

Prepared for:

Illinois Department of
Transportation, District 2
819 Depot Avenue
Dixon, Illinois 61021

Structure Designer:

Hanson Professional Services Inc.
6775 Fincham Drive
Rockford, Illinois 61108
(815)-398-4600

Prepared By:

Hanson Professional Services Inc.
13801 Riverport Drive, Suite 300
Maryland Heights, MO 63043
(314) 770-0467

kchepkoit@hanson-inc.com



Abbreviated Structure Geotechnical Report

F.A.I. 39 (I-39)/F.A.P. 301 (US 20)

Section (201-3)K & (4-1, 5)R

Winnebago County

Job No. P-92-111-06

Contract No. 64C24

PTB No. 141-004

I-39/U.S. 20 over Harrison Avenue

Structure Nos. 101-0213 & 101-0214

Ex. Structure Nos. 101-0071 & 101-072

Submitted October 2016

Revised December 2016; March 2017

Original Report Date: <u>10/04/2016</u>	Proposed SN: <u>101-0213/14</u>	Route: <u>FAI 39 (I-39)/FAP 301 (US 20)</u>
Revised Date: <u>12/20/16; 03/16/17</u>	Existing SN: <u>101-0071/72</u>	Section: <u>(201-3)K & (4-1, 5)R</u>
Geotechnical Engineer: <u>Kipkoech Chepkoi</u>	County: <u>Winnebago</u>	
Structural Engineer: <u>Hanson Professional Services Inc.</u>	Contract: <u>64C24</u>	

Indicate the proposed structure type, substructure types, and foundation locations (attach plan and elevation drawing):

The new structures will be four-span steel girder bridges. The substructures will consist of integral abutments and multiple column piers with crash walls and pile-supported footings. S.N. 101-0213 will replace existing S.N. 101-0071, which is the bridge carrying the northbound traffic, and S.N. 101-0214 will replace existing S.N. 101-0072, which is the bridge carrying the southbound traffic. According to information provided by the structural designer, the estimated vertical factored substructure loads are 1,100 kips at the abutments and 2,200 to 2,400 kips at the piers of the northbound structure and 1,350 kips at the abutments and 2,750 to 2,950 kips at the piers of the southbound structure. The general plan and elevation drawing for the new structures is attached.

Discuss the existing boring data, existing plans foundation information, new subsurface exploration and need for any additional exploration to be provided with SGR Technical Memo (attach all data and subsurface profile plot):

The existing bridge plans contained logs from five borings terminated in glacial deposits at a maximum depth of 21 feet. These borings are not deep enough to design the metal shell piles now used by IDOT, so new borings were drilled at all substructure units.

The existing bridge was constructed in 1963 and widened in 1990. Abutments are supported on 30 ton (allowable) precast piles and 20 ton timber piles. Both types of piles had an estimated length of 20 feet. The three piers are supported on spread footings bearing on glacial soils at Elev. 773.0, 773.0, and 770.0 from south to north. Plans from the 1990 widening indicate that the maximum allowable footing pressure was 3.5 tsf at Piers 1 and 2 and 3.0 tsf at Pier 3.

Five boring logs were provided to Hanson Professional Services Inc. (Hanson) by IDOT District 2. Borings B-1 through B-4 were drilled in January 2012 and Boring B-5J was drilled in August 2016. Locations of the borings are as shown on the attached Boring Location Plan. The stations and offsets shown on the boring logs are relative to the Harrison Avenue and existing US 20 alignments. Boring locations along the current I-39 alignment are shown on the attached Subsurface Data Profile. These borings are sufficient to design the proposed structure.

Two of the borings were drilled through the existing approach embankments, which are composed of medium stiff to very stiff sandy loam, loam, and silty clay loam. The other borings encountered glacial deposits within seven feet of the ground surface. The glacial deposits consisted of layers of very stiff to hard sandy loam till and dense to very dense sand gravel. The deepest boring was terminated at Elev. 717 without encountering bedrock.

Underground coal mine information available from ISGS indicates that the project area has not been undermined.

Provide the location and maximum height of any new soil fill or magnitude of footing bearing pressure. Estimate the amount and time of the expected settlement. Indicate if further testing, analysis, and/or ground improvement/treatment is necessary:

A small amount of fill will be required, because the new profile grade is slightly higher than the existing condition. Up to 2 feet of fill will be placed behind the existing abutments. The area in the median between existing bridges will require up to 4 feet of fill. Anticipated settlement due to the new fill is expected to be less than 0.4 inches.

No treatment or settlement waiting period is necessary.

Identify any new cuts or fill slope angles and heights. Estimate the factor of safety against slope failure. Indicate if further testing, analysis or ground improvement/treatment is necessary:

The proposed end slopes will be constructed to the same 1:2 inclination as the existing end slopes, which show no signs of instability. The existing side slopes will not be affected by the proposed construction. Therefore, global stability analyses are not needed, and the proposed slopes may be assumed to meet IDOT and AASHTO requirements.

Indicate at each substructure, the 100-year and 200-year total scour depths in the Hydraulics report, the non-granular scour depth reduction, the proposed ground surface, and the recommended foundation design scour elevations:

N/A

Determining the seismic soil site class, the seismic performance zone, the 0.2 and 1.0 second design spectral accelerations and indicate if that the soils are liquefiable:

The seismic Site Class is C, the SPZ is 1, $S_{DS} = 0.101g$, and $S_{D1} = 0.056g$. The soils are not considered to be liquefiable for the design earthquake.

Confirm feasibility of the proposed foundation or wall type and provide design parameters. Attach a pile design table indicating feasible pile types, various nominal required bearings, factored resistances available and corresponding estimated lengths at locations where piles will be used. Provide factored bearing resistance and unit sliding resistance at various elevations and confirm no ground improvement/treatment is necessary where spread footings are proposed. Estimated top of rock elevations as well as preliminary factored unit side and tip resistance values shall be indicated when drilled shafts are proposed:

Shallow spread footing foundations bearing on the soils at the piers are not feasible because of unfavourable subsurface conditions. Medium stiff to stiff sandy clay and sandy loam was encountered at soil boring B-5j from El. 775 to El. 764. In addition, possibility of varying subsurface conditions between the piers coupled with high bridge loads could result in excessive differential settlement.

A Pile Design Table including data for several pile types at each substructure is attached.

Metal shell piles that extend to hard till or very dense sand are preferred for the subsurface conditions encountered at the substructure locations. Steel H-piles are feasible, but would be significantly longer than similar capacity metal shell piles. H-piles driven to maximum nominal required bearing (MNRB) would be beyond the depth of the borings with exception of B-2. Therefore, only the nominal required bearing within the limits of the borings are provided in the Pile Design Table for north abutment and pier.

Shoes are not required for H-piles, but are recommended for metal shell piles to protect against damage during driving.

Due to variable subsurface conditions and drilled soil borings located in a significant distance from the bents, four test piles should be specified to determine the pile lengths for production piles. Test piles are recommended at south and north abutments for structure SN 101-0214 (south bound), and between structures at piers 1 and 3. Test piles should be driven at locations to be constructed under the first stage.

If the lateral loads on the piles supporting the piers are larger than can be resisted with battered piles, the structure designer should evaluate lateral resistance considering both soil and structure properties. Soil parameters for generating P-y curves with the LPILE computer program are provided in the attached table.

Calculate the estimated water surface elevation and determine the need for cofferdams (type 1 or 2), and seal coat:

N/A

Assess the need for sheeting or soil retention or temporary construction slope and provide recommendation for other construction concerns:

The proposed structures will be staged to maintain traffic on I-39/US 20 during construction. There is enough space for the sides of the pier footing excavations to be sloped back or benched according to OSHA regulations as the construction is staged. If the project staging changes, then Temporary Sheet Piling, designed in accordance with IDOT Design Guide 3.13.1 – Temporary Sheet Piling Design, may be used for the pier excavation.

A near-vertical cut with approximately 8 ft retained height will be required to construct the abutments near active traffic lanes. Temporary sheet piling, designed in accordance with IDOT Design Guide 3.13.1 – Temporary Sheet Piling Design, is feasible within the existing embankment fill.

Structure No. 101-0213 NB
Pile Design Table

Location	Cutoff Elevation (ft)	Pile Type	Factored Resistance Available, R _F (kips)	Geotechnical Losses, R _{Sdd} (kips)	Nominal Required Bearing, R _N (kips)	Estimated Pile Length (ft)
South Abutment B-2	794.3	MS 12"Φ w/.25" walls	141	0	256	16
			166	0	301	19
			194	0	353	20
		MS 14"Φ w/.25" walls	186	0	338	16
			227	0	413	19
		MS 14"Φ w/.312" walls	186	0	338	16
			215	0	391	19
			282	0	513	21
		HP 10x42	74	0	134	24
			184	0	335	29
		HP 12x53	89	0	161	24
			230	0	418	30
		HP 12x63	94	0	171	24
			273	0	497	31
		HP 14x73	111	0	201	24
			318	0	578	31
		HP 14x89	118	0	215	24
			388	0	705	33
Pier 1 B-1	777.8	MS 12"Φ w/.25" walls	194	0	353	20
		MS 14"Φ w/.25" walls	227	0	413	19
		MS 14"Φ w/.312" walls	282	0	513	22
		HP 10x42	65	0	118	29
			107	0	195	36
			151	0	275	43
		HP 12x53	80	0	146	29
			135	0	246	36
			192	0	348	43
		HP 12x63	81	0	147	29
			137	0	249	36
			196	0	356	43
		HP 14x73	98	0	178	29
			168	0	306	36
			232	0	421	43
		HP 14x89	99	0	180	29
			171	0	310	36
			236	0	429	43
		HP 14x102	100	0	183	29
			173	0	314	36
			238	0	434	43

Structure No. 101-0213 NB
Pile Design Table

Location	Cutoff Elevation (ft)	Pile Type	Factored Resistance Available, R _F (kips)	Geotechnical Losses, R _{Sdd} (kips)	Nominal Required Bearing, R _N (kips)	Estimated Pile Length (ft)
Pier 2 B-5j	777.8	MS 12"Φ w/.25" walls	194	0	353	14
		MS 14"Φ w/.25" walls	227	0	413	13
		MS 14"Φ w/.312" walls	282	0	513	14
		HP 10x42	59	0	107	18
			81	0	147	26
			89	0	162	36
			135	0	245	61
		HP 12x53	71	0	129	18
			99	0	179	26
			111	0	202	36
			168	0	306	61
		HP 12x63	73	0	133	18
			101	0	183	26
			112	0	204	36
			170	0	309	61
		HP 14x73	86	0	157	18
			119	0	217	26
			138	0	250	36
			207	0	377	61
		HP 14x89	89	0	162	18
			122	0	221	26
			139	0	254	36
			210	0	382	61
		HP 14x102	91	0	166	18
			123	0	224	26
			141	0	257	36
			213	0	387	61

Structure No. 101-0213 NB
Pile Design Table

Location	Cutoff Elevation (ft)	Pile Type	Factored Resistance Available, R _F (kips)	Geotechnical Losses, R _{Sdd} (kips)	Nominal Required Bearing, R _N (kips)	Estimated Pile Length (ft)
Pier 3 B-3	778.6	MS 12"Φ w/.25" walls	194	0	353	43
		MS 14"Φ w/.25" walls	227	0	413	43
		MS 14"Φ w/.312" walls	282	0	513	44
		HP 10x42	63	0	115	35
			78	0	141	43
			176	0	319	50
		HP 12x53	76	0	138	35
			97	0	177	43
			210	0	382	50
		HP 12x63	77	0	141	35
			98	0	179	43
		HP 14x73	215	0	391	50
			92	0	167	35
			121	0	220	43
		HP 14x89	255	0	463	50
			94	0	170	35
			123	0	223	43
		HP 14x102	260	0	473	50
			95	0	173	35
			124	0	226	43
			264	0	480	50
North Abutment B-4	796.1	MS 12"Φ w/.25" walls	194	0	353	28
		MS 14"Φ w/.25" walls	227	0	413	27
		MS 14"Φ w/.312" walls	282	0	513	28
		HP 10x42	71	0	129	28
			113	0	205	38
			119	0	216	56
		HP 12x53	85	0	155	28
			135	0	245	38
			148	0	270	56
		HP 12x63	88	0	160	28
			139	0	252	38
			150	0	272	56
		HP 14x73	104	0	189	28
			164	0	298	38
			183	0	333	56
		HP 14x89	108	0	195	28
			168	0	306	38
			185	0	337	56

Note: Where a range of values is shown, pile lengths and capacities may be interpolated between the values given.

Structure No. 101-0214 SB
Pile Design Table

Location	Cutoff Elevation (ft)	Pile Type	Factored Resistance Available, R _F (kips)	Geotechnical Losses, R _{Sdd} (kips)	Nominal Required Bearing, R _N (kips)	Estimated Pile Length (ft)
South Abutment B-2	792.9	MS 12"Φ w/.25" walls	137	0	249	15
			194	0	353	19
		MS 14"Φ w/.25" walls	181	0	330	15
			227	0	413	18
		MS 14"Φ w/.312" walls	181	0	330	15
			282	0	513	20
		HP 10x42	70	0	127	22
			184	0	335	28
		HP 12x53	85	0	154	22
			230	0	418	28
		HP 12x63	90	0	163	22
			273	0	497	30
		HP 14x73	106	0	192	22
			318	0	578	30
		HP 14x89	113	0	205	22
			388	0	705	31
Pier 1 & Pier 2 B-5j	777.4	MS 12"Φ w/.25" walls	194	0	353	13
		MS 14"Φ w/.25" walls	227	0	413	12
		MS 14"Φ w/.312" walls	282	0	513	13
		HP 10x42	59	0	107	18
			81	0	147	25
			89	0	161	35
			135	0	245	60
		HP 12x53	70	0	128	18
			98	0	178	25
			111	0	202	35
			168	0	306	60
		HP 12x63	72	0	132	18
			100	0	182	25
			112	0	204	35
			170	0	309	60
		HP 14x73	86	0	156	18
			119	0	216	25
			137	0	249	35
			207	0	376	60
		HP 14x89	88	0	161	18
			121	0	220	25
			139	0	253	35
			210	0	382	60
		HP 14x102	90	0	164	18
			122	0	223	25
			141	0	256	35
			213	0	387	60

Structure No. 101-0214 SB
Pile Design Table

Location	Cutoff Elevation (ft)	Pile Type	Factored Resistance Available, R _F (kips)	Geotechnical Losses, R _{Sdd} (kips)	Nominal Required Bearing, R _N (kips)	Estimated Pile Length (ft)
Pier 3 B-3	778.2	MS 12"Φ w/.25" walls	110	0	200	19
			125	0	228	32
			159	0	289	40
			194	0	353	42
		MS 14"Φ w/.25" walls	146	0	265	19
			150	0	273	32
			188	0	343	40
			227	0	413	42
		MS 14"Φ w/.312" walls	146	0	265	19
			150	0	273	32
			201	0	365	42
			282	0	513	43
		HP 10x42	49	0	89	32
			77	0	140	42
			175	0	318	50
		HP 12x53	58	0	106	32
			97	0	176	42
			210	0	381	50
		HP 12x63	60	0	109	32
			98	0	178	42
			215	0	390	50
		HP 14x73	71	0	129	32
			120	0	219	42
			254	0	462	50
		HP 14x89	73	0	132	32
			122	0	222	42
			259	0	472	50
		HP 14x102	74	0	135	32
			124	0	225	42
			263	0	478	50

Structure No. 101-0214 SB
Pile Design Table

Location	Cutoff Elevation (ft)	Pile Type	Factored Resistance Available, R_F (kips)	Geotechnical Losses, R_{Sdd} (kips)	Nominal Required Bearing, R_N (kips)	Estimated Pile Length (ft)
North Abutment B-4	794.9	MS 12"Φ w/.25" walls	194	0	353	26
		MS 14"Φ w/.25" walls	227	0	413	26
		MS 14"Φ w/.312" walls	282	0	513	27
		HP 10x42	84	0	153	29
			111	0	202	37
			118	0	214	54
		HP 12x53	101	0	184	29
			133	0	242	37
			147	0	268	54
		HP 12x63	104	0	189	29
			137	0	249	37
			149	0	270	54
		HP 14x73	123	0	224	29
			162	0	295	37
			182	0	330	54
		HP 14x89	126	0	230	29
			166	0	302	37
			184	0	335	54

Note: Where a range of values is shown, pile lengths and capacities may be interpolated between the values given.

Structure No. 101-0213 / 101-0214**Pile Design Parameters****Piers (Boring B-5j)**

Elevations	LPILE Soil Type	γ' (pcf)	c (psf)	Φ	k (pci)	ϵ
*** - 764.0	Stiff Clay w/o Free Water	122	950	N/A	100	0.01
764.0 - 756.5	Sand (Reese)	130	N/A	36	225	0
756.5 - 754.0	Stiff Clay w/o Free Water	125	2,100	N/A	1,000	0.005
754.0 - 746.5	Sand (Reese)	128	N/A	34	175	0
746.5 - 726.5	Stiff Clay w/o Free Water	63	3,000	N/A	1,000	0.005
726.5 - 724.0	Sand (Reese)	63	N/A	33	90	0
724.0 - 721.5	Stiff Clay w/o Free Water	58	1,200	N/A	500	0.007
721.5 - 717.0	Sand (Reese)	66	N/A	35	125	0

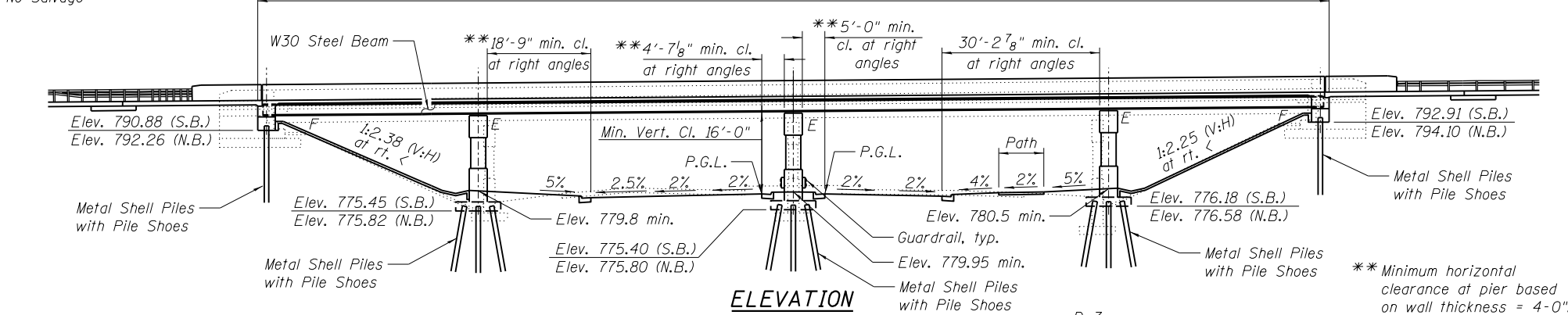
*** - Bottom of footing

Bench Mark: B.M. 405 - N-2030863.68, E-2621037.13 - Elev. 770.67 - N.W. bolt on northerly overhead sign post of "Belvidere Exit 122A" sign.
Approx. 400' into ramp. (East side of Ramp).

Existing SN 101-0071 & SN 101-0072 built as Section 5-HB in 1963. In 1990 the dual structures were widened and rehabilitated. Both structures consist of four span concrete deck on continuous steel wide flange superstructures supported by concrete piers and spill through abutments. Both structures are 228'-1" back to back abutments. SN 101-0071 width varies from 52'-8" to 56'-7". SN 101-0072 width varies from 52'-10" to 56'-4 3/4". Traffic to be maintained utilizing staged construction.

No Salvage

Bridge Omission Sta. 2723+28.51 to Sta. 2725+66.07



HIGHWAY CLASSIFICATION

F.A.P. Rte. 0525 - Harrison
Functional Class: Other Principal Arterial
ADT: 29,000 (2015); 41,250 (2035)
ADTT: 2,610 (2015); 3,713 (2035)
DHW: 4,125 (2035)
Design Speed: 35 m.p.h.
Posted Speed: 35 m.p.h.
2 -Way Traffic
Directional Distribution: 50:50

HIGHWAY CLASSIFICATION

F.A.I. Rte. 39 - I-39/U.S. 20
Functional Class: Interstate
ADT: 63,800 (2015); 104,800 (2035)
ADTT: 18,502 (2015); 30,392 (2035)
DHW: 10,480 (2035)
Design Speed: 70 m.p.h.
Posted Speed: 65 m.p.h.
2 -Way Traffic
Directional Distribution: 50:50

DESIGN STRESSES

FIELD UNITS

f'c = 3,500 psi (Substructure Concrete)
f'c = 4,000 psi (Superstructure Concrete)
fy = 60,000 psi (Reinforcement)
fy = 50,000 psi (Structural Steel) ***
(M270 Grade 50)

*** All structural steel shall be metalized.

LOADING HL-93

Allow 50# / sq. ft. for future wearing surface.

DESIGN SPECIFICATIONS

2014 AASHTO LRFD Bridge
Design Specifications, 7th Edition
with 2015 and 2016 Interims

SEISMIC DATA

Seismic Performance Zone (SPZ) = 1
Design Spectral Acceleration at 1.0 sec. (SD1) = 0.056g
Design Spectral Acceleration at 0.2 sec. (SDS) = 0.10g
Soil Site Class = C

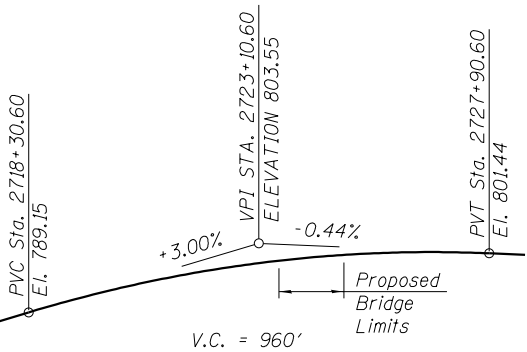
CURVE DATA HARRISON AVE.

PI STA. = 149+02.51 Δ = 8° 20' 45" (LT) D = 1° 00' 00" R = 5,729.71' T = 418.03' L = 834.59' E = 15.23' P.C. STA. = 144+84.47 P.T. STA. = 153+19.06	PI STA. = 1316+03.34 Δ = 9° 34' 19" (LT) D = 1° 00' 00" R = 5,729.71' T = 479.72' L = 957.22' E = 20.05' P.C. STA. = 1311+23.61 P.T. STA. = 1320+80.83
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CURVE DATA

F.A.I. I-39

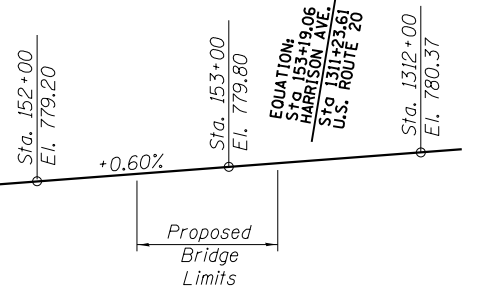
PI STA. = 2724+10.28
Δ = 17° 40' 00" (LT)
D = 0° 50' 00"
R = 6,875.65'
T = 1,068.50'
L = 2,120.05'
E = 82.53'
S.E. = 3.0%
P.C. STA. = 2713+41.77
P.T. STA. = 2734+61.82



PROPOSED PROFILE

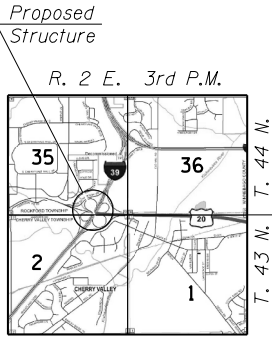
Along I-39/U.S. 20

Note: The profile grade shows the final elevations after grinding. Up to 1/4 inch may be ground off the bridge deck and the bridge approach slabs.



PROPOSED PROFILE

Along Harrison Ave.



LOCATION SKETCH

GENERAL PLAN

I-39/U.S. 20 over HARRISON AVE.

F.A.I. RTE. 39

SECTION (201-3)K & (4-1, 5)R

WINNEBAGO COUNTY

STATION 2724+47.66

STRUCTURE NUMBER 101-0213 (N.B.)

STRUCTURE NUMBER 101-0214 (S.B.)

I:\06\jobs\0652055\CADD\Struct\Sheet\1010213 & 1010214-XXXX-TSL-Harrison-Stl Beam.dgn

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USER NAME = hussu00411

DESIGNED - JKL

CHECKED - FLN

PLOT SCALE = 0.1667' / in.

DRAWN - MGM / MWH

REVIEWED - JKL

PLOT DATE = 3/16/2017

DESIGNED - JKL

CHECKED - FLN

DRAWN - MGM / MWH

REVIEWED - JKL

PLOT DATE = 3/16/2017

DESIGNED - JKL

CHECKED - FLN

DRAWN - MGM / MWH

REVIEWED - JKL

PLOT DATE = 3/16/2017

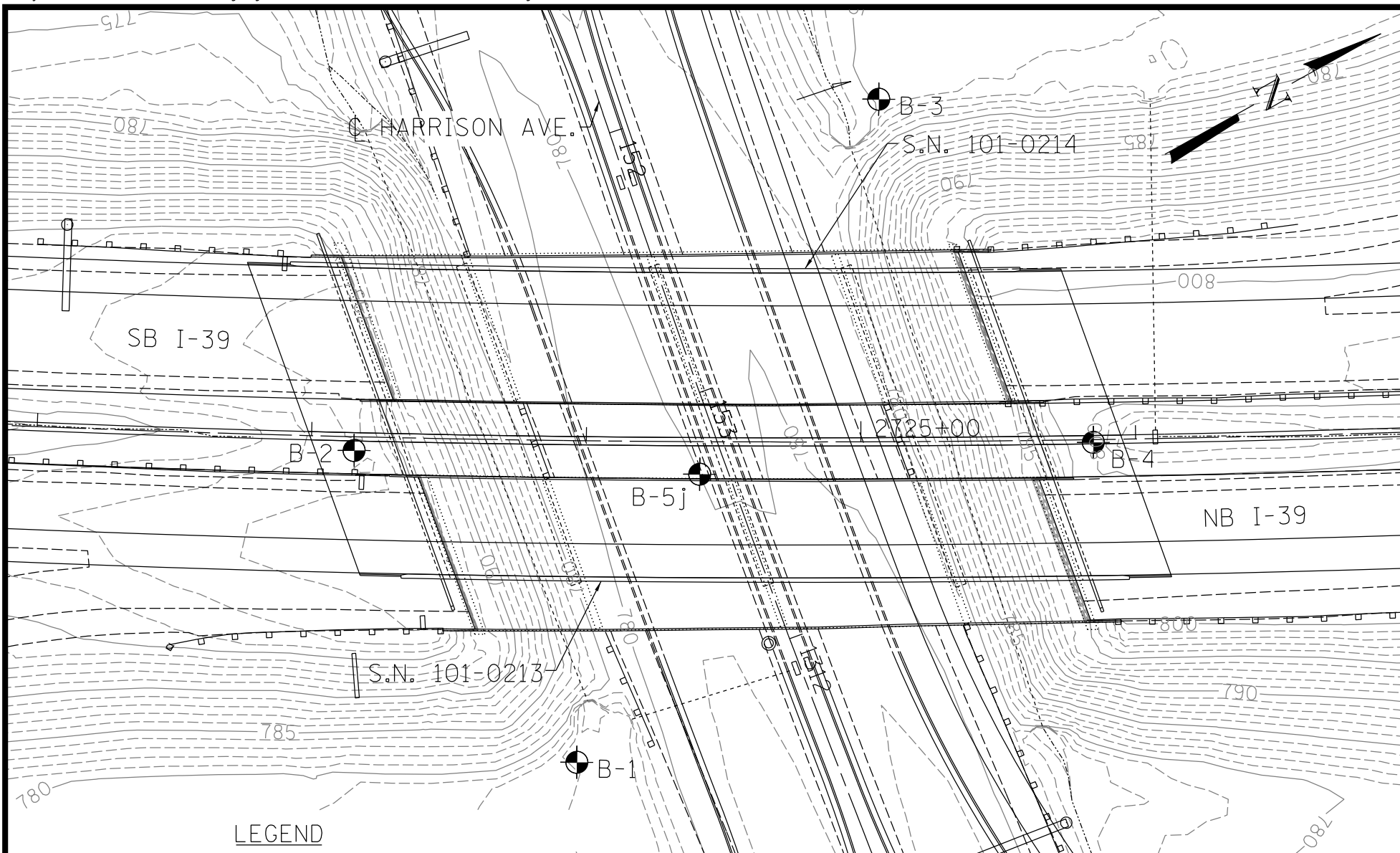
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN & ELEVATION
STRUCTURE NO. 101-0213 & STRUCTURE NO. 101-0214

SHEET NO. 1 OF 3 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
39	(201-3)K & (4-1, 5)R	WINNEBAGO	3	1
CONTRACT NO. 64C24				

ILLINOIS FED. AID PROJECT

**LEGEND**

B-1 BORING LOCATION



SCALE IN FEET



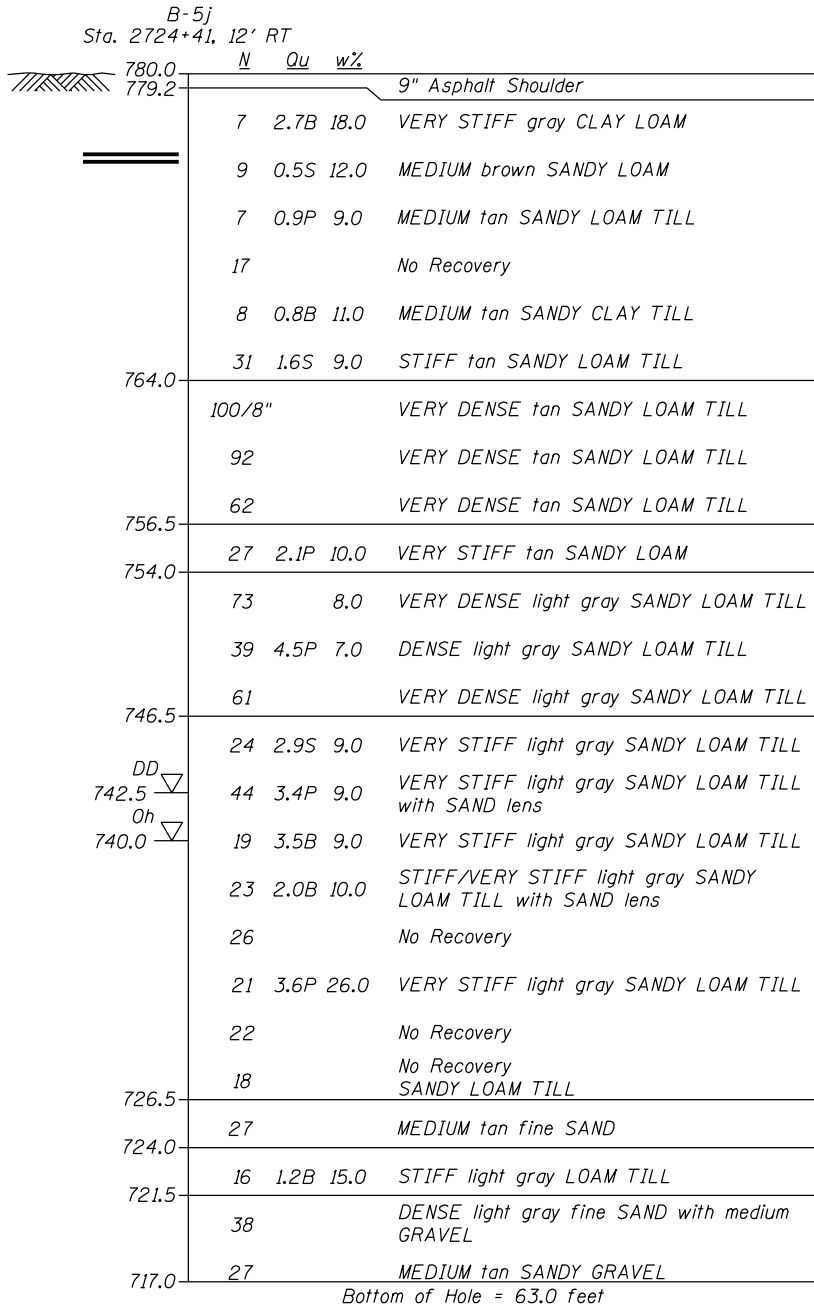
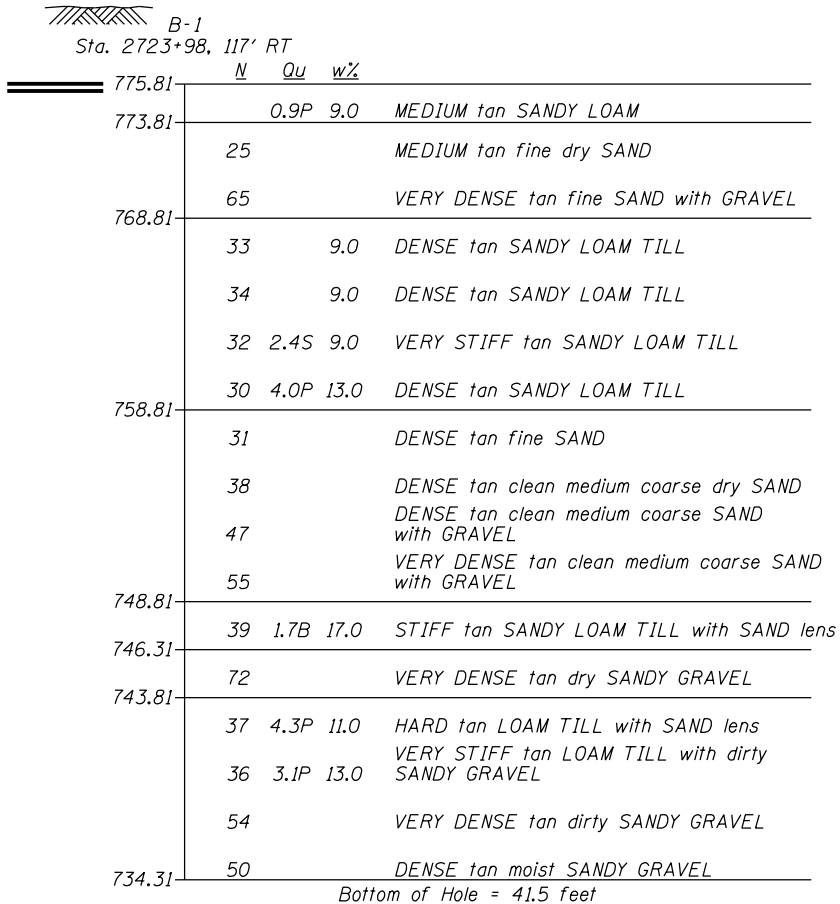
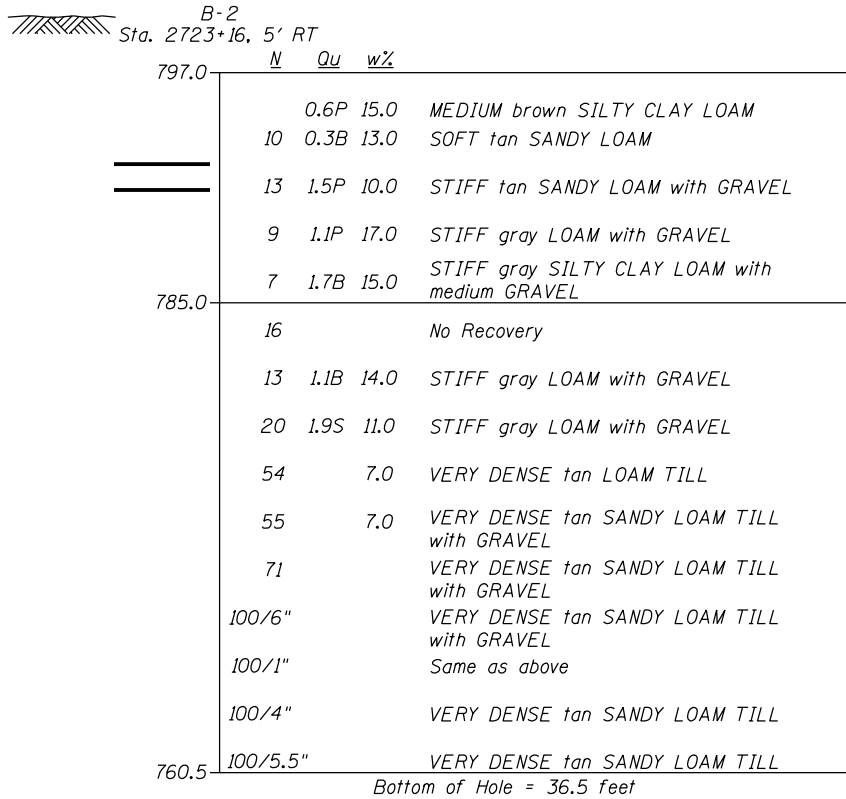
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BORING LOCATION PLAN

I-39 OVER HARRISON AVE.
S.N. 101-0213 & 101-0214
WINNEBAGO COUNTY, ILLINOIS

06S2055

12/07/16

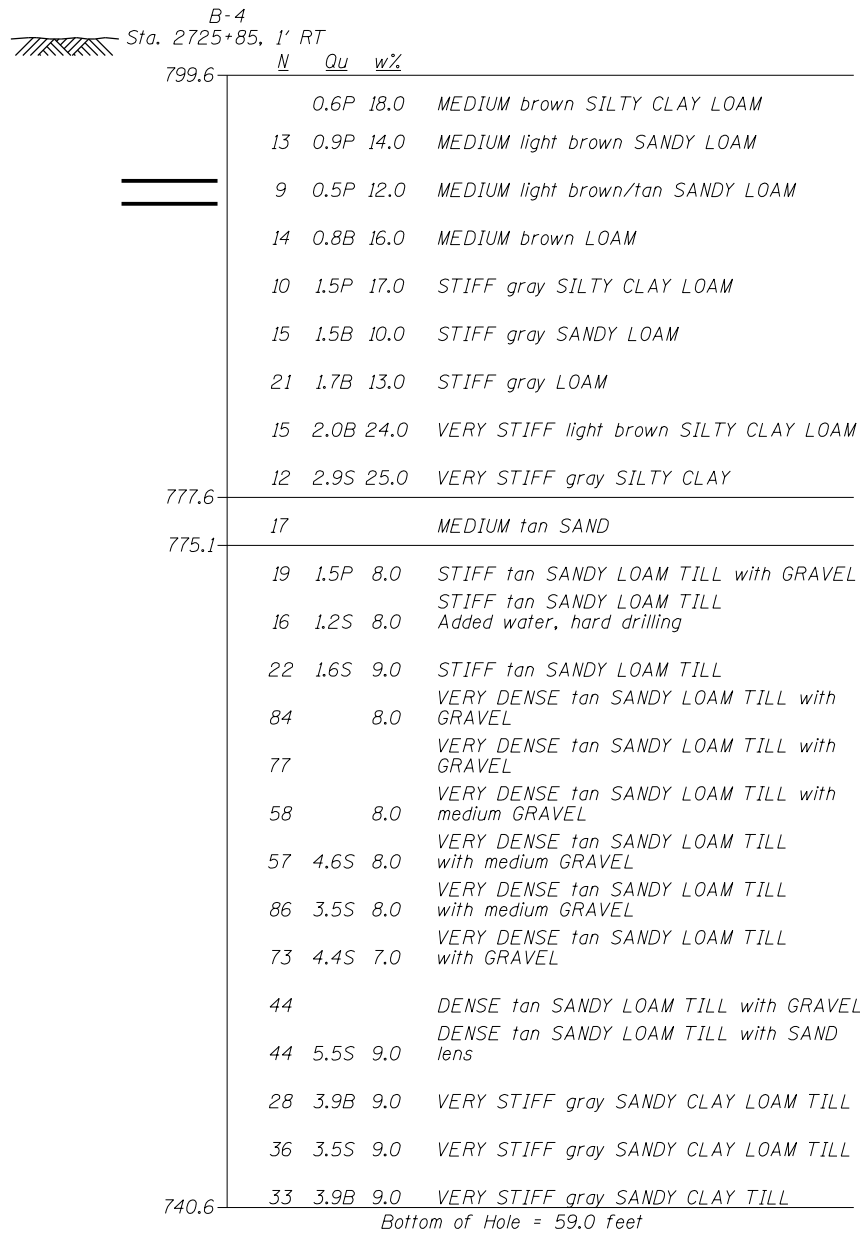
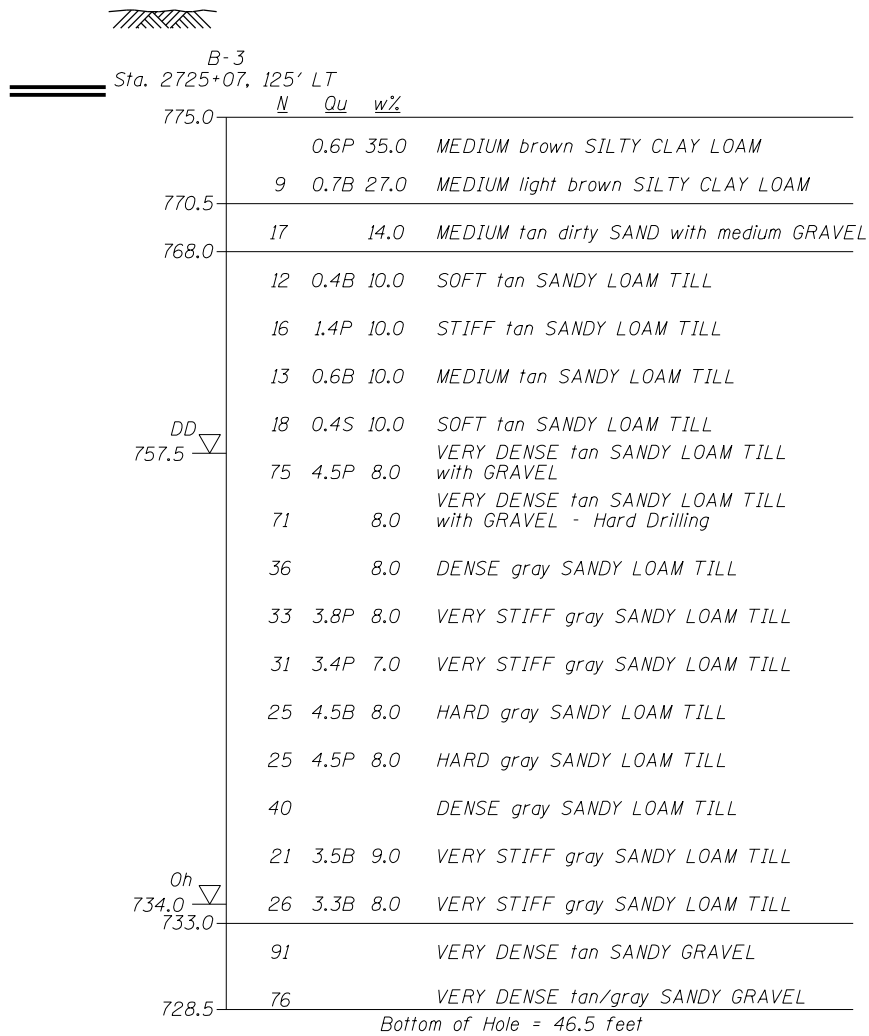


LEGEND

N Standard Penetration Test N (blows/ft)
 Qu Unconfined Strength (tsf)
 w% Natural Moisture Content (%)

DD Water Surface Elevation Encountered in Boring
 507.20 DD = during drilling
 Oh = at completion
 24h = 24 hours after completion

Approximate Finish Grade
 Bottom of Footing



LEGEND

- N Standard Penetration Test N (blows/ft)
Qu Unconfined Strength (tsf)
w% Natural Moisture Content (%)

DD 507.20 Water Surface Elevation Encountered in Boring
DD = during drilling
Oh = at completion
24h = 24 hours after completion

- Approximate Finish Grade
Bottom of Footing



Illinois Department of Transportation

Division of Highways
Illinois Department of Transportation/D-2

SOIL BORING LOG

Page 1 of 2

Date 1/24/12

ROUTE FAP 301 DESCRIPTION 101-0071 0072 I-39 Bridge over Harrison Road, 6 miles west of Mill Road LOGGED BY W. Garza

SECTION (201-3) K (4-1, 5) K LOCATION Rockford Twp. - 35SE, SEC. , TWP. 44N, RNG. 2E

COUNTY Winnebago DRILLING METHOD Hollow Stem Auger HAMMER TYPE B-53 Diedrich Automatic

STRUCT. NO. 101-0071/0072
Station

BORING NO. B-1
Station 50+92 - Harrison Avenue
Offset 88.00ft Rt CL
Ground Surface Elev. 775.81 ft

DEPT H	BLOW S	UCS Qu	MOIST T	Surface Water Elev. ft	Stream Bed Elev. ft	DEPT H	BLOW S	UCS Qu	MOIST T
(ft)	(/6")	(tsf)	(%)			(ft)	(/6")	(tsf)	(%)
MEDIUM tan SANDY LOAM		0.9 P	9.0			DENSE tan clean medium coarse dry SAND	10		
773.81				754.31			16		
							22		
MEDIUM tan fine dry SAND	8					DENSE tan clean medium coarse SAND with GRAVEL	15		
771.81	11			751.81			21		
	14						26		
VERY DENSE tan fine SAND with GRAVEL	9					VERY DENSE tan clean medium coarse SAND with GRAVEL	26		
-5	30			-25			23		
	35						32		
768.81				748.81					
DENSE tan SANDY LOAM TILL	17					STIFF tan SANDY LOAM TILL with SAND lens	10		
766.81	14		9.0				8	1.7 B	17.0
	19			746.31			31		
DENSE tan SANDY LOAM TILL	13					VERY DENSE tan dry SANDY GRAVEL	33		
-10	14		9.0	-30			34		
764.31	20						38		
VERY STIFF tan SANDY LOAM TILL	10			743.81		HARD tan LOAM TILL with SAND lens	13		
761.81	14	2.4 S	9.0				17	4.3 P	11.0
	18			741.81			20		
DENSE tan SANDY LOAM TILL	13					VERY STIFF tan LOAM TILL with dirty SANDY GRAVEL	19		
-15	13	4.0 P	13.0	-35			19	3.1 P	13.0
	17						17		
758.81				739.31		VERY DENSE tan dirty SANDY GRAVEL	24		
DENSE tan fine SAND	12						24		
756.81	13			736.81			30		
	18								
-20				-40					

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)

ROUTE FAP 301 DESCRIPTION 101-0071 0072 1-39 Bridge over Harrison Road,
6 miles west of Mill Road LOGGED BY W. Garza
SECTION (201-3) K (4-1, 5) K LOCATION Rockford Twp. - 35SE, SEC. , TWP. 44N, RNG. 2E
COUNTY Winnebago DRILLING METHOD Hollow Stem Auger HAMMER TYPE B-53 Diedrich Automatic

STRUCT. NO. 101-0071/0072
Station

BORING NO. B-1
Station 50+92 - Harrison Avenue
Offset 88.00ft Rt CL
Ground Surface Elev. 775.81

D E P T H	B L O W S	U C S Qu	M O I S T
(ft)	(/6")	(tsf)	(%)

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft
Groundwater Elev.:
First Encounter _____ ft
Upon Completion _____ ft
After _____ Hrs. _____ ft

DENSE tan moist SANDY GRAVEL

734.31

End of Boring

-45

-50

-55

-60

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
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BBS, from 137 (Rev. 8-99)

Page 1 of 1

Date 1/26/12

VERY DENSE tan LOAM TILL	27		
	22		7.0
775.50	32		
VERY DENSE tan SANDY LOAM TILL with GRAVEL	22		
	25		7.0
773.00	30		
VERY DENSE tan SANDY LOAM TILL with GRAVEL	19		
	28		
770.50	43		
VERY DENSE tan SANDY LOAM TILL with big GRAVEL	100/6"		
768.00			
Same as above	100/1"		
765.50			
VERY DENSE tan SANDY LOAM TILL	100/4"		
763.00			
VERY DENSE tan SANDY LOAM TILL	100/5.5"		
760.50			
End of Boring			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)



Illinois Department of Transportation

Division of Highways
Illinois Department of Transportation/D-2

SOIL BORING LOG

Page 1 of 2

Date 1/27/12

ROUTE FAP 301 DESCRIPTION 101-0071 0072 I-39 Bridge over Harrison Road, 6 miles west of Mill Road LOGGED BY W. Garza

SECTION (201-3) K (4-1, 5) K LOCATION Rockford Twp. - 35SE, SEC. , TWP. 44N, RNG. 2E

COUNTY Winnebago DRILLING METHOD Hollow Stem Auger HAMMER TYPE B-53 Diedrich Automatic

STRUCT. NO. 101-0071/0072
Station

BORING NO. B-3
Station 49+03 - Harrison Avenue
Offset 98.00ft Lt CL
Ground Surface Elev. 775.00 ft

	D E P T H (ft)	B L O W S (/6")	U C S Qu (tsf)	M O I S T (%)	Surface Water Elev. _____ ft Stream Bed Elev. _____ ft Groundwater Elev.: First Encounter 757.5 ft ▼ Upon Completion 734.0 ft ▼ After _____ Hrs. _____ ft	D E P T H (ft)	B L O W S (/6")	U C S Qu (tsf)	M O I S T (%)
MEDIUM brown SILTY CLAY LOAM			0.6 P	35.0	VERY DENSE tan SANDY LOAM TILL with GRAVEL Hard Drilling	33			
						32			8.0
					753.50	39			
MEDIUM light brown SILTY CLAY LOAM	772.50	3			DENSE gray SANDY LOAM TILL		17		
		4	0.7	27.0		19			8.0
		5	B		751.00	17			
	770.50								
MEDIUM tan dirty SAND with medium GRAVEL	-5	6			VERY STIFF gray SANDY LOAM TILL	-25	14		
		7				16	3.8	8.0	
		10		14.0	748.50	17	P		
	768.00								
SOFT tan SANDY LOAM TILL		4			VERY STIFF gray SANDY LOAM TILL		11		
		5	0.4	10.0		12	3.4	7.0	
	766.00	7	B		746.00	19	P		
STIFF tan SANDY LOAM TILL	-10	5			HARD gray SANDY LOAM TILL	-30	5		
		8	1.4	10.0		10	4.5	8.0	
	763.50	8	P		743.50	15	B		
MEDIUM tan SANDY LOAM TILL		3			HARD gray SANDY LOAM TILL		6		
		5	0.6	10.0		12	4.5	8.0	
	761.00	8	B		741.00	13	P		
SOFT tan SANDY LOAM TILL	-15	3			DENSE gray SANDY LOAM TILL	-35	13		
		7	0.4	10.0		18			
	758.50	11	S		738.50	22			
VERY DENSE tan SANDY LOAM TILL with GRAVEL	▼	38			VERY STIFF gray SANDY LOAM TILL		2		
		40	4.5	8.0		7	3.5	9.0	
	756.00	35	P		736.00	14	B		
	-20					-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)



Illinois Department of Transportation

Division of Highways
Illinois Department of Transportation/D-2

SOIL BORING LOG

Page 2 of 2

Date 1/27/12

ROUTE FAP 301 DESCRIPTION 101-0071 0072 I-39 Bridge over Harrison Road, 6 miles west of Mill Road LOGGED BY W. Garza

SECTION (201-3) K (4-1, 5) K LOCATION Rockford Twp. - 35SE, SEC. , TWP. 44N, RNG. 2E

COUNTY Winnebago DRILLING METHOD Hollow Stem Auger HAMMER TYPE B-53 Diedrich Automatic

STRUCT. NO. 101-0071/0072
Station _____

BORING NO. B-3
Station 49+03 - Harrison Avenue
Offset 98.00ft Lt CL
Ground Surface Elev. 775.00 ft

D E P T H	B L O W S	U C S Qu	M O I S T
(ft)	(/6")	(tsf)	(%)

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft
Groundwater Elev.:
First Encounter 757.5 ft ▼
Upon Completion 734.0 ft ▼
After _____ Hrs. _____ ft

VERY STIFF gray SANDY LOAM TILL

▽

733.00

VERY DENSE tan SANDY GRAVEL

731.00

VERY DENSE tan/gray SANDY GRAVEL

728.50

End of Boring

-50

-55

-60

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)



Illinois Department of Transportation

Division of Highways
Illinois Department of Transportation/D-2

SOIL BORING LOG

Page 2 of 2

Date 1/30/12

ROUTE FAP 301 DESCRIPTION 101-0071 0072 I-39 Bridge over Harrison Road, 6 miles west of Mill Road LOGGED BY W. Garza

SECTION (201-3) K (4-1, 5) K LOCATION Rockford Twp. - 35SE, SEC. , TWP. 44N, RNG. 2E

COUNTY Winnebago DRILLING METHOD Hollow Stem Auger HAMMER TYPE B-53 Diedrich Automatic

STRUCT. NO. 101-0071/0072
Station _____

BORING NO. B-4
Station 873+74 - I-39
Offset 1.00ft Rt CL
Ground Surface Elev. 799.60 ft

D E P T H	B L O W S	U C S Qu	M O I S T
(ft)	(/6")	(tsf)	(%)

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft
Groundwater Elev.:
First Encounter _____ ft
Upon Completion _____ ft
After _____ Hrs. _____ ft

VERY DENSE tan SANDY LOAM TILL with medium GRAVEL	25			
	25	4.6	8.0	
758.10	32	S		
VERY DENSE tan SANDY LOAM TILL with medium GRAVEL	25			
	34	3.5	8.0	
755.60	52	S		
VERY DENSE tan SANDY LOAM TILL with GRAVEL	32			
	36	4.4	7.0	
753.10	37	S		
DENSE tan SANDY LOAM TILL with GRAVEL	21			
	21			
750.60	23			
DENSE tan SANDY LOAM TLIL with SAND lens	15			
	19	5.5	9.0	
748.10	25	S		
VERY STIFF gray SANDY CLAY LOAM TILL	8			
	12	3.9	9.0	
745.60	16	B		
VERY STIFF gray SANDY CLAY LOAM TILL	23			
	16	3.5	9.0	
743.10	20	S		
VERY STIFF gray SANDY CLAY TILL	10			
	13	3.9	9.0	
740.60	20	B		
End of Boring				
	-60			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, from 137 (Rev. 8-99)



SOIL BORING LOG

Date 8/2/16

ROUTE FAI 39 & FAP 301 DESCRIPTION P92-111-06 NB & SB Bridge - I-39 over Harrison Avenue LOGGED BY W. Garza

SECTION (201-3)K & 4-1.5)K LOCATION Rockford N.E. Twp. - SE, SEC. 35, TWP. 44N, RNG. 2E

COUNTY Winnebago DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-55

STRUCT. NO. 101-0213 Latitude 42° 14' 23.03" Northing 2,032,170.6978
Station 153+19 Longitude -88° 57' 58.86" Easting 2,621,608.6896

Elevation Conversion:
99.80 = El. 780

BORING NO. B-5J
Station 153+28
Offset 10.00ft Rt Median CL
Ground Surface Elev. 99.80 ft

D E P T H (ft)	B L O W S (/6")	U C S Qu (tsf)	M O I S T (%)	Surface Water Elev. _____ ft	Stream Bed Elev. _____ ft	Groundwater Elev.: First Encounter _____ 62.3 ft ▼ Upon Completion _____ 59.8 ft ▼ After _____ Hrs. _____ ft	D E P T H (ft)	B L O W S (/6")	U C S Qu (tsf)	M O I S T (%)
9" Asphalt Shoulder				79.30			53			
VERY STIFF gray CLAY LOAM	2 3 4	2.7 B	18.0	98.30 96.80		VERY DENSE tan SANDY LOAM TILL		22 33 29		
MEDIUM brown SANDY LOAM	2 4 5	0.5 S	12.0	76.30 94.30		VERY STIFF tan SANDY LOAM TILL	7 13 14	2.1 P	10.0	
MEDIUM tan SANDY LOAM TILL	3 3 4	0.9 P	9.0	73.80 91.80		VERY DENSE light gray SANDY LOAM TILL	14 35 38		8.0	
No Recovery	6 8 9			71.80 89.30		DENSE light gray SANDY LOAM TILL	11 17 22	4.5 P	7.0	
MEDIUM tan SANDY GRAY TILL	0 3 5	0.8 B	11.0	69.30 86.80		VERY DENSE light gray SANDY LOAM TILL	18 28 33			
STIFF tan SANDY LOAM TILL	4 11 20	1.6 S	9.0	66.30 83.80		VERY STIFF light gray SANDY LOAM TILL	7 11 13	2.9 S	9.0	
VERY DENSE tan SANDY LOAM TILL	27 100/8"			64.30 81.80		VERY STIFF light gray SANDY LOAM TILL with SAND lens	10 15 29	3.4 P	9.0	
VERY DENSE tan SANDY LOAM TILL	30 39			61.80 -20		VERY STIFF light gray SANDY LOAM TILL	5 7	3.5	9.0	

Northing and Easting were calculated using the ILHP-WF coordinate system

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)



SOIL BORING LOG

ROUTE FAI 39 & FAP 301 DESCRIPTION P92-111-06 NB & SB Bridge - I-39 over Harrison Avenue LOGGED BY W. Garza

SECTION (201-3)K & 4-1,5)K LOCATION Rockford N.E. Twp. - SE, SEC. 35, TWP. 44N, RNG. 2E

COUNTY Winnebago DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME-55

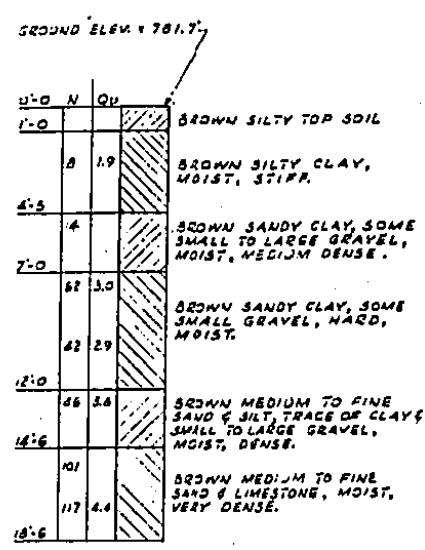
STRUCT. NO. 101-0213 Latitude 42° 14' 23.03" Northing 2,032,170.6978
Station 153+19 Longitude -88° 57' 58.86" Easting 2,621,608.6896

BORING NO. B-5J
Station 153+28
Offset 10.00ft Rt Median CL
Ground Surface Elev. 99.80 ft

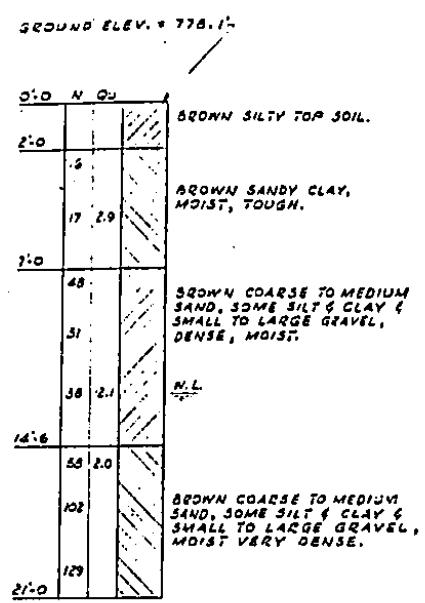
D E P T H (ft)	B L O W S (/6")	U C S Qu (tsf)	M O I S T (%)	Surface Water Elev. _____ ft	D E P T H (ft)	B L O W S (/6")	U C S Qu (tsf)	M O I S T (%)
				Stream Bed Elev. _____ ft				
				Groundwater Elev.: _____ ft				
				First Encounter <u>62.3</u> ft ▼				
				Upon Completion <u>59.8</u> ft ▼				
				After _____ Hrs. _____ ft				
59.30	12	B		39.30	24			
	5					12		
	7	2.0	10.0			13		
56.80	16	B		36.80	14			
				End of Boring				
	13							
-45	13			-65				
54.30	13							
	10							
	9	3.6	26.0					
51.80	12	P						
	6							
-50	9			-70				
49.30	13							
	6							
	8							
	10							
46.30								
	8							
-55	9			-75				
	18							
43.80								
	8							
	6	1.2	15.0					
	10	B						
41.30								
	7							
-60	14			-80				

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

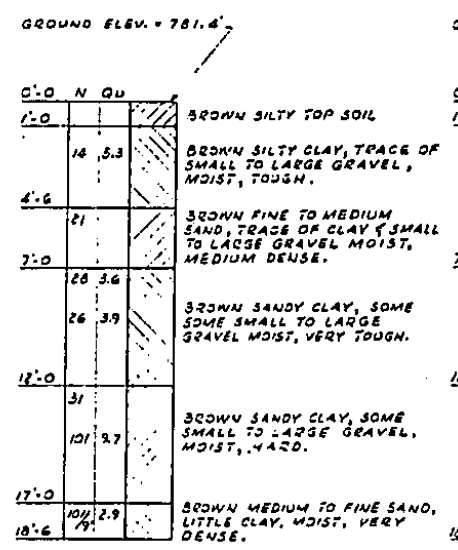
BORING NO. 1



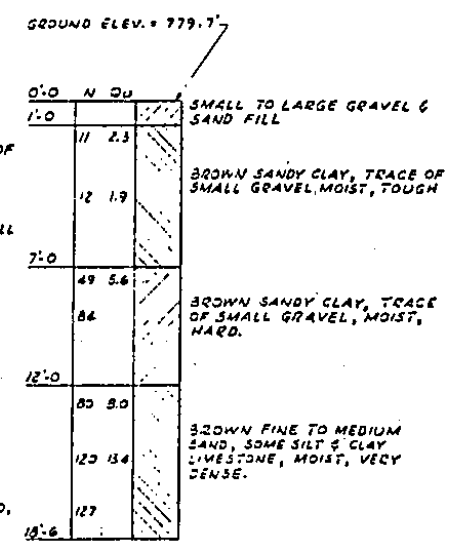
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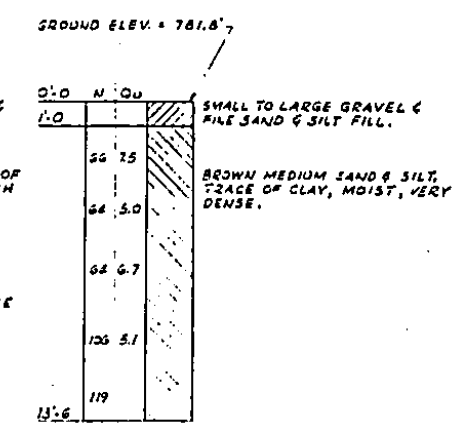
BORING NO. 3



BORING NO. 4



BORING NO. 5

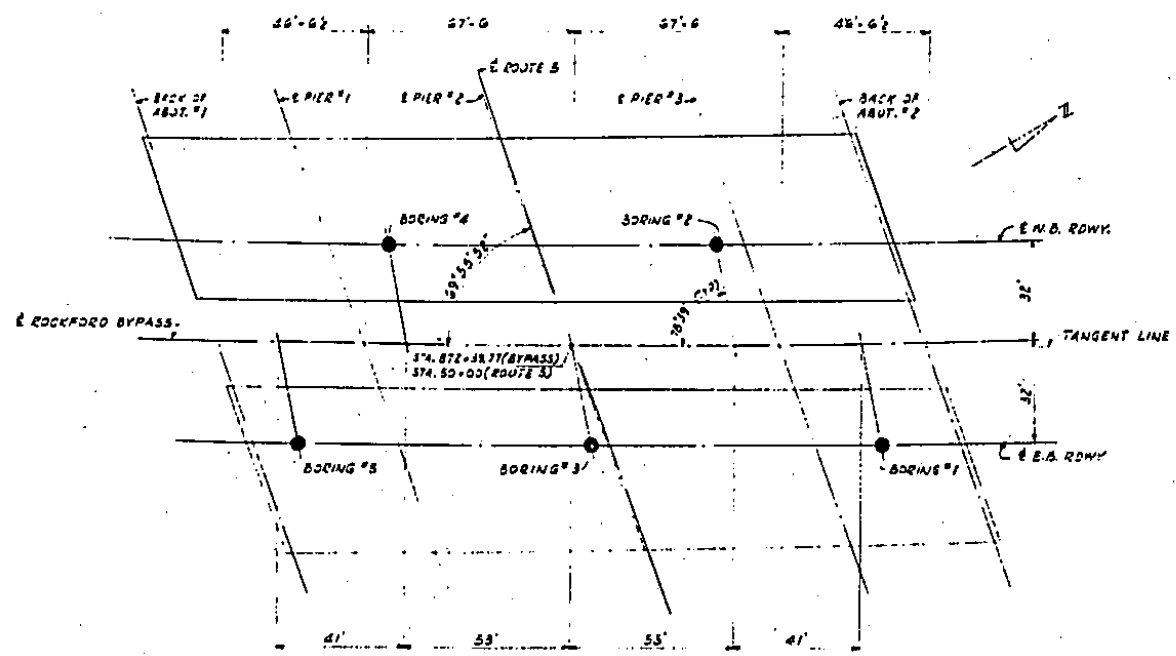


GENERAL NOTES

CLASS "X" CONCRETE SHALL BE USED THROUGHOUT. ALL EXPOSED EDGES SHALL HAVE A 1/4" CHAMFER. THE CONCRETE FLOOR SLAB SHALL BE FINISHED IN ACCORDANCE WITH ART. 51.19 (b) OF THE STANDARD SPECIFICATIONS. RIVETS 3/4" & OPEN HOLES 1/2" & UNLESS NOTED. FIELD CONNECTIONS RIVETED EXCEPTED AS NOTED. ALL ROLLERS, ROCKERS, BEARING PLATES, LEAD PLATES, PINTLES AND ANCHOR BOLTS SHALL BE FABRICATED AND SET IN ACCORDANCE WITH ART. 51.15 OF THE STANDARD SPECIFICATIONS AND ARE INCLUDED IN QUANTITY OF STRUCTURAL STEEL. ANCHOR BOLTS SHALL BE SET BEFORE RIVETING DIAPHRAGMS OVER SUPPORTS. ALL STEEL HANDRAIL POSTS SHALL BE VERTICAL. EXPANSION GUARDS SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH ART. 51.13 (c) OF THE STANDARD SPECIFICATIONS AND ARE INCLUDED IN QUANTITY OF STRUCTURAL STEEL. THE OUTSIDE FACE OF THE VERTICAL LEGS OF THE EXPANSION GUARDS SHALL BE GIVEN TWO SHOP COATS OF RED LEAD PAINT. EXCEPT AS OTHERWISE NOTED, ALL STRUCTURAL STEEL SHALL RECEIVE ONE SHOP COAT OF RED LEAD PAINT AND TWO FIELD COATS OF ALUMINUM PAINT. SEE ART. 56.1 TO 56.5 INCLUSIVE OF THE STANDARD SPECIFICATIONS. ALL PAINT SHALL BE FURNISHED AND APPLIED BY THE CONTRACTOR. REINFORCEMENT BARS SHALL BE PLACED EXACTLY AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH ART. 59.5 OF THE STANDARD SPECIFICATIONS. THE CONTRACTOR SHALL DRIVE TWO CONCRETE TEST PILES, ONE AT ABUTMENT NO. 1 AND ONE AT ABUTMENT NO. 2 IN A PERMANENT LOCATION. TWO TIMBER TEST PILES SHALL BE DRIVEN, ONE IN THE VICINITY OF THE WINGWALL AT ABUTMENT NO. 1 AND ONE IN THE VICINITY OF THE WINGWALL AT ABUTMENT NO. 2 BEFORE ORDERING THE REMAINDER OF THE PILES.

BORING NOTES:

N = NUMBER OF BLOWS PER FT. FOR A 140" HAMMER FALLING 30 INCHES.
QU = UNCONFINED COMPRESSIVE STRENGTH IN KIPS PER SQ. FT.



ROUTE 5 BRIDGE 5HB
BORING LOCATION PLAN

SUMMARY OF QUANTITIES SECTION - 5HB

NON-Participating	Project F-284(6)	CODE NO.	ITEM	UNIT	SUPER STRUCTURE	SUB STRUCTURE	TOTAL
8293	8284	013001	BORROW EXCAVATION	CU. YDS.			18527
		2845	EARTH EXCAVATION	CU. YDS.			2845
		1242	GRAVEL OR CRUSHED STONE BASE COURSE, TYPE B	CU. YDS.			1242
		657	BITUMINOUS MATERIALS (PRIME COAT)	SQ. YDS.			397
		1398	BITUMINOUS MATERIALS (SEAL & SEAL COATS)	SQ. YDS.			398
		38	COVER COAT AGGREGATE	TONS			38
		19	SEAL COAT AGGREGATE	TONS			19
637	560	082001	PAVEMENT REMOVAL	SQ. YDS.			1197
301	302	050001	CLASS "A" EXCAVATION FOR STRUCTURES	CU. YDS.			503
716.4	730.2	052003	CLASS "X" CONCRETE	CU. YDS.	212.1	556.5	1556.6
316.963	316.963	054003	ERECTING STRUCTURAL STEEL	LBS.	283726		633926
450	451	055001	FURNISHING AND ERECTING METAL HANDRAIL	LIN. FT.			321
105.843	105.841	059001	REINFORCEMENT BARS	LBS.	12672	75532	211704
300	380	060044	FURNISHING CONCRETE PILES	LIN. FT.			680
300	380	060043	DRIVING CONCRETE PILES	LIN. FT.			680
320	320	060004	FURNISHING CREOSOTED PILES, UP TO 20'	LIN. FT.			640
745	745	060008	DRIVING TIMBER PILES	LIN. FT.			1490
		2	TEST PILES (CONCRETE)	EACH			2
		2	TEST PILES (TIMBER)	EACH			2
1	1	061001	NAME PLATES	EACH			2
528	528	083001	PIER WALL	SQ. YDS.			1056
220	220	058229	PIER CULVERTS TYPE 2 (36" DIA.)	LIN. FT.			440
16	16	060042	1" DIA. SPODS	LIN. FT.			32
425	425	060005	FURNISHING CREOSOTED PILES, 20' TO 30'	LIN. FT.			850

SUMMARY OF QUANTITIES SECTION - 5HB-F

		SUMMARY OF QUANTITIES		SUBSTRUCTURE		
		ITEM	UNIT	SUPER STRUCTURE	SUB STRUCTURE	TOTAL
✓	316,963	216,963	054002	FURNISHING STRUCTURAL STEEL	LBS.	633,926

ILLINOIS DIVISION OF HIGHWAYS
ROCKFORD BYPASS
F. A. ROUTE 194
PROJECT _____ SECTION 5HB
WINNEBAGO COUNTY
GENERAL NOTES-BORING LOGS
SUMMARY OF QUANTITIES
Checked By: _____ Drawn By: G.W.G. Checked By: 226

Revised: 12-10-59: Class "X" Concrete from 1448.6 to 1456.6 due to rise in curb height from 9" to 10" - R.D.
12-16-59: Removed note for Red concrete. W.E.D.
Revised 11-25-59: Split Summary of Quantities for Non-Participating & Project F-284(6) Work
Revised 11-26-59: Reinforcement Bars for Proj F-284(6) changed from 055001 to 059001.