ROADWAY GEOTECHNICAL REPORT
IL 84 ROADWAY
FROM STATION 705+40 TO STATION 728+90
IDOT PROJECT D-92-001-11
SECTION 104B-2, CONTRACT No. 64G59
CARROLL COUNTY, ILLINOIS

for

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Technical Report Documentation Page

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11. Abstract

Between Stations 705+40 and 728+90, the IL 84 roadway will be realigned, widened, and reconstructed to accommodate the construction of the new US 52 Bridge over Mississippi River. The reconstructed roadway will have 12-foot wide traffic lane, and up to 8-foot wide shoulder and guardrail in each direction. To accommodate the new improvement cross roadways Randolph Street and Calhoun Street will be reconstructed and a detention basin west of IL 84 and North of Calhoun Street will be constructed. The side slopes are proposed to be with a maximum slope of 1:2 to 1:3 (H:V) for IL 84 roadway and most of the east side will be flanked by a retaining wall and for the detention basin the design slope varies from 1:3 to 1:4. The improvements will run on either existing fill or cut. The preliminary pavement structure design shows 9.75 inches of asphalt over 12 inches of aggregate subgrade along the lanes.

Along the improvement, the roadway slopes are covered mainly by discontinuous vegetation. Existing pavement structure includes up to 16-inch thick asphalt over granular base, occasionally old brick pavers, or cohesive subgrade. Beneath the surface the soil consists of up to 2 to 11 feet of fill, up to 15 feet of medium stiff to hard silty clay to silty clay loam colluvium and /or 20 feet of loose to very dense silty loam to gravelly sand colluvium, over up to 9 feet of hard silty clay to silty clay loam with weathered shale fragments, and more than 40.0 feet of shale bedrock.

For the entire project length, an average of 12 inches of existing pavement should be considered for removal estimates. Vegetation should be cleared and stripped. Temporary drainage ditches should be constructed to maintained positive drainage during construction. We do not anticipate detrimental settlement will occur under the new embankment loads, and we do not foresee global slope stability problems. The new pavement should be design based on SSR of POOR or IBR of 3.

The existing embankment slope material should be benched and/or deeply plowed and the exposed subgrade should be proofrolled. Areas identified as unstable during the course of construction should be disked, aerated, and recompacted and/or removed and replaced with granular fill use of a geotextile or combination thereof. Subgrade stabilization material needed should consist of aggregate and geotextile that meets the requirements of IDOT Standard Specifications.

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CARROLL COUNTY, ILLINOIS
FOR
PARSONS

1.0 INTRODUCTION

This roadway geotechnical report presents the results of Wang Engineering, Inc. (Wang) subsurface investigation, laboratory testing, groundwater conditions, and geotechnical evaluations performed to support the design and reconstruction of a section of IL Route 84 (IL 84) in Carroll County, Illinois. A *Site Location Map* is presented as Exhibit 1. The purpose of our geotechnical work was to evaluate the subsurface soil and groundwater conditions within this project area that would form a basis for design and construction recommendations and provide a report summarizing the results of our studies, conclusions, and recommendations.

1.1 Project Description

The US 52/IL 64/IL 84 project includes the replacement of the existing US 52 Bridge over the Mississippi River and reconstruction of the IL 84 from approximately Randolph Street to 2400 feet north thereof. The new bridge will be wider and will be on a new alignment to the south of the existing location. The existing bridge will remain in service until the new bridge is open to the traffic. A connection will be made from the old Iowa's causeway to the new Iowa approach.

According to plans and cross sections provided by Parsons Transportation Group (Parsons), Wang understands that approximately 2350 feet of IL 84 roadway between Station 705+40 and Station 728+90, will be reconstructed south and north of the US 52 Bridge over the Mississippi River. The IL 84 work includes widening of shoulders, which requires, on the east side of the roadway, deep cut into the bluff and retaining wall, upgrading existing guardrail, culvert replacement, and roadway resurfacing. The reconstructed roadway will have 12-foot wide traffic lane, 6- to 8-foot wide shoulder and guardrail in each direction, and 2- to 14-foot wide median.

To accommodate the IL 84 reconstruction, cross roadways Randolph Street and Calhoun Street will be reconstructed and widened on the west side of the IL 84 along the same alignment and approximately the same grade. Also a detention basin is constructed west of IL 84 and north of Calhoun Street.

1.2 Other Reports

For the same project, Wang completed two Structure Geotechnical Reports (SGR) and one Roadway Geotechnical Report (RGR). The two SGRs were for the US 52 Bridge over Mississippi River and for IL 84 retaining wall that will be constructed on the east side of the IL 84 roadway, and the RGR was for US 52 Iowa Section Causeway.

2.0 GEOLOGIC SETTING

The IL 84 proposed for reconstruction is located in the northwestern section of Carroll County just north of Savanna, Illinois. On the USGS *Savanna Quadrangle 7.5 Minute Series* map, the proposed improvement is located in the N ½ of Section 4, Tier 24 North, and Range 3 East of the 4th Principal Meridian.

The following review of published geologic data, with emphasis on factors that might influence the design and construction of the proposed engineering works, is meant to place the project area within a geological framework and, thus, to confirm the dependability and consistency of the present subsurface investigation results. For the study of the regional geologic framework, Wang considered northwestern Illinois area in general and Carroll County in particular. Exhibit 3 illustrates the *Site and Regional Geology*.

2.1 Physiography

Northwestern Carroll County and a slice of northeastern Jackson County are part of the Wisconsin Driftless Section. It is a low plateau area bordering the outwash-filled valley of the upper Mississippi River (Leighton et al. 1948).

The site is located along the Mississippi River Valley in an unglaciated area of northwestern Illinois. The project lies on the southwestern flank of the gently sloping Wisconsin Arch, and just northwest of the Illinois Basin. Although the Savanna area was not directly impacted by glacial

ice, early pre-Illinois glaciers encircled the Savanna area and had a dramatic effect on the region geomorphology. Meltwater from over 400,000 years of glacial retreats and advances established the Mississippi River Valley to its maximum depth by erosion (Richmond et al 1991). After this time, the Mississippi River Valley began to be aggraded by outwash and stratified sand and gravel deposits (Henry Formation); with intermittent periods of erosion during subsequent glacial and interglacial intervals. Modern river deposits are identified as Cahokia Alluvium and occur as stratified silt, clay, and re-deposited loess within the river channel, floodplains and backwaters of the Mississippi River. At the time of our investigation, the Mississippi River water surface elevation measured 582.5 feet. Near the south end of the proposed wall, flanking the reconstructed IL 84 to the east, the abrupt ground surface steps into the valley, from 631.2 feet elevation to river level.

2.2 Pedological Features

In Carrol County, Illinois the soil types were surveyed by the USDA (2014). Summaries of the USDA soil types along the project area, including their relevant geotechnical index properties and suitability as subgrade and road fill are shown in the *Site Pedological Map and Table* (Exhibit 2). The soil information provided by USDA is meant to be used as a general reference in the absence of a site-specific investigation. In this instance, our findings regarding soil features affecting suitability for roadway construction are not necessarily consistent with the information presented in Exhibit 2. Though a useful guide to general surficial soil conditions within the county, the USDA ratings for soil frost susceptibility and suitability as road subgrade seem overly critical and are probably based on different criteria than those applied in roadway engineering works.

2.3 Surficial Cover

The surficial cover is represented by up to 34-foot thick colluvium made up of silty clay to silty loam with little to some angular clasts that rests over the bedrock (Grimley 1997). Along the IL 84 alignment proposed for reconstruction, the surficial cover varies in thickness from 10.0 to 32.0 feet.

2.4 Bedrock

The bedrock outcrops along the edge of the Mississippi River Valley on the Illinois side of the project and forms an extended line of rock cliffs known as the Mississippi Palisades (Frankie 2001). Within the river valley, the elevation of the bedrock surface becomes gradually deeper

toward the west, such that rock beneath the Iowa side of the main river channel was found at approximately 120 feet below the water surface. The general lithological profile includes Silurian dolostones over Ordovician shale and dolostones.

The Plum River fault zone is mapped approximately 1,000 feet south of the existing bridge. The east-west Plum River fault zone width may measure as much as 4,000 feet. The fault is considered inactive, but the near vertical fault lines with a strike-slip component of movement have resulted in a structure with horsts and grabens and zones of breccia with rotated blocks.

There was no coal mining activity in the project area; the nearest active coal mines and coal resources are identified by the Illinois State Geological Survey at approximately 7 miles east from the site, just west from the village of Mount Carroll, Illinois.

Our subsurface investigation results fit into the local geologic context. The borings drilled in the project area revealed the native sediments consists of silty clay loam to silty loam with trace to some gravel to cobble size angular clasts (Colluvium) resting over weathered to solid shale bedrock. Borings referenced in this report encountered the shale bedrock at depths ranging from 12.5 to 41.0 feet bgs (elevation of 602.7 feet).

2.5 Climatological Data

The subsurface investigation was started in December 2013 and continued from May to August in 2014. To assess the possible effects of temperature and precipitation on water table data and soil moisture, the climatic conditions for the investigation period and three months prior to the start of the investigation are summarized graphically in Figures 1 to 4. The precipitation and temperature data for the investigation period are compared against thirty-year monthly data (1981 to 2010) in box-and-whiskers format to illustrate deviations from “normal” climate conditions during the current investigation. Local climatologic data were obtained from the Mount Carroll, Illinois Station (NCDC 2013).

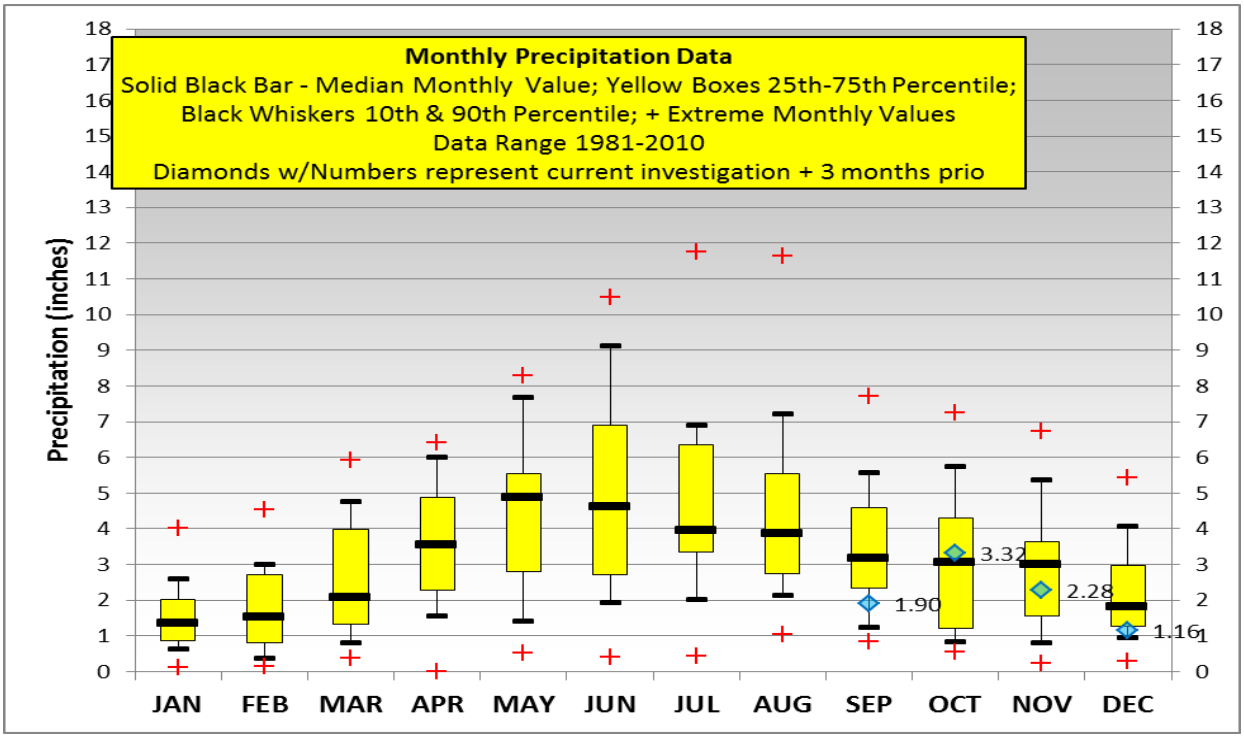

Figure 1: Monthly Precipitation Data (2013)

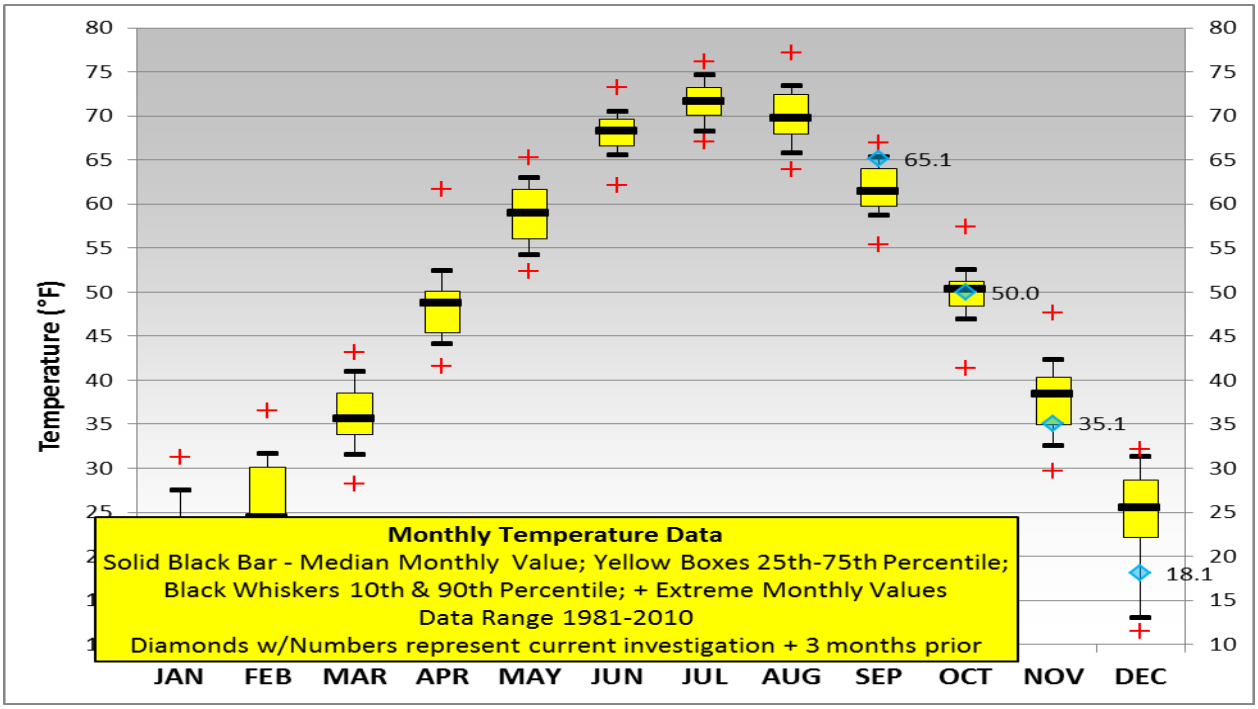

Figure 2: Monthly Temperature Data (2013)

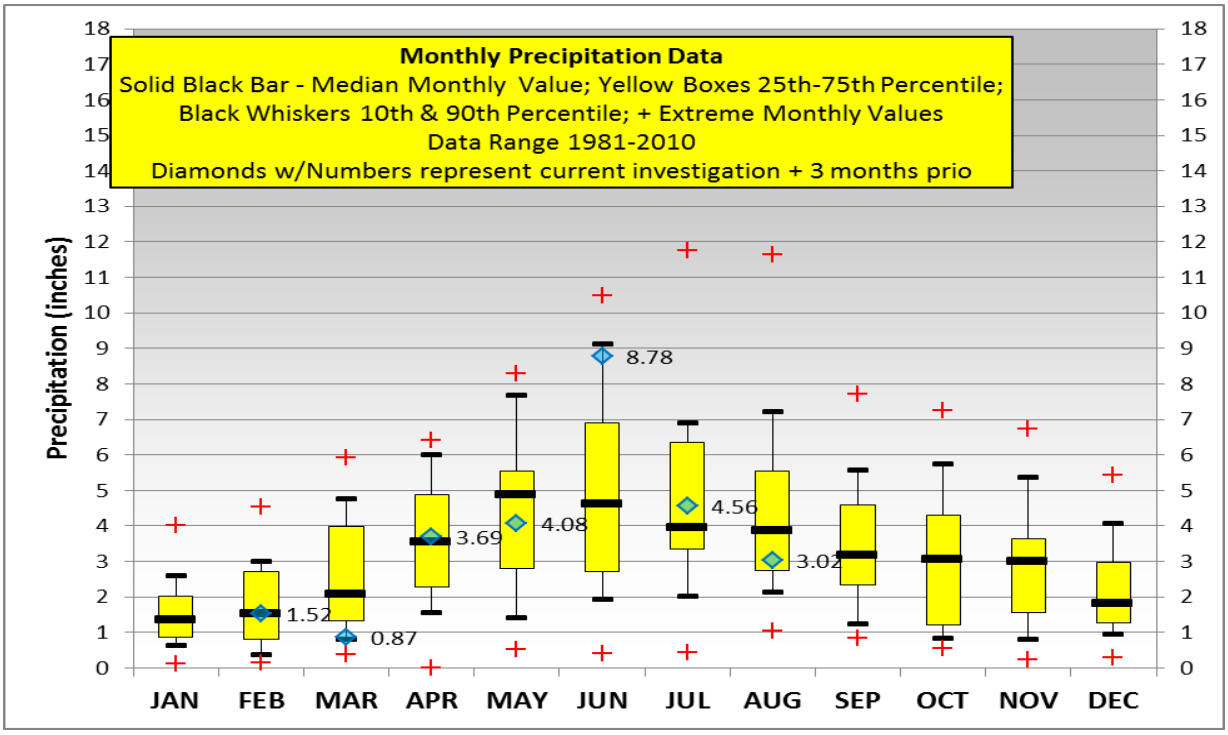

Figure 3: Monthly Precipitation Data (2014)

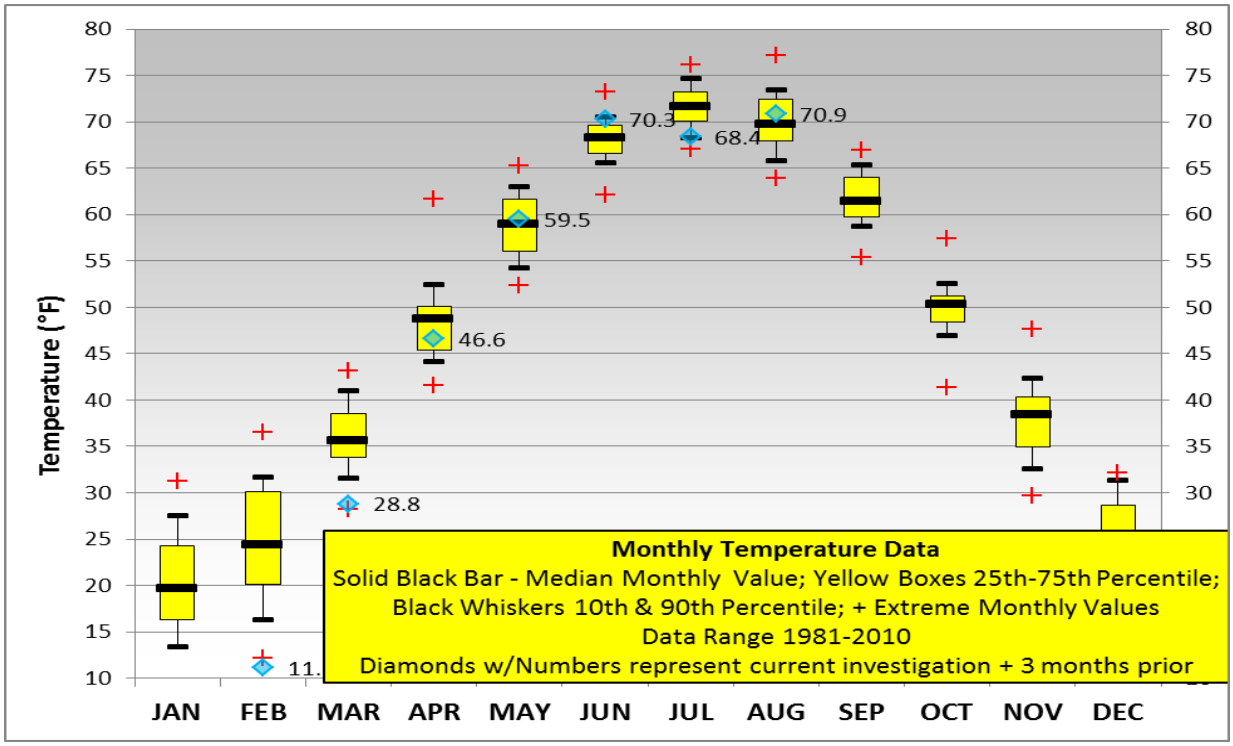

Figure 4: Monthly Temperature Data (2014)

A significantly low precipitation of 1.16 inches was recorded for the month of December 2013 doubled by a significantly low temperature of 18 ^{o}F. For two months preceding our December 2013 investigation, precipitations and temperatures recorded were within the average values. For the 2014 investigation period, significantly high precipitation of 8.78 inches was recorded for the month of June 2014 and average precipitation values were recorded for the rest of investigation period. Average temperature or with little deviation from average temperature were recorded for the 2014 investigation period. We did not observe significant effects on moisture content and water table data. However, groundwater may be affected by seasonal water table fluctuations.

3.0 METHODS OF INVESTIGATION

The following sections outline the subsurface and laboratory investigations.

3.1 Subsurface Exploration

To characterize the subgrade and groundwater conditions along the investigated IL 84 alignment, Wang performed subgrade borings (84-SGB-01 through 84-SGB-21) and detention borings (DSB-01 through DSB-03). Borings performed on the IL 84 roadway for the proposed retaining wall (84-RWB-01, 84-RWB-04, 84-RWB-05, 84-RWB-14, and 84-RWB-16) and US 52 Bridge east abutment (BSB-04, BSB-04A, and BSB-10) were also considered in our analysis.

The borings were advanced to depths ranging from 10.0 to 66.0 feet bgs. The boring locations were marked in the field by Wang based on approved plans. The as-drilled northing, easting, and elevation were surveyed by Wang and by Christian-Roge & Associates, Inc. for Wang. Stations and offsets were determined from design drawings provided by Parsons. Boring location data are included in the *Boring Logs* (Appendix A) and in the *Soil Boring Locations Plans and Soil Profiles* (Appendix E).

The boring were completed using truck-and ATV-mounted drilling rigs. The drilling rigs were equipped with hollow stem augers to advance and maintain an open borehole. Soil sampling was performed according to AASHTO T 206, "*Penetration Test and Split Barrel Sampling of Soils*." The soil was continuously sampled to 10 feet in roadway borings, and at 2.5 feet intervals 10 to 30 feet or bedrock, and at 5 feet thereafter or bedrock in the retaining wall borings. The bedrock

was cored in 5- and 10-foot runs up to 40 feet. Samples collected from each sampling interval were placed in sealed jars.

Field boring logs, prepared and maintained by Wang geologists, included lithological descriptions, visual-manual classifications, Rimac and pocket penetrometer unconfined compressive strength test results. Results of Standard Penetration Tests (SPT) are recorded on the boring logs as blows per 6 inches of penetration.

Groundwater levels were measured while drilling and at completion of each boring. For safety considerations each boreholes was backfilled upon completion with soil cuttings and/or bentonite chips and, where necessary, the pavement surface was restored to its original condition.

3.2 Laboratory Testing

The laboratory testing program included water content determination (AASHTO T 265) on all samples and particle size (T 88), and Atterberg limits (T 89 and T 90) tests on selected soil samples. Tested samples were classified according to the IDH and AASHTO classification systems. Field visual-manual classifications were also verified in the laboratory. The results of the laboratory testing program are shown in the attached *Boring Logs* (Appendix A), IDOT forms BMPR 507A and 508A (Appendix C), and *Laboratory Test Results* (Appendix B).

The soil samples will be retained in our laboratory for 60 days following the final report submittal. After that, the samples will be discarded unless a specific written request is received as to their disposition.

3.3 Pavement Coring

Illinois Department of Transportation District Two, performed pavement coring on August 19, 2011 between Calhoun Street and 2.75 mile north of Calhoun Street. Pavement core numbers 1 through 4 are within this project limits. Approximate locations are shown on *Boring Location Plans and Profile* (Appendix E). The results of pavement coring are included in IDOT District Two Memorandum dated August 29, 2011 included in Appendix F.

4.0 RESULTS OF SUBSURFACE INVESTIGATIONS

Detailed descriptions of the lithological units encountered by the borings are presented in the attached *Boring Logs* (Appendix A) and in the *Soil Boring Locations Plans and Soil Profiles* (Appendix D). Please note that the strata contact lines shown on logs and profiles represent approximate boundaries between soil types; the actual transition between soil types might be gradual in horizontal and vertical directions.

4.1 Surface Characterization

Existing IL 84 roadway is flanked by grassy and wooded slopes. The proposed roadway alignment will be established over existing slopes, existing pavement, and cut into the wooded land.

Borings performed outside the roadway, within the vegetated area encountered 3- to 12-inch thick black to dark brown clay loam, silty loam, and loam topsoil. Borings were performed through the existing roadway, roadway shoulder, and/or wooded slopes. The existing pavement structures along the IL 84 roadway consist of 9- to 16-inch thick asphalt over PCC base course or granular and cohesive subgrade. Borings 84-SGB-02, 84-SGB-04, and 84-RWB-16 were drilled through cross roads or driveway and measured 3- to 5-inch thick asphalt pavement over granular base or over subgrade. The results of pavement coring by IDOT are included in Appendix F.

4.2 Soil Conditions

The following sections present the soils conditions encountered during our subsurface investigation along the proposed roadway alignment. Beneath surface, in descending order, the borings encountered 1) man-made ground (fill); 2) colluvium; 3) weathered shale bedrock; 4) shale bedrock.

(1) Man-made ground (fill)

Man-made ground consisting of 2- to 11-foot thick granular and/or cohesive fill was encountered in Borings 84-RWB-01, 84-RWB-05, 84-SGB-11, 84-SGB-13, and 84-SGB-20. Granular fill consists of medium dense to very dense silty loam and gravelly sand characterized by SPT N-values of 20 blows/foot to spoon refusal and moisture content (MC) values of 3 to 14%. The cohesive fill is made up of soft to very stiff silty clay loam to

gravelly silty clay characterized by unconfined compressive strength (Qu) values of 0.3 to 3.8 tsf and MC values of 11 to 24%. Liquid limit (L_L) values range from 24 to 36%, and plastic limit (P_L) values range from 14 to 16%. According to the AASHTO soil classification, the subgrade soils belong to the A-6 group.

(2) Colluvium

Up to 32-foot thick colluvium deposits overlie the bedrock. The colluvium is made up of 15-foot thick medium stiff to hard silty clay to clay loam with little to some gravel characterized by Qu values of 0.5 to more than 4.5 tsf, MC values of 12 to 20%; and/or 20-foot thick of loose to very dense silty loam and sand to gravelly sandy loam with SPT N-value of 4 blow/foot to spoon refusal. Boring 84-SGB-01 encountered soft silty clay with Qu values of 0.3 to 0.5 tsf and MC values of 26 to 32%. Occasional cobbles may be encountered throughout this layer. L_L values range from 26 to 36%, and P_L values range from 14 to 17%. According to the AASHTO soil classification, the subgrade soils belong to the A-4 and A-6 groups.

(3) Weathered bedrock

Up to 9.0 feet of weathered shale bedrock, described as hard silty clay to silty loam with shale and mudstone fragments characterized by Qu values of 3.3 to more than 4.5 tsf, SPT N-values of 35 blows/foot to sampler refusal, and MC of 10 to 19%.

(4) Shale bedrock

At 17.5 to 41.0 feet bgs, the borings advanced through shale-mudstone interbedded bedrock, of Ordovician - Maquoketa Group, characterized by sampler refusal and MC values of 7 to 8%;

4.3 Groundwater Conditions

Groundwater was encountered in Borings 84-SGB-01 and 84-SGB-02 at 5.8 and 16.0 feet bgs (585.8 to 587.8 feet elevation). In general, borings have not encountered groundwater during our drilling operations. Mississippi River runs approximately 200 feet west from the boring locations. The river level was recorded at elevations of 582.5 feet on October 10, 2013 and at 593.4 on April 24, 2014.

5.0 ANALYSES AND RECOMMENDATIONS

Based on the project information provided by Parsons and the subsurface soil conditions revealed during investigations, recommendations are presented in the following sections for the design and construction of the proposed improvements. The results of the field and laboratory data were utilized to evaluate the engineering properties of the soils encountered during site investigation.

IL 84 roadway will be reconstructed, widened, and realigned from Station 705+40 to Station 728+90. The new roadway follows the existing roadway alignment and grade from the south end of the improvement to just north of the Calhoun Street (south end of the proposed retaining wall). The roadway widens and continues northward adding up to 36 feet on west side near the proposed bridge over the Mississippi River and cutting up to 45 feet into the east side hills where is bordered by the new retaining wall. South of the a proposed bridge, between Stations 710+00 and 715+50, the roadway grade will be raised up to 3.0 feet over the existing roadway grade. However, near the new bridge the west widening will be supported by adding up to 10 feet of new fill to the existing embankment, creating 1:2 (V:H) to 1:3 slopes. Most of the widening will be on the west side of the existing road. North of the proposed bridge, the roadway will follow the existing roadway grade but cutting deeper into the hill to allow for realignment and widening. The north 300 feet of the improvement realigns with the existing roadway.

5.1 Topsoil Stripping and Existing Pavement Removal

Prior to embankment construction, the ground surface should be stripped of topsoil, organic matter, including root zone materials, and pavements. For quantity estimating purposes, the average topsoil thickness to be stripped is 10 inches. The actual depth of stripping should be determined in the field during construction. The required topsoil stripping will also depend on the construction season and precipitation during mass grading operations. Excavated topsoil meeting the requirements of Section 211 of the IDOT Standard Specifications for Road and Bridge Construction can be reused in areas where topsoil is required.

The existing pavement removal should be as per Section 205, Embankment of IDOT Standard Specifications for Road and Bridge Construction (SSRBC). The existing pavement to remain in place should be broken into pieces not to exceed three square feet in surface area. For quantity

estimating purposes, the average pavement thickness to be removed is 12 inches. The actual depth of stripping or pavement removal should be determined in the field during construction.

5.2 Subgrade Preparation and Treatment

All vegetation and debris should be cleared and stripped from the existing roadway construction areas and where embankment fills are to be placed as per Section 201 of the IDOT SSRBC (IDOT 2012). Following removal of exiting pavement, topsoil stripping, and excavation to the proposed subgrade we recommend the exposed subgrade should be proofrolled and observed under construction equipment. Proofrolling aids in providing a firm base for compaction of new fill and identifying unstable soil conditions that may exist at or near the exposed subgrade level. It is recommended that the proofrolling be accomplished with a fully-loaded, 25-ton dump truck or other equipment providing an equivalent loading such as heavy vibratory roller. A minimum of 4 passes should be made over the entire subgrade areas in both the direction. In confined areas and in areas where a dump truck or a roller cannot be used effectively, such as at edges of the excavation bottom, proofrolling/compaction may be performed with hand-operated heavy vibratory equipment with enough number of passes so that unstable subgrade can be detected. The exposed subgrade should be observed for the amount of deflection or rutting.

Remedial work for unstable subgrade should be performed in accordance with Section 301 of IDOT SSRBC. Solutions to a persistent pumping problem may include removal of unsuitable soils and replacement with granular fill. Removal and replacements should extend to at least one foot beyond outside edge of new shoulders or curb and gutter and it should meet the IDOT Special Provisions for *Aggregate Subgrade Improvement*.

Borings 84-SGB-05 and 84-SGB-20 encountered medium stiff soil (0.5 to 0.8 tsf) at the proposed subgrade elevation, more than 4 feet in thickness. During construction, this area may become unstable and should be treated as per IDOT Subgrade Stability Manual. We recommend providing a provision for removal and replacement quantity in the contract plan. Table 1 shows recommended subgrade treatment for estimating quantities. Replacement material should be course aggregate *"Aggregate Subgrade Improvement"* as per IDOT District One Special Provision. For the areas between borings subgrade treatment may become necessary during construction.

The stability of prepared roadway subgrade will depend upon such factors as surface drainage provided by the contractor as well as prevailing temperature and precipitation experienced during construction. The amount of construction traffic and subgrade disturbance created by heavy vehicles will also have an influence on subgrade stability. The contractor should try to make full use of ditches in order to maintain positive drainage for subgrade areas. Temporary drainage ditches or pumping from depressed areas should be provided as needed during construction in order to prevent ponded water from affecting the stability of the roadway.

Table 1: Estimated Subgrade Treatment

Alignment	Stations	Reference Boring	Recommended Treatment	Treatment Width	Comments
IL 84	709+00 to 710+00	84-SGB-05	12 inch[1)] (Removal and Replacement)	Southbound Pavement	Qu=0.5tsf, Unstable Subgrade Soils
IL 84	727+00 to 728+90	84-SGB-20	12 inch[1)] (Removal and Replacement)	Full Pavement Width	Qu=08 tsf, Unstable Subgrade Soils
Calhoun Street	99+50 to 100+00	84-SGB-05	12 inch[1)] (Removal and Replacement)	Westbound Pavement	Qu=0.5tsf, Unstable Subgrade Soils

1) Treatment thickness is below proposed subgrade.

5.3 Pavement Design

Wang understand that the new pavement structure based on 20-year pavement design will be as follow:

Traffic Lanes

9.75-inch thick Hot Mix Asphalt (HMA)

12-inch thick Aggregate Subgrade Improvement

Shoulder

8-inch thick HMA

12-inch thick Aggregate Subgrade Improvement

5.4 Roadway Drainage Considerations

Underdrains

The proposed subgrade and pavement should have proper surface grading to remove water accumulations and prevent the pooling of water. It is desirable to keep the pavement structure

free of water for long term performance. It is our opinion that an effective underdrain system would prevent any effects of detrimental frost action by eliminating capillary rise of water and dissipating water accumulated in the pavement subbase. We recommend that transverse pipe underdrains be placed underneath the subgrade at low points of the roadway profile and also the granular subbase be daylighted to the west side of the embankment to provide proper drainage. If the subbase is not daylighted, a combination of longitudinal and transverse underdrains should be considered within the subgrade. All pipe underdrains shall be installed according to Check Sheet #19 of the IDOT Supplemental Specifications for Road and Bridge Construction.

Storm Sewers

Based on the proposed drainage plan, storm sewers are mostly located on the east side of the roadway and outside the pavement.

The subgrade in majority of the areas will be suitable to support the proposed storm sewers and structures. However, near Borings 84-SGB-03 and 84-SGB-20, low shear strength and high moisture content soil is likely to be encountered near pipe invert and manhole base. If this soil remains unstable during construction, should be removed and replaced with tranch backfill material. The exact removal should be evaluated during construction.

It should be noted that construction of manhole structure number I-9 will require approximately 17 feet of excavation below existing grade. Based on Borings 84-RWB-01 and 84-RWB-01A, weathered shale bedrock will be encountered approximately at 14 feet bgs.

During wet season, seepage groundwater is likely to be encountered from the granular soil layers. Accumulated groundwater can be removed using the sump pump method.

5.5 Detention Basin

The proposed detention basin base elevation ranges from 595.0 feet at the north end to 593.0 feet at the south end. At the south end silt to silty loam soils are expected to be exposed at the base of pond. Even though groundwater was not encountered during drilling, it may be encountered depending upon the time of year and prevailing precipitation. The excavated base in southern portion of the pond may not remain stable during construction, therefor, excavation operations should be tailored to these condition. To stabilize the base during construction, we

recommend using crushed stone CA-1 gradation at the base and left in place. The thicknes of removal should be decided during construction.

Based on slope stability analysis, the side slopes of 1V:3H or flatter are expected to be stable during and after construction. Detail of slope stability analysis with the critical failure surface and results are shown in Appendix D.

The slopes will require permanent protection to prevent erosion and storm water runoff. The slope protection system should provide a structurally stable topsoil environment for grass growth.

5.6 Embankment Material and Slope Stability

The material to be used for the roadway embankment construction should be in accordance with Sections 204 and 205 of the IDOT SSRBC. A shrinkage factor of 15% should be used to measure the borrowed and furnished excavation quantities.

The computer program, SLIDE Version 5.0, was used to calculate the factors of safety against global slope stability. The Simplified Bishop Method was used for slope stability analyses. Details of stability analysis with the critical failure surface and results are shown in Appendix D. Slope stability analyses were performed for embankment side slopes at Stations 713+50 and 714+50. The estimated soil parameters considered and results of stability analysis are shown in appendix D. The calculated minimum factor of safety (FOS) is greater than minimum required by IDOT. The minimum FOS required by IDOT is 1.5 for embankment slopes.

The slopes will require permanent protection to prevent erosion due to precipitation and storm water runoff. A layer of vegetated slope protection can be used.

5.7 Embankment Settlement

Settlement of the embankment will occur due to consolidation of the foundation soils and within the new embankment mass. The maximum new embankment addition is less than 10 feet high, and the subgrade soil within this area exhibits Qu values more than 1.0 tsf, MC less than 22%, LL less than 50%. The immediate (elastic) settlement is expected to occur from the underlying granular soil layers. We do not foresee settlement problems.

We performed settlement evaluations for the new embankment at Station 713+50 where embankment height is estimated to be approximately 10 feet. A computer program FoSSA v2.0 (Foundation Stress and Settlement Analysis) was used for assessing stresses and settlements under embankment. Soil parameters required for elastic settlement evaluation were estimated from the borings and other published data.

We estimate settlement on the order of 0.8 inches after placement of new embankment. Most of the elastic settlement in the granular soils is expected to be occurring at the same rate as construction.

6.0 CONSTRUCTION CONSIDERATIONS

6.1 Excavation

Temporary excavations should have a slope as required to provide a stable side slopes. Excavation slopes should be sloped at no greater than 1:2 (V:H). All temporary cut excavation should be analyzed individually for excavation of more than 4 feet deep or slope steeper than 1:2 (V:H). Excavations should be performed in accordance with local, state, and federal regulations. The potential effect of ground movements upon open roadway and utilities should also be taken into consideration.

6.2 Reuse of Excavated Materials

Excavated materials free of miscellaneous debris can be reused for new embankment. Reuse of existing material should be approved by the Engineer. Excavated soil material from IL 84 retaining wall and detention basin is expected to be suitable for reuse as embankment fill.

6.3 Dewatering

The expected excavation base elevation is above the groundwater elevation observed in the borings, thus no dewatering may not be necessary. However, if water does accumulate in open excavations above groundwater level can be removed using the sump pump method. Surface runoff and ditches should be directed away from the excavation to facilitate dewatering operations.

6.4 Roadway Embankment/Cut Construction

Embankment should be constructed as early as possible in the project construction period in order to allow the embankments to adjust or settle under its own weight as much as possible prior to pavement construction.

Most of the roadway widening on the west side will be over the exiting embankment slope and existing roadway. We recommend removing exiting debris and vegetation from the existing embankment without destabilizing the slopes before placement of new fill. Embankment should be constructed in accordance with Section 205 *Embankment* of IDOT SSRBC.

The new fill should be benched into the side slopes of the existing embankment to provide interlocking between the old and new fill. During benching, any water seeped from the existing embankment should be removed or placement of new fill should be postponed until the area is dry enough. We recommend benching the slopes according to Article 205.03 and placement according to Article 205.04.B of IDOT SSRBC. We recommend including typical benching detail developed by IDOT District One or similar detail in contract plan.

Maintenance of the slope during the construction will be required for localized areas of cut slopes where erosion prone soils (silt and sand) are encountered. These soils will develop minor sloughing however; major sloughing may develop if these soils are saturated with perched groundwater. These conditions should be observed during construction and corrective measure should be taken. Heavy construction equipment and material should not be placed near the top of the slope, unless the stability of slope is acceptable.

Proper construction including quality control and inspection during construction is vital for the overall stability of the embankment even for a short time period. The failure of widened embankment may result due to sub-standard compaction of fill, inadequate benching into the existing embankment and no proper drainage control.

6.5 Earthwork Operations

The required earthwork can be accomplished with conventional construction equipment. We do not anticipate any rock excavation along IL 84 except as noted for the manhole at Calhoun Street. Moisture and traffic will cause deterioration of exposed subgrade soils. Precautions should be taken

by the Contractor to prevent water erosion of the exposed subgrade. A compacted subgrade will minimize water runoff erosion. Silt and fine sands are sensitive to mechanical disturbance such as traffic and construction crew and will cause deterioration of exposed subgrade soils. Earthwork procedures should include provisions to minimize soil disturbance and exposure.

Earth moving operations should be scheduled not to coincide with excessive cold or wet weather (early spring, late fall or winter). Wet sand exposed to cold weather should be protected from freezing. Any soil allowed to freeze or soften due to the standing water should be removed from the subgrade. Wet weather can cause problems with subgrade compaction when the water contents exceed optimum.

6.6 Construction Monitoring

There is no need for a special construction monitoring for the earthwork except normally required by the IDOT Standard Specifications, Special Provisions and Contract Plans.

During construction, an experienced geotechnical engineer or soil technician should be retained to perform the following tasks:

- Monitor earthwork operations;
- Evaluate the suitability of the soils for subgrade support and embankment construction;
- Observe excavation including cut slopes;
- Check soil materials and compaction for project specifications compliance;
- Monitor locations and depths of undercuts; and
- Advise the IDOT Resident Engineer of any conditions not apparent during the subsurface exploration.

7.0 QUALIFICATIONS

The analysis and recommendations submitted in this report are based upon the data obtained from borings by Wang during previous and current investigations. This report does not reflect any variations that may occur between the borings or elsewhere on the site, variations whose nature and extent may not become evident until the course of construction. In the event that any changes in the design are planned, we should be timely informed so that changes can be reviewed, modified, and approved in writing by the geotechnical engineer.

It has been a pleasure to assist Parsons Transportation Group and Illinois Department of Transportation on this project. Please call if there are any questions, or if we can be of further service.

Respectfully Submitted,

WANG ENGINEERING, INC.

Mohammed (Mike) Kothawala, P.E., D.GE
Sr. Project Manager/Sr. Geotechnical Engineer

Jerry W.H. Wang, Ph.D., P.E.
QA/QC Reviewer

Cornelia L. Marin
Sr. Engineering Geologist

REFERENCES

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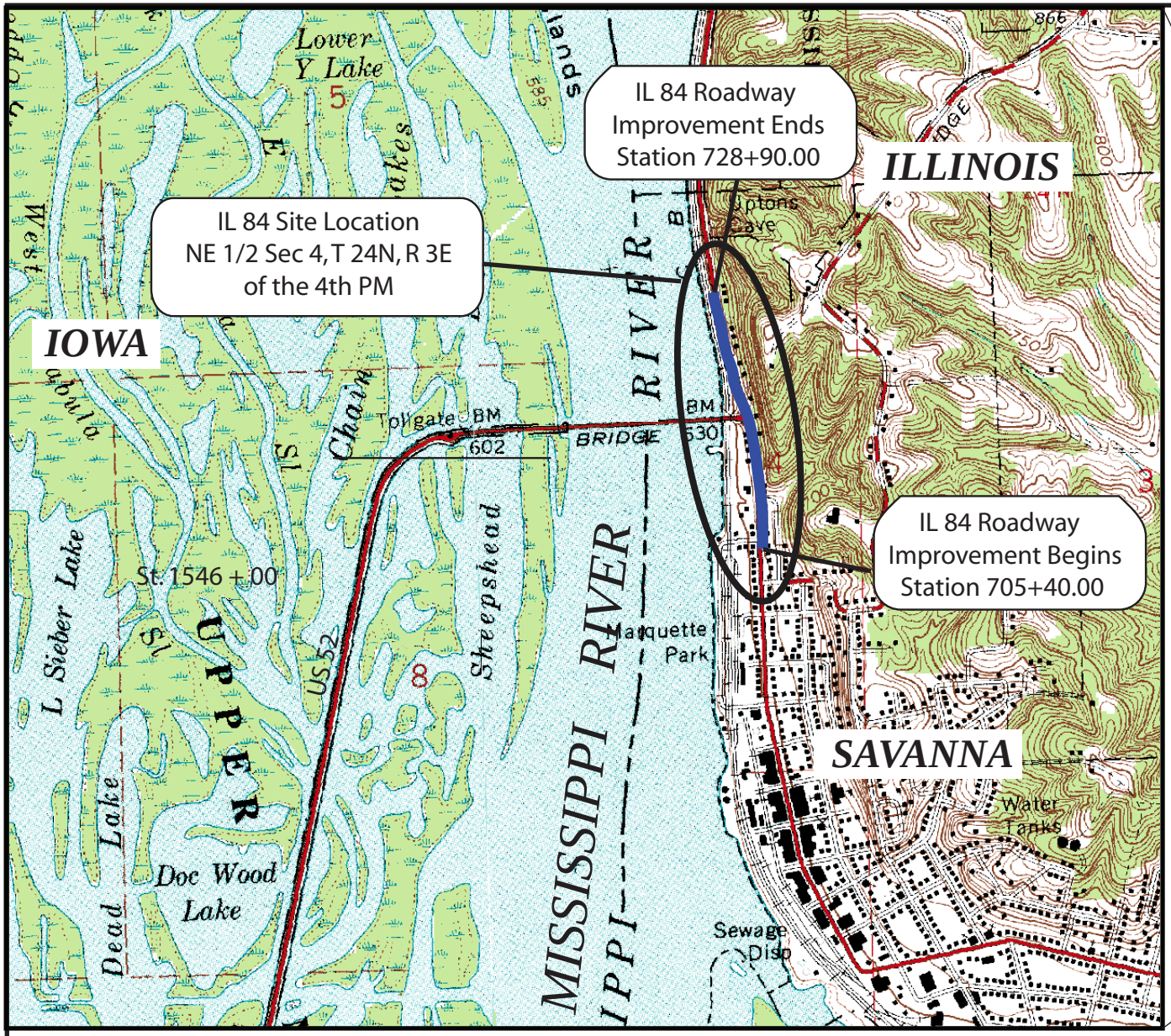
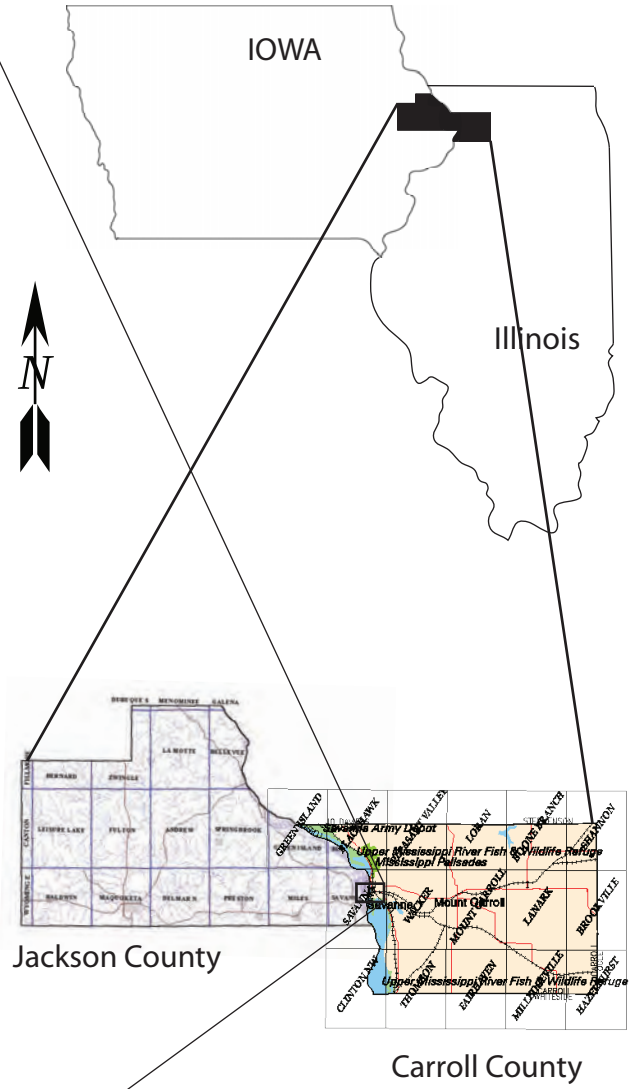
EXHIBITS





SITE LOCATION MAP: IL 84 ROADWAY RECONSTRUCTION, CARROLL COUNTY, ILLINOIS

SCALE: GRAPHICAL	**EXHIBIT 1**	DRAWN BY: D. Kolpacki CHECKED BY: C. Marin

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0 200 400 800 1200 Feet

PEDOLOGY MAP: IL-84 ROADWAY RECONSTRUCTION, CAROLL COUNTY, ILLINOIS

SCALE: GRAPHICAL

EXHIBIT 2-1

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CHECKED BY: C. Marin

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342-06-01

Map unit symbol and soil name	Depth	USDA texture	Classification	Fragments		Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Liquid limit	Plasticity index	Organic matter	Local roads and street	Shallow excavations	Lawns and landscaping
			AASHTO	>10 inches	3-10 inches									Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
	In			%	%	%	%	%	*g/cc*	*micro m/sec*	%		%			
37B—Worthen silt loam, 2 to 5 percent slopes																
Worthen	0-24	Silt loam	A-4, A-7-6, A-6	0	0	0- 8- 15	63-75- 88	12-17- 22	1.20-1.40	4.23-14.11	27-41	7-15	2.0-4.0	Very limited, Frost action, Low strength	Somew hat limited, Dusty, Unstable excavation w alls	Somew hat limited,Dusty
	24-56	Silt loam	A-4, A-6	0	0	0- 8- 15	59-72- 85	15-21- 26	1.20-1.40	4.23-14.11	26-40	10-18	0.5-2.0			
	56-80	Silt loam	A-4, A-6	0	0	0-18- 25	51-63- 75	15-20- 24	1.20-1.40	4.23-14.11	25-36	10-16	0.0-1.0			
905G—NewGlarus- Lamoille silt loams, 35 to 60 percent slopes																
Newglarus	0-5	Silt loam	A-6, A-7-6	0	0	0- 4- 7	63-76- 88	12-20- 27	1.20-1.40	4.23-14.11	20-37	5-18	1.0-3.0	Very limited, Slope, Shrink-sw ell, Frost action, Low strength, Depth to hard bedrock	Very limited, Depth to hard bedrock, Slope, Too clayey, Dusty, Unstable excavation w alls	Very limited, Slope, Depth to bedrock, Dusty
	5-22	Silty clay loam, silt loam	A-6, A-7-6	0	0	0- 4- 7	53-65- 75	20-31- 35	1.25-1.45	1.41-14.11	32-47	13-25	0.5-1.0			
	22-34	Channery silty clay, clay, silty clay	A-7-6	0	0-10	0- 5- 15	20-45- 50	40-50- 80	1.25-1.55	0.42-1.41	49-86	29-59	0.0-0.5			
	34-60	Bedrock	—	—	—	—	—	—	—	0.42-14.11	—	—	—			
Lamoille	0-6	Silt loam	A-4, A-6	0	0	0- 4- 7	66-75- 85	15-21- 27	1.20-1.40	4.23-14.11	24-35	8-15	1.0-3.0	Very limited, Slope, Low strength, Frost action, Shrink-sw ell	Very limited, Slope, Too clayey, Dusty, Unstable excavation w alls	Very limited, Slope, Depth to bedrock, Dusty
	6-10	Silt loam	A-4, A-6	0	0	0- 4- 7	66-77- 88	12-19- 27	1.20-1.40	4.23-14.11	22-38	7-19	0.2-0.5			
	10-38	Clay, clay loam, gravelly clay, silty clay loam, cobbly silty	A-7-6	0	5-25	5-10- 30	30-45- 60	35-45- 55	1.40-1.60	0.42-4.23	43-63	25-40	0.0-0.5			
	38-60	Cobbly loam, cobbly clay loam, very cobbly silt loam	A-2-6, A-6,	0	10-50	10-20-	40-54- 65	20-26- 45	1.30-1.50	1.41-4.23	31-54	13-32	0.0-0.3			

SITE PEDOLOGICAL TABLE: IL 84 ROADWAY RECONSTRUCTION, CARROLL COUNTY, ILLINOIS

SCALE: GRAPHICAL

EXHIBIT 2-2

DRAWN BY: D. Kolpacki
CHECKED BY: C. Marin

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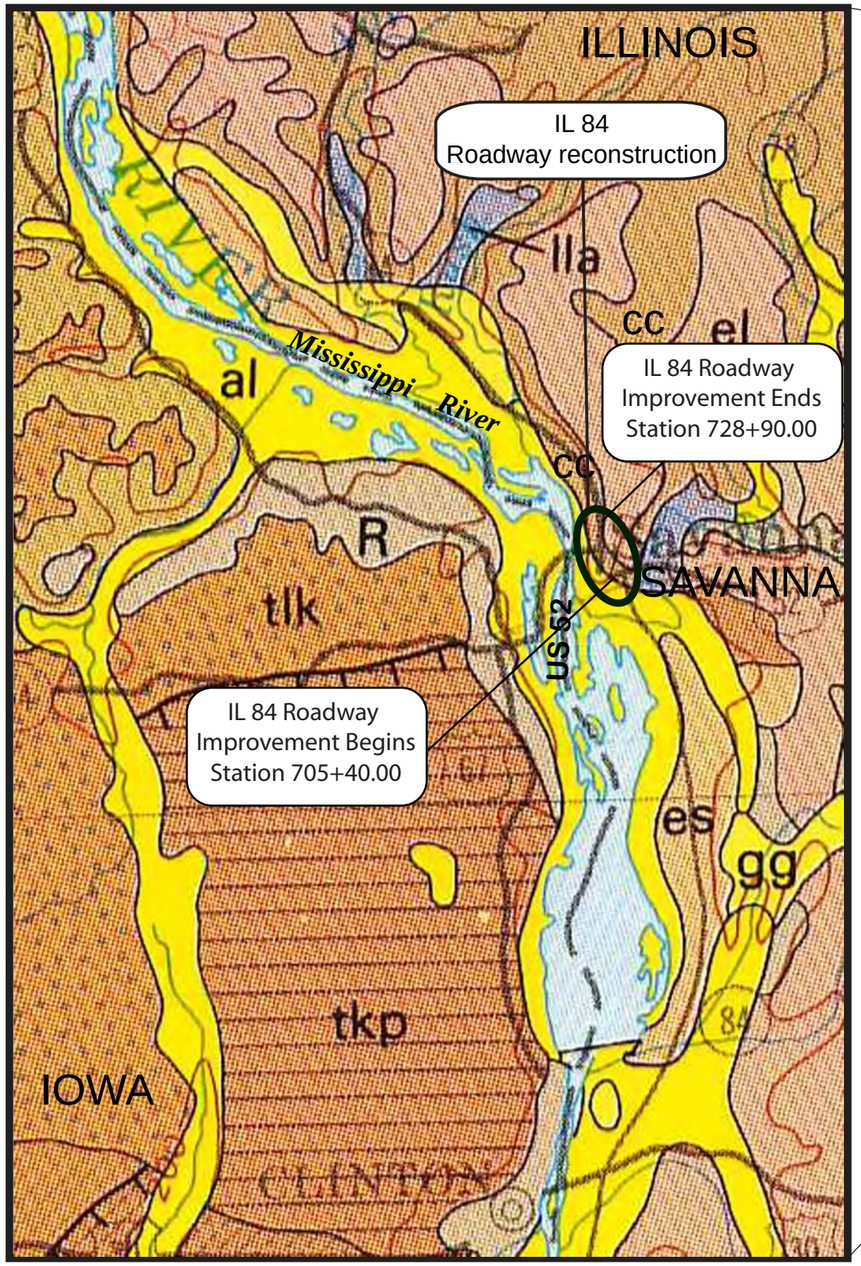

Modified after Richmond et al. (1991)

LEGEND

al	**Cahokia Alluvium,** Deposits in flood plains and channels of modern rivers and streams; stratified silt, clay and sand with wood and shell fragments;
es	**Parkland Sand,** Eolian sheet sand, brown, well-sorted, medium to fine sand; blanketlike deposits and dune overlies the lake deposits;
el	**Peoria Loess,** Gray to yellowish-brown windblown silt and silt loam; mapped only in Illinois and where its thickness is more than 6 m;
cc	**Collivium,** Material transported and deposited by mass-wasting processes; brown or reddish-brown to gray clay, sandy caly, or clayey sand contains angular and subangular clasts of dolostone, chert, minor limestone and sandstone; thin discontinuous patches, maped only in Illinois;
IIa	**Equality Formation,** Slackwater lake deposits; stratified silt, clay and sand; yellowish-brown to brown and gray, massive to thinly laminated silty clay and silt;
gg	**Henry Formation,** Outwash sand and gravel deposits; yellowish-brown to gray pebble to cobble gravel in fine to coarse sand matrix; mapped only in Illinois;
tkp	**Glasford Formation,** Ground moraine; loamy till, reddish-brown to bluish-gray clay lom and loam; texture from sany loam to clay loam, massive and compact with clasts of limestine and dolostone, occasionaly shale, sandstone, granite, coal;
tlk	**Walf Creek Formation,** Pre-Illinoian loamy till; light- to dark-gray sandy to silty loam; nonsorted to poorly sorted; compact calcareous; clasts of peabble and gravel size, most are granite and fine-grained igneous and metamorphis rocks.
R	**Bedrock,** Silurian dolstone and Ordovician Maquoketa shale and Galena dolostone

Modi ed after Richmond et al. (1991)

SITE AND REGIONAL GEOLOGY: IL 84 ROADWAY RECONSTRUCTION, CARROLL COUNTY, ILLINOIS

SCALE GRAPHICAL	EXHIBIT 3	DRAWN BY: D. Kolpacki CHECKED BY: C. Marin

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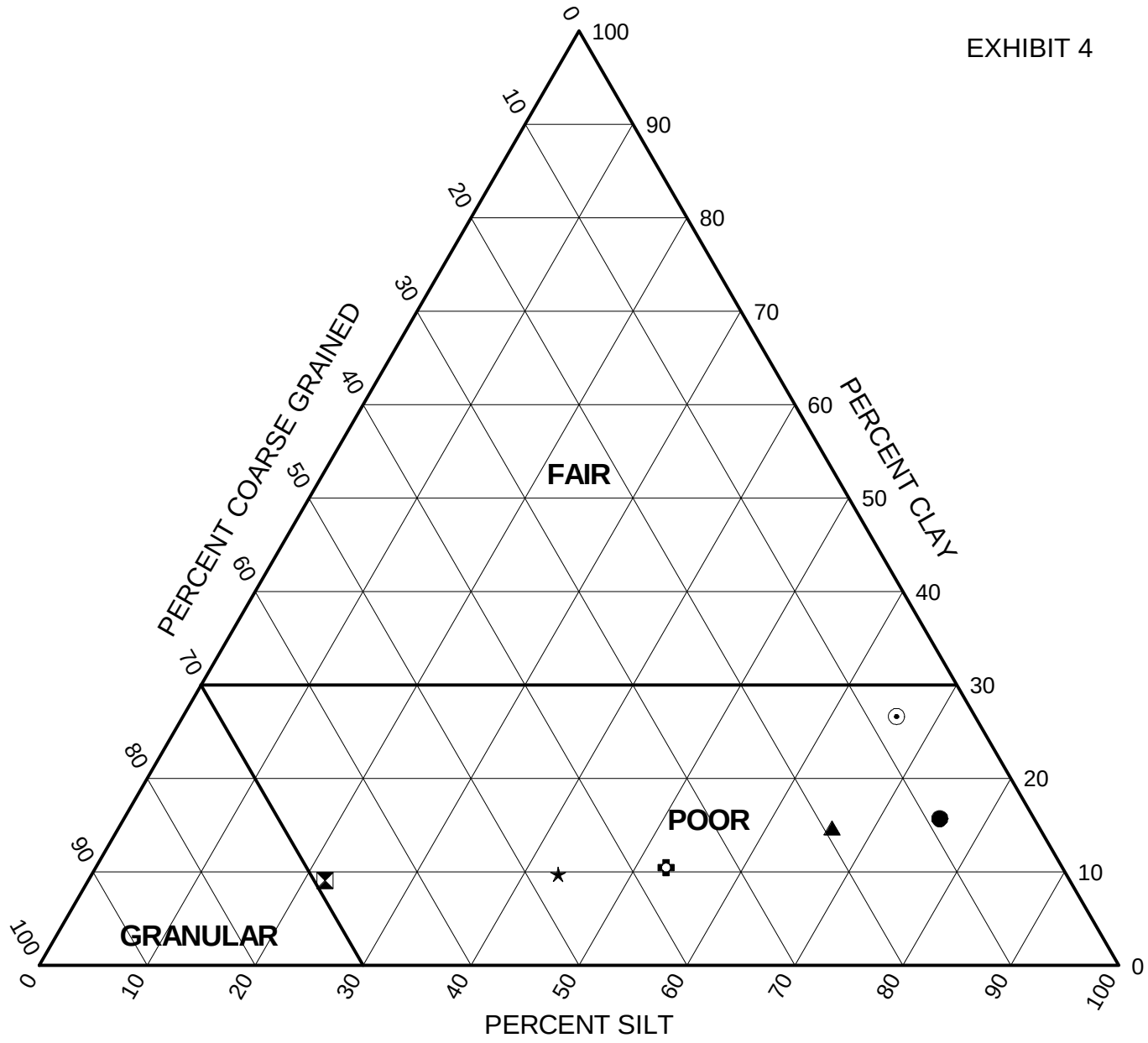
EXHIBIT 4



	Sample	Depth (ft)	Coarse (%)	Silt (%)	Clay (%)	Classification		
						IL DOT	AASHTO	RATING
●	84-SGB-01#2	3.0	8.7	75.5	15.7	Silty Loam	A-6 (13)	POOR
⧗	84-SGB-02#2	3.0	69.0	21.9	9.1	Sandy Loam	A-2-4 (0)	POOR
▲	84-SGB-03#2	3.0	19.2	66.1	14.7	Silty Loam	A-4 (6)	POOR
★	84-SGB-05#1	1.5	47.0	43.2	9.8	Loam	A-4 (2)	POOR
⊙	84-SGB-11#1	1.0	7.3	66.1	26.7	Silty Clay Loam	A-6 (20)	POOR
✿	84-SGB-20#1	1.5	36.7	52.8	10.5	Silty Loam	A-6 (8)	POOR

WEI SINCE 1982

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Subgrade Support Rating Chart

Project: US 52 / IL 64 / IL 84

Location: Carrol County, Illinois

Number: 342-06-02

APPENDIX A

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BORING LOG 84-SGB-01

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 593.64 ft
North: 1979448.85 ft
East: 2298853.76 ft
Station: 197+87.84
Offset: 22.87 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	593.4	3-inch thick, brown LOAM --TOPSOIL--						
		Soft, gray SILTY CLAY, trace gravel			1	2 2 1 2	0.49 B	29
					2	0 0 2 3	0.41 B	32
	587.8		5					
		Very loose, gray, medium SAND --Wet--			3	0 0 0 1	0.25 B	26
	586.2							
		Stiff, gray SILTY CLAY LOAM, trace garvel and organic matter			4	1 2 2 3	1.34 B	22
	583.4		10		5	2 3 3 8	1.39 B	44
	582.6	Brown and gray, medium SAND						
		Boring terminated at 11.00 ft						
			15					
			20					
			25					

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)

GENERAL NOTES

Begin Drilling **12-10-2013** Complete Drilling **12-10-2013**
Drilling Contractor **Wang Testing Services** Drill Rig **CME 55 TMR**
Driller **R&N** Logger **A. Tomaras** Checked by **C. Marin**
Drilling Method **3.25" HSA, Continous sampling, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **5.83 ft**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG 84-SGB-02

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 601.70 ft
North: 1979418.17 ft
East: 2299012.86 ft
Station: 705+83.05
Offset: 53.49 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	601.4	3-inch thick, ASPHALT --PAVEMENT--						
		Loose, brown LOAM to SANDY						
	599.7	LOAM, trace gravel			1	2 3 4 3	NP	14
		Very loose to dense, brown SANDY LOAM to medium SAND, trace gravel			2	2 3 3 3	NP	14
			5		3	3 3 3 3	NP	15
					4	2 2 2 3	NP	3
			10		5	2 2 3 2	NP	7
					6	2 2 2 3	NP	4
					7	2 3 3 2	NP	5
			15					
		--Wet--		▽	8	2 3 2 2	NP	21
					9	2 1 2 2	NP	26
				▼				
	581.6		20		10	3 3 50/1"	NP	24
		Boring terminated at 20.10 ft						
			25					

GENERAL NOTES

Begin Drilling **12-10-2013** Complete Drilling **12-10-2013**
Drilling Contractor **Wang Testing Services** Drill Rig **CME 55 TMR**
Driller **R&N** Logger **A. Tomaras** Checked by **C. Marin**
Drilling Method **3.25" HSA, Continous sampling, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **16.00 ft**
At Completion of Drilling ▼ **19.00 ft**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG 84-SGB-03

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 606.65 ft
North: 1979589.58 ft
East: 2299075.79 ft
Station: 707+53.28
Offset: 11.50 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	605.9	9-inch thick, ASPHALT --PAVEMENT--						
	605.1	Medium dense, brown and gray SILTY LOAM, some gravel			1	14 9 9 6	NP	12
	604.2	Medium dense, brown, medium SAND						
		Stiff, brown SILTY CLAY LOAM, little gravel	5		2	5 4 5 7	1.00 P	18
	601.4							
	600.2	Loose, brown LOAM to SANDY LOAM			3	2 4 4 4	NP	20
		Loose to medium dense, brown, medium SAND			4	2 2 2 2	NP	16
			10		5	3 4 5 4	NP	9
					6	3 5 5 5	NP	3
	593.7	Boring terminated at 13.00 ft						
			15					
			20					
			25					

GENERAL NOTES

Begin Drilling **12-11-2013** Complete Drilling **12-11-2013**
Drilling Contractor **Wang Testing Services** Drill Rig **CME 55 TMR**
Driller **R&N** Logger **A. Tomaras** Checked by **C. Marin**
Drilling Method **3.25" HSA, Continous sampling, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG 84-SGB-04

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 602.12 ft
North: 1979805.12 ft
East: 2298913.86 ft
Station: 89+52.50
Offset: 21.24 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	601.7	5-inch thick ASHALT --PAVEMENT--						
	599.9	Very stiff, brown SILTY CLAY LOAM, trace gravel --FILL--			1	2 1 0 1	3.50 P	16
		Very loose, brown SANDY LOAM, little gravel	5		2	1 0 0 4	NP	13
	596.6							
	595.8	Soft, brown SILTY CLAY LOAM, trace gravel			3	7 3 3 3	0.25 P	19
		Medium dense, brown, medium to coarse SAND, some gravel			4	3 7 6 3	NP	9
	593.6	Loose, brown SILTY LOAM	10		5	4 2 3 3	NP	23
	591.1	Boring terminated at 11.00 ft	15					
			20					
			25					

GENERAL NOTES

Begin Drilling **06-24-2014** Complete Drilling **06-24-2014**
Drilling Contractor **Wang Testing Services** Drill Rig **D-25 ATV**
Driller **K&P** Logger **A. Tomaras** Checked by **C. Marin**
Drilling Method **2.25" SSA, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **NA**
At Completion of Drilling ▼ **NA**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG 84-SGB-05

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 612.80 ft
North: 1979800.36 ft
East: 2299043.86 ft
Station: 709+64.13
Offset: 16.36 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	611.6	15-inch thick, ASPHALT --PAVEMENT--						
		Medium stiff, brown to gray SILTY CLAY, trace to some gravel			1	8 9 4	0.50 P	16
			5		2	2 3 4 4	0.75 P	19
					3	2 2 2 3	0.75 P	18
	605.3							
		Medium dense to dense, brown SAND and GRAVEL			4	8 7 22 25	NP	7
			10		5	13 18 14 10	NP	8
	601.8							
		Boring terminated at 11.00 ft						
			15					
			20					
			25					

GENERAL NOTES

Begin Drilling **12-12-2013** Complete Drilling **12-12-2013**
Drilling Contractor **Wang Testing Services** Drill Rig **CME 55 TMR**
Driller **R&N** Logger **A. Tomaras** Checked by **C. Marin**
Drilling Method **3.25" HSA, Continous sampling, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG 84-SGB-06

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 605.84 ft
North: 1980030.17 ft
East: 2298985.89 ft
Station: 711+98.20
Offset: 63.00 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	605.7	2-inch thick, white GRAVEL --FILL--						
	604.4	10-inch thick, brown SAND --FILL--						
		Stiff to hard, brown and gray SILTY CLAY LOAM, trace gravel			1	4 3 3 4	1.00 P	18
					2	3 3 4 7	1.75 P	16
			5		3	5 7 14 15	5.66 S	16
	597.3				4	2 8 14 23	> 4.50 P	13
		Hard, gray SILTY CLAY LOAM, some weathered shale fragments --WEATHERED BEDROCK--	10		5	5 14 27 31	> 4.50 P	12
	594.8	Boring terminated at 11.00 ft						
			15					
			20					
			25					

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)

GENERAL NOTES

Begin Drilling **06-25-2014** Complete Drilling **06-25-2014**
Drilling Contractor **Wang Testing Services** Drill Rig **D-25 ATV**
Driller **K&P** Logger **A. Tomaras** Checked by **C. Marin**
Drilling Method **2.25" SSA, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **NA**
At Completion of Drilling ▼ **NA**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG 84-SGB-07

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 624.48 ft
North: 1980176.08 ft
East: 2299039.87 ft
Station: 713+39.90
Offset: 02.93 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	623.5	12-inch thick, ASPHALT --PAVEMENT--						
		Medium dense, brown SILTY LOAM, little gravel			1	9 6 7 10	NP	15
	622.0	Very stiff to hard, gray SILTY CLAY to SILTY CLAY LOAM, trace gravel			2	4 6 7 10	4.51 S	19
			5		3	5 7 10 10	3.69 B	19
					4	3 9 11 14	5.74 S	13
			10		5	11 10 13 16	9.84 B	14
	613.5	Boring terminated at 11.00 ft						
			15					
			20					
			25					

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)

GENERAL NOTES

Begin Drilling **12-12-2013** Complete Drilling **12-12-2013**
Drilling Contractor **Wang Testing Services** Drill Rig **CME 55 TMR**
Driller **R&N** Logger **A. Tomaras** Checked by **C. Marin**
Drilling Method **3.25" HSA, Continous sampling, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG 84-SGB-08

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 616.41 ft
North: 1980190.16 ft
East: 2298996.08 ft
Station: 713+58.26
Offset: 39.29 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	615.7	8-inch thick, dark brown SILTY LOAM						
		--TOPSOIL--						
		Hard, brown and gray SILTY CLAY LOAM, trace gravel			1	3 3 3 5	NP	25
					2	6 7 8 11	4.10 B	7
			5		3	5 9 11 12	6.07 B	9
					4	9 10 14 18	7.46 B	15
	606.4		10		5	13 13 16 23	8.61 S	16
		Boring terminated at 10.00 ft						
			15					
			20					
			25					

GENERAL NOTES

Begin Drilling **06-25-2014** Complete Drilling **06-25-2014**
Drilling Contractor **Wang Testing Services** Drill Rig **D-25 ATV**
Driller **K&P** Logger **A. Tomaras** Checked by **C. Marin**
Drilling Method **2.25" SSA, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **NA**
At Completion of Drilling ▼ **NA**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG 84-SGB-09

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 606.30 ft
North: 1980271.08 ft
East: 2298946.59 ft
Station: 714+44.95
Offset: 79.82 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	605.6	8-inch thick, loose black SILTY LOAM, trace organic --TOPSOIL--			1	2 3 4 6	1.75 P	21
		Very stiff, dark brown SILTY CLAY			2	3 5 6 9	2.54 B	18
	601.3		5		3	4 5 6 9	3.03 B	17
		Brown SANDY LOAM, little gravel						
	599.8					14		
		Hard, brown and gray SILTY			4	18 17 50/5	> 4.50 P	10
	598.8	CLAY LOAM, trace gravel						
	598.0	Very dense, brown SILTY LOAM, trace shale fragments --WEATHERED BEDROCK--			5	50/3	NP	11
		Boring terminated at 8.25 ft	10					
			15					
			20					
			25					

GENERAL NOTES

Begin Drilling **06-25-2014** Complete Drilling **06-25-2014**
Drilling Contractor **Wang Testing Services** Drill Rig **D-25 ATV**
Driller **K&P** Logger **A. Tomaras** Checked by **C. Marin**
Drilling Method **2.25" SSA, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **NA**
At Completion of Drilling ▼ **NA**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG 84-SGB-10

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 627.19 ft
North: 1980278.99 ft
East: 2299027.72 ft
Station: 714+43.48
Offset: 01.68 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	626.9	4-inch thick, ASPHALT --PAVEMENT--						
	626.5	4-inch thick,BRICK PAVERS --PAVEMENT--						
		Stiff to very stiff, brown SILTY CLAY to SILTY CLAY LOAM, trace to some gravel			1	13 6 4 5	1.00 P	18
					2	2 3 4 5	1.89 B	20
			5		3	3 5 5 7	3.00 P	18
					4	3 5 6 7	3.44 B	18
			10		5	2 3 4 9	1.15 B	21
	616.2	Boring terminated at 11.00 ft						
			15					
			20					
			25					

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)

GENERAL NOTES

Begin Drilling **12-12-2013** Complete Drilling **12-12-2013**
Drilling Contractor **Wang Testing Services** Drill Rig **CME 55 TMR**
Driller **R&N** Logger **A. Tomaras** Checked by **C. Marin**
Drilling Method **3.25" HSA, Continous sampling, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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BORING LOG 84-SGB-11

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 632.16 ft
North: 1980531.49 ft
East: 2298998.18 ft
Station: 716+97.64
Offset: 07.14 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	631.4	9-inch thick, ASPHALT --PAVEMENT--						
		Stiff to hard, brown and gray SILTY CLAY to SILTY CLAY LOAM, trace gravel and brick fragments --FILL--			1	6 2 3 5	1.56 B	22
			5		2	2 4 9 5	2.13 B	20
					3	2 6 8 10	2.75 P	18
					4	3 6 6 7	1.64 B	19
	622.7							
		Hard, brown and gray SILTY CLAY LOAM, trace gravel	10		5	3 7 11 10	4.50 P	14
	621.2	Boring terminated at 11.00 ft						
			15					
			20					
			25					

GENERAL NOTES

Begin Drilling **12-11-2013** Complete Drilling **12-11-2013**
Drilling Contractor **Wang Testing Service** Drill Rig **CME 55 TMR**
Driller **R&N** Logger **A. Tomaras** Checked by **C. Marin**
Drilling Method **3.25" HSA, Continous sampling, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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BORING LOG 84-SGB-12

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 623.11 ft
North: 1980576.09 ft
East: 2298936.00 ft
Station: 717+51.97
Offset: 50.42 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		Brown SANDY GRAVEL			1	PUSH	NP	3
	621.4							
		Brown SILTY LOAM, trace gravel			2	PUSH	NP	13
	619.1							
		Boring terminated at 4.00 ft	5					
			10					
			15					
			20					
			25					

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)

GENERAL NOTES

Begin Drilling **08-13-2014** Complete Drilling **08-13-2014**
Drilling Contractor **Wang Testing Service** Drill Rig **Geoprobe**
Driller **P&N** Logger **H. Bista** Checked by **RKC**
Drilling Method **Jackhammer driven 1" IDA Geoprobe LB Sampler**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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BORING LOG 84-SGB-13

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 631.47 ft
North: 1980584.27 ft
East: 2298982.95 ft
Station: 717+51.91
Offset: 0.54 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	630.5	12-inch thick, ASPHALT --PAVEMENT--						
		Very stiff, brown SILTY CLAY, trace gravel and brick fragments --FILL--			1	6 5 7 6	3.00 S	14
					2	3 3 4 6	2.71 B	16
	626.3		5					
		Medium dense, gray SILTY LOAM, little gravel			3	8 9 11 9	NP	14
	625.0	--FILL--						
		Hard, gray SILTY CLAY LOAM, some gravel			4	9 9 17 15	6.15 S	16
	622.5							
		Medium dense, brown and gray GRAVELLY SAND, trace cobbles	10		5	8 10 11 11	NP	8
	620.5							
		Boring terminated at 11.00 ft						
			15					
			20					
			25					

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)

GENERAL NOTES

Begin Drilling **12-11-2013** Complete Drilling **12-11-2013**
Drilling Contractor **Wang Testing Services** Drill Rig **CME 55 TMR**
Driller **R&N** Logger **A. Tomaras** Checked by **C. Marin**
Drilling Method **3.25" HSA, Continous sampling, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG 84-SGB-14

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 604.12 ft
North: 1980602.72 ft
East: 2298892.64 ft
Station: 717+85.97
Offset: 88.67 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		Black and brown SILTY LOAM, trace gravel			1	PUSH	NP	17
	602.1	Boring terminated at 2.00 ft	5, 10, 15, 20, 25					

GENERAL NOTES

Begin Drilling **08-13-2014** Complete Drilling **08-13-2014**
Drilling Contractor **Wang Testing Services** Drill Rig **Geoprobe**
Driller **P&N** Logger **H. Bista** Checked by **RKC**
Drilling Method **Jackhammer driven 1" IDA Geoprobe LB Sampler**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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BORING LOG 84-SGB-15

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 625.48 ft
North: 1980607.52 ft
East: 2298938.87 ft
Station: 717+82.73
Offset: 42.30 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	624.6	11-inch thick, brown CLAY LOAM, trace gravel --TOPSOIL--			1	PUSH	0.25 P	34
		Soft to stiff, brown CLAY, trace gravel			2	PUSH	1.50 P	19
	621.7	Stiff, brown and gray SILTY CALY, trace gravel	5		3	PUSH	1.50 P	18
	619.5	Boring terminated at 6.00 ft	10					
			15					
			20					
			25					

GENERAL NOTES

Begin Drilling **08-13-2014** Complete Drilling **08-13-2014**
Drilling Contractor **Wang Testing Services** Drill Rig **Geoprobe**
Driller **P&N** Logger **H. Bista** Checked by **RKC**
Drilling Method **Jackhammer driven 1" IDA Geoprobe LB Sampler**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG 84-SGB-16

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 627.52 ft
North: 1980801.17 ft
East: 2298905.69 ft
Station: 719+80.34
Offset: 33.64 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		Stiff, brown GRAVELLY SILTY CLAY LOAM --FILL--			1	6 5 9 6	1.50 P	13
	624.3							
		Medium dense, brown SAND and GRAVEL, trace brick fragments --FILL--	5		2	3 6 14 15	NP	7
					3	8 6 7 7	NP	8
					4	4 8 17 16	NP	5
			10		5	3 4 8 5	NP	5
	616.5							
		Boring terminated at 11.00 ft						
			15					
			20					
			25					

GENERAL NOTES

Begin Drilling **12-12-2013** Complete Drilling **12-12-2013**
Drilling Contractor **Wang Testing Services** Drill Rig **CME 55 TMR**
Driller **R&N** Logger **A. Tomaras** Checked by **C. Marin**
Drilling Method **3.25" HSA, Continous sampling, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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BORING LOG 84-SGB-17

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 624.41 ft
North: 1980970.08 ft
East: 2298889.70 ft
Station: 721+49.05
Offset: 11.45 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	623.7	9-inch thick, ASPHALT --PAVEMENT--						
		Medium dense, brown GRAVELLY LOAM			1	7 8 8 7	NP	17
	621.9	--FILL--						
		Medium dense, brown SANDY GRAVEL			2	10 6 9 9	NP	6
			5		3	7 7 7 13	NP	8
	617.6							
		Hard, gray GRAVELLY SILTY CLAY LOAM			4	6 12 15 13	4.50 P	13
			10		5	9 13 15 25	4.50 P	14
	613.4							
		Boring terminated at 11.00 ft						
			15					
			20					
			25					

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)

GENERAL NOTES

Begin Drilling **12-11-2013** Complete Drilling **12-11-2013**
Drilling Contractor **Wang Testing Services** Drill Rig **CME 55 TMR**
Driller **R&N** Logger **A. Tomaras** Checked by **C. Marin**
Drilling Method **3.25" HSA, Continous sampling, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG 84-SGB-18

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 621.64 ft
North: 1981115.43 ft
East: 2298856.06 ft
Station: 722+98.25
Offset: 10.88 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	620.4	15-inch thick, ASPHALT --PAVEMENT--						
	619.1	Stiff, black SILTY CLAY, trace gravel --FILL--			1	3 6 7	1.00 P	
		Medium dense, brown SANDY GRAVEL			2	6 8 15 10	NP	7
			5		3	6 5 6 5	NP	10
					4	11 5 5 7	NP	12
			10		5	7 9 18 10	NP	10
	610.6	Boring terminated at 11.00 ft						
			15					
			20					
			25					

GENERAL NOTES

Begin Drilling **12-11-2013** Complete Drilling **12-11-2013**
Drilling Contractor **Wang Testing Services** Drill Rig **CME 55 TMR**
Driller **R&N** Logger **A. Tomaras** Checked by **C. Marin**
Drilling Method **3.25" HSA, Continous sampling, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG 84-SGB-19

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 616.59 ft
North: 1981364.89 ft
East: 2298807.73 ft
Station: 725+52.14
Offset: 0.75 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	615.3	15-inch thick, ASPHALT --PAVEMENT--						
	614.9	5-inch thick, black SILTY CLAY, little gravel --FILL--			1	4 7 6 5	NP	9
		Medium dense, brown GRAVELLY SAND			2	12 10 9 7	NP	6
			5		3	6 7 13 11	NP	9
					4	5 7 8 9	NP	7
			10		5	8 10 9 17	NP	7
	606.1							
	605.6	Hard, gray GRAVELLY SILTY CLAY LOAM						
		Boring terminated at 11.00 ft						
			15					
			20					
			25					

GENERAL NOTES

Begin Drilling **12-11-2013** Complete Drilling **12-11-2013**
Drilling Contractor **Wang Testing Services** Drill Rig **CME 55 TMR**
Driller **R&N** Logger **A. Tomaras** Checked by **C. Marin**
Drilling Method **3.25" HSA, Continous sampling, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG 84-SGB-20

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 612.47 ft
North: 1981690.62 ft
East: 2298734.49 ft
Station: 728+83.76
Offset: 5.15 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	611.1	16-inch thick ASPHALT --PAVEMENT--						
		Medium stiff to stiff, brown and gray SILTY CLAY, some gravel, trace brick fragments and cinders --FILL--			1	2 3 3	0.82 B	16
					2	3 2 2 1	1.00 P	24
			5		3	3 2 2 3	0.33 B	23
					4	3 4 3 2	0.57 B	18
			10		5	2 3 4 4	1.25 P	20
	601.5	Boring terminated at 11.00 ft						
			15					
			20					
			25					

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)

GENERAL NOTES

Begin Drilling **12-12-2013** Complete Drilling **12-12-2013**
Drilling Contractor **Wang Testing Services** Drill Rig **CME 55 TMR**
Driller **R&N** Logger **A. Tomaras** Checked by **C. Marin**
Drilling Method **3.25" HSA, Continous sampling, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG 84-SGB-21

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 631.81 ft
North: 1980434.18 ft
East: 2299018.23 ft
Station: 715+97.99
Offset: 11.95 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	630.7	13-inch thick, ASPHALT --PAVEMENT--						
		Very stiff, brown SILTY CLAY to SILTY CLAY LOAM, trace gravel			1	4 3 5	3.77 B	18
					2	2 4 5 6	2.87 B	17
			5		3	3 5 7 7	2.87 B	19
					4	3 6 10 8	2.95 B	17
			10		5	4 7 9 9	2.54 B	16
	620.8	Boring terminated at 11.00 ft						
			15					
			20					
			25					

GENERAL NOTES

Begin Drilling **12-13-2013** Complete Drilling **12-13-2013**
Drilling Contractor **Wang Testing Services** Drill Rig **CME 55 TMR**
Driller **R&N** Logger **A. Tomaras** Checked by **C. Marin**
Drilling Method **3.25" HSA, Continous sampling, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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BORING LOG DSB-01

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NGVD 88
Elevation: 594.56 ft
North: 1980102.08 ft
East: 2298875.46 ft
Station: NA
Offset: NA

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	593.6	12-inch thick, dark brown SILTY LOAM, trace gravel						
		--TOPSOIL--						
		Loose to dense, dark brown and gray SAND to SANDY LOAM, trace gravel			1	6 4 5	NP	11
		--moist--			2	6 6 5	NP	10
			5		3	11 15 23	NP	4
	586.6							
		Dense, gray GRAVELLY SILTY LOAM, rock fragments			4	41 27 15	NP	13
		--HARD DRILLING--	10					
	584.1	*--Possible Cobbles--*						
		Hard, gray GRAVELLY SILTY CLAY LOAM, rock fragments			5	12 30 34	> 4.50 P	8
					6	28 33 42	> 4.50 P	10
	579.6		15					
		Boring terminated at 15.00 ft						
			20					
			25					

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)

GENERAL NOTES

Begin Drilling **08-13-2014** Complete Drilling **08-13-2014**
Drilling Contractor **Wang** Drill Rig **D-25 ATV**
Driller **P&N** Logger **H. Bista** Checked by **C. Marin**
Drilling Method **2.25" HSA, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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BORING LOG DSB-02

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NGVD 88
Elevation: 600.37 ft
North: 1979973.73 ft
East: 2298908.84 ft
Station: NA
Offset: NA

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	600.0	5-inch thick, GRAVEL						
		Medium dense, brown SAND			1	9 9 8	NP	17
	597.4	Loose, dark gray SILTY LOAM, trace gravel	5		2	3 3 4	NP	20
	594.9	Medium stiff to hard, brown and dark gray SILTY CLAY to SILTY CLAY LOAM, trace to some gravel			3	1 4 5	0.82 S	23
			10		4	3 5 8	3.28 B	20
		--HARD DRILLING-- *--Possible Cobbles--*			5	4 7 12	> 4.50 P	15
	585.4		15		6	5 12 20	9.02 B	14
		Boring terminated at 15.00 ft	20					
			25					

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)

GENERAL NOTES

Begin Drilling **08-13-2014** Complete Drilling **08-13-2014**
Drilling Contractor **Wang** Drill Rig **D-25 ATV**
Driller **P&N** Logger **H. Bista** Checked by **C. Marin**
Drilling Method **2.25" HSA, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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BORING LOG DSB-03

WEI Job No.: 342-06-01

Client: **Parsons Transportation Group, Inc.**
Project: **US 52 / IL 64 / IL 84**
Location: **Carroll County, IL and Jackson County, IA**

Datum: NGVD 88
Elevation: 601.05 ft
North: 1979846.60 ft
East: 2298929.85 ft
Station: NA
Offset: NA

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	600.1	12-inch thick, SILTY LOAM, trace gravel						
		--TOPSOIL--						
		Medium dense, yellowish brown SANDY LOAM, some gravel			1	19 8 7	NP	14
	598.1	Medium dense, yellowish brown SILTY LOAM, little gravel	5		2	3 6 10	NP	16
	595.6	Medium stiff, brown SILTY CLAY LOAM			3	1 2 3	0.82 B	22
	593.1	Loose, brown SILT --moist--	10		4	1 1 3	NP	23
	589.1				5	1 2 2	0.50 P	25
	588.1	Medium stiff, reddish brown SILTY CALY						
		Medium dense, yellowish brown SANDY LOAM, trace gravel --moist--	15		6	2 3 10	NP	18
	586.1	Boring terminated at 15.00 ft	20					
			25					

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)

GENERAL NOTES

Begin Drilling: **08-13-2014** Complete Drilling: **08-13-2014**
Drilling Contractor: **Wang** Drill Rig: **D-25 ATV**
Driller: **P&N** Logger: **H. Bista** Checked by: **C. Marin**
Drilling Method: **2.25" HSA, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **DRY**
At Completion of Drilling: **DRY**
Time After Drilling: **NA**
Depth to Water: **NA**

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BORING LOG 84-RWB-01

WEI Job No.: 342-06-02

Client: **Parsons Transportation Group, Inc.**
Project: **US 52 / IL 64 / IL 84**
Location: **Carroll County, Illinois**

Datum: NAVD 88
Elevation: 613.08 ft
North: 1979795.75 ft
East: 2299061.45 ft
Station: 709+59.03
Offset: 01.10 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	612.1	12-inch thick, ASPHALT --PAVEMENT--						
		Very dense, brown and yellow SANDY GRAVEL, some cobbles --FILL--			1	11 25 50/2	NP	3
	610.1	Soft, brown GRAVELLY SILTY CLAY --FILL--	5		2	3 6 9	0.25 P	16
	607.6	Hard, gray SILTY CLAY to SILTY CLAY LOAM, trace gravel			3	4 8 11	4.50 P	16
		--L_L(%)=36, P_L(%)=17-- --%Gravel=6.4-- --%Sand=11.8-- --%Silt=51.3-- --%Clay=30.5-- --A-6 (14)--	10		4	4 8 12	4.50 P	15
					5	7 17 21	4.50 P	12
	599.2	Very dense, reddish brown and gray GRAVELLY SANDY LOAM, some shale fragments --WEATHERED SHALE BEDROCK-- --%Gravel=35.9-- --%Sand=45.0-- --%Silt=16.0-- --%Clay=3.1-- --A-1-b (0)--	15		6	10 16 19	4.50 P	11
					7	6 14 23	NP	12
					8	13 25 27	NP	11
	593.1		20					
		NOTE: SPT values for samples obtained using 3-inch split-spoon have been adjusted. Boring terminated at 20.00 ft						
			25					

GENERAL NOTES

Begin Drilling: **12-13-2013** Complete Drilling: **12-13-2013**
Drilling Contractor: **Wang Testing Services** Drill Rig: **CME 55 TMR**
Driller: **R&N** Logger: **A. Tomaras** Checked by: **C. Marin**
Drilling Method: **3.25" HSA, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **DRY**
At Completion of Drilling: **DRY**
Time After Drilling: **NA**
Depth to Water: **NA**

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BORING LOG 84-RWB-04

WEI Job No.: 342-06-02

Client: **Parsons Transportation Group, Inc.**
Project: **US 52 / IL 64 / IL 84**
Location: **Carroll County, Illinois**

Datum: NAVD 88
Elevation: 620.24 ft
North: 1980034.13 ft
East: 2299057.75 ft
Station: 711+97.10
Offset: 08.96 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	619.2	12-inch thick, ASPHALT --PAVEMENT--						
		Very stiff to hard, gray SILTY CLAY LOAM, trace to some gravel			1	9 5 5	9.10 B	12
			5		2	3 6 10	3.69 B	14
					3	5 7 18	7.46 B	14
			10		4	10 12 15	7.87 S	14
	609.7	Dense to very dense, gray SILTY LOAM to SILTY CLAY			5	7 20 29	NP	12
		--L_L(%)=37, P_L(%)=17-- --%Gravel=0.4-- --%Sand=4.4-- --%Silt=57.4-- --%Clay=37.9-- --A-6 (19)--	15		6	10 25 50/5	NP	12
	604.7	Very dense, gray SILTY LOAM, some shale fragments			7	25 50/3	NP	10
	602.7	--WEATHERED SHALE BEDROCK--						
		Very dense, gray laminated SHALE fragments --SHALE BEDROCK--	20		8	50/3	NP	8
					9	50 50/1	NP	8
					10	50/3	NP	7
	595.2	Boring terminated at 25.00 ft	25					

GENERAL NOTES

Begin Drilling: **12-13-2013** Complete Drilling: **12-13-2013**
Drilling Contractor: **Wang Testing Services** Drill Rig: **CME 55 TMR**
Driller: **R&N** Logger: **A. Tomaras** Checked by: **C. Marin**
Drilling Method: **3.25" HSA, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **DRY**
At Completion of Drilling: **DRY**
Time After Drilling: **NA**
Depth to Water: **NA**

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BORING LOG 84-RWB-05

WEI Job No.: 342-06-02

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, Illinois**

Datum: NAVD 88
Elevation: 622.57 ft
North: 1980107.26 ft
East: 2299055.79 ft
Station: 712+70.03
Offset: 12.61 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	621.6	12-inch thick, ASPHALT --PAVEMENT--						
		Very stiff, brown and gray SILTY CLAY LOAM, some gravel --FILL--			1	8 4 4	3.75 P	11
	619.6	Dense, brown GRAVELLY SANDY LOAM	5		2	8 23 24	NP	5
	617.1	Hard, gray SILTY CLAY LOAM, little to some gravel			3	6 8 11	4.50 P	17
			10		4	9 10 16	4.50 P	16
					5	5 18 30	4.50 P	15
	607.6		15		6	8 24 50/2	4.50 P	15
		Very dense, gray SILTY LOAM, some shale fragments --WEATHERED SHALE BEDROCK--			7	23 50/3	NP	
	605.1	NOTE: SPT values for samples obtained using 3-inch split-spoon have been adjusted. Boring terminated at 17.50 ft	20					
			25					

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)

GENERAL NOTES

Begin Drilling **12-13-2013** Complete Drilling **12-13-2013**
Drilling Contractor **Wang Testing Services** Drill Rig **CME 55 TMR**
Driller **R&N** Logger **A. Tomaras** Checked by **C. Marin**
Drilling Method **3.25" HSA, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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BORING LOG 84-RWB-14

WEI Job No.: 342-06-02

Client: **Parsons Transportation Group, Inc.**
Project: **US 52 / IL 64 / IL 84**
Location: **Carroll County, Illinois**

Datum: NAVD 88
Elevation: 643.68 ft
North: 1980769.05 ft
East: 2298973.05 ft
Station: 719+34.94
Offset: 25.61 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	642.7	12-inch thick, black SILTY LOAM --TOPSOIL--						
		Loose to medium dense, black SILTY LOAM, with brown sand			1	6 5 7	NP	10
			5		2	8 5 4	NP	9
	638.2	Dense, brown SANDY GRAVEL --WEATHERED SHALE BEDROCK--			3	9 18 14	NP	9
					4	19 21 13	NP	8
			10					
	633.2	--HARD DRILLING--						
		Hard, brown and gray SILTY CLAY LOAM, little gravel			5	8 9 16	4.59 S	20
			15		6	13 24 13		19
	628.2	Very dense, brown SANDY GRAVEL			7	50/2	NP	10
					8	50/3	NP	11
			20					
	623.2	Stiff to very stiff, gray SILTY CLAY LOAM, with shale			9	7 10 11	1.97 S	12
			25		10	7 9 12	2.13 S	16
			30		11	13 13 16	3.03 S	15
					12	8 11 13	2.46 B	18
	611.9	Very stiff, gray SILTY CLAY LOAM, some shale fragments --WEATHERED SHALE BEDROCK--						
			35		13	19 50/4	3.26 S	19
						CORE		
		--RUN 1: 36.0-46.0 ft --RECOVERY= 18% --RQD= 0%	40					
	602.7	Very weak to weak strength, gray and brown, very poor rock mass quality, highly to slightly weathered, laminated to massive SHALE and MUDSTONE			1			
			45					
	597.7	Competent rock, moderate strength, gray and brown, good to excellent rock mass quality, slightly weathered to fresh, laminated to massive SHALE and MUDSTONE				CORE		
			50					

GENERAL NOTES

Begin Drilling: **06-05-2014** Complete Drilling: **06-05-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **D-25 ATV**
Driller: **N&K** Logger: **A. Happel** Checked by: **C. Marin**
Drilling Method: **2.25" HSA. 2.5' interval to 36', Rock core thereafter**

WATER LEVEL DATA

While Drilling: **NA**
At Completion of Drilling: **NA**
Time After Drilling: **NA**
Depth to Water: **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG 84-RWB-14

WEI Job No.: 342-06-02

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, Illinois**

Datum: NAVD 88
Elevation: 643.68 ft
North: 1980769.05 ft
East: 2298973.05 ft
Station: 719+34.94
Offset: 25.61 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		--RUN 2: 46.0-56.0 ft --RECOVERY= 100% --RQD= 89%			2			
			55					
						CORE		
		--RUN 3: 56.0-66.0 ft --RECOVERY= 99% --RQD= 95%	60		3			
			65					
	577.7	Boring terminated at 66.00 ft						
			70					
			75					

GENERAL NOTES

Begin Drilling **06-05-2014** Complete Drilling **06-05-2014**
Drilling Contractor **Wang Testing Services** Drill Rig **D-25 ATV**
Driller **N&K** Logger **A. Happel** Checked by **C. Marin**
Drilling Method **2.25" HSA. 2.5' interval to 36', Rock core thereafter**

WATER LEVEL DATA

While Drilling ▽ **NA**
At Completion of Drilling ▼ **NA**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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BORING LOG 84-RWB-16

WEI Job No.: 342-06-02

Client: **Parsons Transportation Group, Inc.**
Project: **US 52 / IL 64 / IL 84**
Location: **Carroll County, Illinois**

Datum: NAVD 88
Elevation: 643.41 ft
North: 1980944.06 ft
East: 2298944.57 ft
Station: 721+11.15
Offset: 35.99 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	643.1	4-inch thick ASPHALT --PAVEMENT--						
		Loose to medium dense, brown, medium SAND, little to trace cobbles and gravel			1	7 6 6	NP	11
		---HARD DRILLING 3.5-6'--	5		2	3 4 4	NP	7
		--HARD DRILLING 6-8.5'--			3	5 5 6	NP	5
	635.4	Stiff to hard, brown SILTY CLAY LOAM and cobbles						
		---HARD DRILLING 8.5-11'--	10		4	6 8 36	2.25 P	
		---HARD DRILLING 11-13.5'--			5	9 9 8	1.25 P	9
		---HARD DRILLING 13.5-16'--	15		6	6 10 10	4.50 P	15
		---HARD DRILLING 16-18.5'--			7	11 13 7	2.50 P	15
	625.4	Medium dense, brown GRAVELLY SAND						
			20		8	7 12 12	NP	6
		---HARD DRILLING 21-23.5'--			9	8 11 9	NP	7
	620.4	Very stiff to hard, greenish gray, SILTY CLAY, trace cobbles and gravel						
		---HARD DRILLING 23.5'--	25		10	8 10 12	> 4.50 P	13
			30		11	10 10 14	2.00 P	17
					12	4 6 13	2.00 P	16
	612.9	Very dense, gray SILTY LOAM, some shale fragments --WEATHERED SHALE BEDROCK--			13	23 50/2	NP	14
	609.9	Weak strength, gray and brown, poor to fair rock mass quality, moderately to slightly weathered, laminated to massive, interbedded SHALE and MUDSTONE --Run 1: 33.5-38.5 ft --RECOVERY= 58% --RQD= 22%	35		1	CORE		17
			40		2	CORE		
		--Run 2: 38.5-48.5 ft --RECOVERY= 100% --RQD= 54%	45					
	594.9	Competent rock, moderate strength, gray, excellent rock mass quality, fresh, laminated to	50			COR		

GENERAL NOTES

Begin Drilling: **05-07-2014** Complete Drilling: **05-07-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **D-50 TMR**
Driller: **R&J** Logger: **A. Tomaras** Checked by: **C. Marin**
Drilling Method: **3.25" HSA, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **DRY**
At Completion of Drilling: **NA**
Time After Drilling: **NA**
Depth to Water: **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG 84-RWB-16

WEI Job No.: 342-06-02

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, Illinois**

Datum: NAVD 88
Elevation: 643.41 ft
North: 1980944.06 ft
East: 2298944.57 ft
Station: 721+11.15
Offset: 35.99 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		massive, interbedded SHALE and MUDSTONE				E		
		50.0 ft-Qu=5180 psi --->						
		--Run 3: 48.5-58.5 ft --RECOVERY= 92% --RQD= 91%			3			
			55					
	584.9	Boring terminated at 58.50 ft						
			60					
			65					
			70					
			75					

GENERAL NOTES

Begin Drilling **05-07-2014** Complete Drilling **05-07-2014**
Drilling Contractor **Wang Testing Services** Drill Rig **D-50 TMR**
Driller **R&J** Logger **A. Tomaras** Checked by **C. Marin**
Drilling Method **3.25" HSA, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **NA**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG BSB-04

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 631.23 ft
North: 1980439.68 ft
East: 2298954.27 ft
Station: 1585+44.68
Offset: 00.69 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	630.9	4-inch thick, black SILTY LOAM --TOPSOIL--						
		Loose, brown SANDY LOAM, trace wood and concrete fragments --FILL--			1	3 3 3 3	NP	
					2	4 3 3 3	NP	7
	625.7	Loose to medium dense, brown, very fine to fine SAND	5		3	1 2 2	NP	4
	622.2	Rock fragments --Hard drilling--			4	16 7 4	NP	5
	620.7	Hard, brown and gray SILTY CLAY, trace gravel	10		5	6 7 10	> 4.50 P	17
			15		6	10 13 14	4.51 S	17
					7	6 7 9	4.35 B	14
			20		8	6 9 12	6.56 B	16
					9	6 10 10	5.82 B	21
	608.2	Medium stiff, brown SANDY CLAY LOAM	25		10	3 3 5	0.75 P	26

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	605.7	Dense, brown GRAVELLY SANDY LOAM			11	18 22 16	NP	14
	603.2	Very dense, gray, weathered SHALE			12	50/3	NP	15
	601.7	Very dense, dark gray, interbedded SHALE and MUDSTONE 29.5' to 33.5'= 1 min/foot	30		13	50/1	NP	17
		Hard drilling (3 min/foot)	35		14	75/2.5	NP	19
		Hard drilling (1.5 min/foot)	40		15	75/3	NP	19
		Hard drilling (1.5 min/foot)			16	75/1	NP	
		Hard drilling (2 min/foot)	45		17	50/1	NP	14
		Hard drilling (2 min/foot)			18	50/1	NP	18
		Hard drilling (2 min/foot)	50		19	50/3	NP	14

GENERAL NOTES

Begin Drilling **11-15-2011** Complete Drilling **11-16-2011**
Drilling Contractor **Wang Testing Services** Drill Rig **B-57 TMR**
Driller **R&N** Logger **F. Bozga** Checked by **C. Marin**
Drilling Method **3.25" HSA, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG BSB-04

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 631.23 ft
North: 1980439.68 ft
East: 2298954.27 ft
Station: 1585+44.68
Offset: 00.69 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		Hard drilling (2 min/foot)	55		20	50/4	NP	17
		Hard drilling (2 min/foot)	60		21	50/4	NP	17
		Hard drilling (2 min/foot)	65		22	50/4	NP	20
		Hard drilling (2 min/foot)	70		23	50/4	NP	17
		Hard drilling (2.5 min/foot)	75		24	50/5	NP	19
		Hard drilling (2.5 min/foot)	80		25	50/6	NP	14
		Hard drilling (2.5 min/foot)	85		26	50/6	NP	16
		Hard drilling (2 min/foot)	90		27	50/4	NP	18
	540.2	--Possible WEATHERED DOLOSTONE BEDROCK--						
	537.7	Qu=9680 psi ---> Strong, fair rock quality, light gray, fresh, moderately to slightly fractured, vuggy, DOLOSTONE with pyrite, horizontally fractured --RUN 1 - RECOVERY= 98%-- --RQD= 50%-- 93.5' to 103.5' = 4 min/foot	95	CORE	1		NP	
		Qu=14950 psi --->	100					

GENERAL NOTES

Begin Drilling **11-15-2011** Complete Drilling **11-16-2011**
Drilling Contractor **Wang Testing Services** Drill Rig **B-57 TMR**
Driller **R&N** Logger **F. Bozga** Checked by **C. Marin**
Drilling Method **3.25" HSA, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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BORING LOG BSB-04

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 631.23 ft
North: 1980439.68 ft
East: 2298954.27 ft
Station: 1585+44.68
Offset: 00.69 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		--RUN 2 - RECOVERY= 100%--						
		--RQD= 69%--						
		103.5- to 113.5' = 3 min/foot	105			CORE		
		Qu=11060 psi --->			2		NP	
			110					
		Qu=12800 psi --->						
	517.7	Boring terminated at 113.50 ft						
			115					
			120					
			125					

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)

GENERAL NOTES

Begin Drilling **11-15-2011** Complete Drilling **11-16-2011**
Drilling Contractor **Wang Testing Services** Drill Rig **B-57 TMR**
Driller **R&N** Logger **F. Bozga** Checked by **C. Marin**
Drilling Method **3.25" HSA, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ⧩ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG BSB-04A

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 631.23 ft
North: 1980425.66 ft
East: 2298956.03 ft
Station: 1585+46.57
Offset: 11.33 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		Drilled to 31.5 feet without sampling	5					
			10					
			15					
			20					
			25					
	599.7	Moderate to strong, very good to excellent rock quality, dark gray, interbedded SHALE and MUDSTONE	30			CORE		
		Qu=6900 psi --->			1			
		--RUN 1 - RECOVERY= 100%--						
		--RQD= 80%--	35					
		31.5' to 36.5' = 3 min/foot						
		--RUN 2 - RECOVERY= 27%--				CORE		
		--RQD= 15%--			2			
		36.5' to 41.5' = 3 min/foot	40					
		--RUN 3 - RECOVERY= 100%--				CORE		
		--RQD= 100%--						
		41.5' to 46.5' = 3 min/foot						
		Qu=8120 psi --->	45		3			
		--RUN 4 - RECOVERY= 100%--				CORE		
		--RQD= 100%--						
		Qu=7010 psi -->						
		46.5' to 51.5' = 3 min/foot			4			
			50					

GENERAL NOTES

Begin Drilling **11-17-2011** Complete Drilling **11-17-2011**
Drilling Contractor **Wang Testing Services** Drill Rig **B-57 TMR**
Driller **R&N** Logger **F. Bozga** Checked by **C. Marin**
Drilling Method **3.25" HSA, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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BORING LOG BSB-04A

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 631.23 ft
North: 1980425.66 ft
East: 2298956.03 ft
Station: 1585+46.57
Offset: 11.33 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		--RUN 5 - RECOVERY= 100%-- --RQD= 100%-- 51.5' to 56.5' = 3 min/foot			5	CORE		
		Qu=3910 psi --->	55					
		--RUN 6 - RECOVERY= 100%-- --RQD= 100%-- Qu=2350 psi --> 56.5' to 61.5' = 3 min/foot			6	CORE		
			60					
		--RUN 7 - RECOVERY= 100%-- --RQD= 93%-- 61.5' to 66.5' = 3 min/foot			7	CORE		
			65					
		--RUN 8 - RECOVERY= 100%-- --RQD= 100%-- 66.5' to 71.5'= 4 min/foot			8	CORE		
			70					
		--RUN 9 - RECOVERY= 100%-- --RQD= 100%-- 71.5- to 76.5'= 2 min/foot			9	CORE		
			75					
		--RUN 10 - RECOVERY= 100%-- --RQD= 100%-- 76.5' to 81.5'= 3 min/foot			10	CORE		
			80					
		--RUN 11 - RECOVERY= 97%-- --RQD= 80%-- 81.5' to 86.5'= 4 min/foot			11	CORE		
			85					
		--RUN 12 - RECOVERY= 98%-- --RQD= 77%--						
	543.2	86.5' to 91.5'= 3 min/foot			12	CORE		
		Strong, very good rock quality, light gray, fossiliferous DOLOSTONE	90					
	539.7	Boring terminated at 91.50 ft						
			95					
			100					

GENERAL NOTES

Begin Drilling **11-17-2011** Complete Drilling **11-17-2011**
Drilling Contractor **Wang Testing Services** Drill Rig **B-57 TMR**
Driller **R&N** Logger **F. Bozga** Checked by **C. Marin**
Drilling Method **3.25" HSA, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **DRY**
At Completion of Drilling ▼ **DRY**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG BSB-10

WEI Job No.: 342-06-01

Client **Parsons Transportation Group, Inc.**
Project **US 52 / IL 64 / IL 84**
Location **Carroll County, IL and Jackson County, IA**

Datum: NAVD 88
Elevation: 630.10 ft
North: 1980458.87 ft
East: 2298957.81 ft
Station: 1585+48.14
Offset: 19.90 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	620.9	3-inch thick, dark brown, SANDY LOAM with gravel --TOPSOIL--						
		Medium dense, brown SANDY LOAM, some gravel --FILL--			1	6 6 6	NP	4
			5		2	3 4 50/5	NP	5
	624.6	Very dense, brown SANDY GRAVEL --FILL--			3	50/1	NR	
	622.1	Very stiff to hard, brown and gray SILTY CLAY, trace gravel						
			10		4	10 11 9	> 4.50 P	13
					5	7 18 22	> 4.50 P	10
			15		6	6 18 40	> 4.50 P	12
					7	9 47 28	5.33 B	13
			20		8	6 12 11	2.87 B	12
					9	8 13 19	6.31 B	16
	607.1	Very dense, brown SANDY LOAM, trace gravel						
	605.4		25		10	18 29 23	NP	14

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		Brown, coarse SAND, trace gravel						
	603.8	Hard, brown SILTY CLAY, trace gravel			11	13 11 24	7.95 S	14
	601.9	--WEATHERED BEDROCK--			12	50/1 CORE	NP	6
	601.1	30.0ft-Qu=7340 psi --->	30					
		Moderate strength, dark gray, poor rock mass quality, bedded, slightly weathered to fresh SHALE and MUDSTONE interbedded, laminated, up to 18-inch beds, 1- to 18-inch spaced joints, horizontal no infilling, hard joint wall			1		NP	
			35					
		--RUN 1 - RECOVERY= 100%-- --RQD= 42%-- 29 to 34 = 2.5 min/foot 34 to 39 = 2 min/foot						
	591.1	Boring terminated at 39.00 ft						
			40					
			45					
			50					

GENERAL NOTES

Begin Drilling **09-26-2013** Complete Drilling **09-26-2013**
Drilling Contractor **Wang Testing Services** Drill Rig **D-50 ATV**
Driller **R&R** Logger **D. Kolpacki** Checked by **C. Marin**
Drilling Method **2.25" HSA, boring backfilled upon completion**

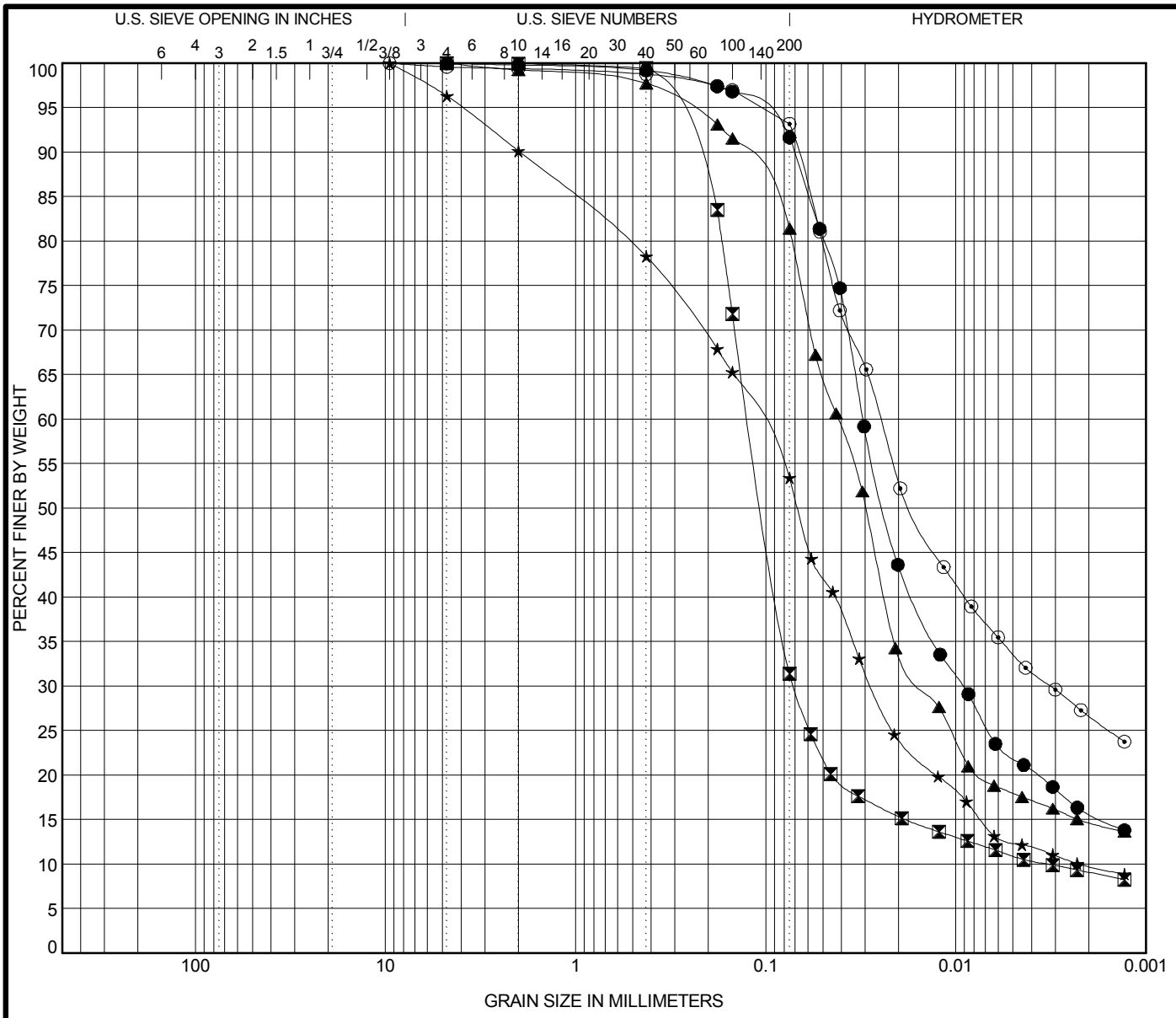
WATER LEVEL DATA

While Drilling ▽ **24.75 ft**
At Completion of Drilling ▼ **NA**
Time After Drilling **NA**
Depth to Water ▼ **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

WANGENGINC 3420601.GPJ WANGENG.GDT 9/30/14

APPENDIX B



COBBLES	GRAVEL	SAND		SILT AND CLAY
		coarse	fine	

	Specimen Identification		IDH Classification	LL	PL	PI	Cc	Cu
●	84-SGB-01#2	3.0 ft	**Silty Loam**	**31**	**16**	**15**		
⊠	84-SGB-02#2	3.0 ft	**Sandy Loam**	**NP**	**NP**	**NP**	**12.56**	**37.23**
▲	84-SGB-03#2	3.0 ft	**Silty Loam**	**26**	**16**	**10**		
★	84-SGB-05#1	1.5 ft	**Loam**	**24**	**15**	**9**	**3.10**	**49.16**
⊙	84-SGB-11#1	1.0 ft	**Silty Clay Loam**	**36**	**14**	**22**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	84-SGB-01#2	3.0 ft	**4.75**	**0.031**	**0.009**		**0.2**	**8.5**	**75.5**	**15.7**
⊠	84-SGB-02#2	3.0 ft	**4.75**	**0.122**	**0.071**	**0.003**	**0.0**	**68.9**	**21.9**	**9.1**
▲	84-SGB-03#2	3.0 ft	**4.75**	**0.042**	**0.015**		**0.8**	**18.4**	**66.1**	**14.7**
★	84-SGB-05#1	1.5 ft	**9.5**	**0.11**	**0.028**	**0.002**	**9.9**	**37.2**	**43.2**	**9.8**
⊙	84-SGB-11#1	1.0 ft	**9.5**	**0.025**	**0.003**		**0.6**	**6.6**	**66.1**	**26.7**

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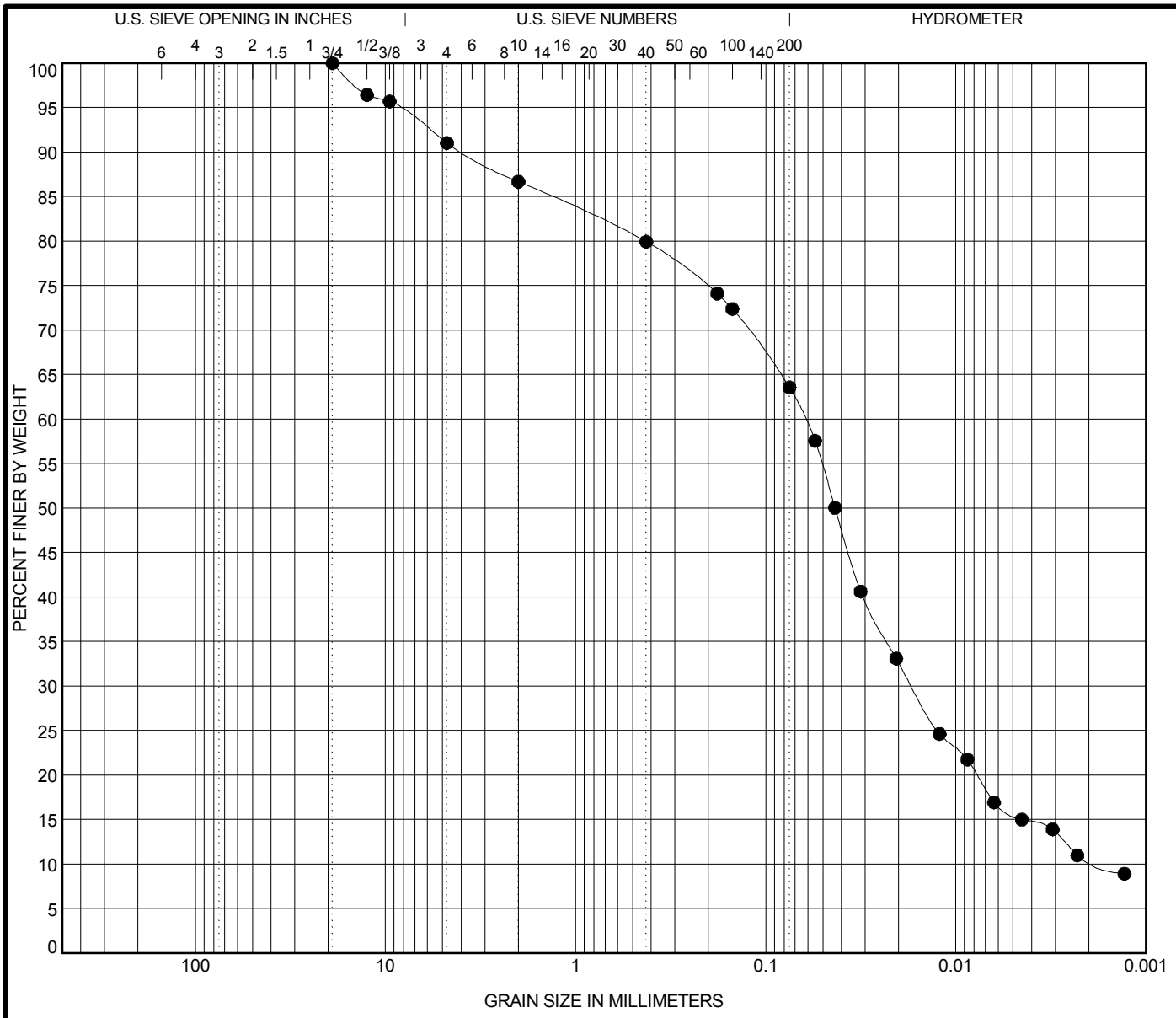
GRAIN SIZE DISTRIBUTION

Project: US 52 / IL 64 / IL 84

Location: Carrol County, Illinois

Number: 342-06-02



COBBLES	GRAVEL	SAND		SILT AND CLAY
		coarse	fine	

Specimen Identification		IDH Classification	LL	PL	PI	Cc	Cu
● **84-SGB-20#1**	**1.5 ft**	**Silty Loam**	**33**	**16**	**17**	**2.65**	**35.64**

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **84-SGB-20#1**	**1.5 ft**	**19**	**0.062**	**0.017**	**0.002**	**13.3**	**23.4**	**52.8**	**10.5**

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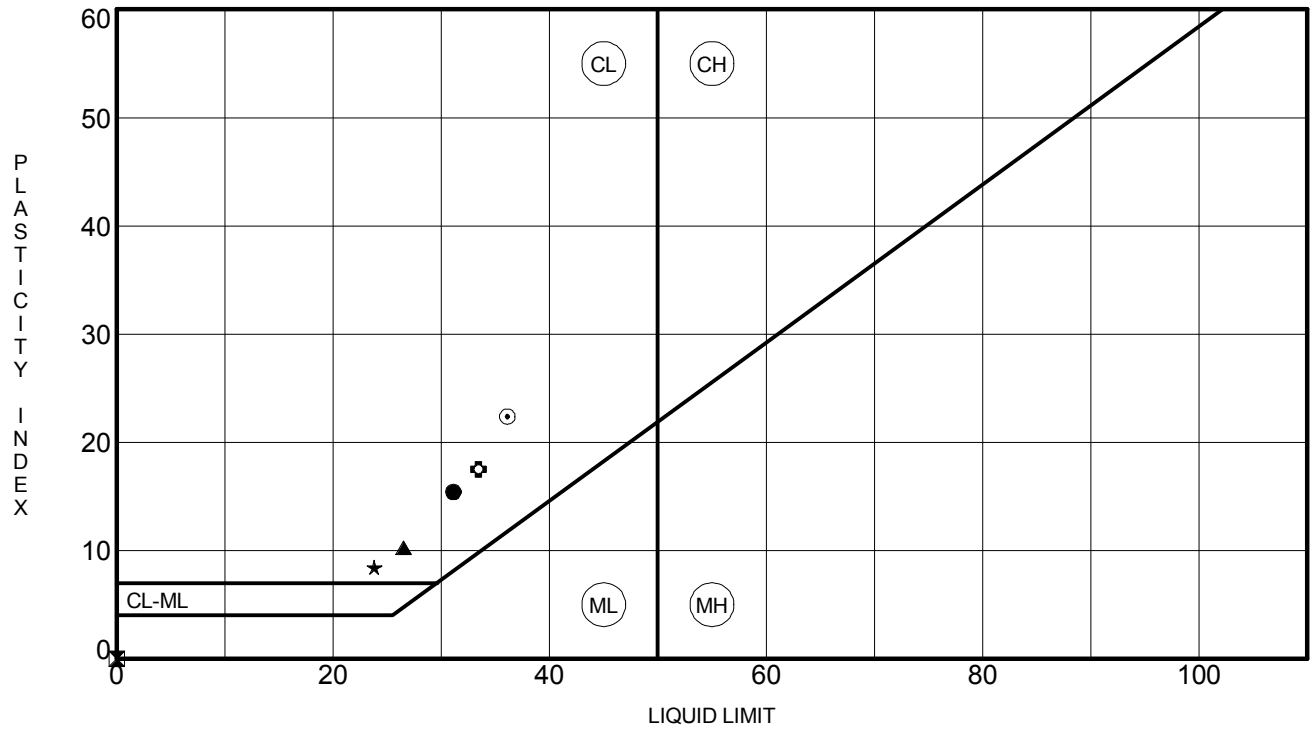
GRAIN SIZE DISTRIBUTION

Project: US 52 / IL 64 / IL 84

Location: Carrol County, Illinois

Number: 342-06-02



Specimen Identification			LL	PL	PI	Fines	IDH Classification
●	84-SGB-01#2	3.0 ft	31	16	15	92	Silty Loam
⧓	84-SGB-02#2	3.0 ft	NP	NP	NP	31	Sandy Loam
▲	84-SGB-03#2	3.0 ft	26	16	10	81	Silty Loam
★	84-SGB-05#1	1.5 ft	24	15	9	53	Loam
⊙	84-SGB-11#1	1.0 ft	36	14	22	93	Silty Clay Loam
✿	84-SGB-20#1	1.5 ft	33	16	17	64	Silty Loam

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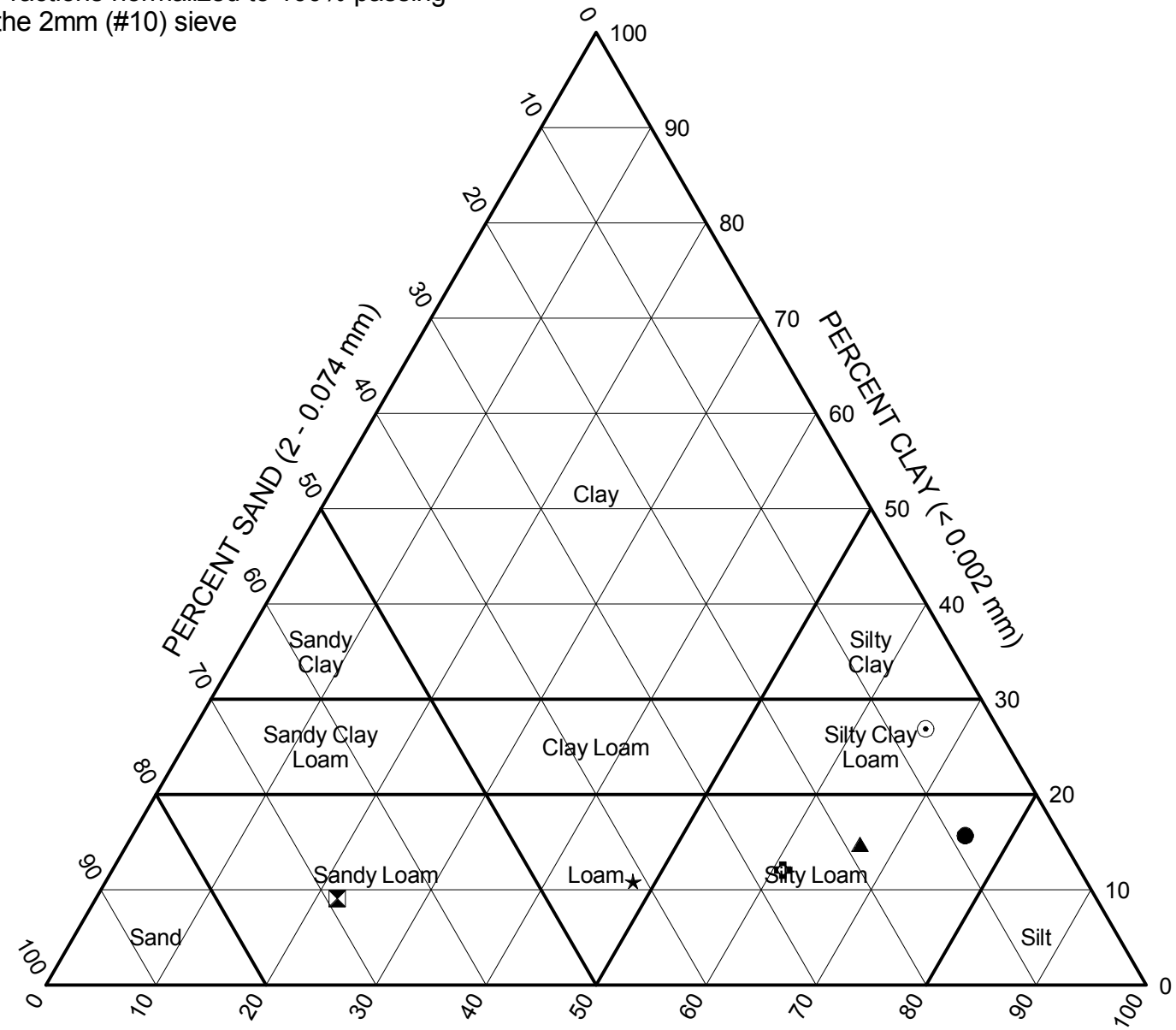
ATTERBERG LIMITS' RESULTS

Project: US 52 / IL 64 / IL 84

Location: Carrol County, Illinois

Number: 342-06-02

Fractions normalized to 100% passing the 2mm (#10) sieve



	Sample	Depth (ft)	Sand (%)	Silt (%)	Clay (%)	Classification		
						IL DOT	AASHTO	ASTM
●	84-SGB-01#2	3.0	8.5	75.7	15.7	Silty Loam	A-6 (13)	CL
⧓	84-SGB-02#2	3.0	68.9	21.9	9.1	Sandy Loam	A-2-4 (0)	SM
▲	84-SGB-03#2	3.0	18.5	66.6	14.8	Silty Loam	A-4 (6)	CL
★	84-SGB-05#1	1.5	41.3	47.9	10.9	Loam	A-4 (2)	CL
⊙	84-SGB-11#1	1.0	6.6	66.5	26.9	Silty Clay Loam	A-6 (20)	CL
✿	84-SGB-20#1	1.5	27.0	60.9	12.1	Silty Loam	A-6 (8)	CL

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IDH Textural Classification Chart

Project: US 52 / IL 64 / IL 84

Location: Carrol County, Illinois

Number: 342-06-02

APPENDIX C

Illinois Department of Transportation

Summary Report on Pavement, Base and Subbase Design

State Job Number: D-92-001-11 Project: US 52/IL 64/IL 84 Route: IL 84

Section: 104B-2 City or County: Carroll Date: 9/12/2014

ADT: NA Year: Design Period: Class Highway: State Highway

Passenger Cars Per Day: NA Trucks S.U. Per Day: NA Trucks M.U. Per Day: NA

Pavement Structure: ASPHALT

Type Surface Course: HMA Thickness: 9.75 inches

Type Base Course: - Thickness: -

Type Subbase Material: Aggregate Subgrade Improvemnet Thickness: 12 inches

Sta. to Sta.	705+40 to 728+90	+ to +	+ to +	+ to +
*Sta. of Test	706+15.07			
*Drainage Class	POOR			
*Ave. Frost Penetration	45 inches			
Illinois Textural Classification	Silty Loam			
Classification and Group Index (AASHTO M 145)	A-6 (13)			
*Percent Silt (AASHTO T 88)	75.5			
*Illinois Bearing Ratio (%)	NA			
Std. Dry Density (IL Mod. AASHTO T 99)	NA			
Optimum Moisture (IL Mod AASHTO T 99)	NA			

* Indicates worst condition within the above station limits.

Remarks:

SOIL TEST DATA

ROUTE
IL Route 84

PROJECT
IDOT P-92-001-11

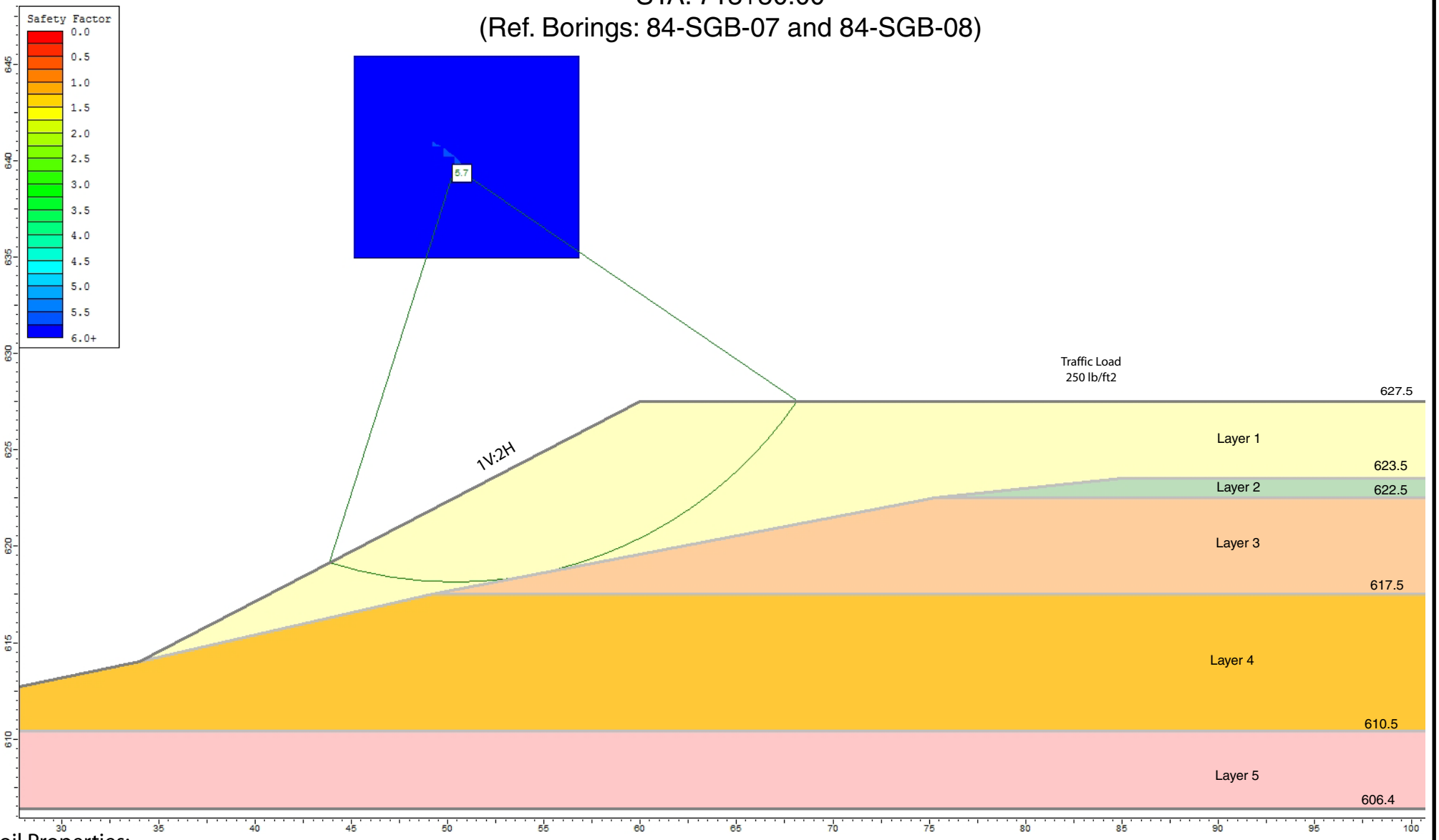
SECTION
IL 84 (Station 705+40 to Station 728+90)

COUNTY
Carroll

Lab. No.	84-SGB-01 No.2	84-SGB-03 No.2	84-SGB-05 No.1	84-SGB-11 No.1	84-SGB-20 No.1
Station ft)	706+15.07	707+53.28	709+64.13	716+97.64	728+83.76
Offset (ft)	211.87 LT	11.50 RT	16.36 LT	07.14 RT	5.15 LT
Depth (ft)	3	3	1.5	1	1.5
AASHTO M 145 Classification and Group Index	A-6 (13)	A-4 (6)	A-4 (2)	A-6 (20)	A-6 (8)
Illinois Textural Classification (Illinois Method)	Silty Loam	Silty Loam	Loam	Silty Clay Loam	Silty Loam
Gradation--Passing 1" Sieve %					
--"-- 3/4" Sieve %					100
--"-- 1/2" Sieve %			100.0	100.0	96.6
--"-- No.4 Sieve %	100.0	100.0	96.3	99.6	91.0
--"-- No.10 Sieve %	99.8	99.2	90.1	99.4	86.7
--"-- No.4 0 Sieve %	99.2	97.7	78.3	98.8	79.9
--"-- No.100 Sieve %	96.8	91.6	65.3	97.0	72.4
--"-- No.200 Sieve %	91.3	80.8	53.0	92.7	63.3
Sand % (AASHTO T 88)	8.5	18.4	37.2	6.6	23.4
Silt % (AASHTO T 88)	75.5	66.1	43.2	66.1	52.8
Clay % (AASHTO T 88)	15.7	14.7	9.8	26.7	10.5
Liquid limit % (AASHTO T 89)	31.0	26.0	24.0	36.0	33.0
Plasticity index % (AASHTO T 90)	15.0	10.0	8.0	22.0	18.0
IBR % (Illinois Method)					
Standard Dry Density % (AASHTO T 99)					
Optimum Moisture % (AASHTO T 99)					
Subgrade Support Rating	POOR	POOR	POOR	POOR	POOR
Insitu Moisture % (AASHTO T 99)	32	18	16	22	16

APPENDIX D

Slope Stability Analysis
STA. 713+50.00
(Ref. Borings: 84-SGB-07 and 84-SGB-08)



Soil Properties:

Layer ID	Soil Type	Unit Weight (pcf)	Undrained Parameter C_u (psf)	Undrained Parameter ϕ (deg.)
1	IDOT Cohesive Fill	125	1000	0
2	Medium Dense Silty Loam	115	0	28
3	Very Stiff to Hard, Silty Clay to Silty Clay Loam	120	4100	0
4	Hard Silty Clay to Silty Clay Loam	120	6400	0
5	Hard Silty Clay to Silty Clay Loam	120	8000	0

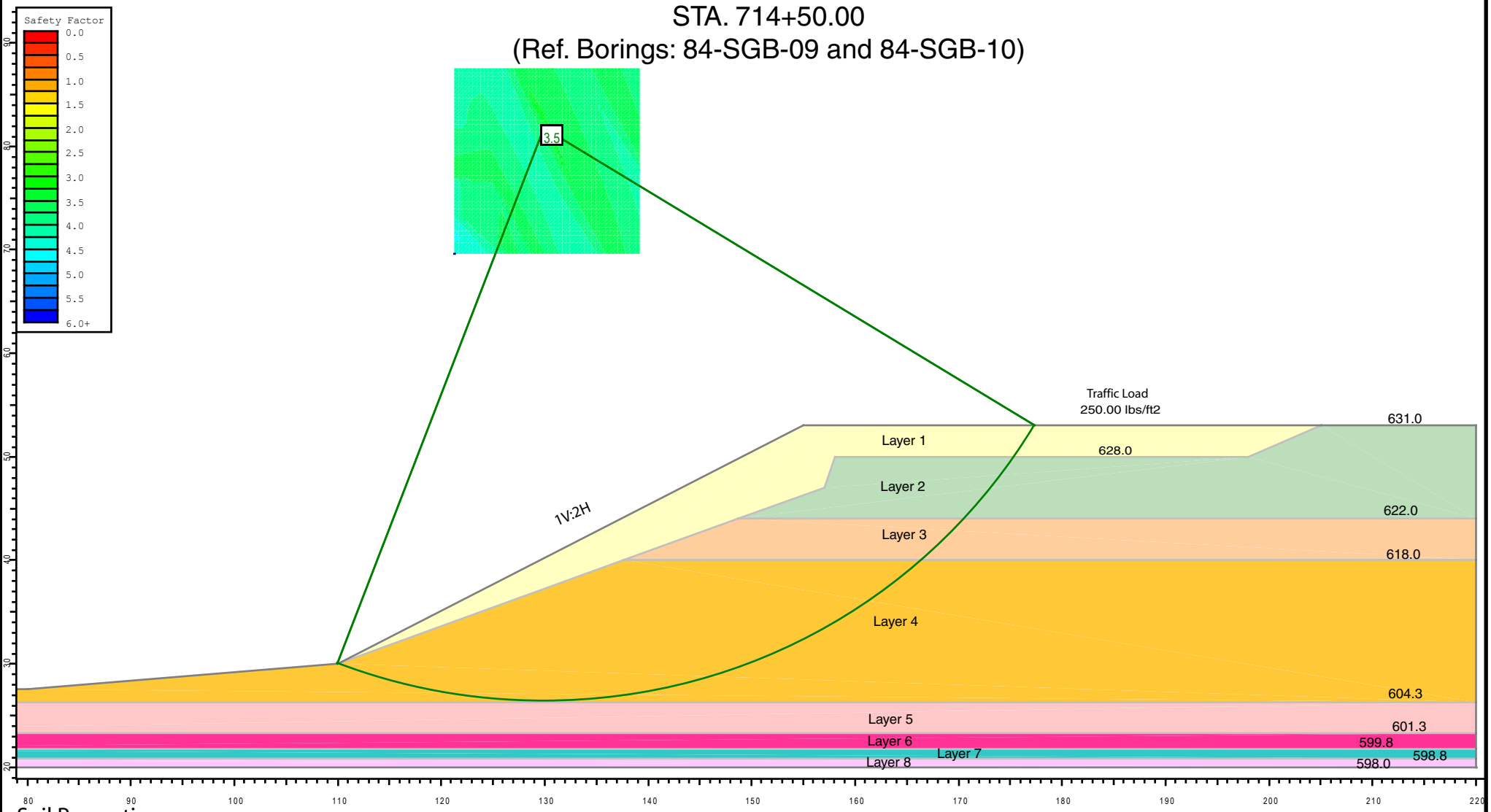
SLOPE STABILITY ANALYSIS: IL-84 ROADWAY RECONSTRUCTION, CARROLL COUNTY, ILLINOIS

SCALE: GRAPHIC | APPENDIX D-1 | DRAWN BY: R. KC, CHECKED BY: C. Marin

Wang Engineering
1145 N. Main Street
Lombard, IL 60148
www.wangeng.com

FOR PARSONS TRANSPORTATION GROUP, INC. | 342-06-01

Slope Stability Analysis
STA. 714+50.00
(Ref. Borings: 84-SGB-09 and 84-SGB-10)



Soil Properties:

Layer ID	Soil Type	Unit Weight (pcf)	Undrained Parameter C_u (psf)	Undrained Parameter ϕ (deg.)
1	IDOT Cohisive FILL	125	1000	0
2	Stiff SILTY CLAY to SILTY CLAY LOAM	120	1000	0
3	Very Stiff SILTY CLAY to SILTY CLAY LOAM	120	3220	0
4	Stiff SILTY CLAY to SILTY CLAY LOAM	120	1450	0
5	Very Stiff SILTY CLAY	120	2540	0
6	Medium Dense SANDY LOAM	120	0	30
7	Hard SILTY CLAY LOAM	125	4500	0
8	Very Dense SILTY LOAM	125	0	37

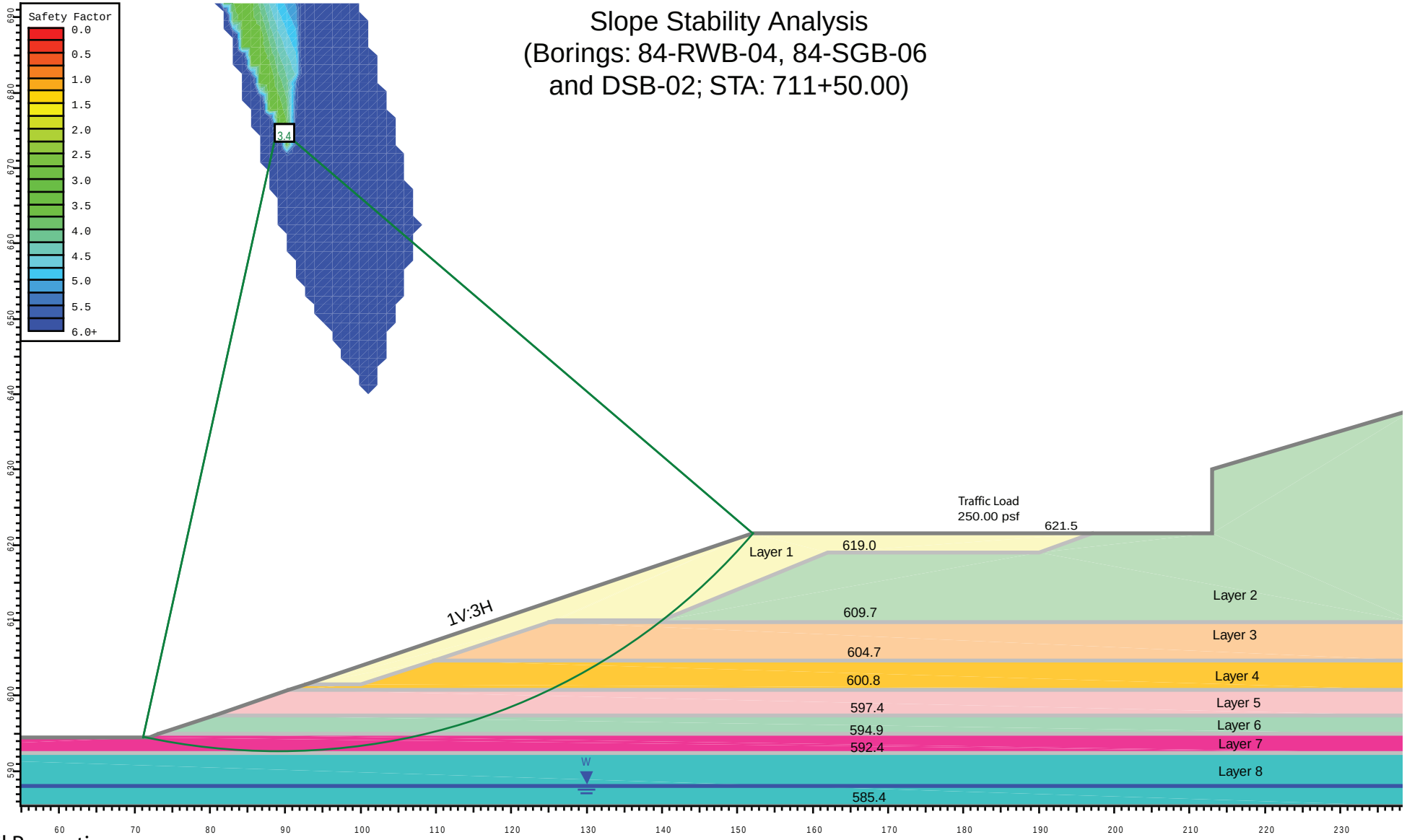
SLOPE STABILITY ANALYSIS: IL-84 ROADWAY RECONSTRUCTION, CARROLL COUNTY, ILLINOIS

SCALE: GRAPHIC | **APPENDIX D-2** | DRAWN BY: H. Bista, CHECKED BY: C. Marin

Wang Engineering
1145 N. Main Street
Lombard, IL 60148
www.wangeng.com

FOR PARSONS TRANSPORTATION GROUP, INC | **342-06-01**

Slope Stability Analysis
(Borings: 84-RWB-04, 84-SGB-06 and DSB-02; STA: 711+50.00)



Soil Properties:

Layer ID	Soil Type	Unit Weight (pcf)	Undrained Parameter C_u (psf)	Undrained Parameter ϕ (deg.)
1	Cohesive FILL	125	1000	0
2	Very Stiff to Hard SILTY CLAY LOAM	125	7000	0
3	Dense to Very Dense SILTY LOAM	125	0	37
4	Stiff SILTY CLAY LOAM	120	1300	0
5	Medium Dense SAND	120	0	31
6	Loose SILTY LOAM	115	0	29
7	Medium Stiff SILTY CLAY to SILTY CLAY LOAM	120	820	0
8	Very Stiff to Hard SILTY CLAY LOAM	125	5000	0

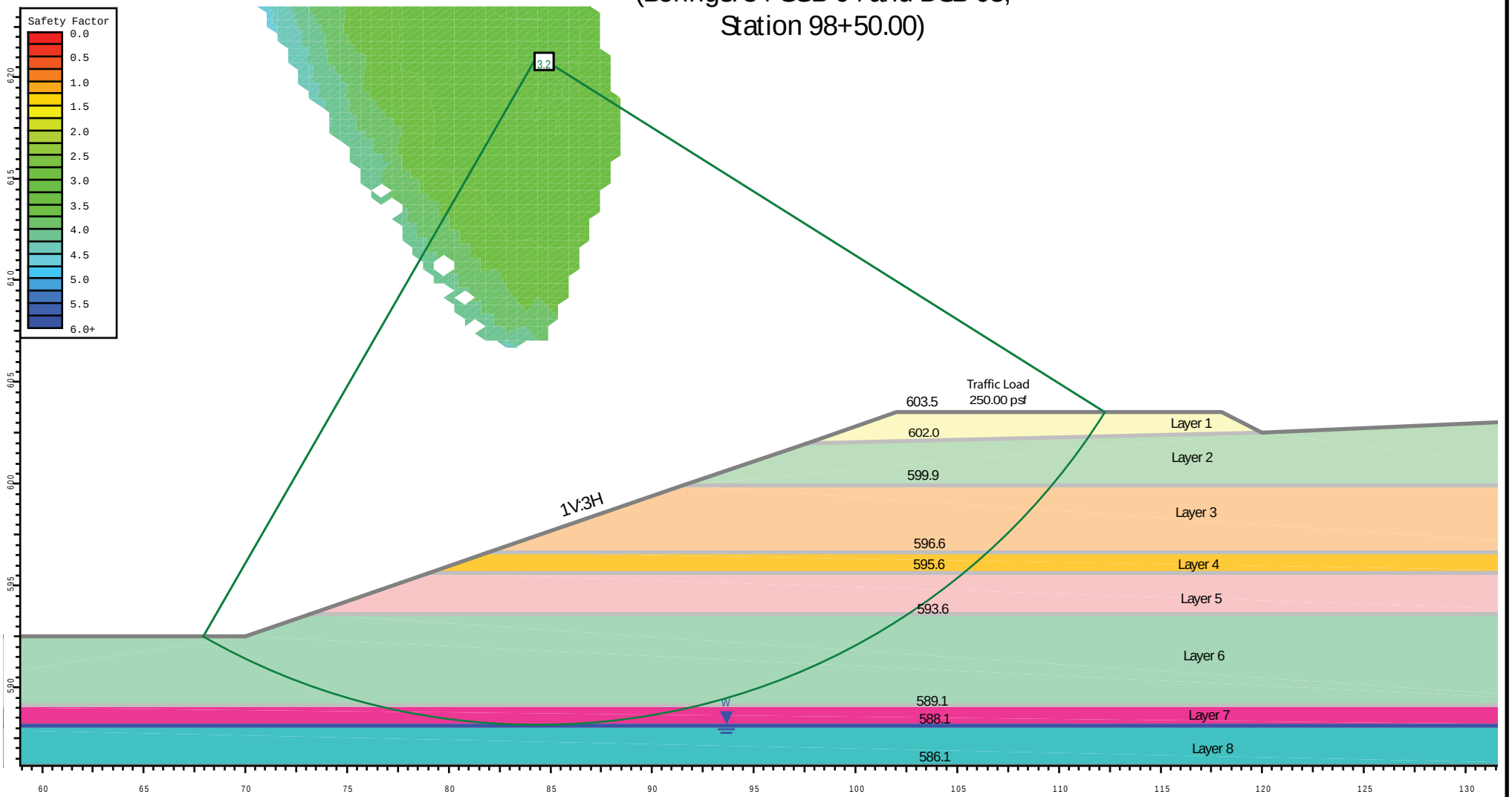
SLOPE STABILITY ANALYSIS: IL-84 ROADWAY RECONSTRUCTION, CAROLL COUNTY, ILLINOIS

SCALE: GRAPHIC | **APPENDIX D-3** | DRAWN BY: H. Bista, CHECKED BY: C. Marin

Wang Engineering
1145 N. Main Street
Lombard, IL 60148
www.wangeng.com

FOR PARSONS TRANSPORTATION GROUP, INC. | **342-06-01**

Slope Stability Analysis
(Borings: 84-SGB-04 and DSB-03, Station 98+50.00)



Soil Properties:

Layer ID	Soil Type	Unit Weight (pcf)	Undrained Parameter C_u (psf)	Undrained Parameter ϕ (deg.)
1	Cohesive FILL	125	1000	0
2	Very Stiff SILTY CLAY LOAM	120	3500	0
3	Very Loose SANDY LOAM	110	0	28
4	Soft SILTY CLAY LOAM	110	250	0
5	Medium Dense SAND	120	0	31
6	Loose SILTY LOAM to SILT	115	0	29
7	Medium Stiff SILTY CLAY	115	500	0
8	Medium Dense SANDY LOAM	120	0	31

SLOPE STABILITY ANALYSIS: IL-84 ROADWAY RECONSTRUCTION, CARROLL COUNTY, ILLINOIS

SCALE: GRAPHIC | **APPENDIX D-4** | DRAWN BY: H. Bista CHECKED BY: C. Marin

Wang Engineering
1145 N. Main Street
Lombard, IL 60148
www.wangeng.com

FOR PARSONS TRANSPORTATION GROUP, INC. | **342-06-01**

APPENDIX E

APPENDIX E
BORING LOCATION PLANS
AND SOIL PROFILES

ROADWAY GEOTECHNICAL REPORT

IL ROUTE 84 RECONSTRUCTION
STATION 705+40 TO STATION 728+90
CARROLL COUNTY, ILLINOIS

FOR

PARSONS TRANSPORTATION GROUP, INC.
10 SOUTH RIVERSIDE PLAZA, SUITE 400
CHICAGO, IL 60606

Prepared by
WANG ENGINEERING, INC.
1145 NORTH MAIN STREET
LOMBARD, IL 60148

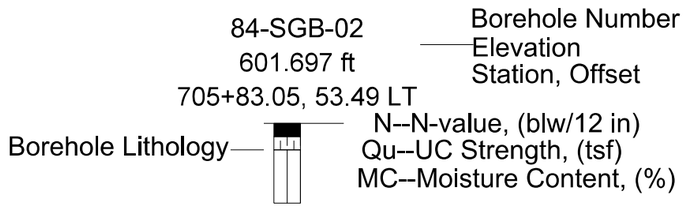
OCTOBER 6, 2014

WANG PROJECT 342-06-01

LEGEND:

Soil Boring

IDOT Pavement Core



Water Level Reading at time of drilling.

Water Level Reading 24-hr after drilling or at end of drilling

Lithology Graphics

- Topsoil
- Pavement
- Gravelly sand, sandy gravel
- IDH Sand, Sandy Loam
- IDH Loam
- IDH Silt, Silty Loam
- IDH Clay Loam
- IDH Silty Clay, Silty Clay Loam
- Weathered bedrock
- Shale Bedrock

RANDOLPH STREET
MATCHLINE STA. 199+40.00
SEE SHEET 09 OF 09

84-SGB-02

84-SGB-03

20 0 20 40
SCALE IN FEET

MATCHLINE STA. 709+00.00

703 | 704 | 705+00 | 706 | 707 | 708 | 15+00

20+00

39.81′ | 38.86′ | 3.87′ | 41.81′ | 38.19′

12.00′ | 12.00′ | 12.00′ | 12.00′ | 12.00′ | 12.00′ | 12.00′ | 24.00′

6.00′ | 6.00′ | 5.00′

1Ø OVERHEAD PRIMARY 7200V

BEGIN IMPROVEMENTS
STATION 705+40.00
MATCH EXISTING

PROPOSED SIDEWALK 5.00′

PROPOSED LIMITS
OF CONSTRUCTION

EXISTING GROUND PROFILE

PROPOSED ℄ PROFILE

STATION 705+40.00
MATCH EXISTING

84-SGB-02,
601.697 ft,
705+83.05, 53.49 LT

84-SGB-03
606.652 ft,
707+53.28, 11.50 RT

N	Qu	MC
7	NP	14
6	NP	14
6	NP	15
4	NP	3
5	NP	7
4	NP	4
6	NP	5
5	NP	21

Loose, brown, medium SAND to SANDY LOAM, trace gravel

Sandy Loam
A-4 (0)
--%Gravel=0.0--
--%Sand=68.5--
--%Silt=21.9--
--%Clay=9.1--

Loose to medium dense, brown, medium SAND to SANDY LOAM, trace gravel

N	Qu	MC
18	NP	12
9	1.00 P	18
8	NP	20
4	NP	16
9	NP	9
10	NP	3

Medium dense, brown and gray SILTY LOAM, some gravel

Silty Loam
A-4 (6)
LL=26 PL=16
--%Gravel=0.8--
--%Sand=18.4--
--%Silt=66.1--
--%Clay=14.7--

Loose to medium dense, brown, medium SAND

622	618	614	610	606	602	598	594	590

602.56	602.92	603.27	603.57	603.89	604.25 **604.25**	604.69 **604.64**	605.25 **605.05**	606.02 **605.72**	607.05 **606.69**	608.35 **607.98**	609.73 **609.57**	611.10 **611.47**

703+00 | 703+50 | 704+00 | 704+50 | 705+00 | 705+50 | 706+00 | 706+50 | 707+00 | 707+50 | 708+00 | 708+50 | 709+00

PLAN — SURVEYED | PLOTTED | DRAWN | CHECKED | ALIGNMENT CHECKED | RT. OF WAY CHECKED | CADD FILE NAME | NOTE BOOK | NO. | BY | DATE

PROFILE — SURVEYED | PLOTTED | DRAWN | CHECKED | BM. NOTED | STRUCTURE NOTATNS CHKD | NOTE BOOK | NO. | BY | DATE

FILE NAME = $FILE$

USER NAME = $USER$	DESIGNED - OCS	REVISED -
	DRAWN - OCS	REVISED -
PLOT SCALE = $SCALE$	CHECKED - JCC	REVISED -
PLOT DATE = $DATE$	DATE - 11/22/2013	REVISED -

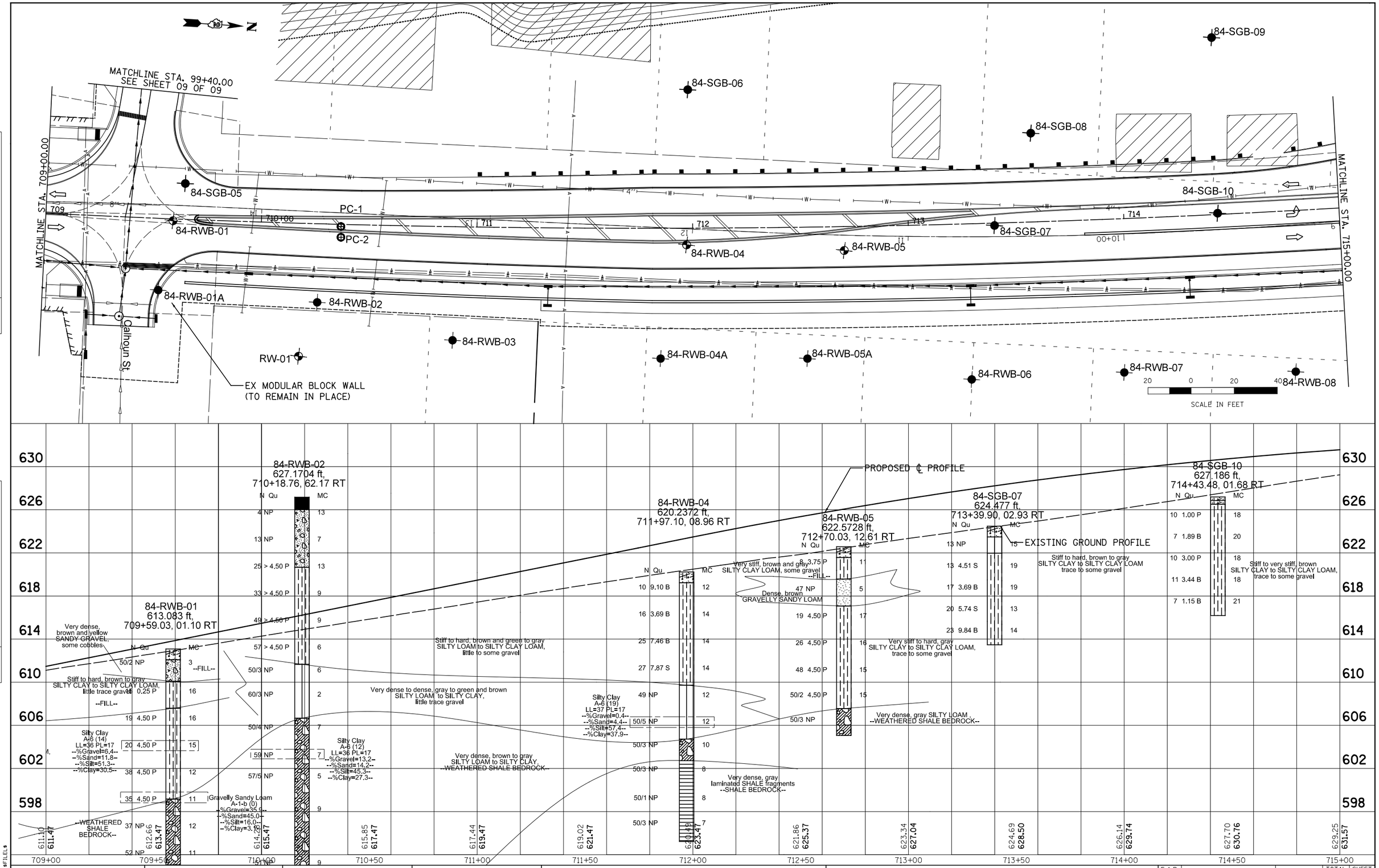
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PLAN AND PROFILE

SCALE: 1"=20′ | SHEET NO. 04 OF 16 SHEETS | STA. 705+48.00 TO STA. 709+00.00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
308/17	104B-2	CARROLL/JACKSON	06	01
	FIGURE 3		CONT. NO. P-92-001-11	
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

PRELIMINARY



PLAN
SURVEYED
PLOTTED
ALIGNMENT CHECKED
NOTE BOOK
NO.
BY
DATE
RT. OF WAY CHECKED
CADD FILE NAME

PROFILE
SURVEYED
PLOTTED
PROFILE CHECKED
NOTE BOOK
NO.
BY
DATE
ELM. NOTED
STRUCTURE NO/TATHS CHKD

FILE NAME = $FILE1$

USER NAME = $USER$	DESIGNED - OCS	REVISED -
	DRAWN - OCS	REVISED -
PLOT SCALE = $SCALE$	CHECKED - JCC	REVISED -
PLOT DATE = $DATE$	DATE - 11/22/2013	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PLAN AND PROFILE

SCALE: 1"=20' | SHEET NO. 05 OF 16 SHEETS | STA. 709+00.00 TO STA. 715+00.00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
308/17	104B-2	CARROLL/JACKSON	06	02
	FIGURE 3		CONT. NO. P-92-001-11	
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

PRELIMINARY

PLAN
SURVEYED
PLOTTED
DRAWN
CHECKED
NOTE BOOK
NO.
BY
DATE
PROJECT CHECKED
RT. OF WAY CHECKED
CADD FILE NAME

2 CENTERED CURVE
50'R - 400'R

2 CENTERED CURVE
50'R - 400'R

MATCHLINE STA. 715+00.00

MATCHLINE STA. 721+00.00

1585+00

BSB-04-A

BSB-04

BSB-10

84-SGB-14

84-SGB-12

84-SGB-15

84-SGB-16

84-SGB-21

84-SGB-11

84-SGB-13

84-RWB-14

84-RWB-15

84-RWB-09

84-RWB-10

84-RWB-11

84-RWB-12

84-RWB-13

715+00

716

717

718

719

720+00

720+00

N

20 0 20 40
SCALE IN FEET

PROFILE
SURVEYED
PLOTTED
DRAWN
CHECKED
NOTE BOOK
NO.
BY
DATE
PROJECT CHECKED
BAR. NOTED
STRUCTURE NOTATNS CHKD

642
638
634
630
626
622
618
614
610

84-SGB-21
631.814 ft,
715+97.99, 11.95 RT

84-SGB-11
632.159 ft,
716+97.64, 07.14 RT

84-SGB-13
631.465 ft,
717+51.91, 0.54 RT

84-RWB-14
643.682 ft,
719+34.94, 25.61 RT

84-SGB-16
627.521 ft,
719+80.34, 33.64 LT

N Qu MC

8 3.77 B 18
9 2.87 B 17
12 2.87 B 19
16 2.95 B 17
16 2.54 B 16

Stiff to very stiff, brown
SILTY CLAY to SILTY CLAY LOAM,
trace to some gravel

Stiff to hard, brown and gray
SILTY CLAY to
SILTY CLAY LOAM, 13 2.13 B
trace gravel and brick fragments
--FILL--
14 2.75 P 18
12 1.64 B 19
18 4.50 P 14

Very stiff to hard brown to gray
SILTY CLAY to SILTY CLAY LOAM,
trace gravel

5 1.56 B 22 Silty Clay Loam
A-6 (20)
LL=36 PL=14
--%Gravel=0.6--
--%Sand=6.6--
20 --%Silt=66.1--
--%Clay=26.7--
12 3.00 S 14
7 2.71 B 16
20 NP 14 --FILL--
26 6.15 S 16
21 NP 8

Very stiff, brown
SILTY CLAY,
trace gravel and brick fragments
--FILL--

Medium dense, gray
SILTY LOAM, trace gravel

Medium dense, brown and gray
GRAVELLY SAND,
trace cobbles

12 NP 10
9 NP 9
32 NP 9
34 NP 8
25 4.59 S 20
37 NA 19
50/2 NP 10
50/3 NP 11
21 1.97 S 12
21 2.13 S 16
29 3.03 S 15
24 2.46 B 18
50/4 3.26 S 19

Hard, brown and gray
SILTY CLAY LOAM,
little gravel

Very dense, brown
SANDY GRAVEL

Stiff to hard, gray
SILTY CLAY LOAM with shale,
some gravel

Very stiff, gray
SILTY CLAY LOAM
-WEATHERED BEDROCK-

-WEATHERED BEDROCK-

EXISTING GROUND PROFILE

PROPOSED ℄ PROFILE

N Qu MC
14 1.50 P 13
20 NP 7
13 NP 8
25 NP 5
12 NP 5

Stiff, brown
GRAVELLY
SILTY CLAY LOAM
--FILL--

Medium dense, brown
SAND and GRAVEL

Stiff to hard brown
SILTY CLAY LOAM, and cobbles

629.25 631.57
630.68 632.16
631.82 632.53
632.38 632.69
632.12 632.63
631.46 632.35
630.65 631.86
631.47 631.14
631.83 630.23
632.06 629.28
637.96 628.33
632.22 627.38
634.21 626.43

715+00 715+50 716+00 716+50 717+00 717+50 718+00 718+50 719+00 719+50 720+00 720+50 721+00

FILE NAME = $FILE$

USER NAME = $USER$	DESIGNED - OCS	REVISED -
	DRAWN - OCS	REVISED -
PLOT SCALE = $SCALE$	CHECKED - JCC	REVISED -
PLOT DATE = $DATE$	DATE - 11/22/2013	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PLAN AND PROFILE

SCALE: 1":20' | SHEET NO. 06 OF 16 SHEETS | STA. 715+00.00 TO STA. 721+00.00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
308/17	104B-2	CARROLL/JACKSON	06	03
	FIGURE 3		CONT. NO. P-92-001-11	
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

PRELIMINARY

MISSISSIPPI RIVER

WATER EDGE

END IMPROVEMENT
STATION 728+90.00

N

50 0 50 100

SCALE IN FEET

MATCHLINE STA. 721+00.00

EX ℄ IL 84

84-SGB-17

84-SGB-18

84-SGB-19

84-SGB-20

+60.00

8.00′

4.00′

29.06

PC 725+00

PC 725+29.06

12.00′

12.00′

8.00′

4.00′

PROP CURVE IL84-231

730+00

12.00′

12.00′

735+00

12.00′

16.00′

84-RWB-16

84-RWB-17

84-RWB-18

+80.00

84-RWB-19

84-RWB-20

84-RWB-21

84-RWB-22B

84-RWB-22A

PROPOSED
RETAINING WALL

PR ℄ IL 84

EXISTING AERIAL CABLE

PLAN
SURVEYED
PLOTTED
CHECKED
NOTE BOOK
NO.
BY
DATE

PROFILE
SURVEYED
PLOTTED
CHECKED
NOTE BOOK
NO.
BY
DATE

84-RWB-16
643,413 ft.
721+11.15, 35.99 RT

84-SGB-18
621,635 ft.
722+98.25, 10.88 LT

84-SGB-19
616,587 ft.
725+52.14, 0.75 LT

84-SGB-20
612,472 ft.
728+83.76, 5.15 LT

Stiff to hard brown
SILTY CLAY LOAM, and cobbles

Medium dense,
brown GRAVELLY SAND

Very stiff to hard,
greenish gray SILTY CLAY
trace cobbles and gravel

–WEATHERED BEDROCK–

Interbedded SHALE
and MUDSTONE
– BEDROCK–

Stiff, black SILTY CLAY,
trace gravel
–FILL–

Medium dense, brown
SANDY GRAVEL,
–FILL–

Medium dense, brown
GRAVELLY SAND,
–FILL–

Hard, gray
SILTY CLAY/LOAM,
with gravel

Medium stiff to stiff,
brown and gray
SILTY CLAY,
some gravel,
trace brick fragments and cinders
–FILL–

EXISTING GROUND PROFILE

PROPOSED ℄ PROFILE

END IMPROVEMENT
STATION 728+90.00

660 650 640 630 620 610 600 590 580

637.98 628.33 | 632.22 627.38 | 634.21 626.43 | 633.11 625.48 | 630.57 624.53 | 625.78 623.58 | 627.53 622.63 | 624.57 621.68 | 622.79 620.73 | 619.98 619.78 | 617.60 618.83 | 616.72 617.88 | 615.78 616.93 | 614.88 615.98 | 614.15 615.06 | 613.55 614.28 | 613.20 613.65 | 612.94 613.17

720+00 721+00 722+00 723+00 724+00 725+00 726+00 727+00 728+00

USER NAME = $USER$	DESIGNED - OCS	REVISED -	
	DRAWN - OCS	REVISED -	
PLOT SCALE = $SCALE$	CHECKED - JCC	REVISED -	
PLOT DATE = $DATE$	DATE - 11/22/2013	REVISED -	

FILE NAME = $FILE$

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PLAN AND PROFILE

SCALE: 1″=100′ | SHEET NO. 07 OF 16 SHEETS | STA. 721+00.00 TO STA. 728+90.00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
308/17	104B-2	CARROLL/JACKSON	06	04
	FIGURE 3		CONT. NO. P-92-001-11	
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

PRELIMINARY

PLAN
SURVEYED
PLOTTED
DRAWN
CHECKED
ALIGNMENT CHECKED
RT. OF WAY CHECKED
CADD FILE NAME
NOTE BOOK
NO.
DATE
BY

PROFILE
SURVEYED
PLOTTED
DRAWN
CHECKED
BM. NOTED
STRUCTURE NO
TAINS CHKD
NOTE BOOK
NO.
DATE
BY

N

20 0 20 40
SCALE IN FEET

84-SGB-01

198 RANDOLPH STREET 199+00

MATCHLINE STA. 199+40.00
SEE SHEET 05 OF 09

PROP. CURVE CAL-01
PI STA. = 98+10.34
Δ = 90° 44′ 37″ (LT)
D = 220° 22′ 06″
R = 26.00′
T = 26.34′
L = 41.18′
E = 11.01′
e = N.C.
T.R. = N/A
S.E. RUN = N/A
P.C. STA = 97+84.00
P.T. STA = 98+25.18

PROP. CURVE CAL-02
Δ = 9° 36′ 08″ (RT)
D = 10° 25′ 03″
R = 550.00′
T = 46.20′
L = 92.18′
E = 1.94′
e = N.C.
T.R. = N/A
S.E. RUN = N/A
P.C. STA = 98+77.23
P.T. STA = 99+69.41

N

20 0 20 40
SCALE IN FEET

84-SGB-04

98

CALHOUN ST.

99

PC Sta 98+77.38

MATCHLINE STA. 99+40.00
SEE SHEET 06 OF 09

606 602 598 594 590 618 614 610

622 618 614 610 606 602 598 594 590

84-SGB-01
593.638 ft,
197+87, 22.87 LT

N	Qu		MC
3	0.49 B		29
2	0.41 B		32
0	0.25 B		26
4	1.34 B		22
6	1.39 B		44

Soft, gray SILTY CLAY, trace gravel
Very loose, gray, medium SAND
Stiff, gray SILTY CLAY LOAM, trace gravel and organic matter
Brown and gray, medium SAND

84-SGB-04
602.116 ft,
89+52.50, 21.24 LT

N	Qu		MC
1	3.50 P		16
0	NP		13
6	0.25 P		19
13	NP		9
5	NP		23

Very stiff, brown SILTY CLAY LOAM, trace gravel --FILL--
Very loose, brown SANDY LOAM, trace gravel
Soft, brown SILTY CLAY LOAM, trace gravel
Medium dense, brown, medium to coarse SAND, trace gravel
Loose, brown SILTY LOAM

594.92	594.48	596.10	598.59	602.62	599.40	602.43	606.09	609.91	612.23
595.03	**594.53**	**595.87**	**598.64**	**602.63**	**599.52**	**603.32**	**607.82**	**611.28**	**612.94**

197+50 198+00 198+50 199+00 199+50 98+00 98+50 99+00 99+50 100+00

USER NAME = $USER$	DESIGNED - OCS	REVISED -	
	DRAWN - OCS	REVISED -	
PLOT SCALE = $SCALE$	CHECKED - JCC	REVISED -	
PLOT DATE = $DATE$	DATE - 11/22/2013	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PLAN AND PROFILE

SCALE: 1″=20′ | SHEET NO. 09 OF 16 SHEETS | STA. | TO STA.

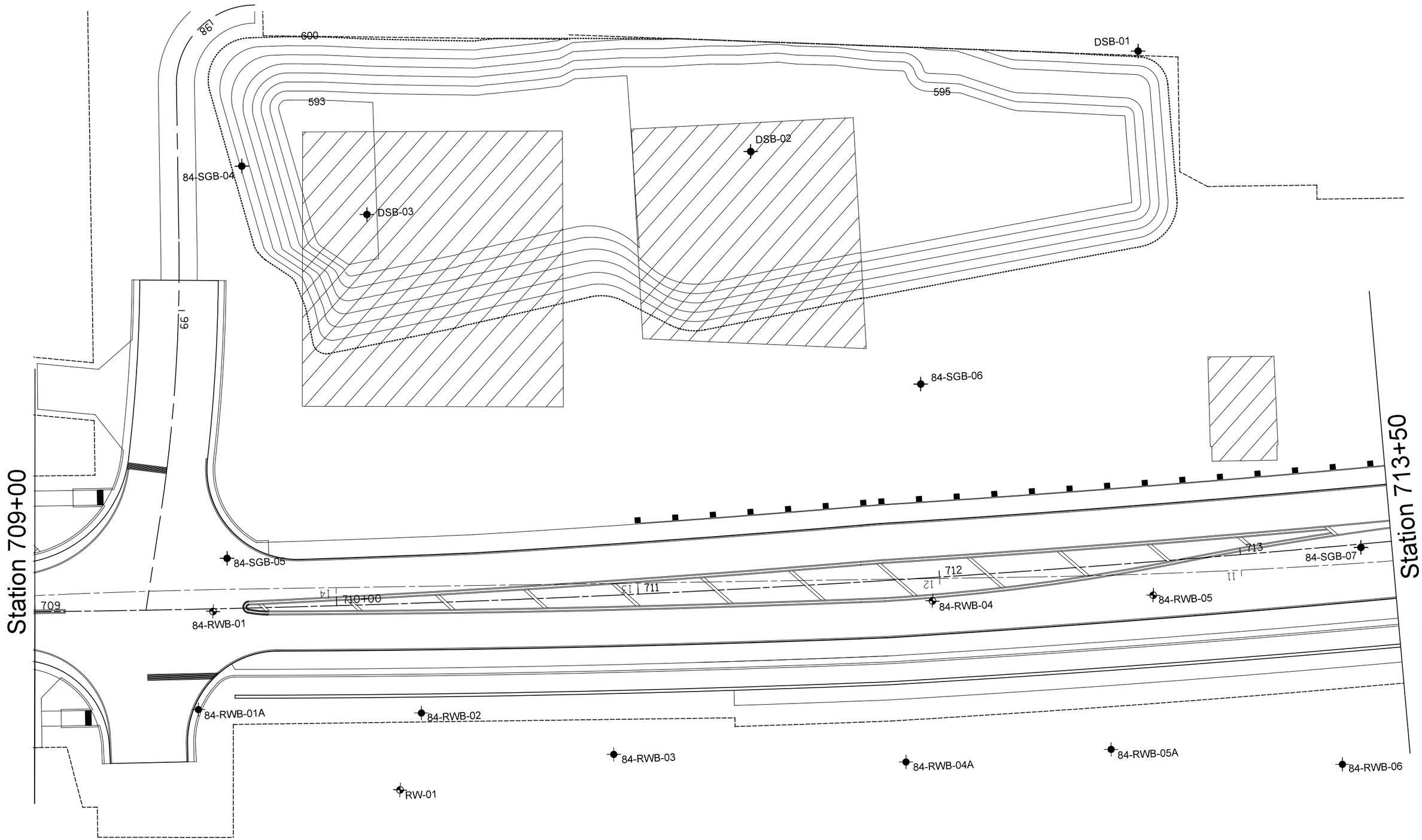
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
308/17	104B-2	CARROLL/JACKSON	06	05
	FIGURE 3		CONT. NO. P-92-001-11	
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

FILE NAME = $FILE$

PRELIMINARY

PLAN	BY	DATE
NOTE BOOK	SURVEYED	
NO.	PLOTTED	
	ALIGNMENT CHECKED	
	PROFILE CHECKED	
	RT. OF WAY CHECKED	
	CADD FILE NAME	

PROFILE	BY	DATE
NOTE BOOK	SURVEYED	
NO.	PLOTTED	
	CROSSES CHECKED	
	BM. NOTED	
	STRUCTURE NOTATNS CHKD	



USER NAME = $USER$	DESIGNED - OCS	REVISED -	**STATE OF ILLINOIS**
	DRAWN - OCS	REVISED -	**DEPARTMENT OF TRANSPORTATION**
PLOT SCALE = $SCALE$	CHECKED - JCC	REVISED -	
PLOT DATE = $DATE$	DATE - 11/22/2013	REVISED -	

DETENTION POND

SCALE: 1":100' | SHEET NO. OF 16 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
308/17	104B-2	CARROLL/JACKSON	06	06
	FIGURE 3		CONT. NO. P-92-001-11	
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

FILE NAME = $FILE$

PRELIMINARY

APPENDIX F

COPY

Illinois Department of Transportation

Memorandum

To:	Jay P. Howell	Attn: Becky Marruffo
From:	John H. Wegmeyer	By: Patrick F. Warkins
Subject:	Pavement Coring	
Date:	August 29, 2011	

Route: FAP 17 (US 52/IL 64)
County: Carroll
Job No.: P-92-001-11
Contract #: 64G59
Description: Randolph Street in Savanna to Palisades State Park Main Entrance

Coring on the above-referenced project was completed on August 19, 2011. Two cores were taken every ¼ mile, alternating from the northbound lane to the southbound lane with every fourth location being of full depth. A total of 24 cores were taken, with 6 cores being of full depth.

The pavement is generally in fair to poor condition with typical longitudinal and transverse cracking being present. Dendritic cracking along with meandering cracking and some edge cracking were present. Reflective widening cracking is also present with the joint between the existing pavement and the widening failing in areas. Type A gutter is present north of Savanna with the gutter not being overlayed. Maintenance has placed cold patch and performed crack sealing along this project.

The bituminous overlay is in fair to poor condition, consisting of an average of 6 lifts – 5 of surface mix and 1 of binder mix. The top lift has been hydraulically stripped by traffic. Most cores were solid but experienced poor bonding between the 2nd and 3rd lifts. The top lift exhibited minor stripping with moderate stripping throughout the remaining lifts. Core thickness ranged from 5.0 inches to 10.5 inches, averaging 7.4 inches thick. Rutting ranged from 0.0 inches to 0.90 inches, averaging 0.12 inches deep.

The underlying PCC pavement is in fair to very poor condition, containing river gravel for coarse aggregate. Some salt staining and top delamination were present in some of the cores also with no reinforcement present in any cores. Core thickness ranged from 6.5 inches to 7.3 inches, averaging 6.9 inches thick.

Recommendation for this project would be to place an unbonded concrete overlay to help raise the profile to avert flooding and also aid in fixing the failing widening joint.

If you have any questions or require additional information, please contact Jan Twardowski at extension 429 or Byron Wetzell at extension 439.

Jt8-29-11-2
c: Faith Duncan
Soils File

BITUMINOUS CORE DATA

ROUTE: IL 84 SECTION: Mt.Carrol- Calhoun St to Palisades N DATE: 08/19/11
JOB NO.: COUNTY: Carroll INSPECTOR: W. Garza

NUMBER CORE	1	2	3	4	5	6	7	8	9	10
STATION / LOCATION	100' N. of Calhoun St NB		.25 mi from loc 1 SB		.5 mi from loc 1 NB		.75 mi from loc 1 SB		1.0 mi from loc 1 NB	
OFFSET	1'	6'	2'	7'	3'	8'	4'	7'	2'	7'
THICKNESS	A: 5.0 C: 7.0	A: 5.0 C: 7.3	A: 5.5 C:	A: 5.8 C:	A: 5.8 C:	A: 5.8 C:	A: 6.5 C: 6.5	A: 6.6 C: 7.3	A: 6.0 C:	A: 5.0 C:
PAVEMENT CONDITION *										
CORE CONDITION	A: Poor 1pc C: Very Poor 5" rec	A: Fair 1pc C: Very Poor 5" rec	A: Fair 1pc C:	A: Poor 1pc C:	A: Poor 2pc C:	A: Poor 2pc C:	A: Poor 2pc C: Fair 1pc	A: Fair 1pc C: Fair 1pc	A: Poor 5" rec C:	A: Fair 1pc C:
RUTTING	1	2	0	1	0	0	0	0	0	0
SLOPE	0.5	1.4	0.8	1.8	0.2	1.4	0.2	1.3	1.7	2.6
BASE	Soil	Soil	Concrete	Concrete	Concrete	Concrete	Soil	Soil	Concrete	Concrete
DCP										

**PAV'T COND. A = Dendritic Craking; B = Transverse; C = Joint Deterioration; D = Centerline Deterioration; E = Longitudinal Cracking; F = Trellised; G = Faulting; I = Conchoidal; L = Alligator; J = Block Cracking; O = Joint Reflective Cracking; P = Overlayed Patch Reflective Cracking; Q = Meandering; R = Reflective Widening; S = Braided; T = Edge Cracking*

NUMBER CORE	11	12	13	14	15	16	17	18	19	20
STATION / LOCATION	1.25 mi from loc 1 SB		1.5 mi from loc 1 NB		1.75 mi from loc 1 SB		2.0 mi from loc NB		2.25 mi from loc 1 Sb	
OFFSET	3'	8'	4'	9'	1'	6'	2'	7'	3'	8'
THICKNESS	A: 10.0 C:	A: 10.0 C:	A: 22.5 C:	A: 20.0 C:	A: 17.5 C:	A: 16.5 C:	A: 7.5 C: 6.5	A: 7.0 C: 7.0	A: 7.8 C:	A: 8.5 C:
PAVEMENT CONDITION *										
CORE CONDITION	A: Fair 1pc C:	A: Fair 1pc C:	A: Poor 3pc C:	A: Fair 1pc C:	A: Very Poor 4pc C:	A: Very Poor 4pc C:	A: Fair 1pc C: Fair 1pc	A: Fair 1pc C: Fair 1pc	A: Fair 1pc C:	A: Poor 2pc C:
RUTTING	0	0	0	0	0	0	1	18	0	12
SLOPE	2.1	2.4	0.4	0.7	2.7	3.1	1	1.3	0.9	0.4
BASE	Concrete	Concrete	Concrete	Concrete	Concrete	Concrete	Soil	Soil	Concrete	Concrete
DCP										

**PAV'T COND. A = Dendritic Craking; B = Transverse; C = Joint Deterioration; D = Centerline Deterioration; E = Longitudinal Cracking; F = Trellised; G = Faulting; I = Conchoidal; L = Alligator; J = Block Cracking; O = Joint Reflective Cracking; P = Overlayed Patch Reflective Cracking; Q = Meandering; R = Reflective Widening; S = Braided; T = Edge Cracking*

OBSERVATIONS: _____

GENERAL PAVEMENT CONDITION: _____

BITUMINOUS CORE DATA

ROUTE: IL 84 SECTION: Mt.Carrol- Calhoun St to Palisades N DATE: 08/19/11
JOB NO.: COUNTY: Carroll INSPECTOR: W. Garza

NUMBER CORE	21	22	23	24	25	26	27	28	29	30
STATION / LOCATION	2.5 mi from loc 1 NB		2.75 mi from loc 1 Sb							
OFFSET	1'	6'	2'	7'						
THICKNESS	A: 10.0	A: 10.5	A: 9.5	A: 9.5	A:	A:	A:	A:	A:	A:
	C:	C:	C:	C:	C:	C:	C:	C:	C:	C:
PAVEMENT CONDITION *										
CORE CONDITION	A: Poor 2pc	A: Very Poor 8" rec	A: Poor 2pc	A: Fair 1pc	A:	A:	A:	A:	A:	A:
	C:	C:	C:	C:	C:	C:	C:	C:	C:	C:
RUTTING	2	3	0	6						
SLOPE	0.2	0.2	0.7	1.2						
BASE	Concrete	Concrete	Concrete	Concrete						
DCP										

**PAV'T COND. A = Dendritic Craking; B = Transverse; C = Joint Deterioration; D = Centerline Deterioration; E = Longitudinal Cracking; F = Trellised; G = Faulting; I = Conchoidal; L = Alligator; J = Block Cracking; O = Joint Reflective Cracking; P = Overlayed Patch Reflective Cracking; Q = Meandering; R = Reflective Widening; S = Braided; T = Edge Cracking*

NUMBER CORE	31	32	33	34	35	36	37	38	38	40
STATION / LOCATION										
OFFSET										
THICKNESS	A:	A:	A:	A:	A:	A:	A:	A:	A:	A:
	C:	C:	C:	C:	C:	C:	C:	C:	C:	C:
PAVEMENT CONDITION *										
CORE CONDITION	A:	A:	A:	A:	A:	A:	A:	A:	A:	A:
	C:	C:	C:	C:	C:	C:	C:	C:	C:	C:
RUTTING										
SLOPE										
BASE										
DCP										

**PAV'T COND. A = Dendritic Craking; B = Transverse; C = Joint Deterioration; D = Centerline Deterioration; E = Longitudinal Cracking; F = Trellised; G = Faulting; I = Conchoidal; L = Alligator; J = Block*

BITUMINOUS CORE DATA SUMMARY SHEET

COUNTY: Carroll
DATE: 08/19/11
JOB NO.:
INSPECTOR(S): W. Garza
ROUTE: IL 84
SECTION: Mt.Carrol- Calhoun St to Palisades N.

Asphalt:

Locations:	1-20	21-40	41-60	61-80	81-100		Totals:
Thick Min.	5.00	9.50				Min	5.00
Thick Max.	10.00	10.50				Max	10.50
Thick Avg.	6.74	9.88				Avg	7.37

Concrete:

Locations:	1-20	21-40	41-60	61-80	81-100		Totals:
Thick Min.	6.50					Min	6.50
Thick Max.	7.30					Max	7.30
Thick Avg.	6.93					Avg	6.93

Rutting:

Locations:	1-20	21-40	41-60	61-80	81-100		Totals:
Min.	0.05	0.10				Min	0.05
Max.	0.90	0.30				Max	0.90
Avg.	0.11	0.14				Avg	0.12

Observations:

Loc 1-20
Loc 21-40
Loc 41-60
Loc 61-80
Loc 81-100

General Pavemnet Conditions:

Loc 1-20
Loc 21-40
Loc 41-60
Loc 61-80
Loc 81-100