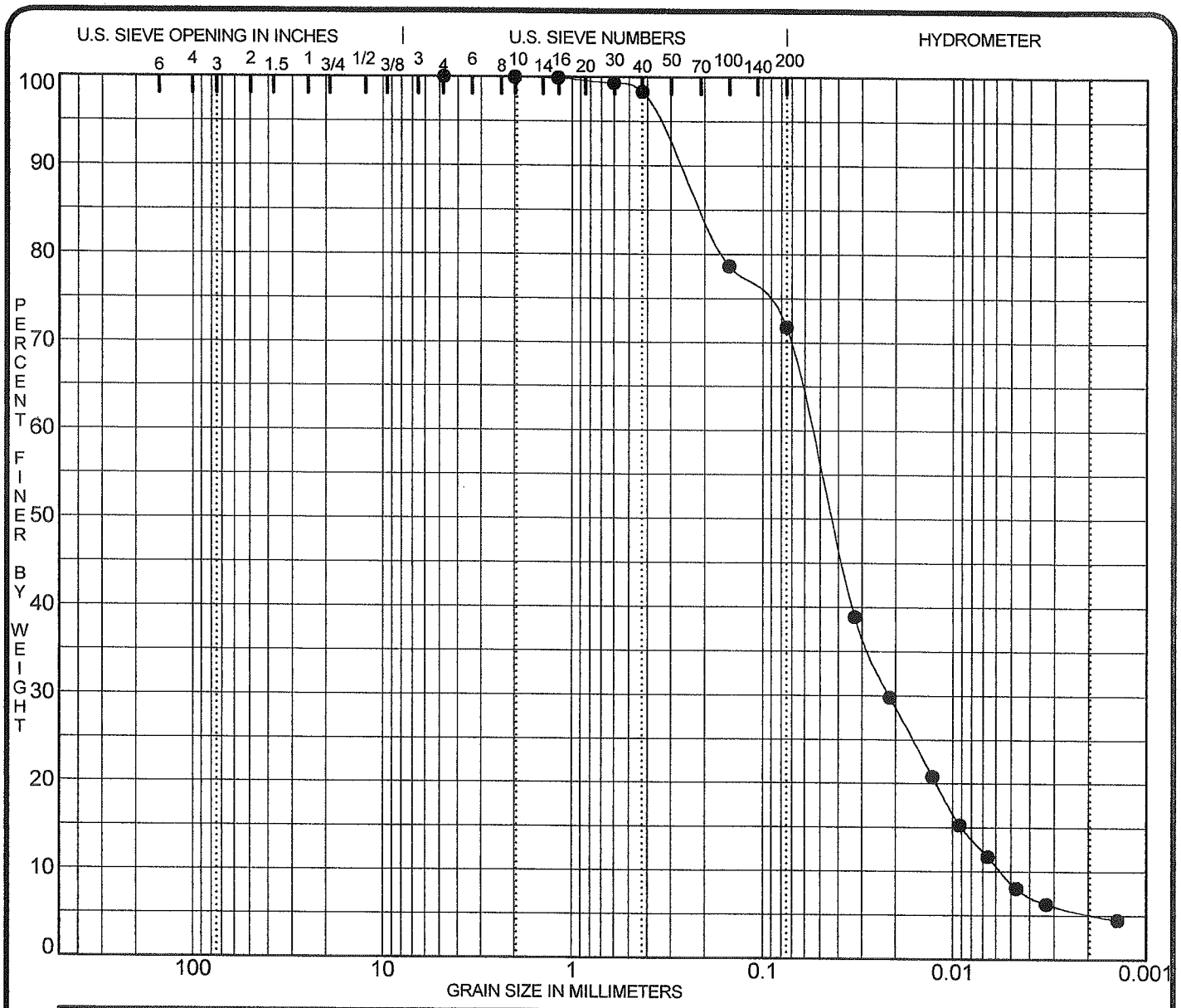
PROJECT **Bridge Rehabilitation on I-70 Over Wabash River and SR 63 - Vigo County, Terre Haute, Indiana**

DES. NO. **9709060**
PROJ. NO. **IM-70-I**
JOB NO. **7956**
DATE **1/31/06**

GRADATION CURVES

K & S ENGINEERS, INC.

Figure 8



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**TB-10**	**13.5**	**Silty Loam A-4 (2)**		**22**	**16**	**6**	**1.49**	**9.9**

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TB-10**	**13.5**	**4.75**	**0.06**	**0.022**	**0.0056**	**0.0**	**28.2**	**66.5**	**5.2**

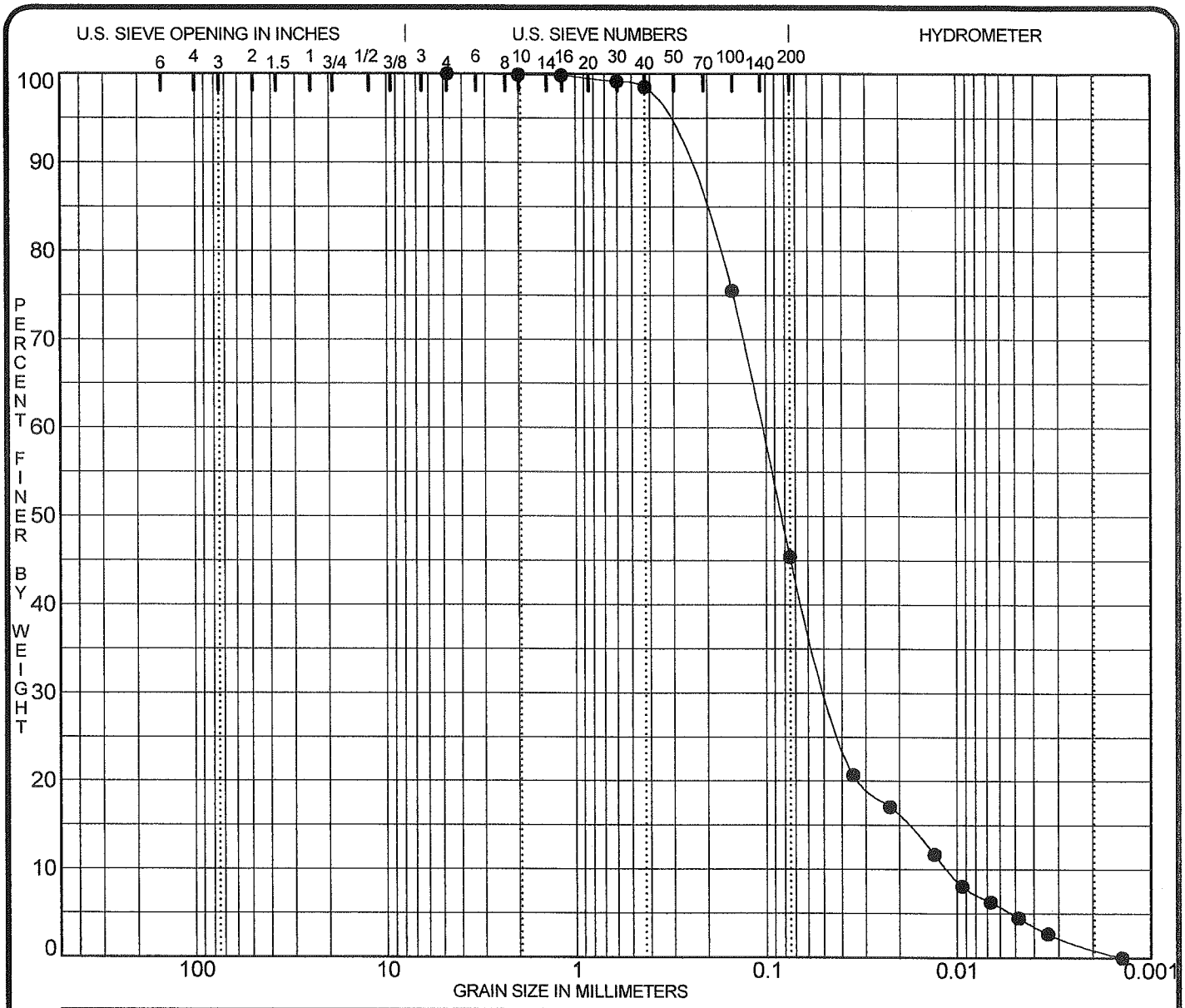
PROJECT **Bridge Rehabilitation on I-70 Over Wabash River and SR 63 - Vigo County, Terre Haute, Indiana**

DES. NO. **9709060**
PROJ. NO. **IM-70-I**
JOB NO. **7956**
DATE **1/31/06**

GRADATION CURVES

K & S ENGINEERS, INC.

Figure 9



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**TB-12**	**3.5**	**Sandy Loam A-4 (0)**		**20**	**16**	**4**	**1.84**	**9.4**

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TB-12**	**3.5**	**4.75**	**0.10**	**0.047**	**0.0112**	**0.1**	**54.5**	**44.3**	**1.1**

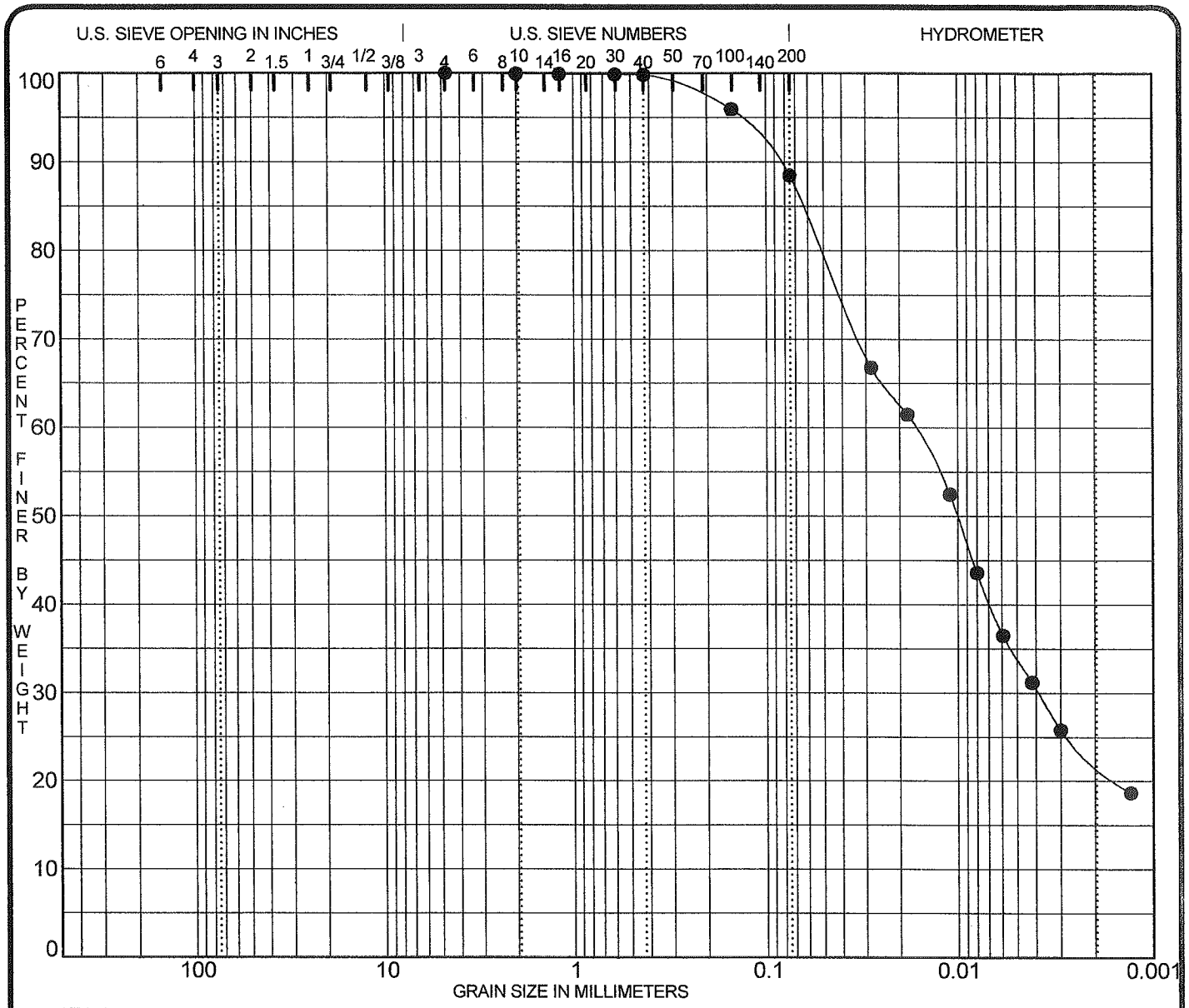
PROJECT **Bridge Rehabilitation on I-70 Over Wabash River and SR 63 - Vigo County, Terre Haute, Indiana**

DES. NO. **9709060**
PROJ. NO. **IM-70-I**
JOB NO. **7956**
DATE **1/31/06**

GRADATION CURVES

K & S ENGINEERS, INC.

Figure 10



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**TB-12**	**18.5**	**Silty Clay Loam A-6 (16)**		**37**	**18**	**19**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TB-12**	**18.5**	**4.75**	**0.02**	**0.004**		**0.0**	**11.5**	**66.1**	**22.4**

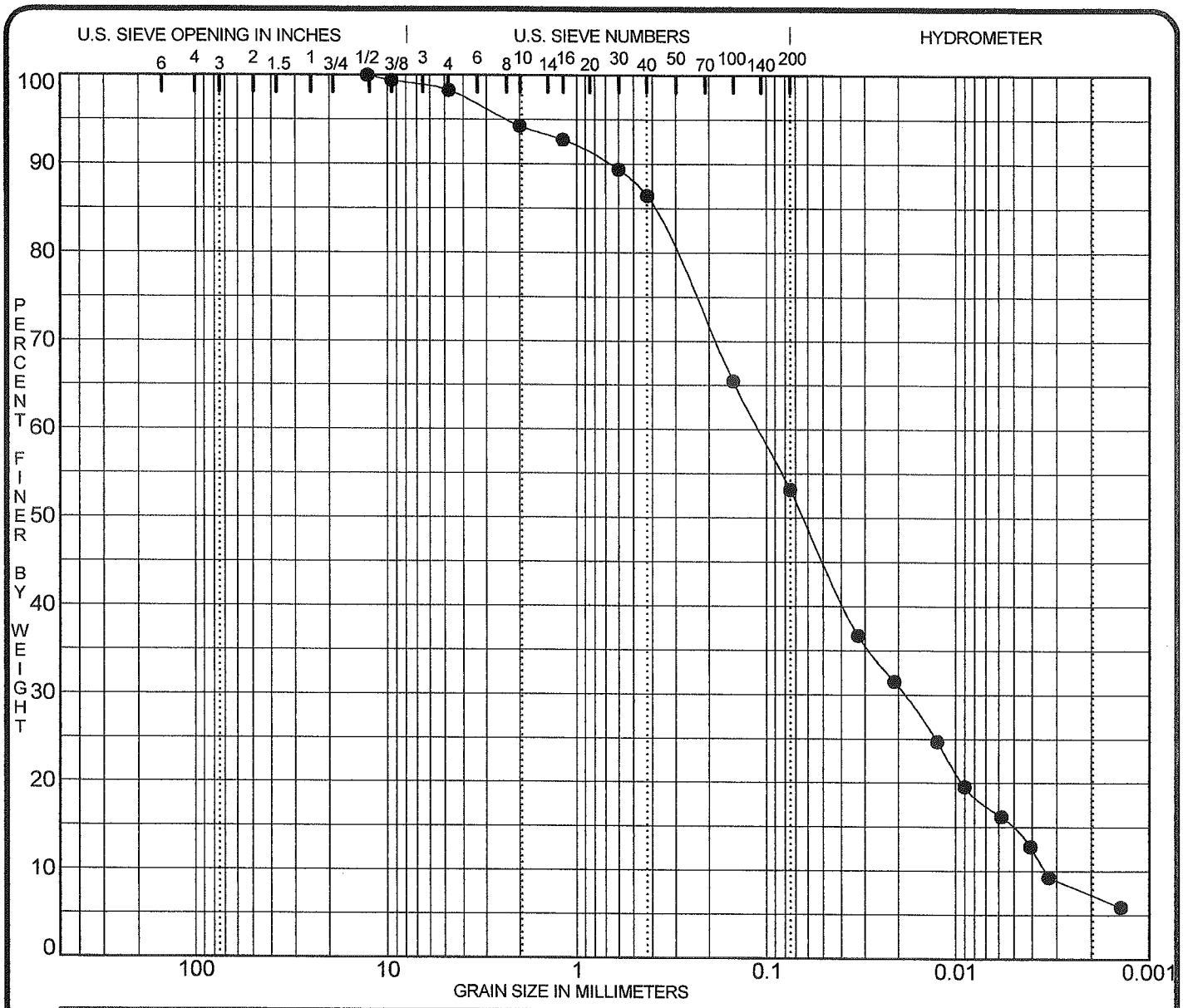
PROJECT **Bridge Rehabilitation on I-70 Over Wabash River and SR 63 - Vigo County, Terre Haute, Indiana**

DES. NO. **9709060**
PROJ. NO. **IM-70-I**
JOB NO. **7956**
DATE **1/31/06**

GRADATION CURVES

K & S ENGINEERS, INC.

Figure 11



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**Bulk**	**1.0**	**Loam A-4 (2)**		**23**	**13**	**10**	**0.93**	**31.9**

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**Bulk**	**1.0**	**12.70**	**0.11**	**0.019**	**0.0034**	**5.7**	**41.1**	**45.9**	**7.3**

PROJECT **Bridge Rehabilitation on I-70 Over Wabash River and SR 63 - Vigo County, Terre Haute, Indiana**

DES. NO. **9709060**
PROJ. NO. **IM-70-I**
JOB NO. **7956**
DATE **1/31/06**

GRADATION CURVES

K & S ENGINEERS, INC.

Figure 12

RESULTS

STANDARD PROCTOR DENSITY AND CBR TESTS

K & S Engineers, Inc.
9715 Kennedy Avenue - Highland IN 46322 (219) 924-5231

REPORT ON

MOISTURE – DENSITY RELATIONSHIP

CLIENT	PROJECT	
INDOT 120 S. Shortridge Road Indianapolis, IN 46219	Designation No. 9709060, Project No. IM-70-1, Pavement Replacement & Bridge Rehab. on I-70 over Wabash River and SR 63	FILE NO. 7956 DATE 1/11/06 REF. NO. 1

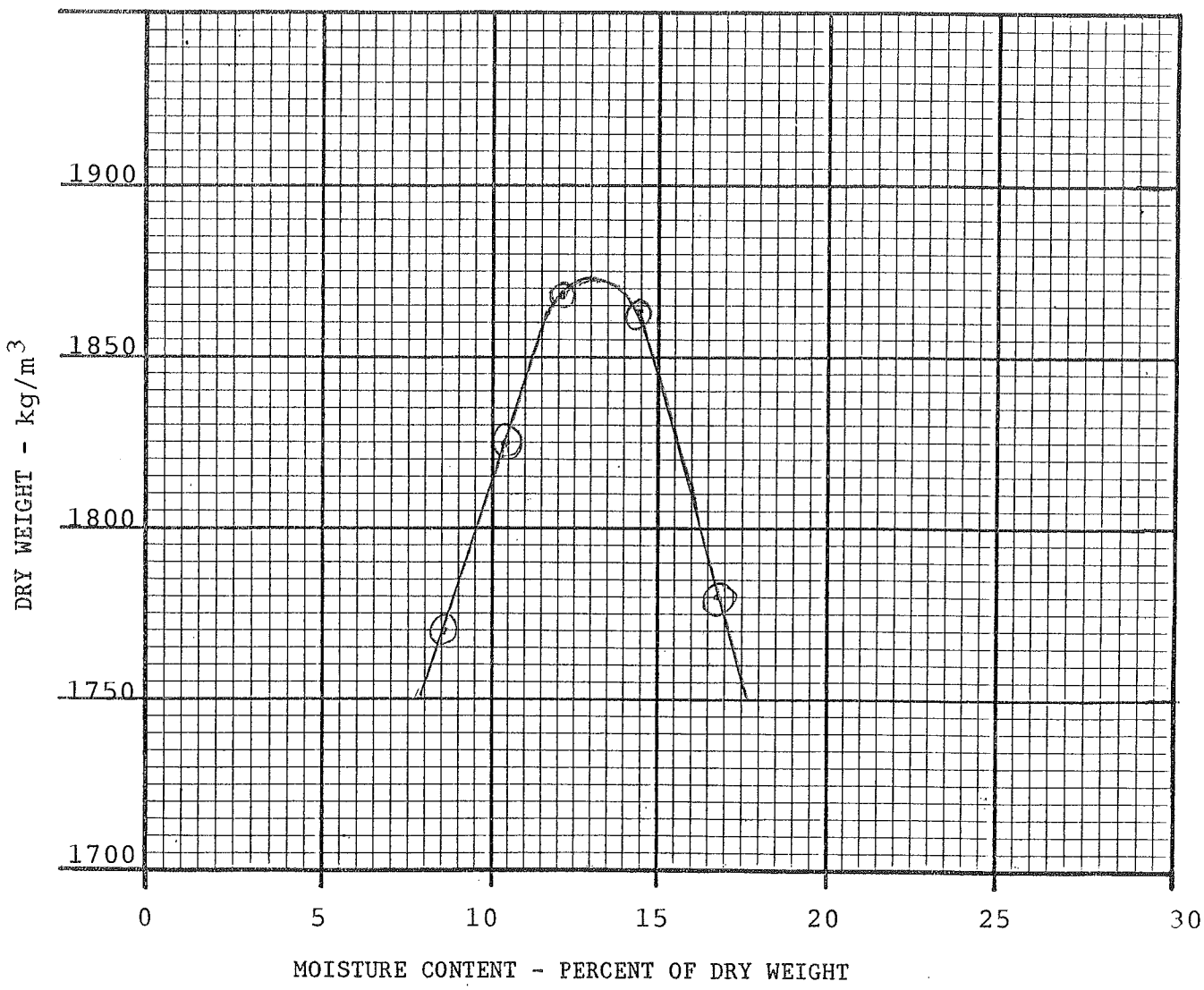
SOURCE OF MATERIAL Close to Boring RB-SG-2

CLASSIFICATION OF MATERIAL Loan A-4(2)

METHOD OF COMPACTION Standard Proctor ASTM D 698, Method A

HAMMER WEIGHT 5.5 LBS. FALL 12 IN NO. OF LAYERS 3

MOLD SIZE 4 INCHES MAX. DENSITY 1874 kg/m^3 (117) PCF OPT. MOISTURE 13 %



Pavement Replacement and Bridges Rehabilitation over Wabash River and SR 63
Crawfordsville District, Vigo County, Indiana
Designation No. 9709060
Bridge File No. I-70-5-4613B
Project No. IM-70-1
K & S Project No. 7956

SUMMARY OF CBR TEST RESULTS

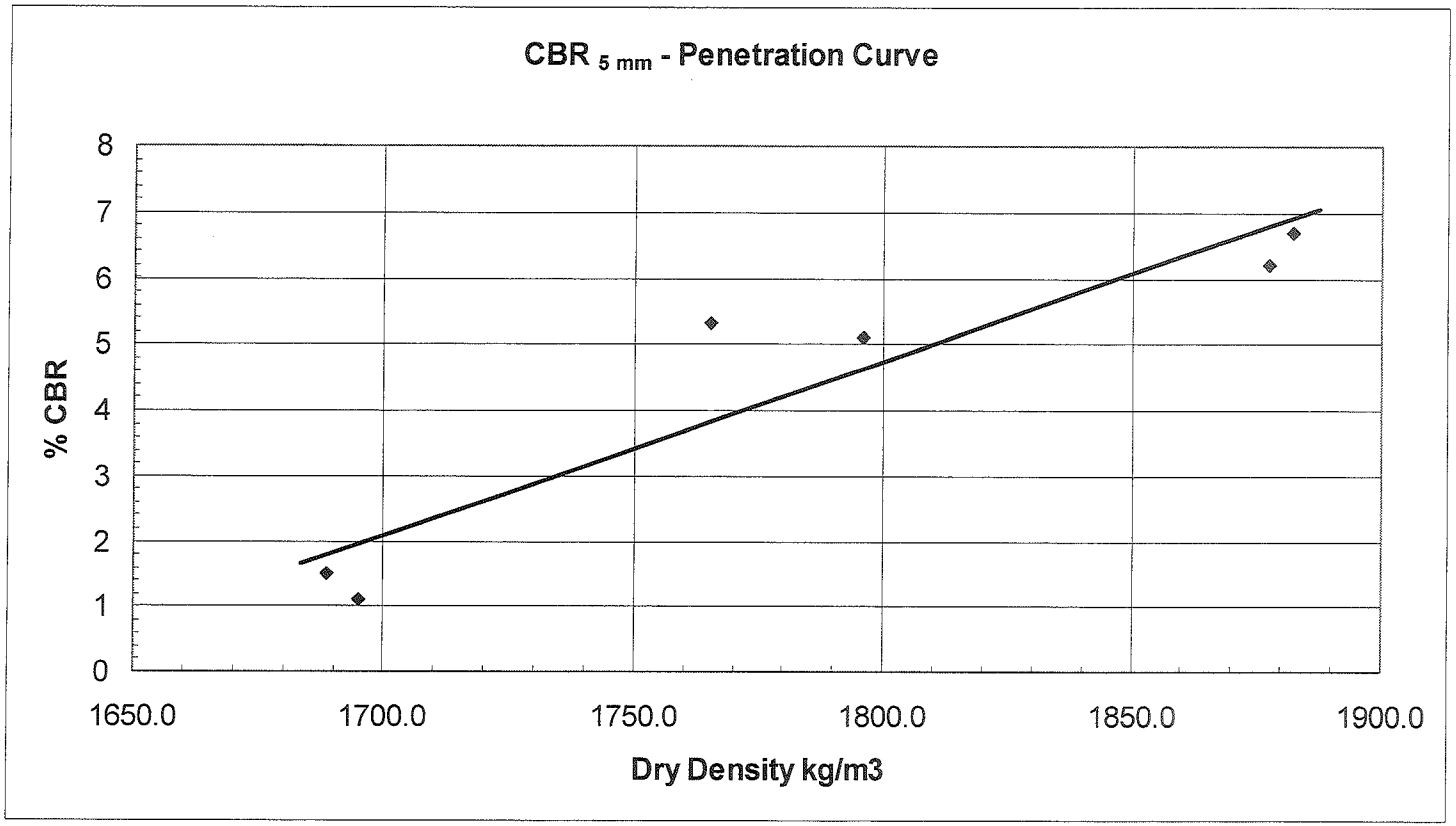
PROJECT NO:	IM-70-1
PROJECT:	Road Replacement on I-70
LOCATION:	Terre Haute, Vigo County, Indiana
CLIENT:	INDOT
K & S PROJECT NO.:	7956
BORING NO.:	RB-SG-2
SAMPLE DEPTH:	0.3 m (1.0 foot) to 1 m (3.0) feet
SOIL DESCRIPTION:	Loam A-4 (2)
MAXIMUM DRY DENSITY, kg/m³:	1874 (117 pcf)
OPT. MOISTURE CONTENT, %:	13 %
SURCHARGE WEIGHT, kg:	11.34

TEST DATA

Specimen Number	Initial Dry Density, kg/m³ (pcf)	% Max. Dry Density	Avg. Water Content, %		Swell %	CBR, % @ 2.5 mm Penetration	CBR, % @ 5.0 mm Penetration
			As Molded	After Soaking			
1	1688.5 (105.4)	90	13.1	16.5	0.40	1.6	1.5
2	1695.0 (105.8)	90	12.7	16.9	0.50	1.1	1.1
3	1765 (110.2)	94	13.1	16.6	0.5	4.8	5.3
4	1795.8 (112.1)	96	13.3	14.6	0.51	4.5	5.1
5	1877.5 (117.2)	100	12.7	14.6	0.36	5.8	6.2
6	1879.1 (117.3)	100	12.6	14.2	0.36	6.5	6.7

TEST RESULTS

Dry Density, kg/m³	Percent Maximum Dry Density	CBR, %	
		@ 2.5 mm Pen.	@ 5.0 mm Pen.
1743	93	3.0	3.2
1780.6	95	4.0	4.2
1818.1	97	4.8	5.3



K & S ENGINEERS, INC. SOIL TESTING AND FOUNDATION CONSULTANTS		Date: 1-27-06	**Plate 5**
Bridges Rehabilitation on I-70 over Wabash River and SR 63 **Designation No. 9709060** **Bridge File No. I-70-5-4613B, Project No. IM-70-1** **Crawfordsville District, Vigo County, Indiana**		Scale: As Shown	**File No. 7956**
		CBR $_{0.2"}$ Penetration Curve	

SUPPLEMENT TO REPORT

'DRIVEN' OUTPUT FOR BRIDGE PILE FOUNDATION
DESIGNATION NO. 9709060
PROJECT NO. IM-70-1
PAVEMENT REPLACEMENT AND BRIDGES
REHABILITATION OVER WABASH RIVER AND SR 63
CRAWFORDSVILLE DISTRICT, VIGO COUNTY, IN
K & S PROJECT NO. 7030

Indiana Department of Transportation
Division of Materials and Tests
120 S. Shortridge Road
Indianapolis, IN 46219-0389

K&S

RESULTS FROM 'DRIVEN'

BRIDGE ON I-70 OVER WABASH RIVER

RESULTS FROM DRIVEN

BORING TB-1

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename: C:\DRIVEN\7956\7956TB1.DVN
Project Name: I-70 & Wabash, TB-1
Project Date: 01/24/2006
Project Client: INDOT
Computed By: AC
Project Manager: AC

PILE INFORMATION

Pile Type: Pipe Pile - Closed End
Top of Pile: 4.50 ft
Diameter of Pile: 14.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	38.50 ft
	- Driving/Restrike	0.00 ft
	- Ultimate:	32.00 ft
Ultimate Considerations:	- Local Scour:	27.00 ft
	- Long Term Scour:	0.00 ft
	- Soft Soil:	0.00 ft

ULTIMATE PROFILE

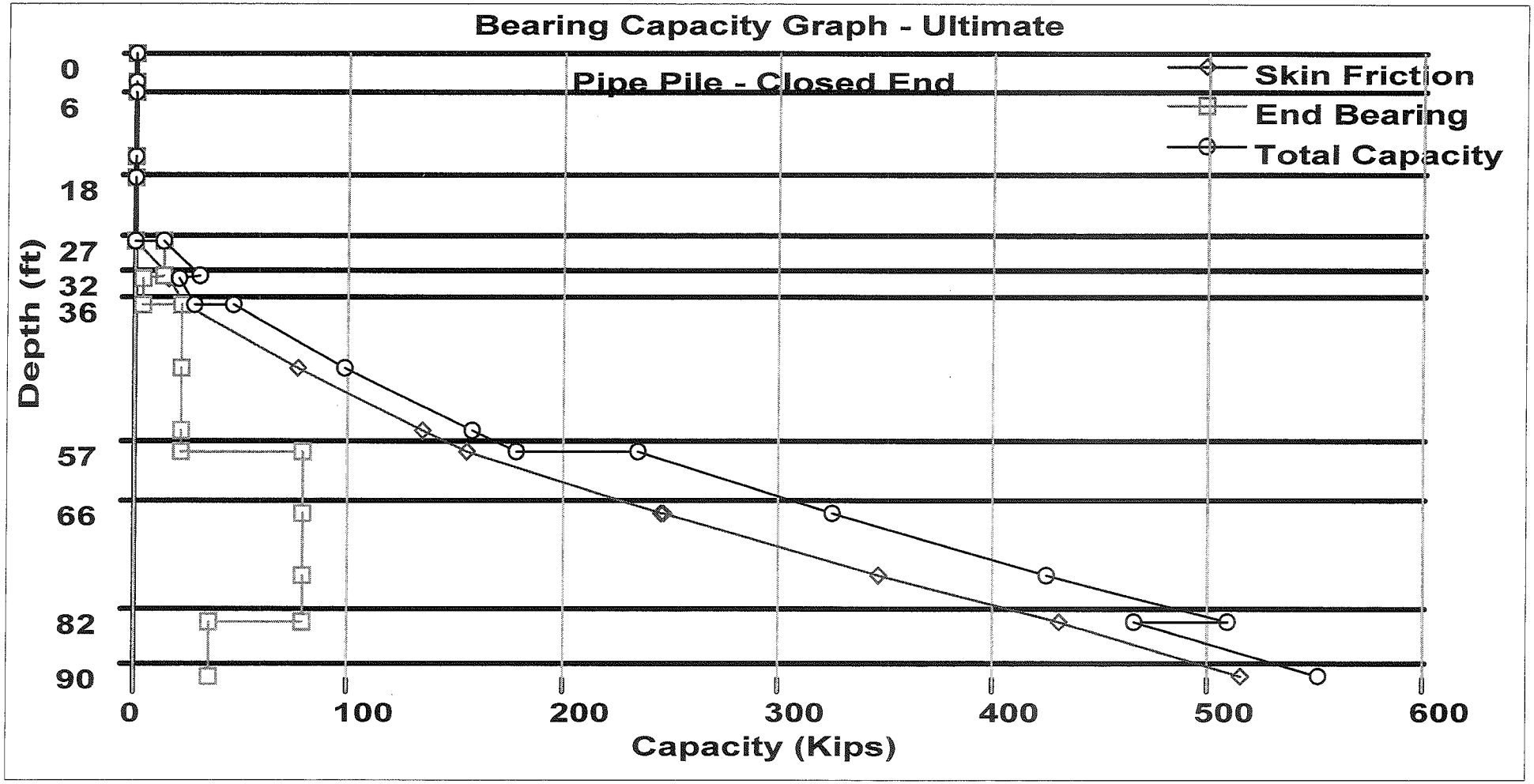
Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesive	6.00 ft	0.00%	115.00 pcf	500.00 psf	T-80 Same
2	Cohesionless	12.00 ft	0.00%	115.00 pcf	31.0/31.0	Nordlund
3	Cohesive	9.00 ft	0.00%	120.00 pcf	1500.00 psf	T-80 Sand
4	Cohesionless	5.00 ft	0.00%	110.00 pcf	27.0/27.0	Nordlund
5	Cohesive	4.00 ft	0.00%	110.00 pcf	500.00 psf	T-80 Sand
6	Cohesionless	21.00 ft	0.00%	115.00 pcf	31.0/31.0	Nordlund
7	Cohesionless	9.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund
8	Cohesionless	16.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund
9	Cohesionless	8.00 ft	0.00%	120.00 pcf	32.0/32.0	Nordlund

ULTIMATE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
4.49 ft	0.00 Kips	0.00 Kips	0.00 Kips
4.50 ft	0.00 Kips	0.00 Kips	0.00 Kips
5.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
6.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
15.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
17.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
18.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
26.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
26.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
27.00 ft	0.00 Kips	14.43 Kips	14.43 Kips
27.01 ft	0.03 Kips	14.24 Kips	14.27 Kips
31.99 ft	16.57 Kips	14.24 Kips	30.81 Kips
32.01 ft	16.63 Kips	4.81 Kips	21.44 Kips
35.99 ft	23.92 Kips	4.81 Kips	28.73 Kips
36.01 ft	23.99 Kips	22.09 Kips	46.08 Kips
45.01 ft	76.27 Kips	22.09 Kips	98.36 Kips
54.01 ft	134.55 Kips	22.09 Kips	156.64 Kips
57' 56.99 ft	155.17 Kips	22.09 Kips	177.26 Kips ← 200 KIPS (57')
57.01 ft	155.33 Kips	78.59 Kips	233.93 Kips
65.99 ft	245.61 Kips	78.59 Kips	324.20 Kips
66.01 ft	245.82 Kips	78.59 Kips	324.42 Kips
75.01 ft	345.97 Kips	78.59 Kips	424.57 Kips
81.99 ft	430.30 Kips	78.59 Kips	508.89 Kips
82.01 ft	430.53 Kips	35.28 Kips	465.80 Kips
89.99 ft	515.59 Kips	35.28 Kips	550.87 Kips

Ground Elev. 482.8 ft (147.16 m)

52.5' { Pile Top 478.34 ft (145.8 m)
Pile Tip 425.8 ft (129.8 m)


Bearing Capacity Graph - Ultimate
Pipe Pile - Closed End
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
6
18
27
32
36
57
66
82
90
0
100
200
300
400
500
600
Capacity (Kips)

RESULTS FROM DRIVEN

BORING TB-2

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename: C:\DRIVEN\7956\7956TB2.DVN
Project Name: I-70 & Wabash, TB-2
Project Date: 01/27/2006
Project Client: INDOT
Computed By: AC
Project Manager: AC

PILE INFORMATION

Pile Type: Pipe Pile - Closed End
Top of Pile: 16.00 ft
Diameter of Pile: 14.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	6.00 ft
	- Driving/Restrike	0.00 ft
	- Ultimate:	6.00 ft
Ultimate Considerations:	- Local Scour:	0.00 ft
	- Long Term Scour:	23.00 ft
	- Soft Soil:	0.00 ft

ULTIMATE PROFILE

Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesive	3.50 ft	0.00%	100.00 pcf	200.00 psf	T-80 Clay
2	Cohesionless	14.50 ft	0.00%	105.00 pcf	27.0/27.0	Nordlund
3	Cohesionless	4.00 ft	0.00%	105.00 pcf	27.0/27.0	Nordlund
4	Cohesionless	20.00 ft	0.00%	115.00 pcf	31.0/31.0	Nordlund
5	Cohesionless	11.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund
6	Cohesionless	5.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund
7	Cohesionless	27.00 ft	0.00%	120.00 pcf	32.0/32.0	Nordlund

ULTIMATE - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
3.49 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
3.51 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
5.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
6.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
15.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
15.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
16.00 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
17.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
18.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
21.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
22.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
22.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
23.00 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
31.01 ft	Cohesionless	210.66 psf	20.66	N/A	2.37 Kips
40.01 ft	Cohesionless	447.36 psf	20.66	N/A	10.71 Kips
41.99 ft	Cohesionless	499.44 psf	20.66	N/A	13.35 Kips
42.01 ft	Cohesionless	999.71 psf	22.66	N/A	13.38 Kips
51.01 ft	Cohesionless	1281.41 psf	22.66	N/A	35.36 Kips
52.99 ft	Cohesionless	1343.39 psf	22.66	N/A	41.49 Kips
53.01 ft	Cohesionless	1688.31 psf	22.66	N/A	41.55 Kips
57.99 ft	Cohesionless	1844.19 psf	22.66	N/A	59.06 Kips
58.01 ft	Cohesionless	2001.29 psf	21.33	N/A	59.12 Kips
67.01 ft	Cohesionless	2260.49 psf	21.33	N/A	91.07 Kips
76.01 ft	Cohesionless	2519.69 psf	21.33	N/A	130.33 Kips
84.99 ft	Cohesionless	2778.31 psf	21.33	N/A	176.81 Kips

ULTIMATE - END BEARING

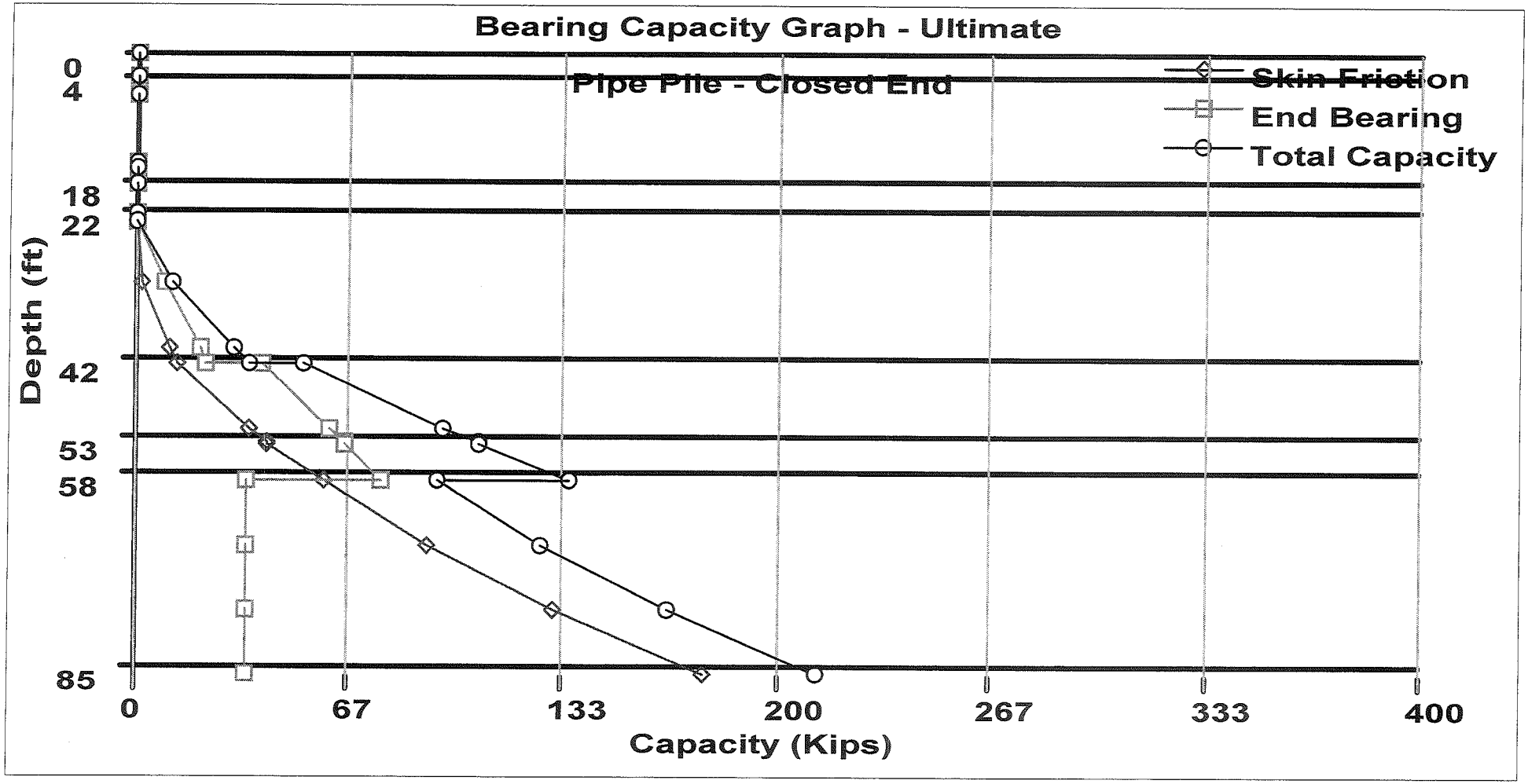
Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
3.49 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
3.51 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
5.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
6.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
15.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
15.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
16.00 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
17.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
18.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
21.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
22.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
22.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
23.00 ft	Cohesionless	0.00 psf	35.20	22.09 Kips	0.00 Kips
31.01 ft	Cohesionless	421.33 psf	35.20	22.09 Kips	9.56 Kips
40.01 ft	Cohesionless	894.73 psf	35.20	22.09 Kips	20.30 Kips
41.99 ft	Cohesionless	998.87 psf	35.20	22.09 Kips	22.09 Kips
42.01 ft	Cohesionless	1000.03 psf	55.60	78.59 Kips	39.40 Kips
51.01 ft	Cohesionless	1563.43 psf	55.60	78.59 Kips	60.89 Kips
52.99 ft	Cohesionless	1687.37 psf	55.60	78.59 Kips	65.40 Kips
53.01 ft	Cohesionless	1688.63 psf	55.60	78.59 Kips	65.44 Kips
57.99 ft	Cohesionless	2000.37 psf	55.60	78.59 Kips	76.57 Kips
58.01 ft	Cohesionless	2001.58 psf	40.40	35.28 Kips	35.28 Kips
67.01 ft	Cohesionless	2519.98 psf	40.40	35.28 Kips	35.28 Kips
76.01 ft	Cohesionless	3038.38 psf	40.40	35.28 Kips	35.28 Kips
84.99 ft	Cohesionless	3555.62 psf	40.40	35.28 Kips	35.28 Kips

ULTIMATE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
3.49 ft	0.00 Kips	0.00 Kips	0.00 Kips
3.51 ft	0.00 Kips	0.00 Kips	0.00 Kips
5.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
6.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
15.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
15.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
16.00 ft	0.00 Kips	0.00 Kips	0.00 Kips
17.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
18.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
21.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
22.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
22.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
23.00 ft	0.00 Kips	0.00 Kips	0.00 Kips
31.01 ft	2.37 Kips	9.56 Kips	11.93 Kips
40.01 ft	10.71 Kips	20.30 Kips	31.00 Kips
41.99 ft	13.35 Kips	22.09 Kips	35.44 Kips
42.01 ft	13.38 Kips	39.40 Kips	52.78 Kips
51.01 ft	35.36 Kips	60.89 Kips	96.25 Kips
52.99 ft	41.49 Kips	65.40 Kips	106.89 Kips
53.01 ft	41.55 Kips	65.44 Kips	107.00 Kips
57.99 ft	59.06 Kips	76.57 Kips	135.63 Kips
58.01 ft	59.12 Kips	35.28 Kips	94.40 Kips
67.01 ft	91.07 Kips	35.28 Kips	126.34 Kips
8.98' 76.01 ft	130.33 Kips	35.28 Kips	165.61 Kips ← 200 kips. (82.6')
84.99 ft	176.81 Kips	35.28 Kips	212.09 Kips

Ground Elev. 455.3 ft (138.76 m)

67' { pile top 439.6 ft (134.0 m)
pile tip 372.7 ft (113.6 m)


Bearing Capacity Graph - Ultimate
Pipe Pile - Closed End
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
4
18
22
42
53
58
85
0
67
133
200
267
333
400
Capacity (Kips)

RESULTS FROM DRIVEN

BORING TB-3

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename: C:\DRIVEN\7956\7956TB3.DVN
Project Name: Bridg I-70& Wabash, TB-3
Project Date: 01/25/2006
Project Client: INDOT
Computed By: AC
Project Manager: AC

PILE INFORMATION

Pile Type: Pipe Pile - Closed End
Top of Pile: 18.40 ft
Diameter of Pile: 14.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	5.50 ft
	- Driving/Restrike	0.00 ft
	- Ultimate:	5.50 ft
Ultimate Considerations:	- Local Scour:	0.00 ft
	- Long Term Scour:	21.00 ft
	- Soft Soil:	0.00 ft

ULTIMATE PROFILE

Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesive	3.50 ft	0.00%	100.00 pcf	100.00 psf	T-80 Same
2	Cohesionless	18.50 ft	0.00%	105.00 pcf	27.0/27.0	Nordlund
3	Cohesionless	20.00 ft	0.00%	115.00 pcf	31.0/31.0	Nordlund
4	Cohesionless	4.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund
5	Cohesionless	10.00 ft	0.00%	115.00 pcf	31.0/31.0	Nordlund
6	Cohesionless	34.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund

ULTIMATE - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
3.49 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
3.51 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
5.49 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
5.51 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
14.51 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
18.39 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
18.40 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
20.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
21.00 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
21.99 ft	Cohesionless	21.09 psf	18.00	N/A	0.02 Kips
22.01 ft	Cohesionless	42.86 psf	20.66	N/A	0.02 Kips
31.01 ft	Cohesionless	279.56 psf	20.66	N/A	3.57 Kips
40.01 ft	Cohesionless	516.26 psf	20.66	N/A	13.11 Kips
41.99 ft	Cohesionless	568.34 psf	20.66	N/A	16.01 Kips
42.01 ft	Cohesionless	1094.91 psf	22.66	N/A	16.05 Kips
45.99 ft	Cohesionless	1219.49 psf	22.66	N/A	25.30 Kips
46.01 ft	Cohesionless	1345.26 psf	20.66	N/A	25.34 Kips
55.01 ft	Cohesionless	1581.96 psf	20.66	N/A	45.38 Kips
55.99 ft	Cohesionless	1607.74 psf	20.66	N/A	47.92 Kips
56.01 ft	Cohesionless	1871.31 psf	22.66	N/A	47.99 Kips
65.01 ft	Cohesionless	2153.01 psf	22.66	N/A	84.91 Kips
74.01 ft	Cohesionless	2434.71 psf	22.66	N/A	131.49 Kips
83.01 ft	Cohesionless	2716.41 psf	22.66	N/A	187.74 Kips
89.99 ft	Cohesionless	2934.89 psf	22.66	N/A	238.01 Kips

ULTIMATE - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
3.49 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
3.51 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
5.49 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
5.51 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
14.51 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
18.39 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
18.40 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
20.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
21.00 ft	Cohesionless	0.00 psf	19.80	14.24 Kips	0.00 Kips
21.99 ft	Cohesionless	42.17 psf	19.80	14.24 Kips	0.46 Kips
22.01 ft	Cohesionless	43.13 psf	35.20	22.09 Kips	0.98 Kips
31.01 ft	Cohesionless	516.53 psf	35.20	22.09 Kips	11.72 Kips
40.01 ft	Cohesionless	989.93 psf	35.20	22.09 Kips	22.09 Kips
41.99 ft	Cohesionless	1094.07 psf	35.20	22.09 Kips	22.09 Kips
42.01 ft	Cohesionless	1095.23 psf	55.60	78.59 Kips	43.15 Kips
45.99 ft	Cohesionless	1344.37 psf	55.60	78.59 Kips	52.75 Kips
46.01 ft	Cohesionless	1345.53 psf	35.20	22.09 Kips	22.09 Kips
55.01 ft	Cohesionless	1818.93 psf	35.20	22.09 Kips	22.09 Kips
55.99 ft	Cohesionless	1870.47 psf	35.20	22.09 Kips	22.09 Kips
56.01 ft	Cohesionless	1871.63 psf	55.60	78.59 Kips	71.64 Kips
65.01 ft	Cohesionless	2435.03 psf	55.60	78.59 Kips	78.59 Kips
74.01 ft	Cohesionless	2998.43 psf	55.60	78.59 Kips	78.59 Kips
83.01 ft	Cohesionless	3561.83 psf	55.60	78.59 Kips	78.59 Kips
89.99 ft	Cohesionless	3998.77 psf	55.60	78.59 Kips	78.59 Kips

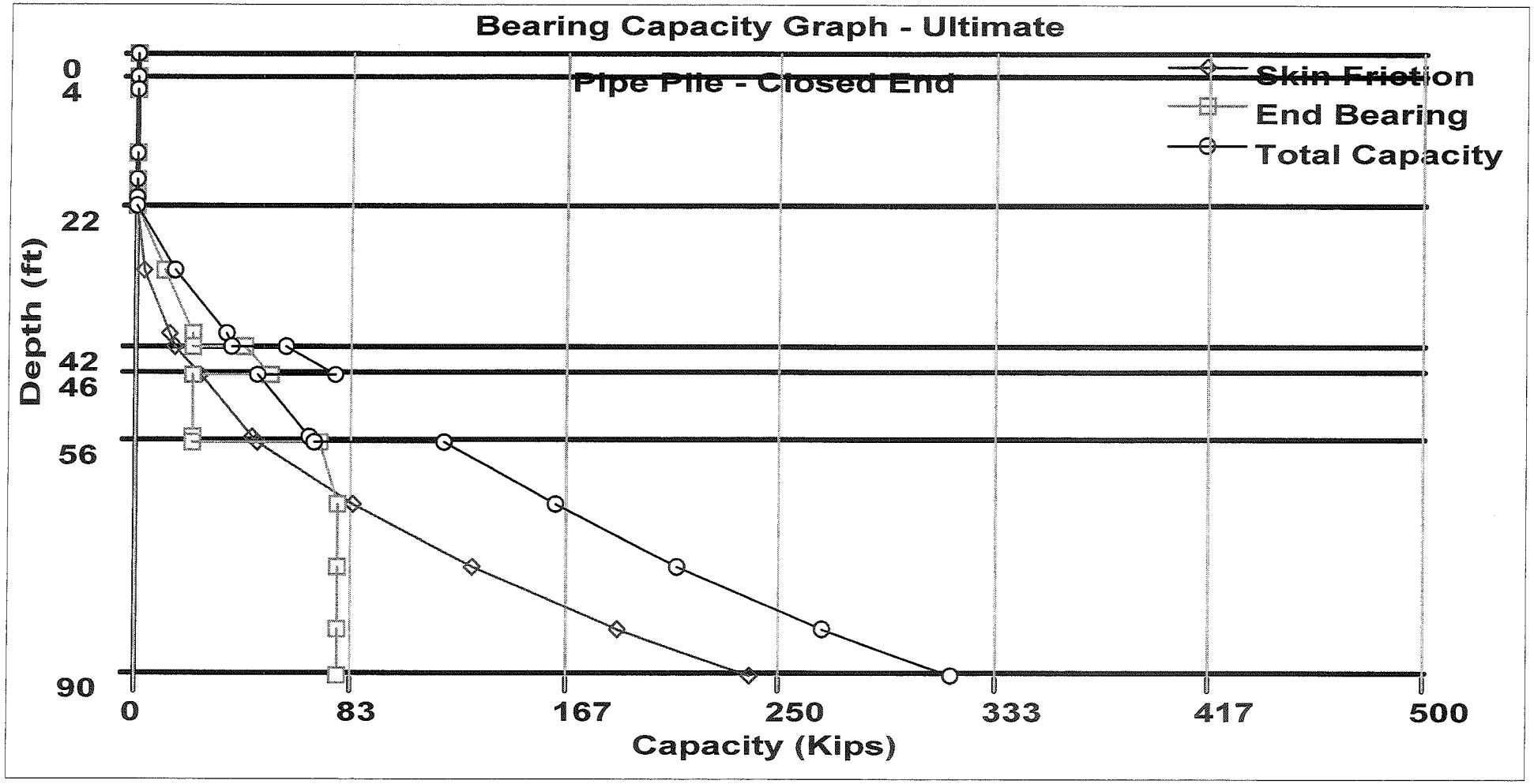
ULTIMATE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
3.49 ft	0.00 Kips	0.00 Kips	0.00 Kips
3.51 ft	0.00 Kips	0.00 Kips	0.00 Kips
5.49 ft	0.00 Kips	0.00 Kips	0.00 Kips
5.51 ft	0.00 Kips	0.00 Kips	0.00 Kips
14.51 ft	0.00 Kips	0.00 Kips	0.00 Kips
18.39 ft	0.00 Kips	0.00 Kips	0.00 Kips
18.40 ft	0.00 Kips	0.00 Kips	0.00 Kips
20.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
21.00 ft	0.00 Kips	0.00 Kips	0.00 Kips
21.99 ft	0.02 Kips	0.46 Kips	0.48 Kips
22.01 ft	0.02 Kips	0.98 Kips	1.00 Kips
31.01 ft	3.57 Kips	11.72 Kips	15.28 Kips
40.01 ft	13.11 Kips	22.09 Kips	35.20 Kips
41.99 ft	16.01 Kips	22.09 Kips	38.10 Kips
42.01 ft	16.05 Kips	43.15 Kips	59.19 Kips
45.99 ft	25.30 Kips	52.75 Kips	78.04 Kips
46.01 ft	25.34 Kips	22.09 Kips	47.43 Kips
55.01 ft	45.38 Kips	22.09 Kips	67.47 Kips
55.99 ft	47.92 Kips	22.09 Kips	70.01 Kips
56.01 ft	47.99 Kips	71.64 Kips	119.63 Kips
9 65.01 ft	84.91 Kips	78.59 Kips	163.50 Kips ← 200 kip (72.1')
74.01 ft	131.49 Kips	78.59 Kips	210.09 Kips
83.01 ft	187.74 Kips	78.59 Kips	266.33 Kips
89.99 ft	238.01 Kips	78.59 Kips	316.60 Kips

TB-3

Ground Elev. 453.6 ft (138.26 m)

53.7' { pile TOP 435.23 ft (132.7 m)
pile TIP 381.5 ft (116.3 m)


Bearing Capacity Graph - Ultimate
Pipe Pile - Closed End
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
4
22
42
46
56
90
0
83
167
250
333
417
500
Capacity (Kips)

RESULTS FROM DRIVEN

BORING TB-4

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename: C:\DRIVEN\7956\7956TB4.DVN
Project Name: Bridge I-70&Wabash, TB-4
Project Date: 01/25/2006
Project Client: INDOT
Computed By: AC
Project Manager: AC

PILE INFORMATION

Pile Type: Pipe Pile - Closed End
Top of Pile: 25.00 ft
Diameter of Pile: 14.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	7.00 ft
	- Driving/Restrike	0.00 ft
	- Ultimate:	5.00 ft
Ultimate Considerations:	- Local Scour:	0.00 ft
	- Long Term Scour:	23.00 ft
	- Soft Soil:	0.00 ft

ULTIMATE PROFILE

Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesive	6.00 ft	0.00%	250.00 pcf	200.00 psf	T-80 Clay
2	Cohesionless	4.00 ft	0.00%	105.00 pcf	27.0/27.0	Nordlund
3	Cohesive	9.00 ft	0.00%	100.00 pcf	100.00 psf	T-80 Sand
4	Cohesionless	9.00 ft	0.00%	105.00 pcf	27.0/27.0	Nordlund
5	Cohesionless	14.00 ft	0.00%	115.00 pcf	31.0/31.0	Nordlund
6	Cohesionless	16.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund
7	Cohesionless	32.00 ft	0.00%	115.00 pcf	31.0/31.0	Nordlund

ULTIMATE - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
5.99 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
6.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
9.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
10.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
18.99 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
19.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
24.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
25.00 ft	Cohesionless	85.20 psf	18.00	N/A	0.00 Kips
22.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
23.00 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
27.99 ft	Cohesionless	148.89 psf	18.00	N/A	0.43 Kips
28.01 ft	Cohesionless	213.26 psf	20.66	N/A	0.44 Kips
37.01 ft	Cohesionless	449.96 psf	20.66	N/A	6.14 Kips
41.99 ft	Cohesionless	580.94 psf	20.66	N/A	11.87 Kips
42.01 ft	Cohesionless	949.71 psf	22.66	N/A	11.90 Kips
51.01 ft	Cohesionless	1231.41 psf	22.66	N/A	33.02 Kips
57.99 ft	Cohesionless	1449.89 psf	22.66	N/A	56.06 Kips
58.01 ft	Cohesionless	1951.26 psf	20.66	N/A	56.12 Kips
67.01 ft	Cohesionless	2187.96 psf	20.66	N/A	83.84 Kips
76.01 ft	Cohesionless	2424.66 psf	20.66	N/A	117.55 Kips
85.01 ft	Cohesionless	2661.36 psf	20.66	N/A	157.26 Kips
89.99 ft	Cohesionless	2792.34 psf	20.66	N/A	181.80 Kips

ULTIMATE - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
5.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
6.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
9.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
10.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
18.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
19.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
24.99 ft	Cohesionless	0.00 psf	19.80	14.24 Kips	0.00 Kips
25.00 ft	Cohesionless	85.20 psf	19.80	14.24 Kips	0.93 Kips
22.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
23.00 ft	Cohesionless	0.00 psf	19.80	14.24 Kips	0.00 Kips
27.99 ft	Cohesionless	212.57 psf	19.80	14.24 Kips	2.31 Kips
28.01 ft	Cohesionless	213.53 psf	35.20	22.09 Kips	4.84 Kips
37.01 ft	Cohesionless	686.93 psf	35.20	22.09 Kips	15.58 Kips
41.99 ft	Cohesionless	948.87 psf	35.20	22.09 Kips	21.52 Kips
42.01 ft	Cohesionless	950.03 psf	55.60	78.59 Kips	37.43 Kips
51.01 ft	Cohesionless	1513.43 psf	55.60	78.59 Kips	58.94 Kips
57.99 ft	Cohesionless	1950.37 psf	55.60	78.59 Kips	74.66 Kips
58.01 ft	Cohesionless	1951.53 psf	35.20	22.09 Kips	22.09 Kips
67.01 ft	Cohesionless	2424.93 psf	35.20	22.09 Kips	22.09 Kips
76.01 ft	Cohesionless	2898.33 psf	35.20	22.09 Kips	22.09 Kips
85.01 ft	Cohesionless	3371.73 psf	35.20	22.09 Kips	22.09 Kips
89.99 ft	Cohesionless	3633.67 psf	35.20	22.09 Kips	22.09 Kips

ULTIMATE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
5.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
6.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
9.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
10.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
18.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
19.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
24.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
25.00 ft	0.00 Kips	0.93 Kips	0.93 Kips
22.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
23.00 ft	0.00 Kips	0.00 Kips	0.00 Kips
27.99 ft	0.43 Kips	2.31 Kips	2.74 Kips
28.01 ft	0.44 Kips	4.84 Kips	5.28 Kips
37.01 ft	6.14 Kips	15.58 Kips	21.72 Kips
41.99 ft	11.87 Kips	21.52 Kips	33.39 Kips
42.01 ft	11.90 Kips	37.43 Kips	49.33 Kips
51.01 ft	33.02 Kips	58.94 Kips	91.97 Kips
57.99 ft	56.06 Kips	74.66 Kips	130.71 Kips
58.01 ft	56.12 Kips	22.09 Kips	78.21 Kips
67.01 ft	83.84 Kips	22.09 Kips	105.93 Kips
76.01 ft	117.55 Kips	22.09 Kips	139.64 Kips
4.98 85.01 ft	157.26 Kips	22.09 Kips	179.35 Kips ← 200kip (89.2')
89.99 ft	181.80 Kips	22.09 Kips	203.90 Kips

Ground Elev 455.3 ft (138.76m)

65' { Pile Top 430.59ft (131.28m)
Pile Tip 366.1 ft (111.6m)

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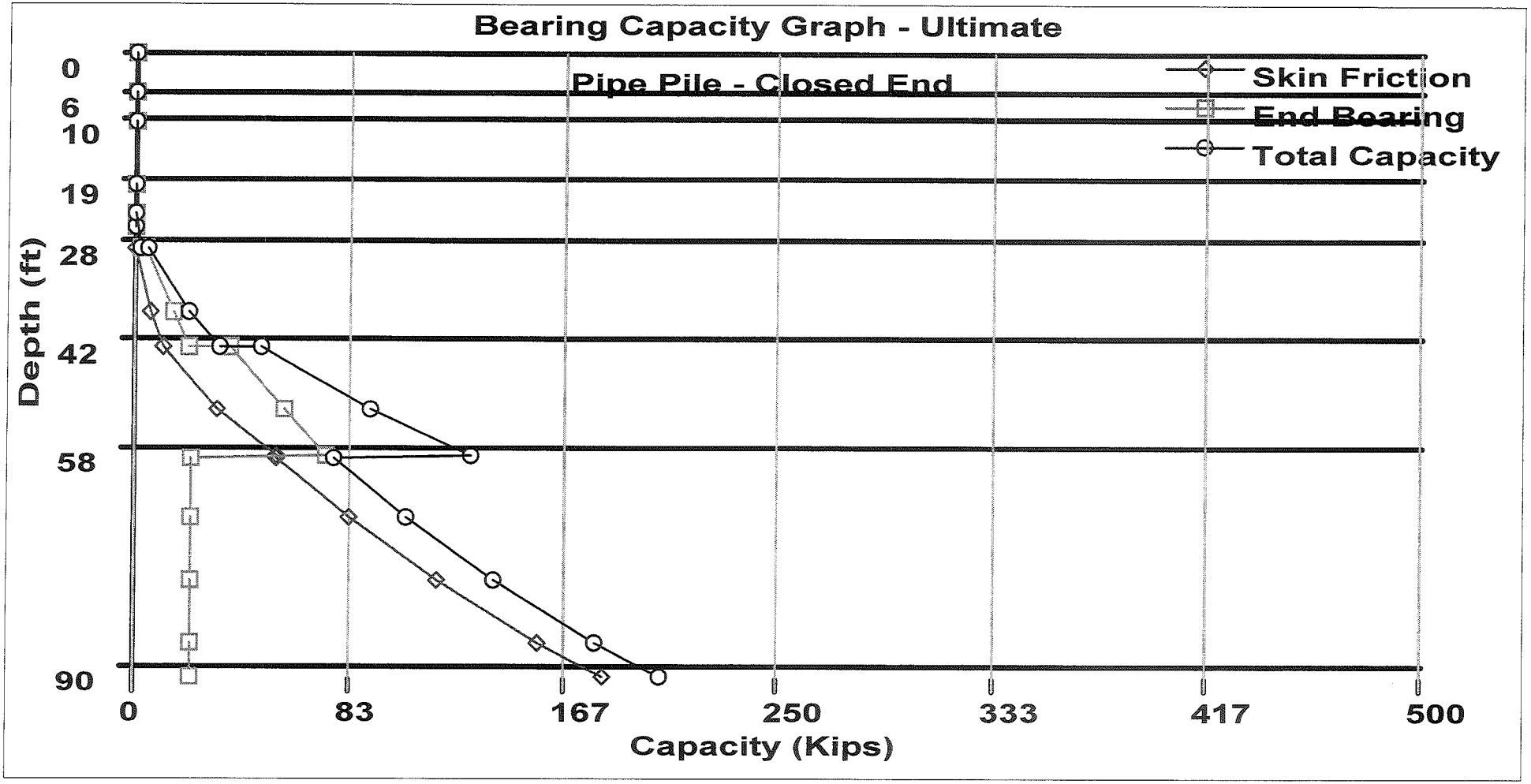


RESULTS FROM DRIVEN

BORING TB-5

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename: C:\DRIVEN\7956\7956TB5.DVN
Project Name: Bridgel-70&Wabash, TB-5
Project Date: 01/25/2006
Project Client: INDOT
Computed By: AC
Project Manager: AC

PILE INFORMATION

Pile Type: Pipe Pile - Closed End
Top of Pile: 25.00 ft
Diameter of Pile: 14.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	16.00 ft
	- Driving/Restrike	0.00 ft
	- Ultimate:	5.00 ft
Ultimate Considerations:	- Local Scour:	0.00 ft
	- Long Term Scour:	27.50 ft
	- Soft Soil:	0.00 ft

ULTIMATE PROFILE

Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesive	8.00 ft	0.00%	100.00 pcf	250.00 psf	T-80 Clay
2	Cohesionless	3.00 ft	0.00%	115.00 pcf	31.0/31.0	Nordlund
3	Cohesive	2.00 ft	0.00%	100.00 pcf	250.00 psf	T-80 Sand
4	Cohesionless	3.00 ft	0.00%	115.00 pcf	31.0/31.0	Nordlund
5	Cohesionless	10.00 ft	0.00%	105.00 pcf	27.0/27.0	Nordlund
6	Cohesionless	37.00 ft	0.00%	115.00 pcf	31.0/31.0	Nordlund
7	Cohesionless	27.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund

ULTIMATE - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
7.99 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
8.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
10.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
11.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
12.99 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
13.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
15.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
16.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
24.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
25.00 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
25.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
25.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
26.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
27.49 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
27.50 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
35.01 ft	Cohesionless	197.51 psf	20.66	N/A	2.09 Kips
44.01 ft	Cohesionless	434.21 psf	20.66	N/A	10.09 Kips
53.01 ft	Cohesionless	670.91 psf	20.66	N/A	24.09 Kips
62.01 ft	Cohesionless	907.61 psf	20.66	N/A	44.08 Kips
62.99 ft	Cohesionless	933.39 psf	20.66	N/A	46.62 Kips
63.01 ft	Cohesionless	1867.61 psf	22.66	N/A	46.68 Kips
72.01 ft	Cohesionless	2149.31 psf	22.66	N/A	83.54 Kips
81.01 ft	Cohesionless	2431.01 psf	22.66	N/A	130.06 Kips
89.99 ft	Cohesionless	2712.09 psf	22.66	N/A	186.11 Kips

ULTIMATE - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
7.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
8.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
10.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
11.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
12.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
13.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
15.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
16.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
24.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
25.00 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
25.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
25.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
26.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
27.49 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
27.50 ft	Cohesionless	0.00 psf	35.20	22.09 Kips	0.00 Kips
35.01 ft	Cohesionless	395.03 psf	35.20	22.09 Kips	8.96 Kips
44.01 ft	Cohesionless	868.43 psf	35.20	22.09 Kips	19.70 Kips
53.01 ft	Cohesionless	1341.83 psf	35.20	22.09 Kips	22.09 Kips
62.01 ft	Cohesionless	1815.23 psf	35.20	22.09 Kips	22.09 Kips
62.99 ft	Cohesionless	1866.77 psf	35.20	22.09 Kips	22.09 Kips
63.01 ft	Cohesionless	1867.93 psf	55.60	78.59 Kips	71.45 Kips
72.01 ft	Cohesionless	2431.33 psf	55.60	78.59 Kips	78.59 Kips
81.01 ft	Cohesionless	2994.73 psf	55.60	78.59 Kips	78.59 Kips
89.99 ft	Cohesionless	3556.87 psf	55.60	78.59 Kips	78.59 Kips

ULTIMATE - SUMMARY OF CAPACITIES

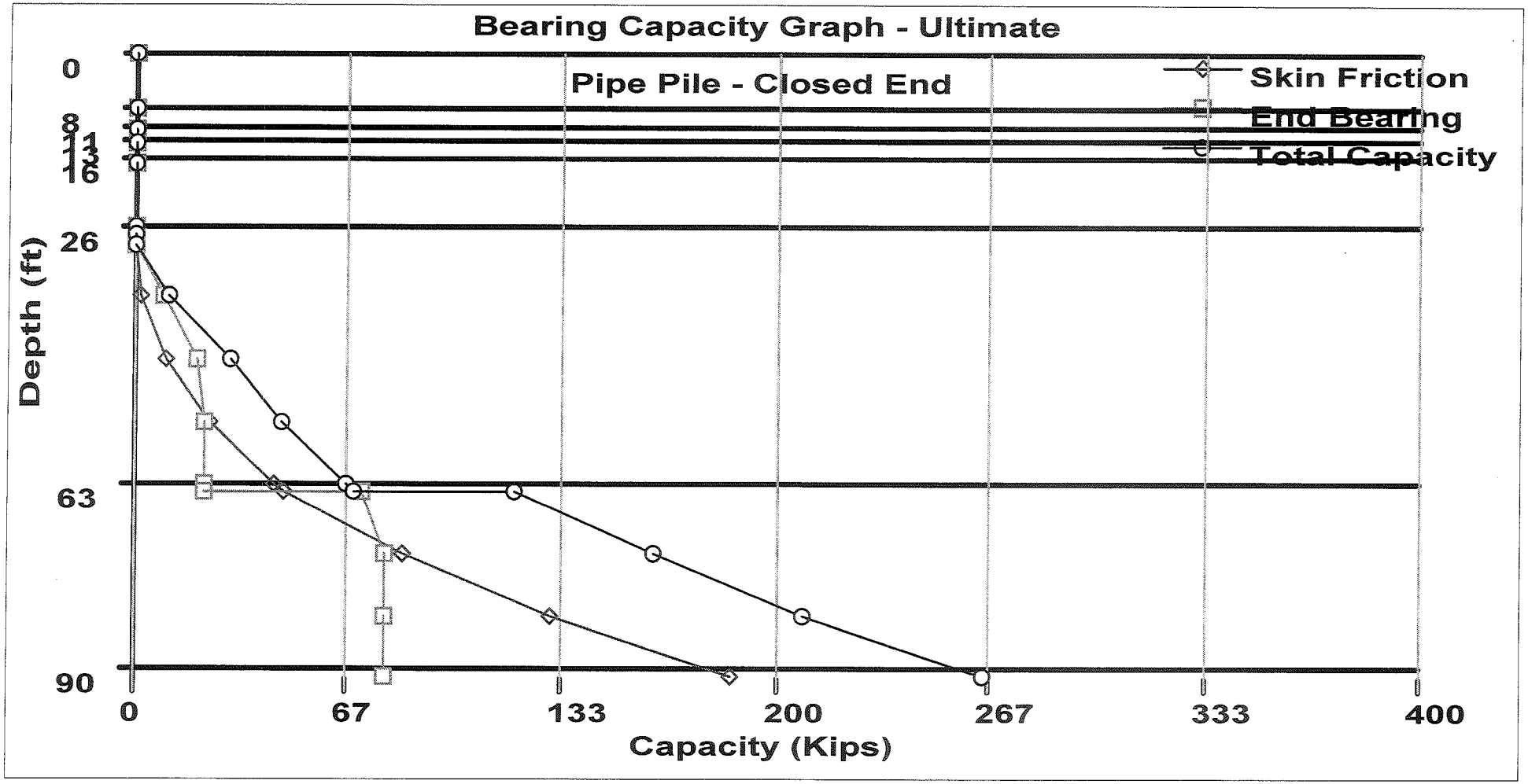
Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
7.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
8.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
10.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
11.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
12.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
13.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
15.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
16.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
24.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
25.00 ft	0.00 Kips	0.00 Kips	0.00 Kips
25.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
25.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
26.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
27.49 ft	0.00 Kips	0.00 Kips	0.00 Kips
27.50 ft	0.00 Kips	0.00 Kips	0.00 Kips
35.01 ft	2.09 Kips	8.96 Kips	11.05 Kips
44.01 ft	10.09 Kips	19.70 Kips	29.79 Kips
53.01 ft	24.09 Kips	22.09 Kips	46.18 Kips
62.01 ft	44.08 Kips	22.09 Kips	66.17 Kips
62.99 ft	46.62 Kips	22.09 Kips	68.71 Kips
63.01 ft	46.68 Kips	71.45 Kips	118.13 Kips
9 } 72.01 ft	83.54 Kips	78.59 Kips	162.13 Kips ← 200 kips (79.5')
81.01 ft	130.06 Kips	78.59 Kips	208.66 Kips
89.99 ft	186.11 Kips	78.59 Kips	264.70 Kips

73-5

Ground Elev. 459.9 ft (140.17m)

Pile Top 434.63 ft (132.5m)

Pile Tip 380.4 ft (115.9m)


Bearing Capacity Graph - Ultimate
Pipe Pile - Closed End
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
8
11
13
16
26
63
90
0
67
133
200
267
333
400
Capacity (Kips)

RESULTS FROM DRIVEN

BORING TB-6

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename: C:\DRIVEN\7956\7956TB6.DVN
Project Name: Bridgel-70&Wabash, TB-6
Project Date: 01/25/2006
Project Client: INDOT
Computed By: AC
Project Manager: AC

PILE INFORMATION

Pile Type: Pipe Pile - Closed End
Top of Pile: 26.00 ft
Diameter of Pile: 14.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	21.00 ft
	- Driving/Restrike	0.00 ft
	- Ultimate:	4.00 ft
Ultimate Considerations:	- Local Scour:	0.00 ft
	- Long Term Scour:	28.00 ft
	- Soft Soil:	0.00 ft

ULTIMATE PROFILE

Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesionless	5.00 ft	0.00%	105.00 pcf	27.0/27.0	Nordlund
2	Cohesive	12.00 ft	0.00%	100.00 pcf	200.00 psf	T-80 Sand
3	Cohesionless	11.00 ft	0.00%	105.00 pcf	27.0/27.0	Nordlund
4	Cohesionless	5.00 ft	0.00%	115.00 pcf	31.0/31.0	Nordlund
5	Cohesionless	3.00 ft	0.00%	105.00 pcf	27.0/27.0	Nordlund
6	Cohesionless	50.00 ft	0.00%	120.00 pcf	32.0/32.0	Nordlund
7	Cohesionless	4.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund

ULTIMATE - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
3.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
4.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
4.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
5.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
14.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
16.99 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
17.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
25.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
26.00 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
26.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
27.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
27.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
28.00 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
28.01 ft	Cohesionless	0.26 psf	20.66	N/A	0.00 Kips
32.99 ft	Cohesionless	131.24 psf	20.66	N/A	0.92 Kips
33.01 ft	Cohesionless	263.21 psf	18.00	N/A	0.93 Kips
35.99 ft	Cohesionless	326.69 psf	18.00	N/A	1.87 Kips
36.01 ft	Cohesionless	391.09 psf	21.33	N/A	1.88 Kips
45.01 ft	Cohesionless	650.29 psf	21.33	N/A	11.07 Kips
54.01 ft	Cohesionless	909.49 psf	21.33	N/A	27.59 Kips
63.01 ft	Cohesionless	1168.69 psf	21.33	N/A	51.43 Kips
72.01 ft	Cohesionless	1427.89 psf	21.33	N/A	82.60 Kips
81.01 ft	Cohesionless	1687.09 psf	21.33	N/A	121.09 Kips
85.99 ft	Cohesionless	1830.51 psf	21.33	N/A	145.53 Kips
86.01 ft	Cohesionless	3271.11 psf	22.66	N/A	145.64 Kips
89.99 ft	Cohesionless	3395.69 psf	22.66	N/A	171.40 Kips

ULTIMATE - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
3.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
4.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
4.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
5.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
14.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
16.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
17.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
25.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
26.00 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
26.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
27.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
27.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
28.00 ft	Cohesionless	0.00 psf	19.80	14.24 Kips	0.00 Kips
28.01 ft	Cohesionless	0.53 psf	35.20	22.09 Kips	0.01 Kips
32.99 ft	Cohesionless	262.47 psf	35.20	22.09 Kips	5.95 Kips
33.01 ft	Cohesionless	263.43 psf	19.80	14.24 Kips	2.87 Kips
35.99 ft	Cohesionless	390.37 psf	19.80	14.24 Kips	4.25 Kips
36.01 ft	Cohesionless	391.38 psf	40.40	35.28 Kips	10.57 Kips
45.01 ft	Cohesionless	909.78 psf	40.40	35.28 Kips	24.58 Kips
54.01 ft	Cohesionless	1428.18 psf	40.40	35.28 Kips	35.28 Kips
63.01 ft	Cohesionless	1946.58 psf	40.40	35.28 Kips	35.28 Kips
72.01 ft	Cohesionless	2464.98 psf	40.40	35.28 Kips	35.28 Kips
81.01 ft	Cohesionless	2983.38 psf	40.40	35.28 Kips	35.28 Kips
85.99 ft	Cohesionless	3270.22 psf	40.40	35.28 Kips	35.28 Kips
86.01 ft	Cohesionless	3271.43 psf	55.60	78.59 Kips	78.59 Kips
89.99 ft	Cohesionless	3520.57 psf	55.60	78.59 Kips	78.59 Kips

ULTIMATE - SUMMARY OF CAPACITIES

	Depth	Skin Friction	End Bearing	Total Capacity
	0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
	3.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
	4.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
	4.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
	5.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
	14.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
	16.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
	17.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
	25.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
	26.00 ft	0.00 Kips	0.00 Kips	0.00 Kips
	26.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
	27.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
	27.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
	28.00 ft	0.00 Kips	0.00 Kips	0.00 Kips
	28.01 ft	0.00 Kips	0.01 Kips	0.01 Kips
	32.99 ft	0.92 Kips	5.95 Kips	6.88 Kips
	33.01 ft	0.93 Kips	2.87 Kips	3.79 Kips
	35.99 ft	1.87 Kips	4.25 Kips	6.12 Kips
	36.01 ft	1.88 Kips	10.57 Kips	12.46 Kips
	45.01 ft	11.07 Kips	24.58 Kips	35.66 Kips
	54.01 ft	27.59 Kips	35.28 Kips	62.87 Kips
	63.01 ft	51.43 Kips	35.28 Kips	86.71 Kips
	72.01 ft	82.60 Kips	35.28 Kips	117.87 Kips
	81.01 ft	121.09 Kips	35.28 Kips	156.36 Kips
4.98	85.99 ft	145.53 Kips	35.28 Kips	180.81 Kips ← 200
	86.01 ft	145.64 Kips	78.59 Kips	224.24 Kips
	89.99 ft	171.40 Kips	78.59 Kips	249.99 Kips

83'

Ground Elev. 460.5 Ft (140.36m)

Pile Top 434.75 Ft (132.55m)

57.5 Pile Tip 377.3 Ft (115.0 m)

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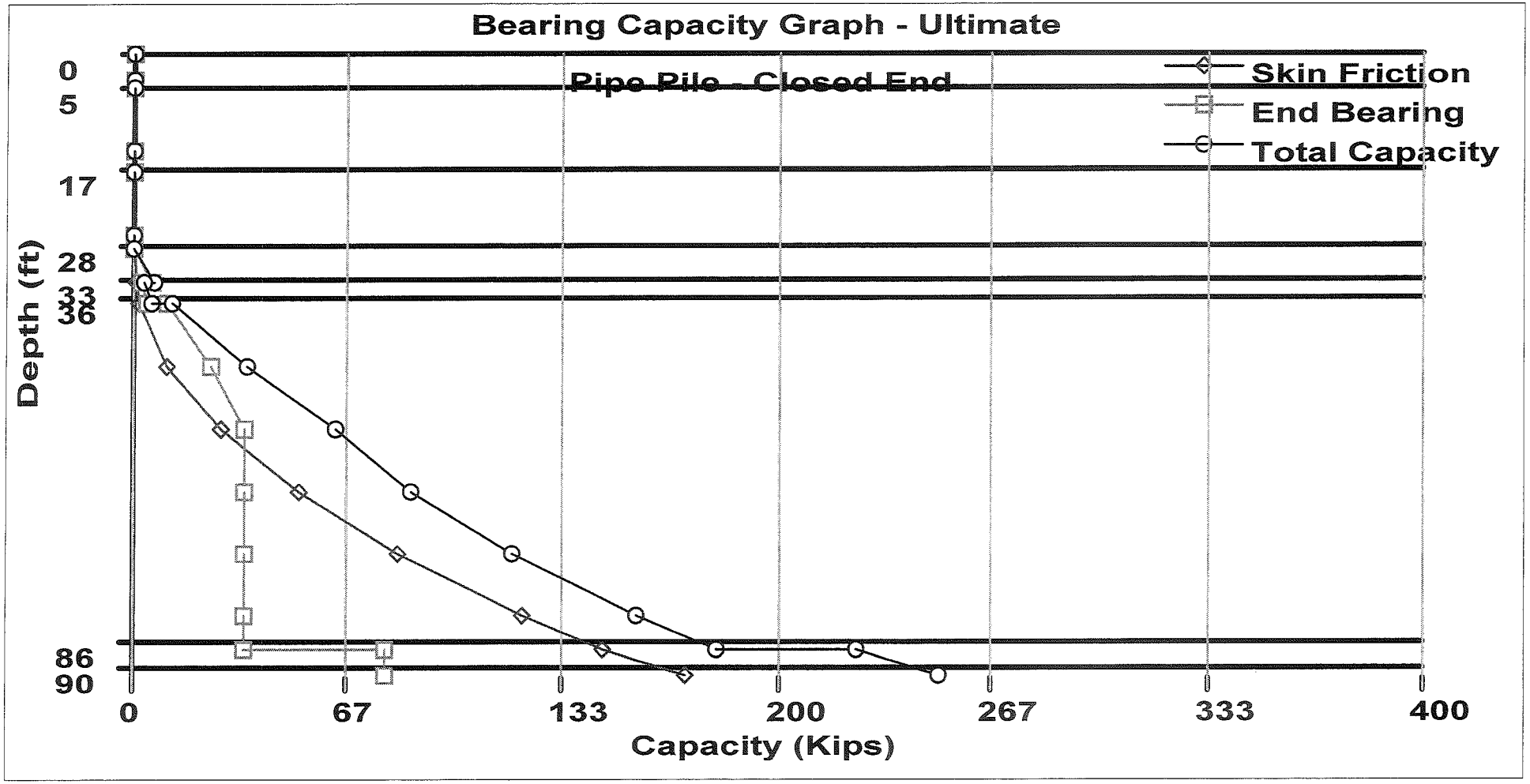

RESULTS FROM DRIVEN

BORING TB-7

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename:
Project Name: Bridge I-70&Wabash, TB-7
Project Date: 01/25/2006
Project Client: INDOT
Computed By: AC
Project Manager: AC

PILE INFORMATION

Pile Type: Pipe Pile - Closed End
Top of Pile: 22.00 ft
Diameter of Pile: 14.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	0.00 ft
	- Driving/Restrike	0.00 ft
	- Ultimate:	0.00 ft
Ultimate Considerations:	- Local Scour:	0.00 ft
	- Long Term Scour:	25.50 ft
	- Soft Soil:	0.00 ft

ULTIMATE PROFILE

Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesionless	3.00 ft	0.00%	110.00 pcf	27.0/27.0	Nordlund
2	Cohesionless	18.00 ft	0.00%	115.00 pcf	31.0/31.0	Nordlund
3	Cohesionless	12.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund
4	Cohesionless	7.00 ft	0.00%	120.00 pcf	32.0/32.0	Nordlund
5	Cohesionless	16.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund
6	Cohesionless	14.00 ft	0.00%	115.00 pcf	31.0/31.0	Nordlund
7	Cohesionless	5.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund

ULTIMATE - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
2.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
3.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
12.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
20.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
21.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
21.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
22.00 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
25.49 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
25.50 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
30.01 ft	Cohesionless	141.16 psf	22.66	N/A	1.21 Kips
32.99 ft	Cohesionless	234.44 psf	22.66	N/A	3.35 Kips
33.01 ft	Cohesionless	469.79 psf	21.33	N/A	3.36 Kips
39.99 ft	Cohesionless	670.81 psf	21.33	N/A	10.72 Kips
40.01 ft	Cohesionless	873.01 psf	22.66	N/A	10.75 Kips
49.01 ft	Cohesionless	1154.71 psf	22.66	N/A	30.55 Kips
55.99 ft	Cohesionless	1373.19 psf	22.66	N/A	52.56 Kips
56.01 ft	Cohesionless	1874.56 psf	20.66	N/A	52.62 Kips
65.01 ft	Cohesionless	2111.26 psf	20.66	N/A	79.37 Kips
69.99 ft	Cohesionless	2242.24 psf	20.66	N/A	96.75 Kips
70.01 ft	Cohesionless	2611.01 psf	22.66	N/A	96.83 Kips
74.99 ft	Cohesionless	2766.89 psf	22.66	N/A	123.09 Kips

TB-7

ULTIMATE - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
2.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
3.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
12.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
20.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
21.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
21.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
22.00 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
25.49 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
25.50 ft	Cohesionless	0.00 psf	55.60	78.59 Kips	0.00 Kips
30.01 ft	Cohesionless	282.33 psf	55.60	78.59 Kips	11.12 Kips
32.99 ft	Cohesionless	468.87 psf	55.60	78.59 Kips	18.47 Kips
33.01 ft	Cohesionless	470.08 psf	40.40	35.28 Kips	12.70 Kips
39.99 ft	Cohesionless	872.12 psf	40.40	35.28 Kips	23.56 Kips
40.01 ft	Cohesionless	873.33 psf	55.60	78.59 Kips	34.40 Kips
49.01 ft	Cohesionless	1436.73 psf	55.60	78.59 Kips	56.58 Kips
55.99 ft	Cohesionless	1873.67 psf	55.60	78.59 Kips	72.53 Kips
56.01 ft	Cohesionless	1874.83 psf	35.20	22.09 Kips	22.09 Kips
65.01 ft	Cohesionless	2348.23 psf	35.20	22.09 Kips	22.09 Kips
69.99 ft	Cohesionless	2610.17 psf	35.20	22.09 Kips	22.09 Kips
70.01 ft	Cohesionless	2611.33 psf	55.60	78.59 Kips	78.59 Kips
74.99 ft	Cohesionless	2923.07 psf	55.60	78.59 Kips	78.59 Kips

ULTIMATE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
2.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
3.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
12.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
20.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
21.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
21.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
22.00 ft	0.00 Kips	0.00 Kips	0.00 Kips
25.49 ft	0.00 Kips	0.00 Kips	0.00 Kips
25.50 ft	0.00 Kips	0.00 Kips	0.00 Kips
30.01 ft	1.21 Kips	11.12 Kips	12.34 Kips
32.99 ft	3.35 Kips	18.47 Kips	21.82 Kips
33.01 ft	3.36 Kips	12.70 Kips	16.06 Kips
39.99 ft	10.72 Kips	23.56 Kips	34.28 Kips
40.01 ft	10.75 Kips	34.40 Kips	45.15 Kips
49.01 ft	30.55 Kips	56.58 Kips	87.13 Kips
55.99 ft	52.56 Kips	72.53 Kips	125.09 Kips
56.01 ft	52.62 Kips	22.09 Kips	74.72 Kips
65.01 ft	79.37 Kips	22.09 Kips	101.46 Kips
69.99 ft	96.75 Kips	22.09 Kips	118.84 Kips
70.01 ft	96.83 Kips	78.59 Kips	175.43 Kips ← 200 kips (74.5 ft)
4.98 74.99 ft	123.09 Kips	78.59 Kips	201.68 Kips

Ground Elevation 457.9 ft (139.56 m)

52' { pile TOP 435.6 ft (132.8 m)
pile TIP 383.4 ft (116.7 m)

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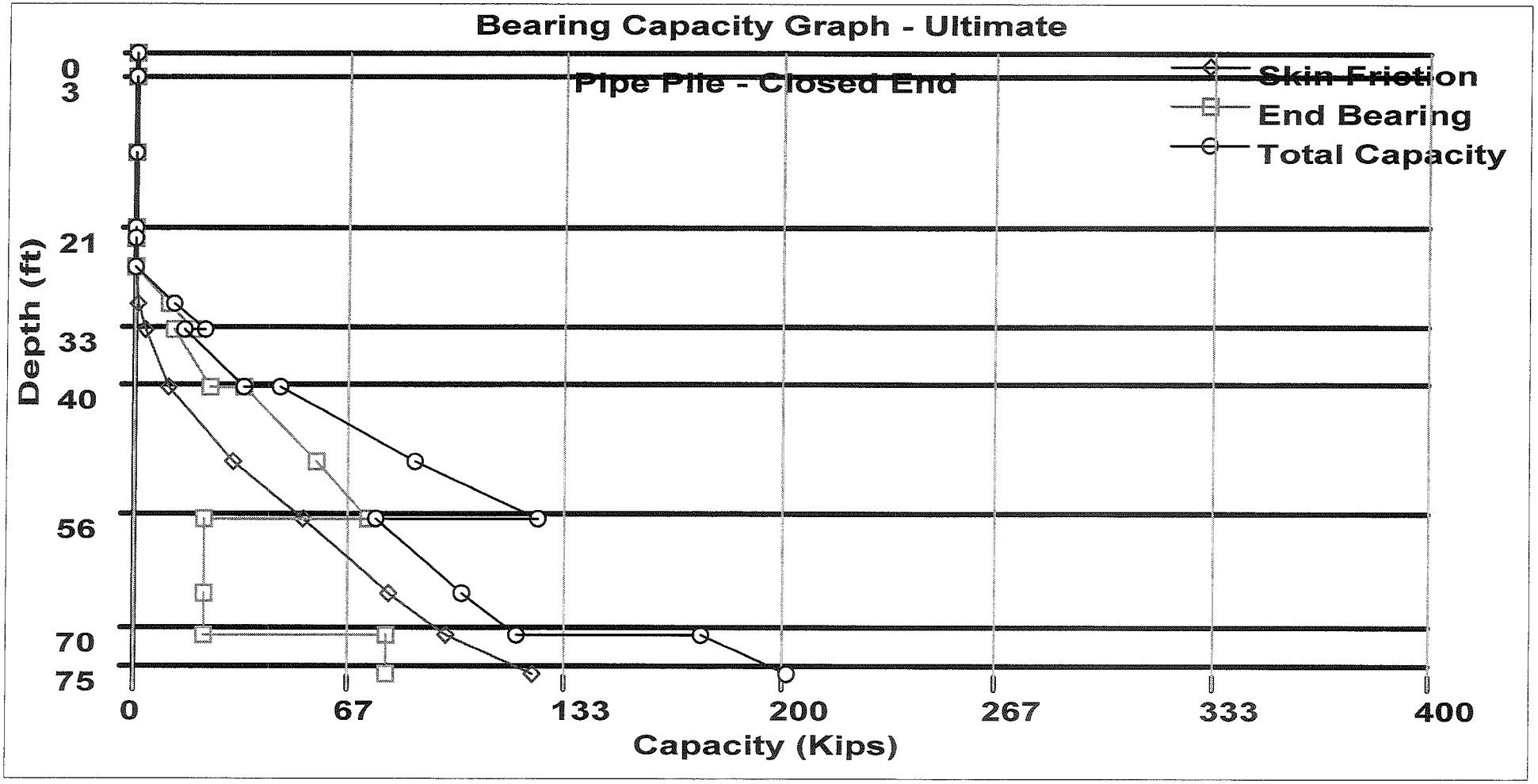


RESULTS FROM DRIVEN

BORING TB-8

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename: C:\DRIVEN\7956\7956TB8.DVN
Project Name: Bridgel-70&Wabash, TB-8
Project Date: 01/25/2006
Project Client: INDOT
Computed By: AC
Project Manager: AC

PILE INFORMATION

Pile Type: Pipe Pile - Closed End
Top of Pile: 22.00 ft
Diameter of Pile: 14.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	0.00 ft
	- Driving/Restrike	0.00 ft
	- Ultimate:	0.00 ft
Ultimate Considerations:	- Local Scour:	0.00 ft
	- Long Term Scour:	25.00 ft
	- Soft Soil:	0.00 ft

ULTIMATE PROFILE

Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesionless	3.00 ft	0.00%	105.00 pcf	27.0/27.0	Nordlund
2	Cohesive	3.00 ft	0.00%	105.00 pcf	200.00 psf	T-80 Sand
3	Cohesionless	2.00 ft	0.00%	105.00 pcf	27.0/27.0	Nordlund
4	Cohesionless	18.00 ft	0.00%	115.00 pcf	31.0/31.0	Nordlund
5	Cohesionless	15.00 ft	0.00%	120.00 pcf	32.0/32.0	Nordlund
6	Cohesionless	49.00 ft	0.00%	120.00 pcf	32.0/32.0	Nordlund

ULTIMATE - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
2.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
3.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
5.99 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
6.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
7.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
8.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
17.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
21.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
22.00 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
24.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
25.00 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
25.99 ft	Cohesionless	26.04 psf	20.66	N/A	0.04 Kips
26.01 ft	Cohesionless	52.89 psf	21.33	N/A	0.04 Kips
35.01 ft	Cohesionless	312.09 psf	21.33	N/A	4.45 Kips
40.99 ft	Cohesionless	484.31 psf	21.33	N/A	11.43 Kips
41.01 ft	Cohesionless	916.89 psf	21.33	N/A	11.46 Kips
50.01 ft	Cohesionless	1176.09 psf	21.33	N/A	28.08 Kips
59.01 ft	Cohesionless	1435.29 psf	21.33	N/A	52.03 Kips
68.01 ft	Cohesionless	1694.49 psf	21.33	N/A	83.30 Kips
77.01 ft	Cohesionless	1953.69 psf	21.33	N/A	121.89 Kips
86.01 ft	Cohesionless	2212.89 psf	21.33	N/A	167.81 Kips
89.99 ft	Cohesionless	2327.51 psf	21.33	N/A	190.45 Kips

ULTIMATE - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
2.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
3.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
5.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
6.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
7.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
8.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
17.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
21.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
22.00 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
24.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
25.00 ft	Cohesionless	0.00 psf	35.20	22.09 Kips	0.00 Kips
25.99 ft	Cohesionless	52.07 psf	35.20	22.09 Kips	1.18 Kips
26.01 ft	Cohesionless	53.18 psf	40.40	35.28 Kips	1.44 Kips
35.01 ft	Cohesionless	571.58 psf	40.40	35.28 Kips	15.44 Kips
40.99 ft	Cohesionless	916.02 psf	40.40	35.28 Kips	24.75 Kips
41.01 ft	Cohesionless	917.18 psf	40.40	35.28 Kips	24.78 Kips
50.01 ft	Cohesionless	1435.58 psf	40.40	35.28 Kips	35.28 Kips
59.01 ft	Cohesionless	1953.98 psf	40.40	35.28 Kips	35.28 Kips
68.01 ft	Cohesionless	2472.38 psf	40.40	35.28 Kips	35.28 Kips
77.01 ft	Cohesionless	2990.78 psf	40.40	35.28 Kips	35.28 Kips
86.01 ft	Cohesionless	3509.18 psf	40.40	35.28 Kips	35.28 Kips
89.99 ft	Cohesionless	3738.42 psf	40.40	35.28 Kips	35.28 Kips

ULTIMATE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
2.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
3.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
5.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
6.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
7.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
8.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
17.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
21.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
22.00 ft	0.00 Kips	0.00 Kips	0.00 Kips
24.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
25.00 ft	0.00 Kips	0.00 Kips	0.00 Kips
25.99 ft	0.04 Kips	1.18 Kips	1.22 Kips
26.01 ft	0.04 Kips	1.44 Kips	1.47 Kips
35.01 ft	4.45 Kips	15.44 Kips	19.89 Kips
40.99 ft	11.43 Kips	24.75 Kips	36.18 Kips
41.01 ft	11.46 Kips	24.78 Kips	36.24 Kips
50.01 ft	28.08 Kips	35.28 Kips	63.36 Kips
59.01 ft	52.03 Kips	35.28 Kips	87.31 Kips
68.01 ft	83.30 Kips	35.28 Kips	118.58 Kips
77.01 ft	121.89 Kips	35.28 Kips	157.17 Kips ← 200 KIPS
86.01 ft	167.81 Kips	35.28 Kips	203.09 Kips
89.99 ft	190.45 Kips	35.28 Kips	225.73 Kips

85.4'

TB-8

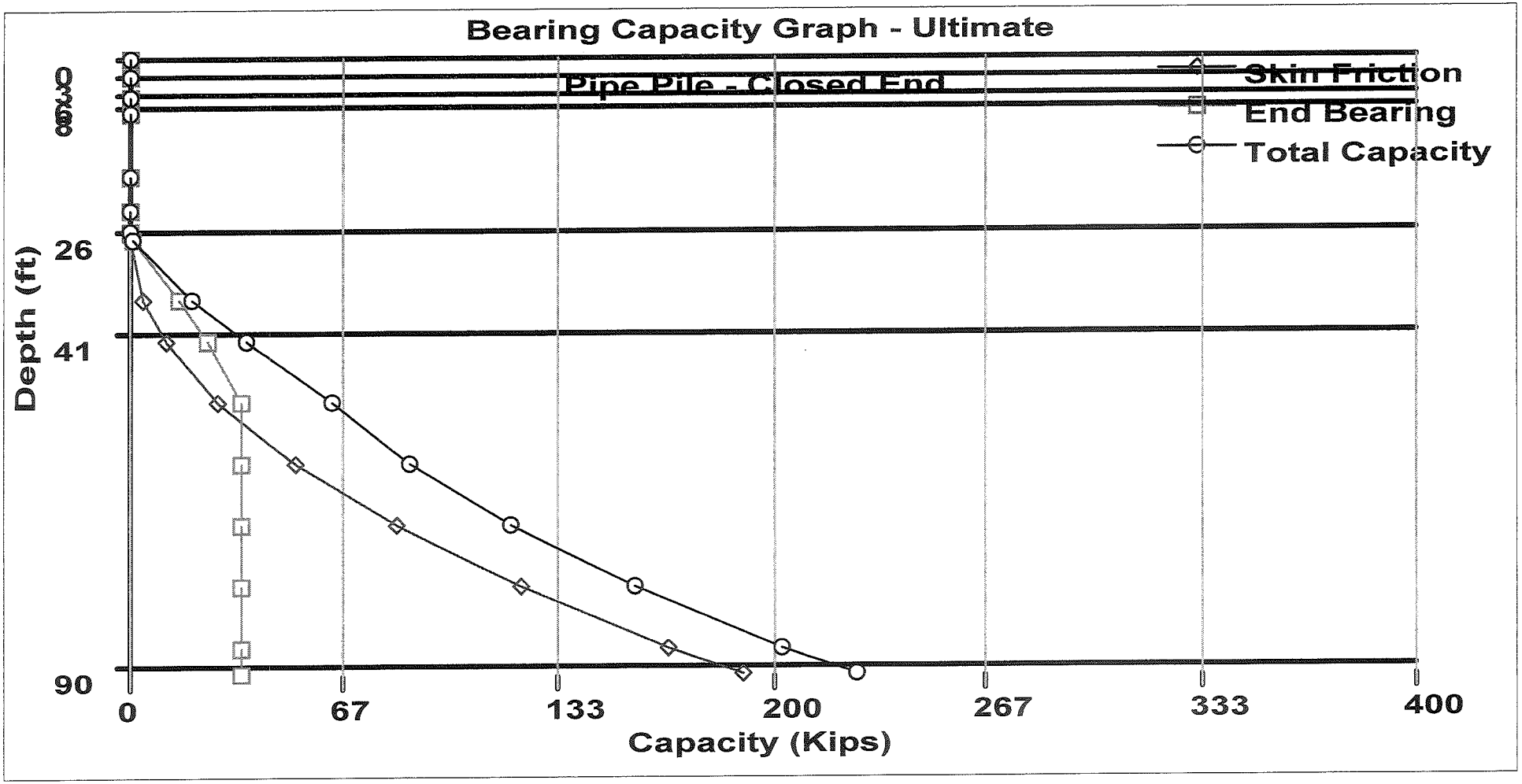
Ground Elev. 457.2' (139.4m)

63.6'

Pile Top 435.35 (132.7m)

Pile Tip 371.8 (113.4m)

Filename: C:\DRIVEN\7956\7956Tb8.DVN



RESULTS FROM DRIVEN

BORING TB-9

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename: C:\DRIVEN\7956\7956TB9.DVN
Project Name: Bridge I-70&Wabash, TB-9
Project Date: 01/25/2006
Project Client: INDOT
Computed By: AC
Project Manager: AC

PILE INFORMATION

Pile Type: Pipe Pile - Closed End
Top of Pile: 27.00 ft
Diameter of Pile: 14.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	23.00 ft
	- Driving/Restrike	0.00 ft
	- Ultimate:	4.50 ft
Ultimate Considerations:	- Local Scour:	0.00 ft
	- Long Term Scour:	29.50 ft
	- Soft Soil:	0.00 ft

ULTIMATE PROFILE

Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesive	8.00 ft	0.00%	105.00 pcf	200.00 psf	T-80 Clay
2	Cohesive	8.00 ft	0.00%	115.00 pcf	1500.00 psf	T-79 Steel
3	Cohesive	7.00 ft	0.00%	110.00 pcf	750.00 psf	T-79 Steel
4	Cohesionless	3.00 ft	0.00%	105.00 pcf	27.0/27.0	Nordlund
5	Cohesionless	6.00 ft	0.00%	110.00 pcf	31.0/31.0	Nordlund
6	Cohesionless	10.00 ft	0.00%	105.00 pcf	27.0/27.0	Nordlund
7	Cohesionless	10.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund
8	Cohesionless	11.00 ft	0.00%	120.00 pcf	32.0/32.0	Nordlund
9	Cohesionless	9.00 ft	0.00%	115.00 pcf	31.0/31.0	Nordlund
10	Cohesionless	23.00 ft	0.00%	120.00 pcf	32.0/32.0	Nordlund

ULTIMATE - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
7.99 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
8.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
15.99 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
16.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
22.99 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
23.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
25.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
26.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
26.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
27.00 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
29.49 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
29.50 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
31.99 ft	Cohesionless	59.26 psf	20.66	N/A	0.21 Kips
32.01 ft	Cohesionless	119.21 psf	18.00	N/A	0.21 Kips
41.01 ft	Cohesionless	310.91 psf	18.00	N/A	2.93 Kips
41.99 ft	Cohesionless	331.79 psf	18.00	N/A	3.42 Kips
42.01 ft	Cohesionless	545.31 psf	22.66	N/A	3.44 Kips
51.01 ft	Cohesionless	827.01 psf	22.66	N/A	17.63 Kips
51.99 ft	Cohesionless	857.69 psf	22.66	N/A	19.75 Kips
52.01 ft	Cohesionless	1171.29 psf	21.33	N/A	19.79 Kips
61.01 ft	Cohesionless	1430.49 psf	21.33	N/A	40.01 Kips
62.99 ft	Cohesionless	1487.51 psf	21.33	N/A	45.44 Kips
63.01 ft	Cohesionless	1804.86 psf	20.66	N/A	45.49 Kips
71.99 ft	Cohesionless	2041.04 psf	20.66	N/A	71.29 Kips
72.01 ft	Cohesionless	2278.29 psf	21.33	N/A	71.36 Kips
81.01 ft	Cohesionless	2537.49 psf	21.33	N/A	107.21 Kips
90.01 ft	Cohesionless	2796.69 psf	21.33	N/A	150.39 Kips
94.99 ft	Cohesionless	2940.11 psf	21.33	N/A	177.44 Kips

ULTIMATE - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
7.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
8.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
15.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
16.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
22.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
23.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
25.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
26.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
26.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
27.00 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
29.49 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
29.50 ft	Cohesionless	0.00 psf	35.20	22.09 Kips	0.00 Kips
31.99 ft	Cohesionless	118.52 psf	35.20	22.09 Kips	2.69 Kips
32.01 ft	Cohesionless	119.43 psf	19.80	14.24 Kips	1.30 Kips
41.01 ft	Cohesionless	502.83 psf	19.80	14.24 Kips	5.47 Kips
41.99 ft	Cohesionless	544.57 psf	19.80	14.24 Kips	5.92 Kips
42.01 ft	Cohesionless	545.63 psf	55.60	78.59 Kips	21.49 Kips
51.01 ft	Cohesionless	1109.03 psf	55.60	78.59 Kips	43.69 Kips
51.99 ft	Cohesionless	1170.37 psf	55.60	78.59 Kips	46.11 Kips
52.01 ft	Cohesionless	1171.58 psf	40.40	35.28 Kips	31.65 Kips
61.01 ft	Cohesionless	1689.98 psf	40.40	35.28 Kips	35.28 Kips
62.99 ft	Cohesionless	1804.02 psf	40.40	35.28 Kips	35.28 Kips
63.01 ft	Cohesionless	1805.13 psf	35.20	22.09 Kips	22.09 Kips
71.99 ft	Cohesionless	2277.47 psf	35.20	22.09 Kips	22.09 Kips
72.01 ft	Cohesionless	2278.58 psf	40.40	35.28 Kips	35.28 Kips
81.01 ft	Cohesionless	2796.98 psf	40.40	35.28 Kips	35.28 Kips
90.01 ft	Cohesionless	3315.38 psf	40.40	35.28 Kips	35.28 Kips
94.99 ft	Cohesionless	3602.22 psf	40.40	35.28 Kips	35.28 Kips

ULTIMATE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
7.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
8.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
15.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
16.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
22.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
23.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
25.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
26.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
26.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
27.00 ft	0.00 Kips	0.00 Kips	0.00 Kips
29.49 ft	0.00 Kips	0.00 Kips	0.00 Kips
29.50 ft	0.00 Kips	0.00 Kips	0.00 Kips
31.99 ft	0.21 Kips	2.69 Kips	2.90 Kips
32.01 ft	0.21 Kips	1.30 Kips	1.51 Kips
41.01 ft	2.93 Kips	5.47 Kips	8.40 Kips
41.99 ft	3.42 Kips	5.92 Kips	9.35 Kips
42.01 ft	3.44 Kips	21.49 Kips	24.93 Kips
51.01 ft	17.63 Kips	43.69 Kips	61.32 Kips
51.99 ft	19.75 Kips	46.11 Kips	65.86 Kips
52.01 ft	19.79 Kips	31.65 Kips	51.45 Kips
61.01 ft	40.01 Kips	35.28 Kips	75.29 Kips
62.99 ft	45.44 Kips	35.28 Kips	80.72 Kips
63.01 ft	45.49 Kips	22.09 Kips	67.58 Kips
71.99 ft	71.29 Kips	22.09 Kips	93.38 Kips
72.01 ft	71.36 Kips	35.28 Kips	106.64 Kips
81.01 ft	107.21 Kips	35.28 Kips	142.49 Kips
90.01 ft ← 4.98	150.39 Kips	35.28 Kips	185.67 Kips ← 200 kip (92.6')
94.99 ft	177.44 Kips	35.28 Kips	212.71 Kips

Ground Elev. 461.8 Ft (140.76 m)

Pile Top 434.8 Ft (132.56 m)

Pile Tip 369.2 Ft (112.5 m)

66'

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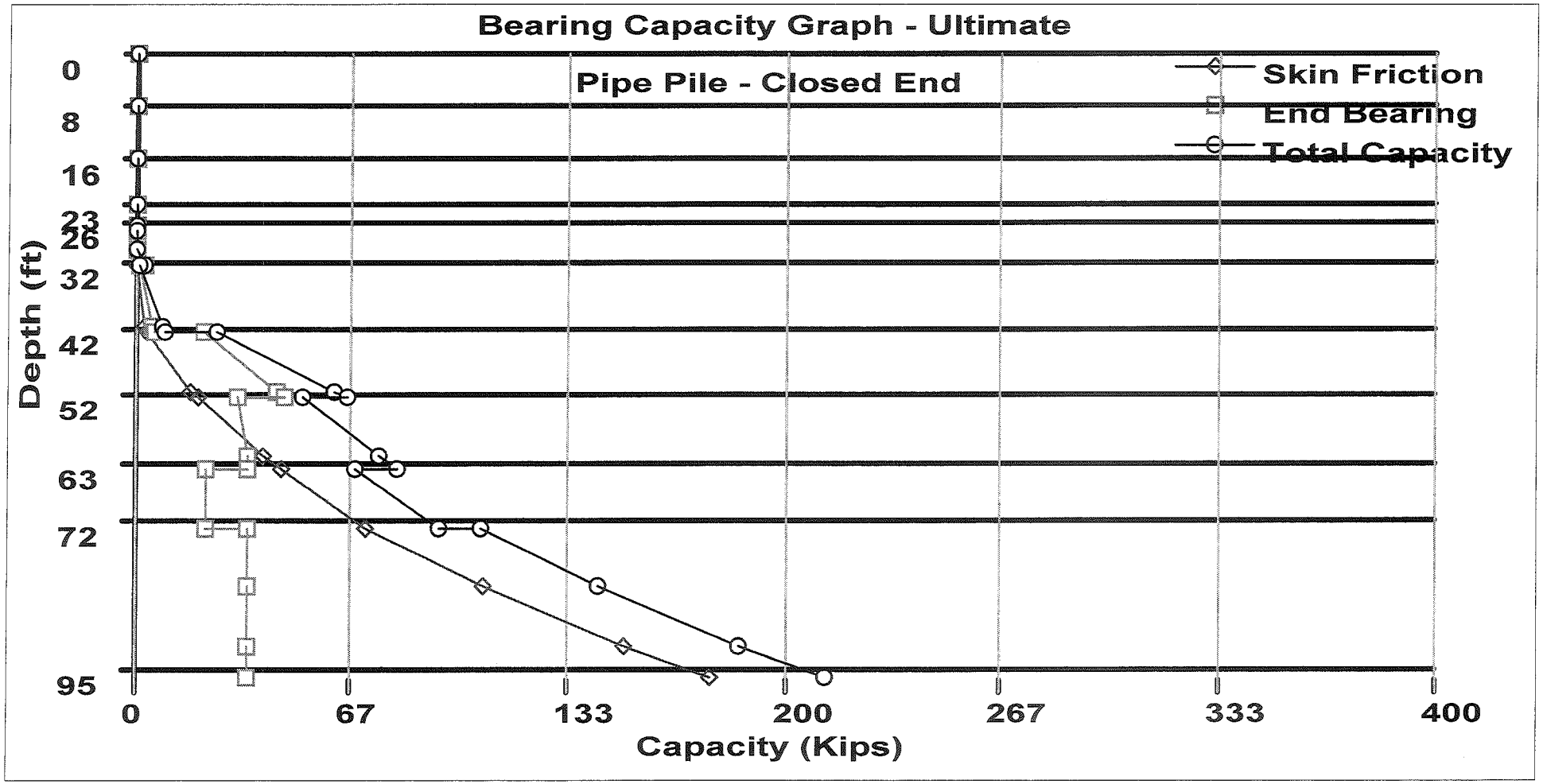

RESULTS FROM DRIVEN

BORING TB-10

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename: C:\DRIVEN\7956\7956TB10.DVN
Project Name: I-70 & Wabash, TB-10
Project Date: 01/25/2006
Project Client: INDOT
Computed By: AC
Project Manager: AC

PILE INFORMATION

Pile Type: Pipe Pile - Closed End
Top of Pile: 18.50 ft
Diameter of Pile: 14.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	18.00 ft
	- Driving/Restrike	0.00 ft
	- Ultimate:	8.50 ft
Ultimate Considerations:	- Local Scour:	0.00 ft
	- Long Term Scour:	27.00 ft
	- Soft Soil:	0.00 ft

ULTIMATE PROFILE

Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesive	15.00 ft	0.00%	105.00 pcf	250.00 psf	T-80 Clay
2	Cohesive	5.00 ft	0.00%	110.00 pcf	750.00 psf	T-79 Steel
3	Cohesionless	11.00 ft	0.00%	105.00 pcf	27.0/27.0	Nordlund
4	Cohesionless	28.00 ft	0.00%	110.00 pcf	31.0/31.0	Nordlund
5	Cohesionless	13.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund
6	Cohesionless	23.00 ft	0.00%	115.00 pcf	32.0/32.0	Nordlund

ULTIMATE - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
9.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
14.99 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
15.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
18.49 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
18.50 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
19.99 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
20.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
26.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
27.00 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
29.01 ft	Cohesionless	42.81 psf	18.00	N/A	0.08 Kips
30.99 ft	Cohesionless	84.99 psf	18.00	N/A	0.33 Kips
31.01 ft	Cohesionless	170.64 psf	20.66	N/A	0.33 Kips
40.01 ft	Cohesionless	384.84 psf	20.66	N/A	5.21 Kips
49.01 ft	Cohesionless	599.04 psf	20.66	N/A	15.51 Kips
58.01 ft	Cohesionless	813.24 psf	20.66	N/A	31.24 Kips
58.99 ft	Cohesionless	836.56 psf	20.66	N/A	33.28 Kips
59.01 ft	Cohesionless	1503.51 psf	22.66	N/A	33.33 Kips
68.01 ft	Cohesionless	1785.21 psf	22.66	N/A	63.95 Kips
71.99 ft	Cohesionless	1909.79 psf	22.66	N/A	80.57 Kips
72.01 ft	Cohesionless	2317.26 psf	21.33	N/A	80.65 Kips
81.01 ft	Cohesionless	2553.96 psf	21.33	N/A	116.74 Kips
90.01 ft	Cohesionless	2790.66 psf	21.33	N/A	159.52 Kips
94.99 ft	Cohesionless	2921.64 psf	21.33	N/A	186.06 Kips

ULTIMATE - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
9.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
14.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
15.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
18.49 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
18.50 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
19.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
20.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
26.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
27.00 ft	Cohesionless	0.00 psf	19.80	14.24 Kips	0.00 Kips
29.01 ft	Cohesionless	85.63 psf	19.80	14.24 Kips	0.93 Kips
30.99 ft	Cohesionless	169.97 psf	19.80	14.24 Kips	1.85 Kips
31.01 ft	Cohesionless	170.88 psf	35.20	22.09 Kips	3.88 Kips
40.01 ft	Cohesionless	599.28 psf	35.20	22.09 Kips	13.59 Kips
49.01 ft	Cohesionless	1027.68 psf	35.20	22.09 Kips	22.09 Kips
58.01 ft	Cohesionless	1456.08 psf	35.20	22.09 Kips	22.09 Kips
58.99 ft	Cohesionless	1502.72 psf	35.20	22.09 Kips	22.09 Kips
59.01 ft	Cohesionless	1503.83 psf	55.60	78.59 Kips	57.99 Kips
68.01 ft	Cohesionless	2067.23 psf	55.60	78.59 Kips	78.42 Kips
71.99 ft	Cohesionless	2316.37 psf	55.60	78.59 Kips	78.59 Kips
72.01 ft	Cohesionless	2317.53 psf	40.40	35.28 Kips	35.28 Kips
81.01 ft	Cohesionless	2790.93 psf	40.40	35.28 Kips	35.28 Kips
90.01 ft	Cohesionless	3264.33 psf	40.40	35.28 Kips	35.28 Kips
94.99 ft	Cohesionless	3526.27 psf	40.40	35.28 Kips	35.28 Kips

ULTIMATE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
9.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
14.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
15.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
18.49 ft	0.00 Kips	0.00 Kips	0.00 Kips
18.50 ft	0.00 Kips	0.00 Kips	0.00 Kips
19.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
20.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
26.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
27.00 ft	0.00 Kips	0.00 Kips	0.00 Kips
29.01 ft	0.08 Kips	0.93 Kips	1.02 Kips
30.99 ft	0.33 Kips	1.85 Kips	2.18 Kips
31.01 ft	0.33 Kips	3.88 Kips	4.21 Kips
40.01 ft	5.21 Kips	13.59 Kips	18.80 Kips
49.01 ft	15.51 Kips	22.09 Kips	37.60 Kips
58.01 ft	31.24 Kips	22.09 Kips	53.33 Kips
58.99 ft	33.28 Kips	22.09 Kips	55.37 Kips
59.01 ft	33.33 Kips	57.99 Kips	91.33 Kips
68.01 ft	63.95 Kips	78.42 Kips	142.37 Kips
71.99 ft	80.57 Kips	78.59 Kips	159.16 Kips
72.01 ft	80.65 Kips	35.28 Kips	115.93 Kips
81.01 ft	116.74 Kips	35.28 Kips	152.02 Kips
90.01 ft ← 4.96	159.52 Kips	35.28 Kips	194.79 Kips ← 200
94.99 ft	186.06 Kips	35.28 Kips	221.34 Kips

TB-10

91

Ground Elev 459.2' (139.96m)

72.5' { Pile Top 440.66' (134.35)
Pile Tip 368.2' (112.26m)

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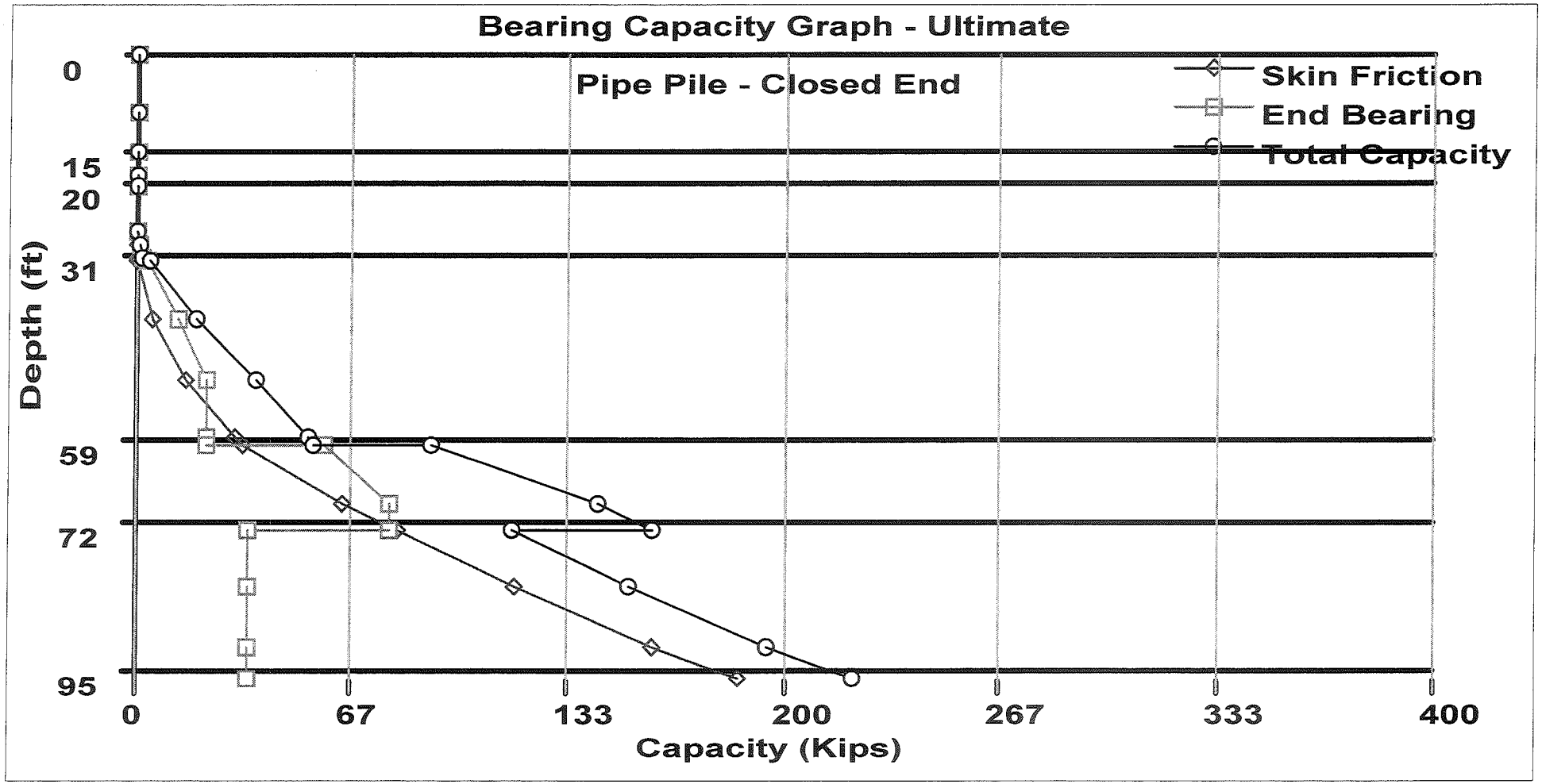

Bearing Capacity Graph - Ultimate
Pipe Pile - Closed End
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
15
20
31
59
72
95
0
67
133
200
267
333
400
Capacity (Kips)

RESULTS FROM DRIVEN

BORING TB-11

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename: C:\DRIVEN\7956\7956TB11.DVN
Project Name: I-70 & Wabash, TB-11 Project Date: 01/25/2006
Project Client: INDOT
Computed By: AC
Project Manager: AC

PILE INFORMATION

Pile Type: Pipe Pile - Closed End
Top of Pile: 19.50 ft
Diameter of Pile: 14.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	8.00 ft
	- Driving/Restrike	0.00 ft
	- Ultimate:	5.50 ft
Ultimate Considerations:	- Local Scour:	0.00 ft
	- Long Term Scour:	28.00 ft
	- Soft Soil:	0.00 ft

ULTIMATE PROFILE

Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesive	3.00 ft	0.00%	110.00 pcf	750.00 psf	T-80 Clay
2	Cohesionless	5.00 ft	0.00%	110.00 pcf	31.0/31.0	Nordlund
3	Cohesionless	31.00 ft	0.00%	105.00 pcf	27.0/27.0	Nordlund
4	Cohesionless	43.00 ft	0.00%	110.00 pcf	31.0/31.0	Nordlund
5	Cohesionless	8.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund

ULTIMATE - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
2.99 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
3.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
5.49 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
5.51 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
7.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
8.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
17.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
19.49 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
19.50 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
26.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
27.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
28.00 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
35.01 ft	Cohesionless	149.31 psf	18.00	N/A	1.02 Kips
38.99 ft	Cohesionless	234.09 psf	18.00	N/A	2.49 Kips
39.01 ft	Cohesionless	468.84 psf	20.66	N/A	2.51 Kips
48.01 ft	Cohesionless	683.04 psf	20.66	N/A	11.16 Kips
57.01 ft	Cohesionless	897.24 psf	20.66	N/A	25.24 Kips
66.01 ft	Cohesionless	1111.44 psf	20.66	N/A	44.75 Kips
75.01 ft	Cohesionless	1325.64 psf	20.66	N/A	69.68 Kips
81.99 ft	Cohesionless	1491.76 psf	20.66	N/A	92.75 Kips
82.01 ft	Cohesionless	2515.71 psf	22.66	N/A	92.84 Kips
89.99 ft	Cohesionless	2765.49 psf	22.66	N/A	134.89 Kips

ULTIMATE - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
2.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
3.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
5.49 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
5.51 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
7.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
8.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
17.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
19.49 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
19.50 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
26.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
27.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
28.00 ft	Cohesionless	0.00 psf	19.80	14.24 Kips	0.00 Kips
35.01 ft	Cohesionless	298.63 psf	19.80	14.24 Kips	3.25 Kips
38.99 ft	Cohesionless	468.17 psf	19.80	14.24 Kips	5.09 Kips
39.01 ft	Cohesionless	469.08 psf	35.20	22.09 Kips	10.64 Kips
48.01 ft	Cohesionless	897.48 psf	35.20	22.09 Kips	20.36 Kips
57.01 ft	Cohesionless	1325.88 psf	35.20	22.09 Kips	22.09 Kips
66.01 ft	Cohesionless	1754.28 psf	35.20	22.09 Kips	22.09 Kips
75.01 ft	Cohesionless	2182.68 psf	35.20	22.09 Kips	22.09 Kips
81.99 ft	Cohesionless	2514.92 psf	35.20	22.09 Kips	22.09 Kips
82.01 ft	Cohesionless	2516.03 psf	55.60	78.59 Kips	78.59 Kips
89.99 ft	Cohesionless	3015.57 psf	55.60	78.59 Kips	78.59 Kips

ULTIMATE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
2.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
3.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
5.49 ft	0.00 Kips	0.00 Kips	0.00 Kips
5.51 ft	0.00 Kips	0.00 Kips	0.00 Kips
7.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
8.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
17.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
19.49 ft	0.00 Kips	0.00 Kips	0.00 Kips
19.50 ft	0.00 Kips	0.00 Kips	0.00 Kips
26.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
27.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
28.00 ft	0.00 Kips	0.00 Kips	0.00 Kips
35.01 ft	1.02 Kips	3.25 Kips	4.26 Kips
38.99 ft	2.49 Kips	5.09 Kips	7.59 Kips
39.01 ft	2.51 Kips	10.64 Kips	13.15 Kips
48.01 ft	11.16 Kips	20.36 Kips	31.52 Kips
57.01 ft	25.24 Kips	22.09 Kips	47.33 Kips
66.01 ft	44.75 Kips	22.09 Kips	66.84 Kips
75.01 ft	69.68 Kips	22.09 Kips	91.77 Kips
81.99 ft	92.75 Kips	22.09 Kips	114.84 Kips
82.01 ft 7.99	92.84 Kips	78.59 Kips	171.43 Kips ← 200
89.99 ft	134.89 Kips	78.59 Kips	213.48 Kips

TB-11

87.4'

Ground elevation 460.2 ft (140.26 m)

439.78 ft (134.08 m)

67' { Pile TOP

Pile TID 372.77 ft (113.6 m)

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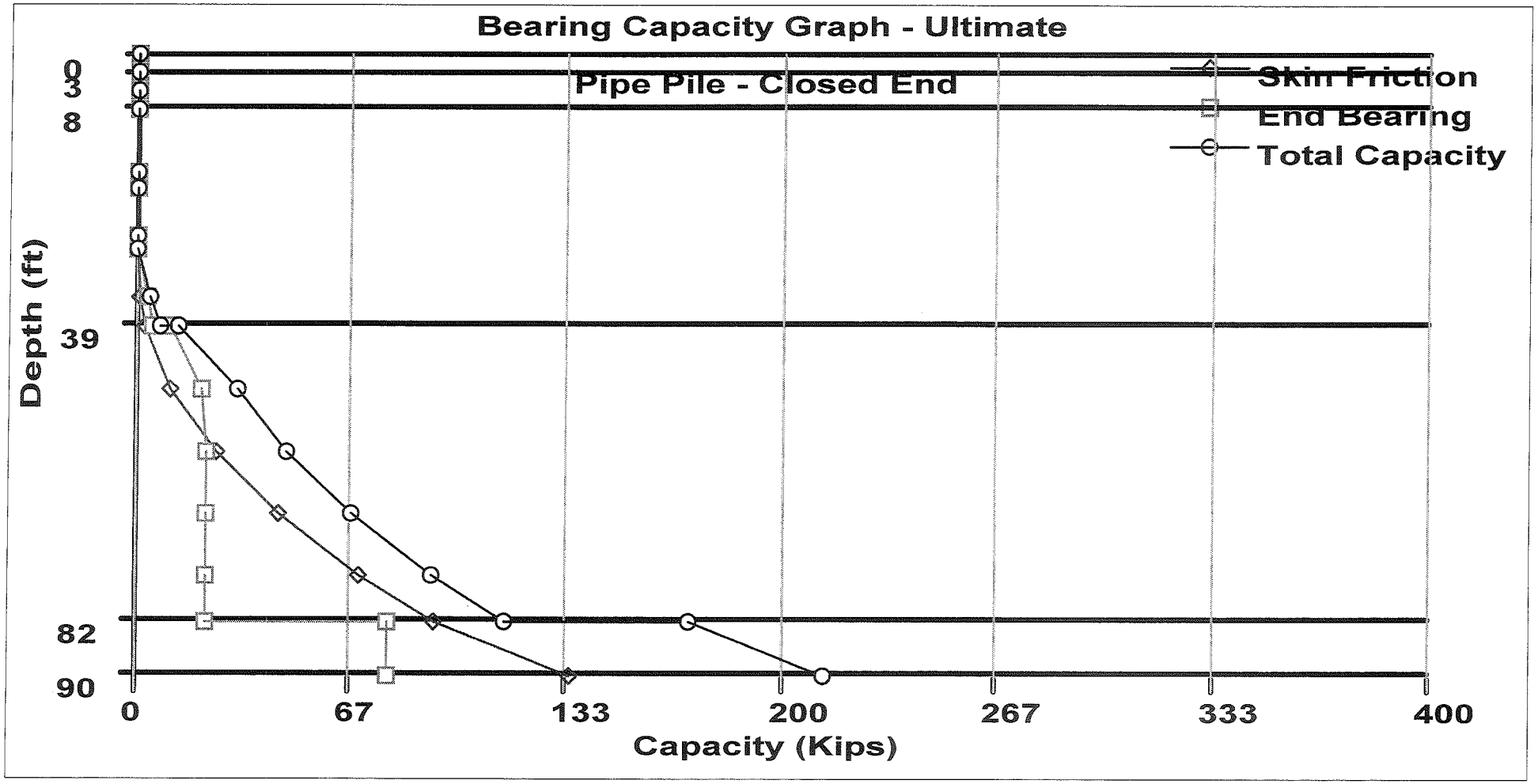


RESULTS FROM DRIVEN

BORING TB-12

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename: C:\DRIVEN\7956\7956TB12.DVN
Project Name: I-70 & Wabash, TB-12 Project Date: 01/25/2006
Project Client: INDOT
Computed By: AC
Project Manager: AC

PILE INFORMATION

Pile Type: Pipe Pile - Closed End
Top of Pile: 0.00 ft
Diameter of Pile: 14.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	38.00 ft
	- Driving/Restrike	0.00 ft
	- Ultimate:	38.00 ft
Ultimate Considerations:	- Local Scour:	21.00 ft
	- Long Term Scour:	0.00 ft
	- Soft Soil:	0.00 ft

ULTIMATE PROFILE

Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesive	2.00 ft	0.00%	105.00 pcf	750.00 psf	T-80 Clay
2	Cohesionless	15.00 ft	0.00%	110.00 pcf	31.0/31.0	Nordlund
3	Cohesive	4.00 ft	0.00%	115.00 pcf	1500.00 psf	T-80 Sand
4	Cohesionless	9.00 ft	0.00%	110.00 pcf	31.0/31.0	Nordlund
5	Cohesive	5.00 ft	0.00%	115.00 pcf	1500.00 psf	T-80 Sand
6	Cohesive	6.00 ft	0.00%	105.00 pcf	250.00 psf	T-80 Clay
7	Cohesionless	35.00 ft	0.00%	110.00 pcf	31.0/31.0	Nordlund
8	Cohesionless	13.00 ft	0.00%	115.00 pcf	32.0/32.0	Nordlund

ULTIMATE - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
1.99 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
2.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
11.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
16.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
17.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
20.99 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
20.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
21.00 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
21.01 ft	Cohesionless	2320.55 psf	20.66	N/A	0.03 Kips
29.99 ft	Cohesionless	2814.45 psf	20.66	N/A	35.61 Kips
30.01 ft	Cohesive	N/A	N/A	1500.00 psf	35.71 Kips
34.99 ft	Cohesive	N/A	N/A	1500.00 psf	63.09 Kips
35.01 ft	Cohesive	N/A	N/A	133.00 psf	63.15 Kips
40.99 ft	Cohesive	N/A	N/A	133.00 psf	66.06 Kips
41.01 ft	Cohesionless	4328.04 psf	20.66	N/A	66.13 Kips
50.01 ft	Cohesionless	4542.24 psf	20.66	N/A	123.66 Kips
59.01 ft	Cohesionless	4756.44 psf	20.66	N/A	186.63 Kips
68.01 ft	Cohesionless	4970.64 psf	20.66	N/A	255.01 Kips
75.99 ft	Cohesionless	5160.56 psf	20.66	N/A	320.19 Kips
76.01 ft	Cohesionless	5994.06 psf	21.33	N/A	320.37 Kips
85.01 ft	Cohesionless	6230.76 psf	21.33	N/A	408.40 Kips
88.99 ft	Cohesionless	6335.44 psf	21.33	N/A	449.47 Kips

ULTIMATE - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
1.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
2.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
11.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
16.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
17.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
20.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
20.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
21.00 ft	Cohesionless	2320.00 psf	0.00	14.43 Kips	14.43 Kips
21.01 ft	Cohesionless	2321.10 psf	35.20	22.09 Kips	22.09 Kips
29.99 ft	Cohesionless	3308.90 psf	35.20	22.09 Kips	22.09 Kips
30.01 ft	Cohesive	N/A	N/A	N/A	14.43 Kips
34.99 ft	Cohesive	N/A	N/A	N/A	14.43 Kips
35.01 ft	Cohesive	N/A	N/A	N/A	2.41 Kips
40.99 ft	Cohesive	N/A	N/A	N/A	2.41 Kips
41.01 ft	Cohesionless	4328.28 psf	35.20	22.09 Kips	22.09 Kips
50.01 ft	Cohesionless	4756.68 psf	35.20	22.09 Kips	22.09 Kips
59.01 ft	Cohesionless	5185.08 psf	35.20	22.09 Kips	22.09 Kips
68.01 ft	Cohesionless	5613.48 psf	35.20	22.09 Kips	22.09 Kips
75.99 ft	Cohesionless	5993.32 psf	35.20	22.09 Kips	22.09 Kips
76.01 ft	Cohesionless	5994.33 psf	40.40	35.28 Kips	35.28 Kips
85.01 ft	Cohesionless	6467.73 psf	40.40	35.28 Kips	35.28 Kips
88.99 ft	Cohesionless	6677.07 psf	40.40	35.28 Kips	35.28 Kips

ULTIMATE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
1.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
2.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
11.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
16.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
17.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
20.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
20.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
21.00 ft	0.00 Kips	14.43 Kips	14.43 Kips
21.01 ft	0.03 Kips	22.09 Kips	22.12 Kips
29.99 ft	35.61 Kips	22.09 Kips	57.70 Kips
30.01 ft	35.71 Kips	14.43 Kips	50.14 Kips
34.99 ft	63.09 Kips	14.43 Kips	77.52 Kips
35.01 ft	63.15 Kips	2.41 Kips	65.55 Kips
40.99 ft	66.06 Kips	2.41 Kips	68.47 Kips
41.01 ft	66.13 Kips	22.09 Kips	88.22 Kips
50.01 ft	123.66 Kips	22.09 Kips	145.75 Kips
59.01 ft	186.63 Kips	22.09 Kips	208.72 Kips
68.01 ft	255.01 Kips	22.09 Kips	277.10 Kips
75.99 ft	320.19 Kips	22.09 Kips	342.28 Kips
76.01 ft	320.37 Kips	35.28 Kips	355.64 Kips
85.01 ft	408.40 Kips	35.28 Kips	443.68 Kips
88.99 ft	449.47 Kips	35.28 Kips	484.75 Kips

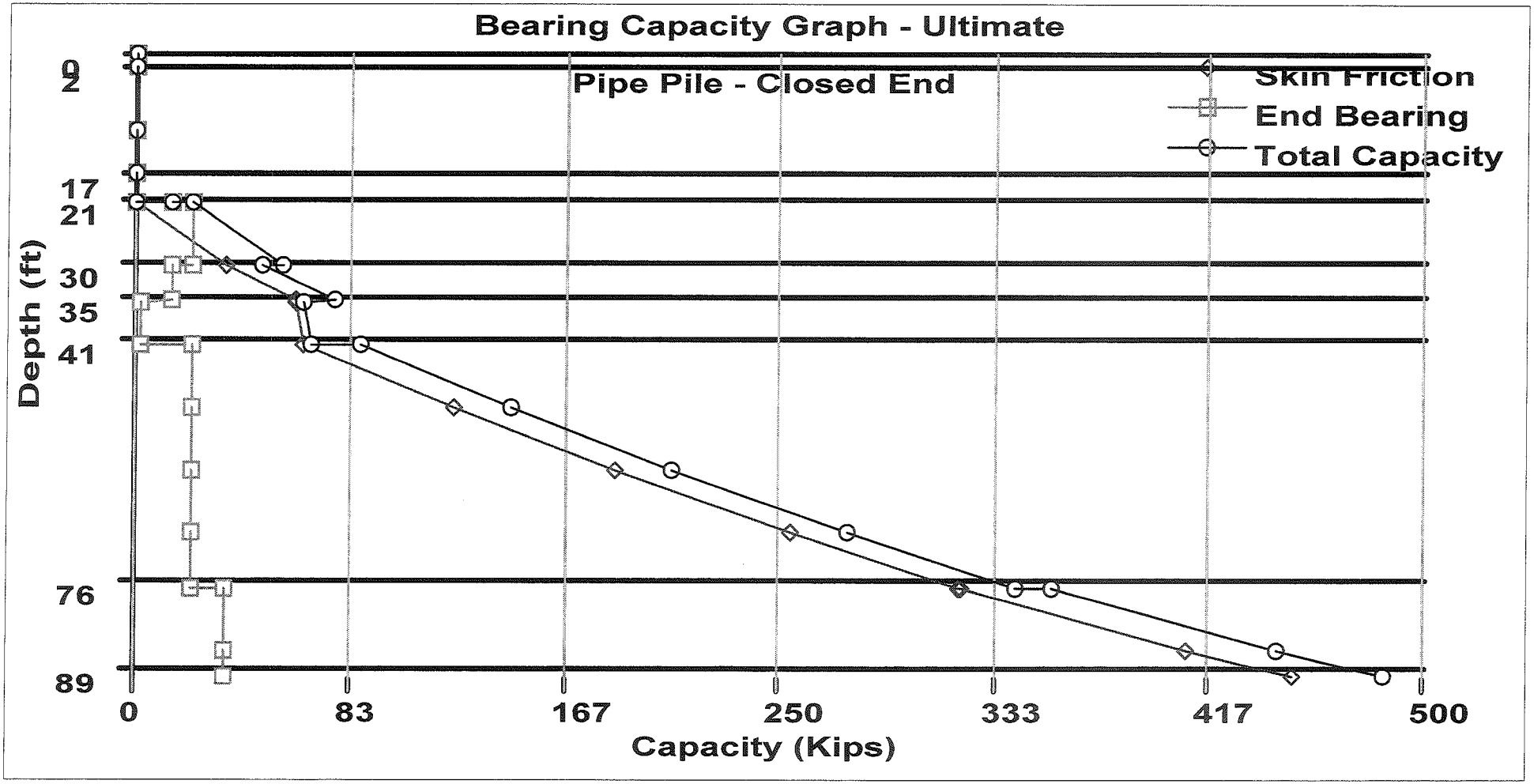
TB-12

200 (57.8')

Ground Elev. 486.8 Ft (148.36 m)

54' { Pile Top 482.96 Ft (147.24 m)
Pile Tip 429.0 Ft (130.8 m)

F... ...ham... C:\...VEI...956...56T...DV...



RESULTS FROM 'DRIVEN'

BRIDGE ON I-70 OVER SR 63

RESULTS FROM DRIVEN

BORING TB-13

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename: C:\DRIVEN\7956\7956TB13.DVN
Project Name: I-70 _SR -63 Project Date: 01/26/2006
Project Client: INDOT
Computed By: AC
Project Manager: AC

PILE INFORMATION

Pile Type: Pipe Pile - Closed End
Top of Pile: 0.00 ft
Diameter of Pile: 14.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	70.00 ft
	- Driving/Restrike	0.00 ft
	- Ultimate:	67.00 ft
Ultimate Considerations:	- Local Scour:	60.00 ft
	- Long Term Scour:	0.00 ft
	- Soft Soil:	0.00 ft

ULTIMATE PROFILE

Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesionless	24.00 ft	0.00%	110.00 pcf	27.0/27.0	Nordlund
2	Cohesionless	12.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund
3	Cohesionless	21.00 ft	0.00%	120.00 pcf	32.0/32.0	Nordlund
4	Cohesive	3.00 ft	0.00%	120.00 pcf	2000.00 psf	T-80 Sand
5	Cohesionless	7.00 ft	0.00%	120.00 pcf	32.0/32.0	Nordlund
6	Cohesionless	23.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund

ULTIMATE - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
9.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
18.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
23.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
24.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
33.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
35.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
36.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
45.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
54.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
56.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
57.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
59.99 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
59.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
60.00 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
60.01 ft	Cohesionless	7020.60 psf	21.33	N/A	0.11 Kips
66.99 ft	Cohesionless	7439.40 psf	21.33	N/A	81.64 Kips
67.01 ft	Cohesionless	7860.31 psf	22.66	N/A	81.91 Kips
76.01 ft	Cohesionless	8142.01 psf	22.66	N/A	221.53 Kips
85.01 ft	Cohesionless	8423.71 psf	22.66	N/A	370.80 Kips
89.99 ft	Cohesionless	8579.59 psf	22.66	N/A	457.56 Kips

ULTIMATE - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
9.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
18.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
23.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
24.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
33.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
35.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
36.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
45.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
54.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
56.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
57.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
59.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
59.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
60.00 ft	Cohesionless	7020.00 psf	0.00	19.24 Kips	19.24 Kips
60.01 ft	Cohesionless	7021.20 psf	40.40	35.28 Kips	35.28 Kips
66.99 ft	Cohesionless	7858.80 psf	40.40	35.28 Kips	35.28 Kips
67.01 ft	Cohesionless	7860.63 psf	55.60	78.59 Kips	78.59 Kips
76.01 ft	Cohesionless	8424.03 psf	55.60	78.59 Kips	78.59 Kips
85.01 ft	Cohesionless	8987.43 psf	55.60	78.59 Kips	78.59 Kips
89.99 ft	Cohesionless	9299.17 psf	55.60	78.59 Kips	78.59 Kips

ULTIMATE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
9.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
18.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
23.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
24.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
33.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
35.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
36.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
45.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
54.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
56.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
57.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
59.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
59.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
60.00 ft	0.00 Kips	19.24 Kips	19.24 Kips
60.01 ft	0.11 Kips	35.28 Kips	35.39 Kips
66.99 ft	81.64 Kips	35.28 Kips	116.91 Kips
67.01 ft	81.91 Kips	78.59 Kips	160.50 Kips
9 → 76.01 ft	221.53 Kips	78.59 Kips	300.12 Kips
85.01 ft	370.80 Kips	78.59 Kips	449.40 Kips
89.99 ft	457.56 Kips	78.59 Kips	536.15 Kips

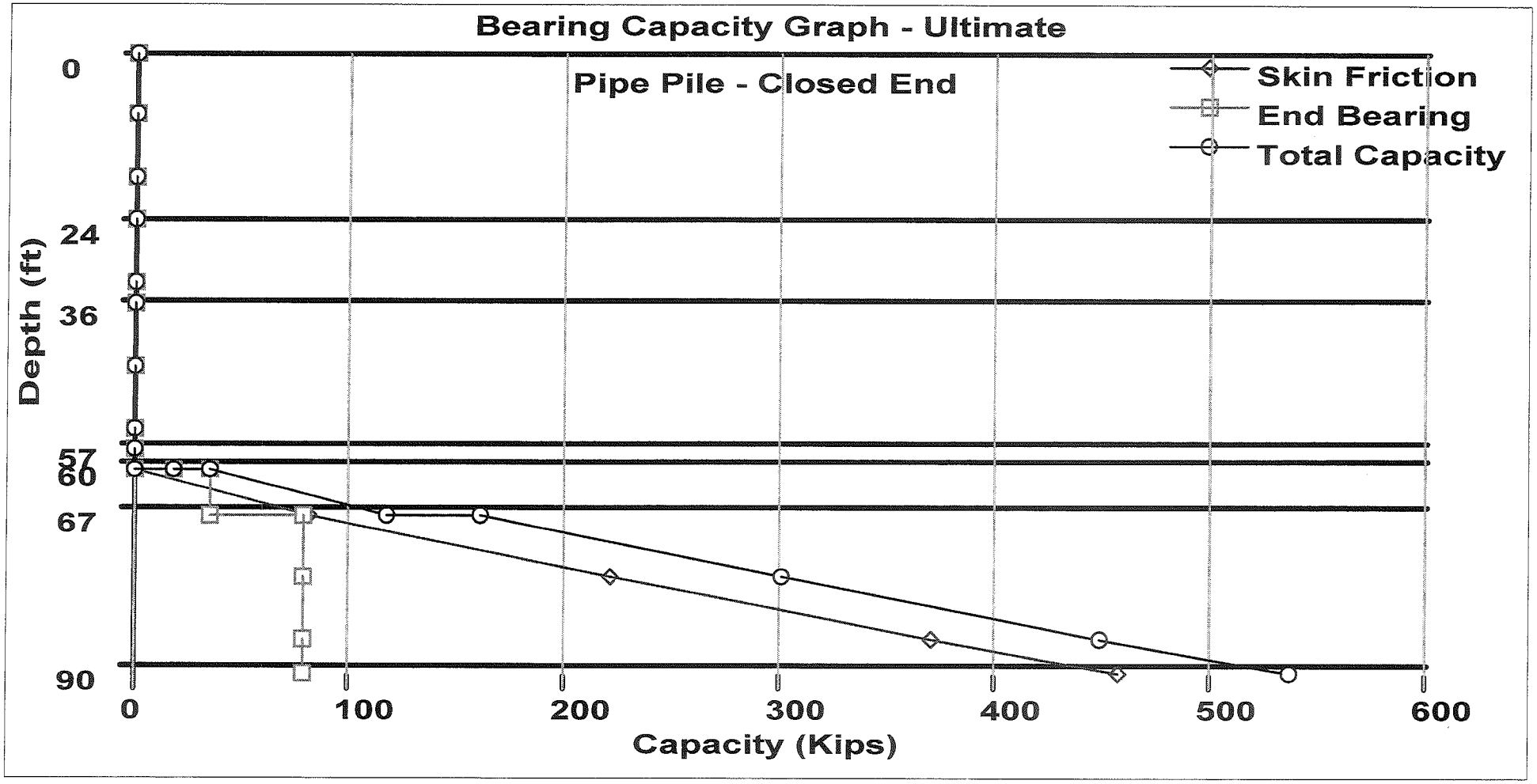
TB-13

200 KIPS (69.6')

Ground Elev. 516.6 ft (157.46 m)

65' { Pile Top 512.63 ft (156.29 m)
Pile Tip 447.0 (136.3 m)

Filename: C:\DRIVEN\7956\7956TB13.DVN



RESULTS FROM DRIVEN

BORING TB-14

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename: C:\DRIVEN\7956\7956TB14.DVN
Project Name: I-70 & SR-63
Project Date: 01/26/2006
Project Client: INDOT
Computed By: AC
Project Manager: AC

PILE INFORMATION

Pile Type: Pipe Pile - Closed End
Top of Pile: 5.20 ft
Diameter of Pile: 14.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	41.50 ft
	- Driving/Restrike	0.00 ft
	- Ultimate:	45.00 ft
Ultimate Considerations:	- Local Scour:	8.00 ft
	- Long Term Scour:	0.00 ft
	- Soft Soil:	0.00 ft

ULTIMATE PROFILE

Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesionless	8.00 ft	0.00%	105.00 pcf	27.0/27.0	Nordlund
2	Cohesionless	3.00 ft	0.00%	105.00 pcf	27.0/27.0	Nordlund
3	Cohesionless	5.00 ft	0.00%	115.00 pcf	31.0/31.0	Nordlund
4	Cohesionless	6.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund
5	Cohesionless	10.00 ft	0.00%	115.00 pcf	31.0/31.0	Nordlund
6	Cohesionless	5.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund
7	Cohesionless	25.00 ft	0.00%	120.00 pcf	32.0/32.0	Nordlund
8	Cohesionless	10.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund
9	Cohesionless	18.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund

ULTIMATE - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
5.19 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
5.20 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
7.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
7.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
8.00 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
8.01 ft	Cohesionless	840.53 psf	18.00	N/A	0.01 Kips
10.99 ft	Cohesionless	996.97 psf	18.00	N/A	2.89 Kips
11.01 ft	Cohesionless	1155.58 psf	20.66	N/A	2.92 Kips
15.99 ft	Cohesionless	1441.92 psf	20.66	N/A	13.03 Kips
16.01 ft	Cohesionless	1730.63 psf	22.66	N/A	13.09 Kips
21.99 ft	Cohesionless	2104.37 psf	22.66	N/A	37.07 Kips
22.01 ft	Cohesionless	2480.58 psf	20.66	N/A	37.15 Kips
31.01 ft	Cohesionless	2998.08 psf	20.66	N/A	75.13 Kips
31.99 ft	Cohesionless	3054.42 psf	20.66	N/A	80.06 Kips
32.01 ft	Cohesionless	3630.62 psf	22.66	N/A	80.18 Kips
36.99 ft	Cohesionless	3941.88 psf	22.66	N/A	117.59 Kips
37.01 ft	Cohesionless	4255.60 psf	21.33	N/A	117.73 Kips
44.99 ft	Cohesionless	4734.40 psf	21.33	N/A	177.05 Kips
45.01 ft	Cohesionless	5215.29 psf	21.33	N/A	177.21 Kips
54.01 ft	Cohesionless	5474.49 psf	21.33	N/A	254.57 Kips
61.99 ft	Cohesionless	5704.31 psf	21.33	N/A	329.28 Kips
62.01 ft	Cohesionless	6194.51 psf	22.66	N/A	329.49 Kips
71.01 ft	Cohesionless	6476.21 psf	22.66	N/A	440.55 Kips
71.99 ft	Cohesionless	6506.89 psf	22.66	N/A	453.22 Kips
72.01 ft	Cohesionless	6820.51 psf	22.66	N/A	453.48 Kips
81.01 ft	Cohesionless	7102.21 psf	22.66	N/A	575.27 Kips
89.99 ft	Cohesionless	7383.29 psf	22.66	N/A	706.42 Kips

ULTIMATE - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
5.19 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
5.20 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
7.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
7.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
8.00 ft	Cohesionless	840.00 psf	19.80	14.24 Kips	9.14 Kips
8.01 ft	Cohesionless	841.05 psf	19.80	14.24 Kips	9.15 Kips
10.99 ft	Cohesionless	1153.95 psf	19.80	14.24 Kips	12.55 Kips
11.01 ft	Cohesionless	1156.15 psf	35.20	22.09 Kips	22.09 Kips
15.99 ft	Cohesionless	1728.85 psf	35.20	22.09 Kips	22.09 Kips
16.01 ft	Cohesionless	1731.25 psf	55.60	78.59 Kips	68.20 Kips
21.99 ft	Cohesionless	2478.75 psf	55.60	78.59 Kips	78.59 Kips
22.01 ft	Cohesionless	2481.15 psf	35.20	22.09 Kips	22.09 Kips
31.01 ft	Cohesionless	3516.15 psf	35.20	22.09 Kips	22.09 Kips
31.99 ft	Cohesionless	3628.85 psf	35.20	22.09 Kips	22.09 Kips
32.01 ft	Cohesionless	3631.25 psf	55.60	78.59 Kips	78.59 Kips
36.99 ft	Cohesionless	4253.75 psf	55.60	78.59 Kips	78.59 Kips
37.01 ft	Cohesionless	4256.20 psf	40.40	35.28 Kips	35.28 Kips
44.99 ft	Cohesionless	5213.80 psf	40.40	35.28 Kips	35.28 Kips
45.01 ft	Cohesionless	5215.58 psf	40.40	35.28 Kips	35.28 Kips
54.01 ft	Cohesionless	5733.98 psf	40.40	35.28 Kips	35.28 Kips
61.99 ft	Cohesionless	6193.62 psf	40.40	35.28 Kips	35.28 Kips
62.01 ft	Cohesionless	6194.83 psf	55.60	78.59 Kips	78.59 Kips
71.01 ft	Cohesionless	6758.23 psf	55.60	78.59 Kips	78.59 Kips
71.99 ft	Cohesionless	6819.57 psf	55.60	78.59 Kips	78.59 Kips
72.01 ft	Cohesionless	6820.83 psf	55.60	78.59 Kips	78.59 Kips
81.01 ft	Cohesionless	7384.23 psf	55.60	78.59 Kips	78.59 Kips
89.99 ft	Cohesionless	7946.37 psf	55.60	78.59 Kips	78.59 Kips

ULTIMATE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
5.19 ft	0.00 Kips	0.00 Kips	0.00 Kips
5.20 ft	0.00 Kips	0.00 Kips	0.00 Kips
7.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
7.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
8.00 ft	0.00 Kips	9.14 Kips	9.14 Kips
8.01 ft	0.01 Kips	9.15 Kips	9.16 Kips
10.99 ft	2.89 Kips	12.55 Kips	15.45 Kips
11.01 ft	2.92 Kips	22.09 Kips	25.01 Kips
15.99 ft	13.03 Kips	22.09 Kips	35.12 Kips
16.01 ft	13.09 Kips	68.20 Kips	81.29 Kips
21.99 ft	37.07 Kips	78.59 Kips	115.66 Kips
22.01 ft	37.15 Kips	22.09 Kips	59.24 Kips
31.01 ft	75.13 Kips	22.09 Kips	97.22 Kips
31.99 ft	80.06 Kips	22.09 Kips	102.15 Kips
32.01 ft	80.18 Kips	78.59 Kips	158.77 Kips
36.99 ft	117.59 Kips	78.59 Kips	196.18 Kips
37.01 ft	117.73 Kips	35.28 Kips	153.01 Kips
44.99 ft	177.05 Kips	35.28 Kips	212.33 Kips
45.01 ft	177.21 Kips	35.28 Kips	212.49 Kips
54.01 ft	254.57 Kips	35.28 Kips	289.84 Kips
61.99 ft	329.28 Kips	35.28 Kips	364.56 Kips
62.01 ft	329.49 Kips	78.59 Kips	408.09 Kips
71.01 ft	440.55 Kips	78.59 Kips	519.14 Kips
71.99 ft	453.22 Kips	78.59 Kips	531.82 Kips
72.01 ft	453.48 Kips	78.59 Kips	532.08 Kips
81.01 ft	575.27 Kips	78.59 Kips	653.86 Kips
89.99 ft	706.42 Kips	78.59 Kips	785.01 Kips

7.98' { 37.01 ft – 44.99 ft

200

(43.3')

TB-14

Ground elevation 490.7 feet (149.56m)

38' { pile TOP 485.46 feet (148 m)
pile TIP 447.37 feet (136.4m)

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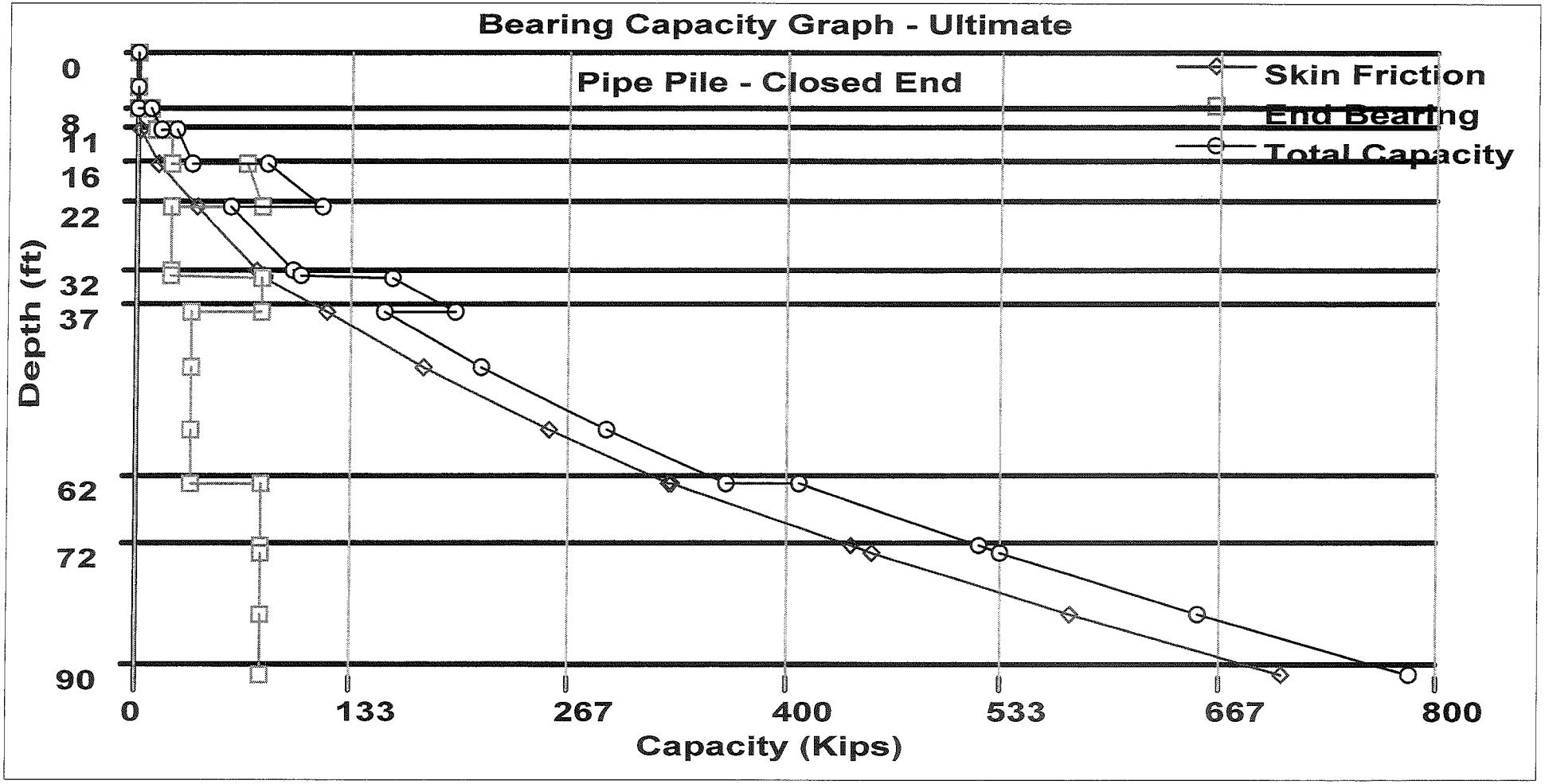


RESULTS FROM DRIVEN

BORING TB-15

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename: C:\DRIVEN\7956\7956TB15.DVN
Project Name: I-70 & SR - 63, TB-15
Project Date: 01/26/2006
Project Client: INDOT
Computed By: AC
Project Manager: AC

PILE INFORMATION

Pile Type: Pipe Pile - Closed End
Top of Pile: 5.00 ft
Diameter of Pile: 14.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	41.50 ft
	- Driving/Restrike	0.00 ft
	- Ultimate:	20.00 ft
Ultimate Considerations:	- Local Scour:	8.00 ft
	- Long Term Scour:	0.00 ft
	- Soft Soil:	0.00 ft

ULTIMATE PROFILE

Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesionless	8.00 ft	0.00%	110.00 pcf	31.0/31.0	Nordlund
2	Cohesionless	10.00 ft	0.00%	110.00 pcf	31.0/31.0	Nordlund
3	Cohesionless	4.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund
4	Cohesionless	20.00 ft	0.00%	115.00 pcf	32.0/32.0	Nordlund
5	Cohesionless	19.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund
6	Cohesionless	16.00 ft	0.00%	115.00 pcf	32.0/32.0	Nordlund
7	Cohesionless	13.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund

ULTIMATE - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
4.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
5.00 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
7.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
7.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
8.00 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
8.01 ft	Cohesionless	880.55 psf	20.66	N/A	0.01 Kips
17.01 ft	Cohesionless	1375.55 psf	20.66	N/A	17.44 Kips
17.99 ft	Cohesionless	1429.45 psf	20.66	N/A	20.10 Kips
18.01 ft	Cohesionless	1980.63 psf	22.66	N/A	20.16 Kips
19.99 ft	Cohesionless	2104.37 psf	22.66	N/A	28.10 Kips
20.01 ft	Cohesionless	2230.31 psf	22.66	N/A	28.19 Kips
21.99 ft	Cohesionless	2292.29 psf	22.66	N/A	36.84 Kips
22.01 ft	Cohesionless	2355.46 psf	21.33	N/A	36.92 Kips
31.01 ft	Cohesionless	2592.16 psf	21.33	N/A	73.55 Kips
40.01 ft	Cohesionless	2828.86 psf	21.33	N/A	116.86 Kips
41.99 ft	Cohesionless	2880.94 psf	21.33	N/A	127.29 Kips
42.01 ft	Cohesionless	3407.51 psf	22.66	N/A	127.41 Kips
51.01 ft	Cohesionless	3689.21 psf	22.66	N/A	190.67 Kips
60.01 ft	Cohesionless	3970.91 psf	22.66	N/A	263.60 Kips
60.99 ft	Cohesionless	4001.59 psf	22.66	N/A	272.12 Kips
61.01 ft	Cohesionless	4596.86 psf	21.33	N/A	272.28 Kips
70.01 ft	Cohesionless	4833.56 psf	21.33	N/A	340.58 Kips
76.99 ft	Cohesionless	5017.14 psf	21.33	N/A	398.15 Kips
77.01 ft	Cohesionless	5438.51 psf	22.66	N/A	398.34 Kips
86.01 ft	Cohesionless	5720.21 psf	22.66	N/A	496.43 Kips
89.99 ft	Cohesionless	5844.79 psf	22.66	N/A	542.89 Kips

ULTIMATE - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
4.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
5.00 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
7.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
7.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
8.00 ft	Cohesionless	880.00 psf	35.20	22.09 Kips	19.96 Kips
8.01 ft	Cohesionless	881.10 psf	35.20	22.09 Kips	19.99 Kips
17.01 ft	Cohesionless	1871.10 psf	35.20	22.09 Kips	22.09 Kips
17.99 ft	Cohesionless	1978.90 psf	35.20	22.09 Kips	22.09 Kips
18.01 ft	Cohesionless	1981.25 psf	55.60	78.59 Kips	78.05 Kips
19.99 ft	Cohesionless	2228.75 psf	55.60	78.59 Kips	78.59 Kips
20.01 ft	Cohesionless	2230.63 psf	55.60	78.59 Kips	78.59 Kips
21.99 ft	Cohesionless	2354.57 psf	55.60	78.59 Kips	78.59 Kips
22.01 ft	Cohesionless	2355.73 psf	40.40	35.28 Kips	35.28 Kips
31.01 ft	Cohesionless	2829.13 psf	40.40	35.28 Kips	35.28 Kips
40.01 ft	Cohesionless	3302.53 psf	40.40	35.28 Kips	35.28 Kips
41.99 ft	Cohesionless	3406.67 psf	40.40	35.28 Kips	35.28 Kips
42.01 ft	Cohesionless	3407.83 psf	55.60	78.59 Kips	78.59 Kips
51.01 ft	Cohesionless	3971.23 psf	55.60	78.59 Kips	78.59 Kips
60.01 ft	Cohesionless	4534.63 psf	55.60	78.59 Kips	78.59 Kips
60.99 ft	Cohesionless	4595.97 psf	55.60	78.59 Kips	78.59 Kips
61.01 ft	Cohesionless	4597.13 psf	40.40	35.28 Kips	35.28 Kips
70.01 ft	Cohesionless	5070.53 psf	40.40	35.28 Kips	35.28 Kips
76.99 ft	Cohesionless	5437.67 psf	40.40	35.28 Kips	35.28 Kips
77.01 ft	Cohesionless	5438.83 psf	55.60	78.59 Kips	78.59 Kips
86.01 ft	Cohesionless	6002.23 psf	55.60	78.59 Kips	78.59 Kips
89.99 ft	Cohesionless	6251.37 psf	55.60	78.59 Kips	78.59 Kips

ULTIMATE - SUMMARY OF CAPACITIES

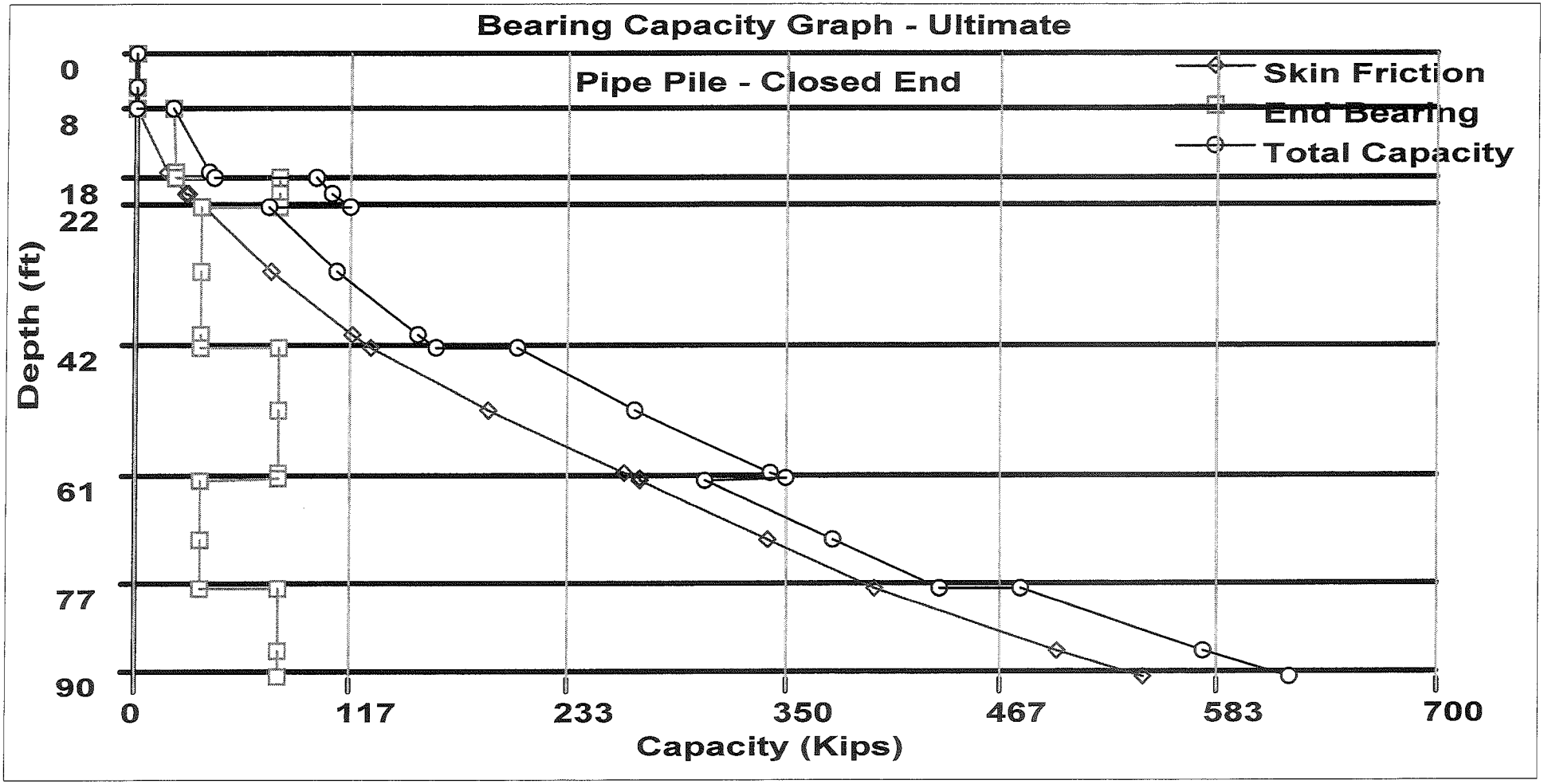
Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
4.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
5.00 ft	0.00 Kips	0.00 Kips	0.00 Kips
7.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
7.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
8.00 ft	0.00 Kips	19.96 Kips	19.96 Kips
8.01 ft	0.01 Kips	19.99 Kips	20.00 Kips
17.01 ft	17.44 Kips	22.09 Kips	39.53 Kips
17.99 ft	20.10 Kips	22.09 Kips	42.19 Kips
18.01 ft	20.16 Kips	78.05 Kips	98.21 Kips
19.99 ft	28.10 Kips	78.59 Kips	106.70 Kips
20.01 ft	28.19 Kips	78.59 Kips	106.78 Kips
21.99 ft	36.84 Kips	78.59 Kips	115.43 Kips
22.01 ft	36.92 Kips	35.28 Kips	72.20 Kips
31.01 ft	73.55 Kips	35.28 Kips	108.82 Kips
40.01 ft	116.86 Kips	35.28 Kips	152.14 Kips
41.99 ft ← 42'	127.29 Kips	35.28 Kips	162.57 Kips ← 200 (42')
42.01 ft	127.41 Kips	78.59 Kips	206.00 Kips
51.01 ft	190.67 Kips	78.59 Kips	269.27 Kips
60.01 ft	263.60 Kips	78.59 Kips	342.19 Kips
60.99 ft	272.12 Kips	78.59 Kips	350.72 Kips
61.01 ft	272.28 Kips	35.28 Kips	307.56 Kips
70.01 ft	340.58 Kips	35.28 Kips	375.86 Kips
76.99 ft	398.15 Kips	35.28 Kips	433.43 Kips
77.01 ft	398.34 Kips	78.59 Kips	476.93 Kips
86.01 ft	496.43 Kips	78.59 Kips	575.02 Kips
89.99 ft	542.89 Kips	78.59 Kips	621.48 Kips

TB-15

Ground Elevation 490 ft (149.36 m)

37.5' { pile TOP 485.46 ft (148.0 m)
pile TiD 448.0 ft (136.6 m)

Filename: C:\DRIVEN\956\956TB15.DWN



RESULTS FROM DRIVEN

BORING TB-16

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename: C:\DRIVEN\7956\7956TB16.DVN
Project Name: I-70 & SR-63, TB-16
Project Date: 01/26/2006
Project Client: INDOT
Computed By: AC
Project Manager: AC

PILE INFORMATION

Pile Type: Pipe Pile - Closed End
Top of Pile: 3.70 ft
Diameter of Pile: 14.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	41.50 ft
	- Driving/Restrike	0.00 ft
	- Ultimate:	40.00 ft
Ultimate Considerations:	- Local Scour:	0.00 ft
	- Long Term Scour:	0.00 ft
	- Soft Soil: (Downdrag Condition)	2.00 ft

ULTIMATE PROFILE

Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesive	2.00 ft	0.00%	105.00 pcf	250.00 psf	T-80 Same
2	Cohesive	2.50 ft	0.00%	110.00 pcf	750.00 psf	T-80 Clay
3	Cohesionless	12.00 ft	0.00%	110.00 pcf	31.0/31.0	Nordlund
4	Cohesionless	35.00 ft	0.00%	115.00 pcf	32.0/32.0	Nordlund
5	Cohesionless	5.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund
6	Cohesionless	10.00 ft	0.00%	120.00 pcf	32.0/32.0	Nordlund
7	Cohesionless	22.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund

ULTIMATE - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
1.99 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
1.99 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
2.00 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
2.01 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
3.69 ft	Cohesive	N/A	N/A	0.00 psf	0.00 Kips
3.70 ft	Cohesive	N/A	N/A	340.78 psf	0.00 Kips
4.49 ft	Cohesive	N/A	N/A	340.78 psf	0.99 Kips
4.51 ft	Cohesionless	485.55 psf	20.66	N/A	1.01 Kips
13.51 ft	Cohesionless	980.55 psf	20.66	N/A	13.43 Kips
16.49 ft	Cohesionless	1144.45 psf	20.66	N/A	20.31 Kips
16.51 ft	Cohesionless	1805.58 psf	21.33	N/A	20.36 Kips
25.51 ft	Cohesionless	2323.08 psf	21.33	N/A	53.19 Kips
34.51 ft	Cohesionless	2840.58 psf	21.33	N/A	100.65 Kips
39.99 ft	Cohesionless	3155.68 psf	21.33	N/A	136.71 Kips
40.01 ft	Cohesionless	4507.76 psf	21.33	N/A	136.85 Kips
49.01 ft	Cohesionless	4744.46 psf	21.33	N/A	203.88 Kips
51.49 ft	Cohesionless	4809.69 psf	21.33	N/A	223.53 Kips
51.51 ft	Cohesionless	5112.71 psf	22.66	N/A	223.71 Kips
56.49 ft	Cohesionless	5268.59 psf	22.66	N/A	273.70 Kips
56.51 ft	Cohesionless	5425.69 psf	21.33	N/A	273.89 Kips
65.51 ft	Cohesionless	5684.89 psf	21.33	N/A	354.21 Kips
66.49 ft	Cohesionless	5713.11 psf	21.33	N/A	363.40 Kips
66.51 ft	Cohesionless	6001.71 psf	22.66	N/A	363.61 Kips
75.51 ft	Cohesionless	6283.41 psf	22.66	N/A	471.36 Kips
84.51 ft	Cohesionless	6565.11 psf	22.66	N/A	588.77 Kips
88.49 ft	Cohesionless	6689.69 psf	22.66	N/A	643.77 Kips

ULTIMATE - END BEARING

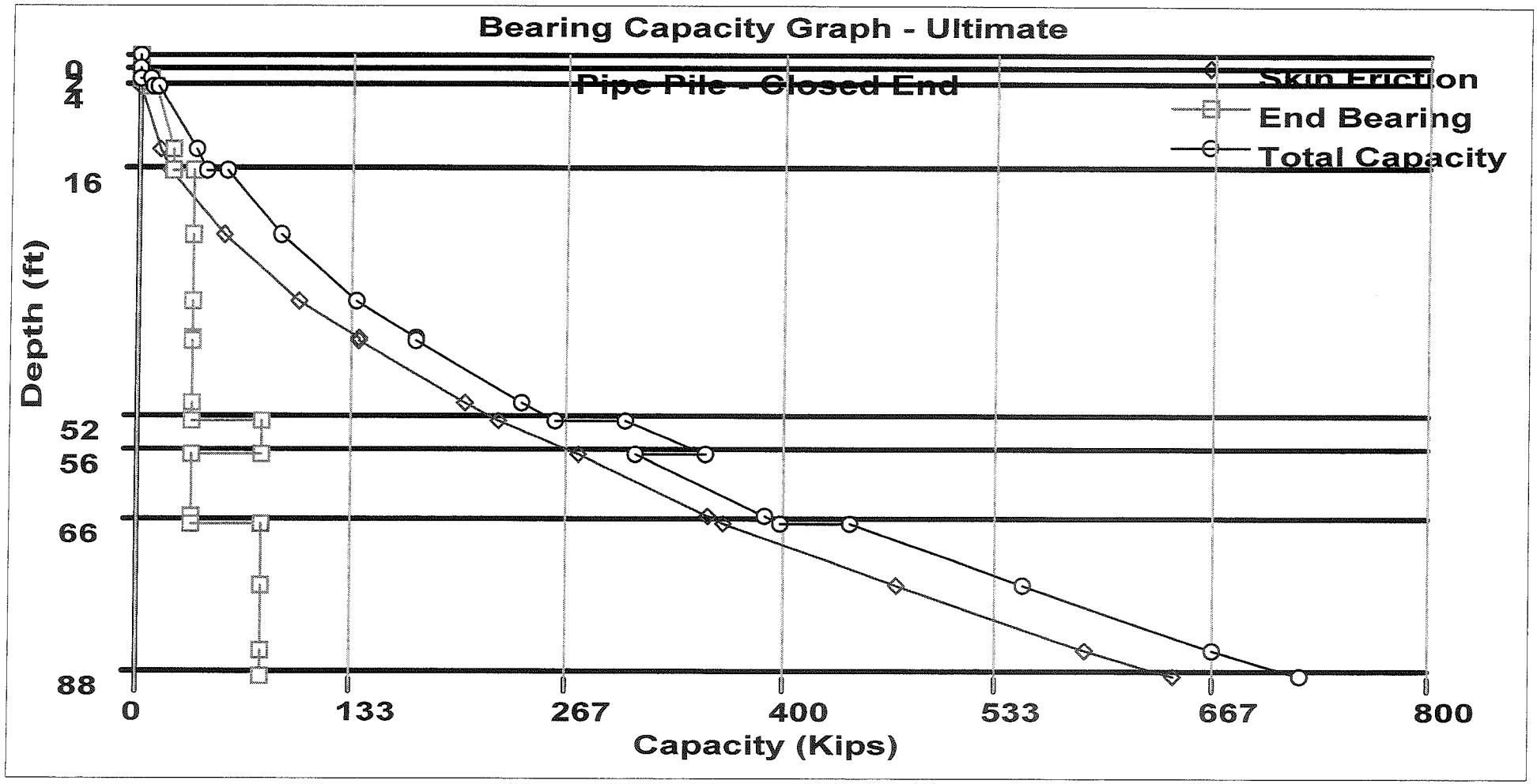
Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
1.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
1.99 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
2.00 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
2.01 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
3.69 ft	Cohesive	N/A	N/A	N/A	0.00 Kips
3.70 ft	Cohesive	N/A	N/A	N/A	7.22 Kips
4.49 ft	Cohesive	N/A	N/A	N/A	7.22 Kips
4.51 ft	Cohesionless	486.10 psf	35.20	22.09 Kips	11.03 Kips
13.51 ft	Cohesionless	1476.10 psf	35.20	22.09 Kips	22.09 Kips
16.49 ft	Cohesionless	1803.90 psf	35.20	22.09 Kips	22.09 Kips
16.51 ft	Cohesionless	1806.15 psf	40.40	35.28 Kips	35.28 Kips
25.51 ft	Cohesionless	2841.15 psf	40.40	35.28 Kips	35.28 Kips
34.51 ft	Cohesionless	3876.15 psf	40.40	35.28 Kips	35.28 Kips
39.99 ft	Cohesionless	4506.35 psf	40.40	35.28 Kips	35.28 Kips
40.01 ft	Cohesionless	4508.03 psf	40.40	35.28 Kips	35.28 Kips
49.01 ft	Cohesionless	4981.43 psf	40.40	35.28 Kips	35.28 Kips
51.49 ft	Cohesionless	5111.87 psf	40.40	35.28 Kips	35.28 Kips
51.51 ft	Cohesionless	5113.03 psf	55.60	78.59 Kips	78.59 Kips
56.49 ft	Cohesionless	5424.77 psf	55.60	78.59 Kips	78.59 Kips
56.51 ft	Cohesionless	5425.98 psf	40.40	35.28 Kips	35.28 Kips
65.51 ft	Cohesionless	5944.38 psf	40.40	35.28 Kips	35.28 Kips
66.49 ft	Cohesionless	6000.82 psf	40.40	35.28 Kips	35.28 Kips
66.51 ft	Cohesionless	6002.03 psf	55.60	78.59 Kips	78.59 Kips
75.51 ft	Cohesionless	6565.43 psf	55.60	78.59 Kips	78.59 Kips
84.51 ft	Cohesionless	7128.83 psf	55.60	78.59 Kips	78.59 Kips
88.49 ft	Cohesionless	7377.97 psf	55.60	78.59 Kips	78.59 Kips

ULTIMATE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
1.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
1.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
2.00 ft	0.00 Kips	0.00 Kips	0.00 Kips
2.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
3.69 ft	0.00 Kips	0.00 Kips	0.00 Kips
3.70 ft	0.00 Kips	7.22 Kips	7.22 Kips
4.49 ft	0.99 Kips	7.22 Kips	8.20 Kips
4.51 ft	1.01 Kips	11.03 Kips	12.03 Kips
13.51 ft	13.43 Kips	22.09 Kips	35.52 Kips
16.49 ft	20.31 Kips	22.09 Kips	42.40 Kips
16.51 ft	20.36 Kips	35.28 Kips	55.64 Kips
25.51 ft	53.19 Kips	35.28 Kips	88.47 Kips
34.51 ft	100.65 Kips	35.28 Kips	135.93 Kips
39.99 ft	136.71 Kips	35.28 Kips	171.98 Kips
40.01 ft	136.85 Kips	35.28 Kips	172.12 Kips ← 200 KiP (40')
49.01 ft	203.88 Kips	35.28 Kips	239.16 Kips
51.49 ft	223.53 Kips	35.28 Kips	258.81 Kips
51.51 ft	223.71 Kips	78.59 Kips	302.30 Kips
56.49 ft	273.70 Kips	78.59 Kips	352.30 Kips
56.51 ft	273.89 Kips	35.28 Kips	309.17 Kips
65.51 ft	354.21 Kips	35.28 Kips	389.49 Kips
66.49 ft	363.40 Kips	35.28 Kips	398.68 Kips
66.51 ft	363.61 Kips	78.59 Kips	442.21 Kips
75.51 ft	471.36 Kips	78.59 Kips	549.95 Kips
84.51 ft	588.77 Kips	78.59 Kips	667.36 Kips
88.49 ft	643.77 Kips	78.59 Kips	722.36 Kips

Ground Elevation 491.0' (149.66m)

35' { Pile Top 485.93' (148.15m)
Pile Tip 451.0' (137.5m)


Bearing Capacity Graph - Ultimate
Pipe Pile - Closed End
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
2
4
16
52
56
66
88
0
133
267
400
533
667
800
Capacity (Kips)

RESULTS FROM DRIVEN

BORING TB-17

DRIVEN 1.0

GENERAL PROJECT INFORMATION

Filename: C:\DRIVEN\7956\7956TB17.DVN
Project Name: I-70 & SR-63, TB-17
Project Date: 01/26/2006
Project Client: INDOT
Computed By: Ac
Project Manager: AC

PILE INFORMATION

Pile Type: Pipe Pile - Closed End
Top of Pile: 4.50 ft
Diameter of Pile: 14.00 in

ULTIMATE CONSIDERATIONS

Water Table Depth At Time Of:	- Drilling:	63.50 ft
	- Driving/Restrike	0.00 ft
	- Ultimate:	64.00 ft
Ultimate Considerations:	- Local Scour:	23.00 ft
	- Long Term Scour:	0.00 ft
	- Soft Soil:	0.00 ft

ULTIMATE PROFILE

Layer	Type	Thickness	Driving Loss	Unit Weight	Strength	Ultimate Curve
1	Cohesionless	23.00 ft	0.00%	105.00 pcf	27.0/27.0	Nordlund
2	Cohesionless	5.00 ft	0.00%	105.00 pcf	27.0/27.0	Nordlund
3	Cohesionless	8.00 ft	0.00%	110.00 pcf	31.0/31.0	Nordlund
4	Cohesionless	12.00 ft	0.00%	125.00 pcf	34.0/34.0	Nordlund
5	Cohesionless	22.00 ft	0.00%	120.00 pcf	32.0/32.0	Nordlund

ULTIMATE - SKIN FRICTION

Depth	Soil Type	Effective Stress At Midpoint	Sliding Friction Angle	Adhesion	Skin Friction
0.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
4.49 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
4.50 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
9.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
18.01 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
22.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
22.99 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
23.00 ft	Cohesionless	0.00 psf	0.00	N/A	0.00 Kips
23.01 ft	Cohesionless	2415.53 psf	18.00	N/A	0.02 Kips
27.99 ft	Cohesionless	2676.97 psf	18.00	N/A	12.95 Kips
28.01 ft	Cohesionless	2940.55 psf	20.66	N/A	13.02 Kips
35.99 ft	Cohesionless	3379.45 psf	20.66	N/A	50.98 Kips
36.01 ft	Cohesionless	3820.62 psf	22.66	N/A	51.11 Kips
45.01 ft	Cohesionless	4383.12 psf	22.66	N/A	126.28 Kips
47.99 ft	Cohesionless	4569.38 psf	22.66	N/A	155.42 Kips
48.01 ft	Cohesionless	5320.60 psf	21.33	N/A	155.60 Kips
57.01 ft	Cohesionless	5860.60 psf	21.33	N/A	238.42 Kips
63.99 ft	Cohesionless	6279.40 psf	21.33	N/A	313.15 Kips
64.01 ft	Cohesionless	7240.29 psf	21.33	N/A	313.37 Kips
69.99 ft	Cohesionless	7412.51 psf	21.33	N/A	382.96 Kips

ULTIMATE - END BEARING

Depth	Soil Type	Effective Stress At Tip	Bearing Cap. Factor	Limiting End Bearing	End Bearing
0.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
4.49 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
4.50 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
9.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
18.01 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
22.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
22.99 ft	Cohesionless	0.00 psf	0.00	0.00 Kips	0.00 Kips
23.00 ft	Cohesionless	2415.00 psf	19.80	14.24 Kips	14.24 Kips
23.01 ft	Cohesionless	2416.05 psf	19.80	14.24 Kips	14.24 Kips
27.99 ft	Cohesionless	2938.95 psf	19.80	14.24 Kips	14.24 Kips
28.01 ft	Cohesionless	2941.10 psf	35.20	22.09 Kips	22.09 Kips
35.99 ft	Cohesionless	3818.90 psf	35.20	22.09 Kips	22.09 Kips
36.01 ft	Cohesionless	3821.25 psf	55.60	78.59 Kips	78.59 Kips
45.01 ft	Cohesionless	4946.25 psf	55.60	78.59 Kips	78.59 Kips
47.99 ft	Cohesionless	5318.75 psf	55.60	78.59 Kips	78.59 Kips
48.01 ft	Cohesionless	5321.20 psf	40.40	35.28 Kips	35.28 Kips
57.01 ft	Cohesionless	6401.20 psf	40.40	35.28 Kips	35.28 Kips
63.99 ft	Cohesionless	7238.80 psf	40.40	35.28 Kips	35.28 Kips
64.01 ft	Cohesionless	7240.58 psf	40.40	35.28 Kips	35.28 Kips
69.99 ft	Cohesionless	7585.02 psf	40.40	35.28 Kips	35.28 Kips

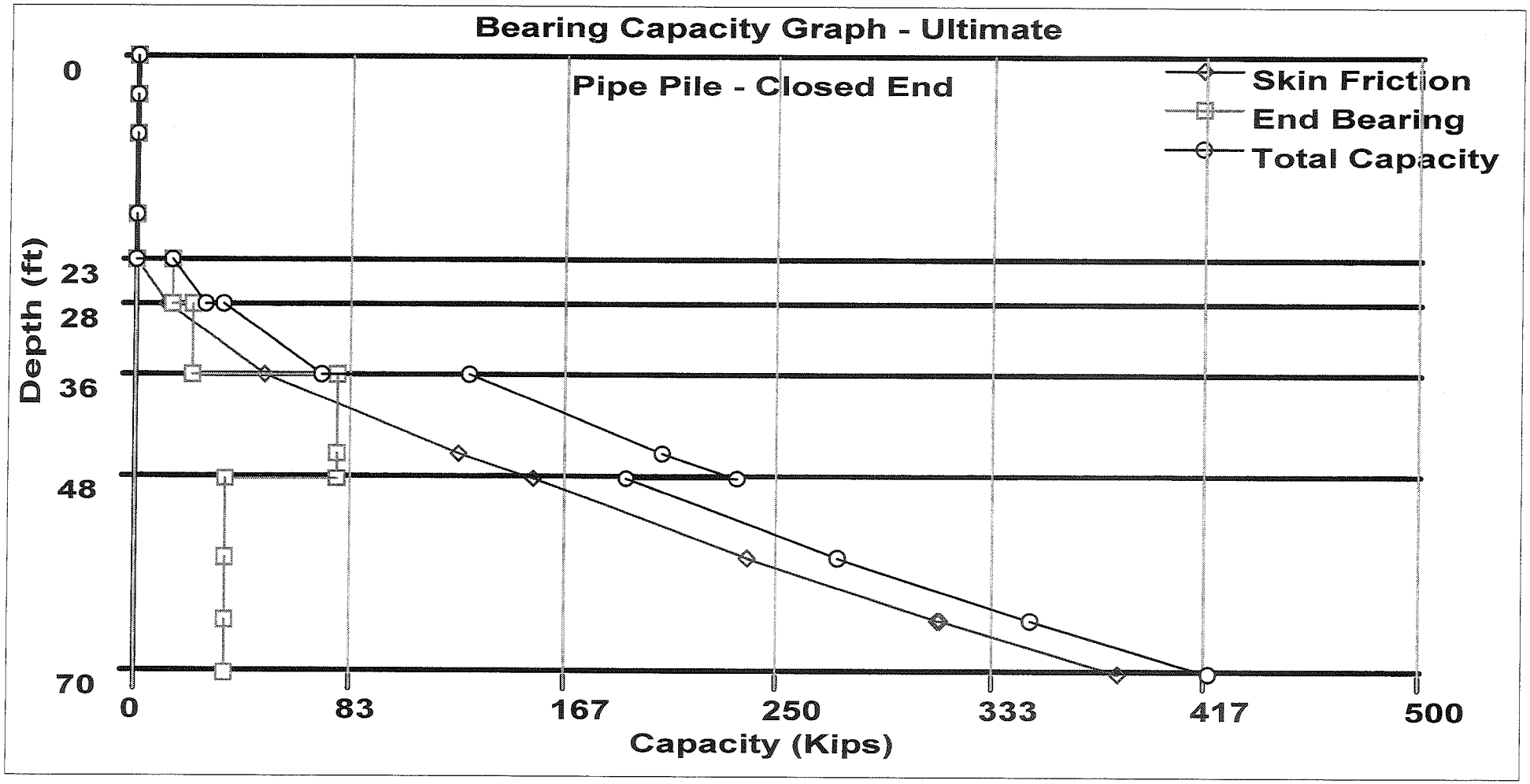
ULTIMATE - SUMMARY OF CAPACITIES

Depth	Skin Friction	End Bearing	Total Capacity
0.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
4.49 ft	0.00 Kips	0.00 Kips	0.00 Kips
4.50 ft	0.00 Kips	0.00 Kips	0.00 Kips
9.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
18.01 ft	0.00 Kips	0.00 Kips	0.00 Kips
22.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
22.99 ft	0.00 Kips	0.00 Kips	0.00 Kips
23.00 ft	0.00 Kips	14.24 Kips	14.24 Kips
23.01 ft	0.02 Kips	14.24 Kips	14.26 Kips
27.99 ft	12.95 Kips	14.24 Kips	27.19 Kips
28.01 ft	13.02 Kips	22.09 Kips	35.11 Kips
35.99 ft	50.98 Kips	22.09 Kips	73.07 Kips
36.01 ft	51.11 Kips	78.59 Kips	129.70 Kips ← 200 kips (44.4')
9 45.01 ft	126.28 Kips	78.59 Kips	204.87 Kips
47.99 ft	155.42 Kips	78.59 Kips	234.01 Kips
48.01 ft	155.60 Kips	35.28 Kips	190.88 Kips
57.01 ft	238.42 Kips	35.28 Kips	273.69 Kips
63.99 ft	313.15 Kips	35.28 Kips	348.42 Kips
64.01 ft	313.37 Kips	35.28 Kips	348.65 Kips
69.99 ft	382.96 Kips	35.28 Kips	418.24 Kips

TB-17

Grand Elevation 516.6 ft (157.46m)

40' (12.2m) { pile TOP 512.34 ft (156.2m)
pile tip 472.2 ft (144.0m)


Bearing Capacity Graph - Ultimate
Pipe Pile - Closed End
Skin Friction
End Bearing
Total Capacity
Depth (ft)
0
23
28
36
48
70
0
83
167
250
333
417
500
Capacity (Kips)