



Original Report Date: Feb 13, 2013 Proposed SN: 019-0049 Route: FAP 573 (US 30)
 Revised Date: N/A Existing SN: 019-0031 Section: (116R-2BR)BR
 Geotechnical Engineer: IDOT District 3: Michael Short County: DeKalb
 Structural Engineer: IDOT BB&S: Richard Chaput Contract: 66A90

Indicate the proposed structure type, substructure types, and foundation locations (attach plan and elevation drawing):
 The proposed structure is a single span bridge and will provide a clear width of 40 feet, with a proposed back to back of abutments distance of 79.25 feet. Wide flange beams and integral abutments will be used. A draft General Plan and Elevation drawing 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): See attached "Supplemental Information" sheet.

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: The profile of US 30 will increase by a maximum of 1 foot. This is not expected to cause excessive settlement.

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. See attached "Supplemental Information" sheet.

Indicate at each substructure, the 100-year and 500-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. The design scour elevations are set as the bottom of the abutments: East Abutment = 756.14. West Abutment = 756.05. There is some scour present at the existing structure, which has created a small void under the east abutment at the second pile from the north.

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 soil site class is D. The seismic performance zone, SPZ = 1. The 0.2 second design spectral acceleration, SDS = 0.162g. The 1.0 second design spectral acceleration, SD1 = 0.090g. The soils were not checked for liquefaction because the SPZ = 1.

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 skin friction and end bearing values shall be indicated when drilled shafts are proposed. Driven H piling is the District's preferred foundation type. Pile design tables are attached. Pile shoes should be included on pile because of the cobbles identified in both borings and because the pile will be driven to the top of the limestone surface. A test pile at each abutment is recommended because the consistency of the top of rock elevation cannot be determined based on the soil boring logs. The proposed pile locations should be checked to ensure they do not conflict with the battered pile of the existing structure.

Calculate the estimated water surface elevation and determine the need for cofferdam(s) and seal coat: Cofferdams and seal coats will not be needed because this is a single span bridge.

Assess the need for sheeting/soil retention versus using a temporary construction slope and provide recommendation for the most feasible option. Temporary sheet piling is feasible for use at the stage construction line. However, the exact location of the temporary sheet piling at the west abutment needs to be checked for conflicts with the original and current structure foundations.

Abbreviated Structure Geotechnical Report – Supplemental Information

Original Report Date:	February 13, 2013	County:	DeKalb
Revised Date:	N/A	Proposed SN:	019-0049
Route:	FAP 573 (US 30)	Existing SN:	019-0031

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):

Two soil boring logs from the existing structure are attached. Boring 1 encountered "Very Hard Drilling" at elevation 715 and the boring ended at elevation 713.5. Boring 2 encountered "Hard Drilling" at elevation 716, however samples are recorded to elevation 703.5, which was auger refusal. Limestone was encountered and verified to elevation 695.5. Both borings encountered very similar soils above elevation 714. It is assumed that the soils and rock between elevation 695.5 and elevation 715 are uniform throughout the site. For the purposes of determination of the seismic soil site class and pile analysis, Boring 1 is assumed to have "Hard Till" with $N = 50$ from elevation 715 to elevation 703.5 and "Yellow Limestone" below elevation 703.5.

The existing single span structure is supported by 2 rows of concrete pile with 45 ton capacity. The estimated lengths are 24 feet at the west abutment and 22 feet at the east abutment. The wingwalls at the west abutment are supported by HP8X36 pile with an estimated length of 7.5 feet. The wingwalls at the east abutment are supported by concrete pile with an estimated length of 22 feet. The actual driven lengths of pile were 28 feet to 50 feet, which are up to twice the estimated length and place the pile tip near the top of the "Yellow Limestone" layer. The pile driving records are attached.

Identify any new cuts of 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 side slopes will be widened slightly to accommodate the change in profile grade and to maintain 1:3 or flatter slopes. There is no evidence of slope stability problems at the site and the ditches are less than 10 feet deep. Therefore, stability of the side slopes was not evaluated. For the end slope, a slope of 1:2 covered with riprap is proposed. The slope stability of the end slope has a factor of safety greater than 1.5. This is based on the assumption that the existing roadway is founded on soil with an unconfined compressive strength of 0.5 tsf.

Benchmark: BM #1 - Chiseled "X", Sta. 709+09.58, 14.34' Lt., Elev. 762.16

Existing Structure: S.N. 019-0031 built in 1982 as F.A.P. Rte 573, Sec. 116R-2BR at Sta. 709+56.09 as a one-span P.P.C. deck beam bridge, 33'-0" out-to-out deck, 80'-4" back-to-back abutments supported on concrete piles. Bituminous overlay replaced with concrete overlay in 1999. Existing bridge to be removed and replaced. Traffic maintained utilizing stage construction.

No Salvage.

DESIGN SCOUR ELEVATION TABLE

Design Scour Elevations (ft.)		
	West Abut.	East Abut.
Q100	756.05	756.14
Q500	756.05	756.14

WATERWAY INFORMATION

Drainage Area = 12.3 sq. mi. Existing Low Grade Elev. 762.16 @ Sta. 710+60
Proposed Low Grade Elev. 762.15 @ Sta. 708+00

Flood	Freq. Yr.	Q C.F.S.	Opening Sq. Ft.		Nat. H.W.E.	Head - Ft.		Headwater El.	
			Exist.	Prop.		Exist.	Prop.	Exist.	Prop.
Design	10	932	339	340	756.8	0.1	0.1	756.9	756.8
Base	50	1390	391	397	757.6	0.1	0.1	757.7	757.7
Overtopping	100	1570	410	418	757.8	0.1	0.1	758.0	757.9
Max. Calc.	500	-	451	464	758.4	0.2	0.1	758.6	758.6

10-year existing velocity = 3.0 ft./sec.
10-year proposed velocity = 2.9 ft./sec.

DESIGN SPECIFICATIONS

2012 AASHTO LRFD Bridge Design Specifications, 6th Edition

DESIGN STRESSES

FIELD UNITS

f'c = 3,500 psi
fy = 60,000 psi (Reinforcement)
fy = 50,000 psi (M270 Grade 50)

HIGHWAY CLASSIFICATION

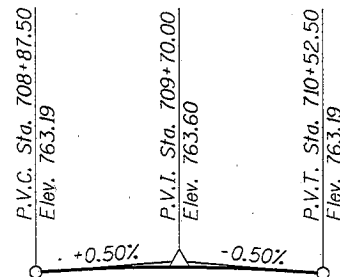
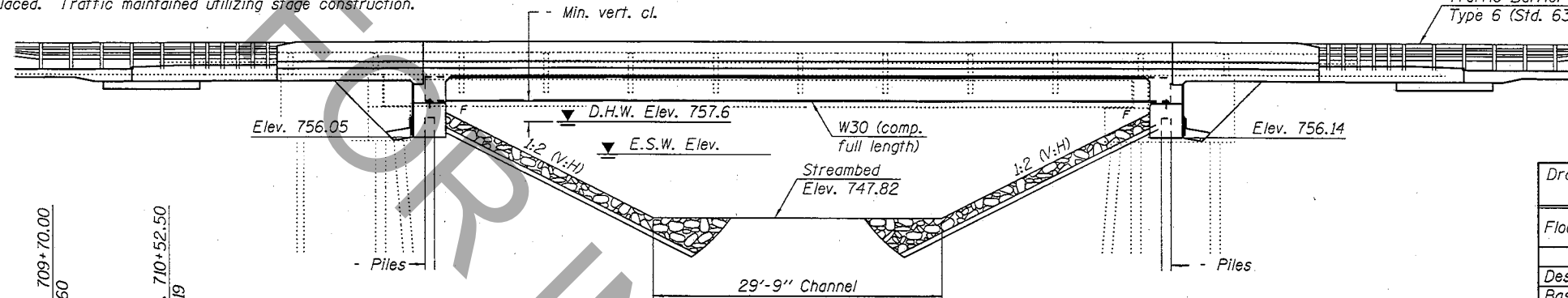
F.A.P. Rte. 573 - U.S. Rte. 30
Functional Class: Minor Arterial
ADT: 4,200 (2009); 5,500 (2025)
ADTT: 330 (2025)
DHW: 550 (One-way)
Design Speed: 55 m.p.h.
Posted Speed: 55 m.p.h.
Two-Way Traffic
Directional Distribution: 50:50

LOADING HL-93

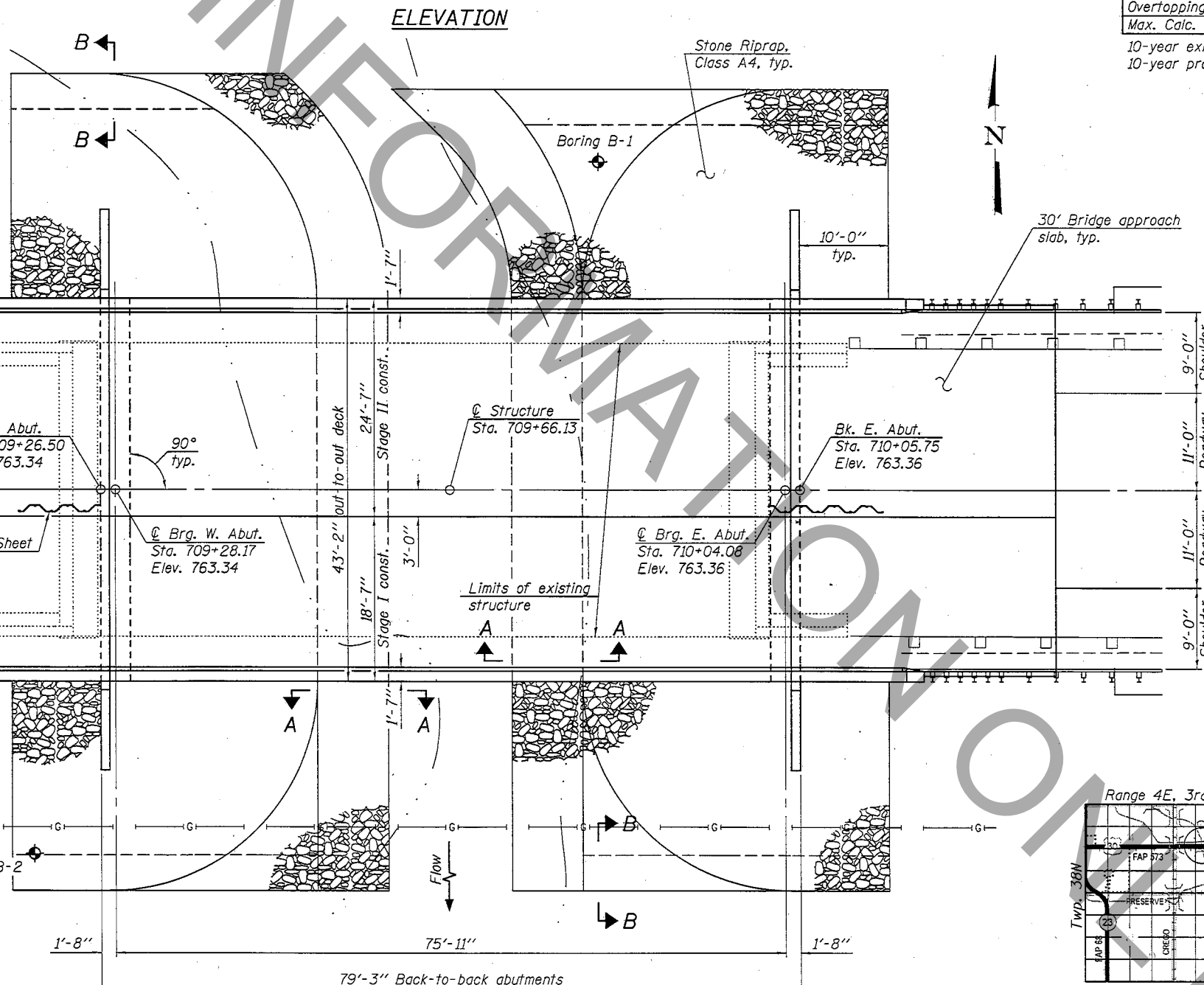
Allow 50#/sq. ft. for future wearing surface.

SEISMIC DATA

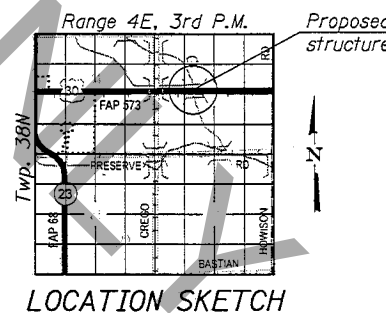
Seismic Performance Zone (SPZ) = 1
Design Spectral Acceleration at 1.0 sec. (SD1) =
Design Spectral Acceleration at 0.2 sec. (SD5) =
Soil Site Class =



PROFILE GRADE
(Along U.S. Rte. 30)



PLAN



LOCATION SKETCH

GENERAL PLAN & ELEVATION
U.S. RTE. 30 OVERSOMONAUK CREEK
F.A.P. RTE. 573 - SEC. (116R-2BR)BR
DEKALB COUNTY
STATION 709+66.13
STRUCTURE NO. 019-0049

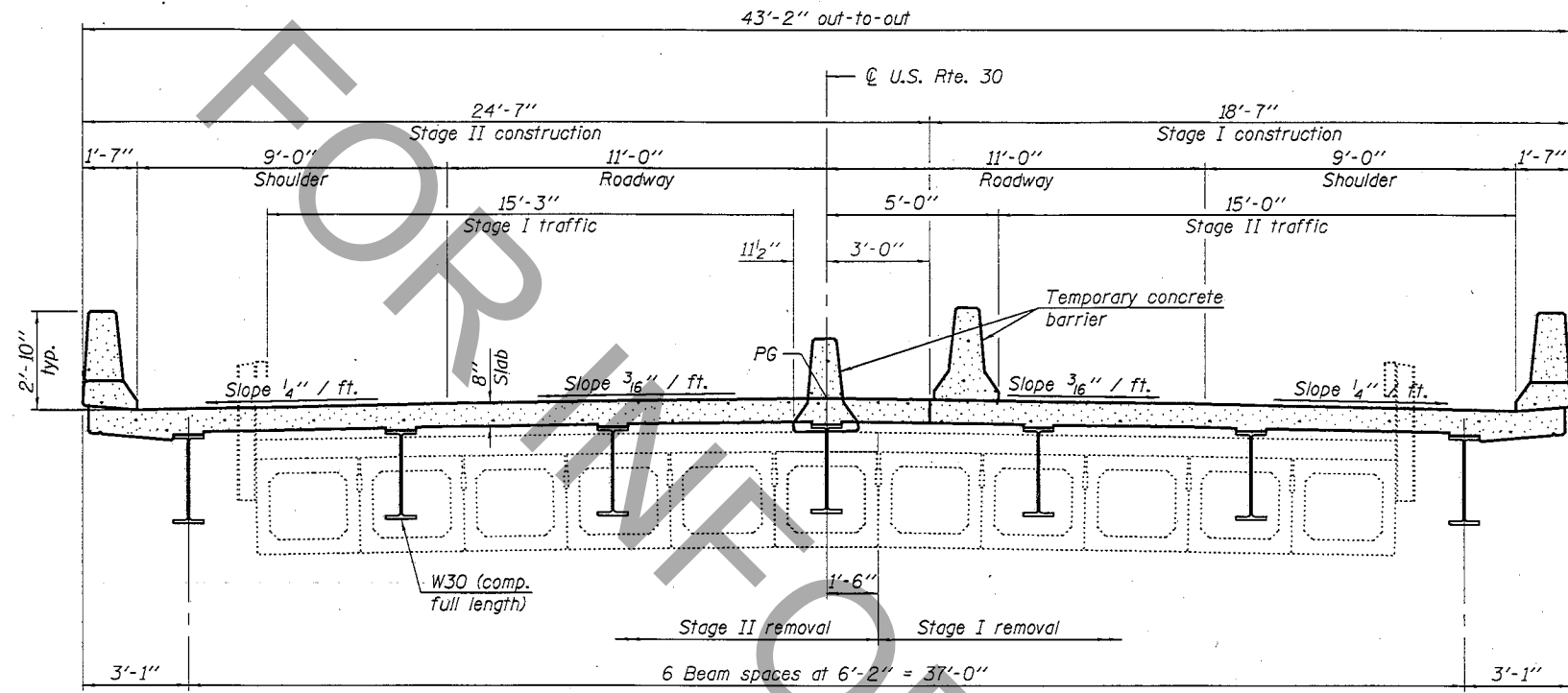
DESIGNED	RICHARD J. CHAPUT
CHECKED	
DRAWN	MICHAEL B. MOSSMAN
CHECKED	

2-5-2013

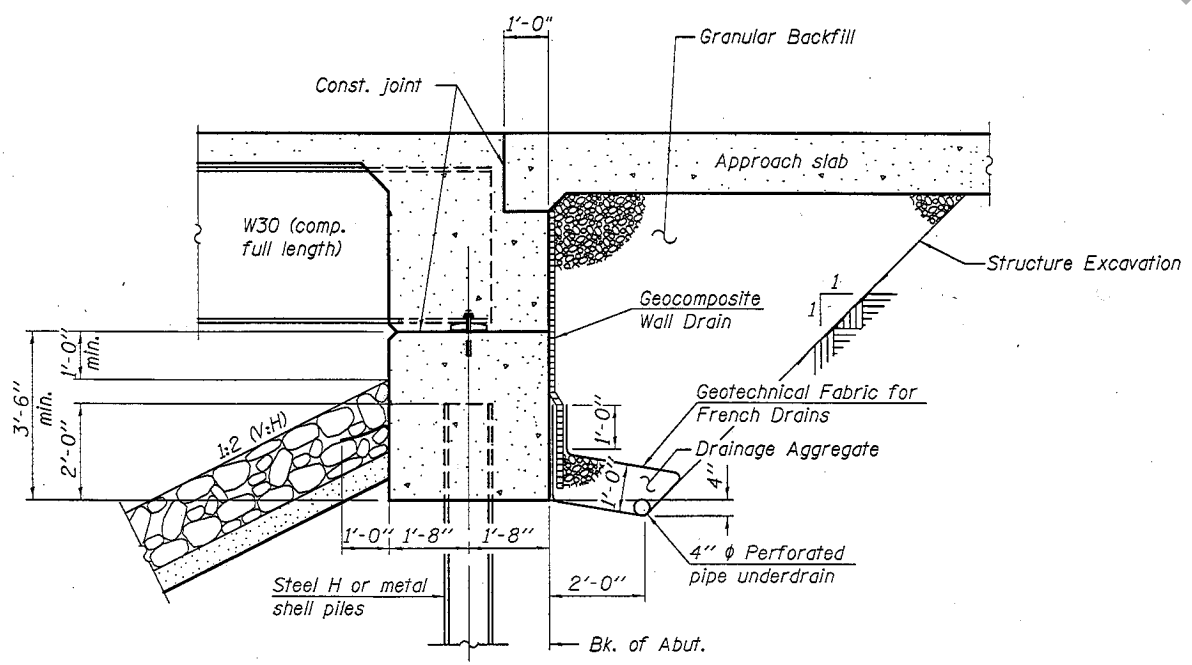
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SHEET NO. 1 OF 2 SHEETS

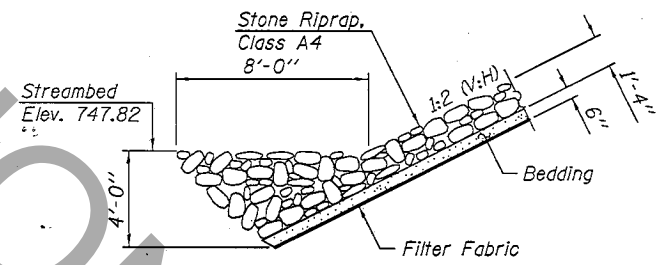
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
573	Q116R-2BR BR	DEKALB		
			CONTRACT NO. 66A90	
ILLINOIS FED. AID PROJECT				



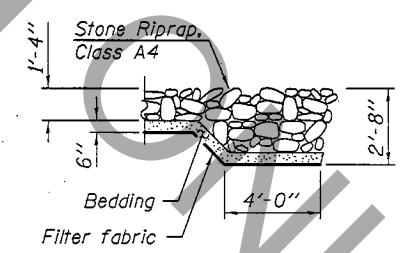
CROSS SECTION
(Looking East)



SECTION THRU INTEGRAL ABUTMENT
(Horiz. dim. @ Rt. L's)



SECTION A-A



SECTION B-B

DETAILS
U.S. RTE. 30 OVERSOMONAUK CREEK
F.A.P. RTE. 573 - SEC. (116R-2BR)BR
DEKALB COUNTY
STATION 709+66.13
STRUCTURE NO. 019-0049

DESIGNED -	RICHARD J. CHAPUT
CHECKED -	---
DRAWN -	MICHAEL B. MOSSMAN
CHECKED -	---

2-5-2013

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SHEET NO. 2 OF 2 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
573	(116R-2BR)BR	DEKALB	---	---
CONTRACT NO. 66A90			ILLINOIS FED. AID PROJECT	

NW₄, Section 13, T 38 N, R 4 E, 3rd PM



Illinois Department of Transportation

Bridge Foundation Boring Log

PROJECT P-92-011-78 BRIDGE Somonauk Creek Date 12-26-79 Sh. 1 of 1 Sh.

ROUTE FA 573 (US 30) NE side 019-0016 Bored By P. Wilson

SEC. 116R-2BR STA. 709+45 Checked By R. Wildman

COUNTY Dekalb

Boring No. B-1 Station 709+83 Offset 37' Lt. E	Elevation	N	Qu t/sf.	w (%)	Surface Water El.	Elevation	N	Qu t/sf.	w (%)
					Groundwater El. at Completion				
Ground Surface	756.0	0			After _____ Hours				
Soft Black Loam			P .5	25					
Medium Black Silt Loam with roots	6	75	P .75	34	Medium Gray Gravel				
Very Soft Same	5	08	S .08	74	Same				
Very Loose Gray Sand & Gravel (WASH)	2				Dense Same				
Medium (Same)	20				Same (possible cobbles)				
Very Dense (Same)	56				Same				
Dense Same	41				Medium Same				
Medium Same	28				Very Dense Same				
Medium Same	22				Very Hard Drilling				
					End of Boring				

N-Standard Penetration Test-Blows per foot to drive 2" O.D. Split Spoon Sampler 12" with 140 No. hammer falling 30".

Qu-Unconfined Compressive Strength - t/sf

w - Water Content - percentage of oven dry weight-%.

Type failure:

- B - Bulge Failure
- S - Shear Failure
- E - Estimated Value
- P - Penetrometer



Illinois Department
of Transportation

Bridge Foundation
Boring Log

PROJECT P-92-011-78 BRIDGE Somonauk Creek Date 12-27-79 Sh. 1 of 2 Sh.
 ROUTE FA 573 (US 30) 019-0016 Bored By P. Wilson
 SEC. 116R-28R STA. 709+15 Checked By R. Wildman
 COUNTY DeKalb

Boring No. <u>B-2</u> Station <u>709+19</u> Offset <u>41' Rt. E</u>	Elevation	N	Qu t/c.f.	w (%)	Surface Water Et. Groundwater Et. at Completion	wash	After _____ Hours	Elevation	N	Qu t/c.f.	w (%)
<u>Soft Black Loam</u>			P 5	12							
<u>Stiff black Silty Clay Loam</u>	10		S	54	Same			34			
<u>Very Soft Gray Silt</u>	5		S	38	Same			45			
<u>Very Loose Gray Sand & Gravel</u>	2				Same			40			
<u>Medium Same</u>	26				Same			30			
<u>Same As Above</u>	14				Same			35			
<u>Dense Gray Sand & Gravel</u>	41				Same			35	14		
<u>Very Dense Same (Cobbles) (rock in end of sampler)</u>	20				Same			21			
<u>Dense Gray Sand & Gravel</u>	39				Same			21			
					Same			38	12		
					Same			40	12		
					Same			45	10		
					Same			50	11		
					Same			45			

N-Standard Penetration Test-
Blows per foot to drive 2"
O.D. Split Spoon Sampler 12" with
140 No. hammer falling 30".

Qu-Unconfined Compressive
Strength - t/sf

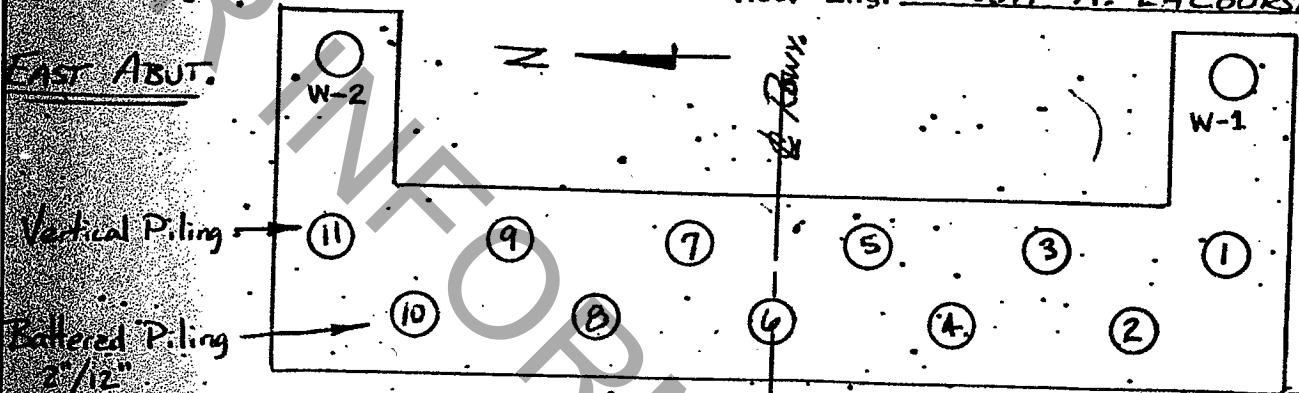
w - Water Content - percentage
of oven dry weight-%.

Type failure:
B - Bulge Failure
S - Shear Failure
E - Estimated Value
P - Penetrometer

PILING DIAGRAM

Station DeKalb 037
 Route 116R-2BR
 District FA-573
 Contract No. 2
 Job No. 35103
 Project C-92-052-81
BR-F-573(8)

Station 709 + 56.09
 Type Of Piling METAL SHELL
 Plan Length 22'
 Ordered Length 45'
 Date Driven 10-20, 10-21, 12-11-81
 Hammer Make & Model DELMAG D-11
 Test Pile Length 52 No.
 Location EAST ABUTMENT
 Res. Eng. SCOTT A. LACOURSIERE



PILE NO.	LENGTH FURNISHED	LENGTH REMAINING IN PLACE	PILE NO.	LENGTH FURNISHED	LENGTH REMAINING IN PLACE	PILE NO.	LENGTH FURNISHED	LENGTH REMAINING IN PLACE
W-1	45.0	36.8						
1	45.0	31.5						
2	45.0	43.7						
3	45.0	33.0						
4*	45.0	50.75						
5	45.0	41.70						
6	60.0	42.3						
7**	TEST PILE	28.0						
8	60.0	42.5						
9	60.0	42.1						
10	60.0	42.15						
11	60.0	41.95						
W-2	60.0	41.65						
							45.00 * +	36.80 *
							45.00 +	31.50
							45.00 +	43.70
							45.00 +	33.00
							45.00 +	50.75
							55.00 +	41.70
							45.00 +	42.30
							60.00 +	28.00
							60.00 +	42.50
							60.00 +	42.10
							60.00 +	42.15
							60.00 +	41.95
							60.00 +	41.65
							640.00 *	518.10

* spliced - add 10' to Furn. Length, splicing rd. for by unit price
 ** Test Pile = 60.0' Long

TOTALS
 PAY ~~518.10~~ 550.00
 PAY 518.1

SEISMIC SITE CLASS DETERMINATION

I.D.O.T. BBS FOUNDATIONS AND GEOTECHNICAL UNIT

Modified on 12/10/10

PROJECT TITLE====019-0031: US 30 over Semonauk Creek

Substructure 1

Base of Substruct. Elev. (or ground surf for bents) 756.05 ft.
Pile or Shaft Dia. 12 inches
Boring Number 2
Top of Boring Elev. 756 ft.
Approximate Fixity Elev. 750.05 ft.

Individual Site Class Definition:

N (bar): 28 (Blows/ft.) Soil Site Class D
 N_{ch} (bar): 32 (Blows/ft.) Soil Site Class D <----Controls
 s_u (bar): 2.39 (ksf) Soil Site Class C

Seismic Soil Column Depth (ft)	Bot. Of Sample Elevation (ft)	Sample Thick. (ft)	Layer Description	
			N (blows/ft)	Qu (tsf) Boundary
	753.5	2.50	2	0.50
	751.0	2.50	10	1.24
1.5	748.5	2.50	3	0.21
4.0	746.0	2.50	2	B
6.5	743.5	2.50	36	
9.0	741.0	2.50	14	B
11.6	738.5	2.50	41	
14.1	736.0	2.50	72	
16.6	733.5	2.50	39	
19.1	731.0	2.50	34	
21.6	728.5	2.50	45	
24.1	726.0	2.50	40	
26.6	723.5	2.50	35	B
29.1	721.0	2.50	10	0.35
31.6	718.5	2.50	21	B
34.1	716.0	2.50	38	1.38
36.6	713.5	2.50	45	6.11
39.1	711.0	2.50	50	6.00
41.6	708.5	2.50	50	6.80
44.1	706.0	2.50	48	3.30
46.6	703.5	2.50	52	2.33
99.9	650.1	53.40	100	10.00

Substructure 2

Base of Substruct. Elev. (or ground surf for bents) 756.14 ft.
Pile or Shaft Dia. 12 inches
Boring Number 1
Top of Boring Elev. 756 ft.
Approximate Fixity Elev. 750.14 ft.

Individual Site Class Definition:

N (bar): 26 (Blows/ft.) Soil Site Class D
 N_{ch} (bar): 30 (Blows/ft.) Soil Site Class D <----Controls
 s_u (bar): 4.37 (ksf) Soil Site Class C

Seismic Soil Column Depth (ft)	Bot. Of Sample Elevation (ft)	Sample Thick. (ft)	Layer Description	
			N (blows/ft)	Qu (tsf) Boundary
	753.4	2.65	0.50	
	750.9	2.50	6	0.75
1.8	748.4	2.50	3	0.80
4.3	745.9	2.50	2	b
6.8	743.4	2.50	20	b
9.3	740.9	2.50	56	
11.8	738.4	2.50	41	B
14.3	735.9	2.50	28	
16.8	733.4	2.50	22	
19.3	730.9	2.50	28	
21.8	728.4	2.50	30	
24.3	725.9	2.50	32	
26.8	723.4	2.50	35	
29.3	720.9	2.50	40	
31.8	718.4	2.50	20	
34.3	715.9	2.50	52	
36.8	713.4	2.50	40	B
39.3	710.9	2.50	50	
41.8	708.4	2.50	50	
44.3	705.9	2.50	50	
46.8	703.4	2.50	50	
100.0	650.2	53.20	100	10.00

Substructure 3

Base of Substruct. Elev. (or ground surf for bents) _____ ft.
Pile or Shaft Dia. _____ inches
Boring Number _____
Top of Boring Elev. _____ ft.
Approximate Fixity Elev. _____ ft.

Individual Site Class Definition:

N (bar): _____ (Blows/ft.) NA
 N_{ch} (bar): _____ (Blows/ft.) NA
 s_u (bar): _____ (ksf) NA

Seismic Soil Column Depth (ft)	Bot. Of Sample Elevation (ft)	Sample Thick. (ft)	Layer Description	
			N (blows/ft)	Qu (tsf) Boundary

Substructure 4

Base of Substruct. Elev. (or ground surf for bents) _____ ft.
Pile or Shaft Dia. _____ inches
Boring Number _____
Top of Boring Elev. _____ ft.
Approximate Fixity Elev. _____ ft.

Individual Site Class Definition:

N (bar): _____ (Blows/ft.) NA
 N_{ch} (bar): _____ (Blows/ft.) NA
 s_u (bar): _____ (ksf) NA

Seismic Soil Column Depth (ft)	Bot. Of Sample Elevation (ft)	Sample Thick. (ft)	Layer Description	
			N (blows/ft)	Qu (tsf) Boundary

Global Site Class Definition: Substructures 1 through 2

N (bar): 27 (Blows/ft.) Soil Site Class D
 N_{ch} (bar): 31 (Blows/ft.) Soil Site Class D <----Controls
 s_u (bar): 3.33 (ksf) Soil Site Class C

Pile Design Table for West Abutment utilizing Boring #2

Nominal Required Bearing (Kips)	Factored Resistance Available (Kips)	Estimated Pile Length (Ft.)	Nominal Required Bearing (Kips)	Factored Resistance Available (Kips)	Estimated Pile Length (Ft.)	Nominal Required Bearing (Kips)	Factored Resistance Available (Kips)	Estimated Pile Length (Ft.)
Steel HP 8 X 36			Steel HP 12 X 53			Steel HP 14 X 73		
115	63	40	131	72	22	95	52	20
143	79	52	149	82	25	159	88	22
145	80	53	153	84	35	181	99	25
147	81	53	175	96	40	183	101	35
149	82	54	221	122	52	212	117	40
150	83	54	224	123	53	269	148	52
216	119	55	226	125	53	272	150	53
286	157	56	229	126	54	275	151	53
Steel HP 10 X 42			231	127	54	278	153	54
127	70	35	322	177	55	281	155	54
143	79	40	418	230	56	392	216	55
180	99	52	Steel HP 12 X 63			578	318	56
182	100	53	135	74	22	Steel HP 14 X 89		
184	101	53	153	84	25	101	56	20
186	102	54	155	85	35	164	90	22
188	103	54	177	97	40	185	102	25
269	148	55	223	123	52	185	102	35
335	184	56	226	124	53	214	118	40
Steel HP 10 X 57			229	126	53	273	150	52
130	71	35	231	127	54	276	152	53
146	80	40	234	129	54	279	153	53
184	101	52	331	182	55	282	155	54
186	102	53	497	273	56	285	157	54
188	103	53	Steel HP 12 X 74			403	222	55
190	105	54	137	76	22	705	388	57
192	106	54	155	85	25	Steel HP 14 X 102		
278	153	55	157	86	35	107	59	20
454	250	56	179	99	40	167	92	22
			227	125	52	187	103	35
			229	126	53	217	119	40
			232	128	53	276	152	52
			234	129	54	279	153	53
			237	130	54	282	155	53
			339	186	55	285	157	54
			589	324	57	288	159	54
			Steel HP 12 X 84			411	226	55
			140	77	22	810	445	57
			158	87	25	Steel HP 14 X 117		
			159	87	35	113	62	20
			182	100	40	171	94	22
			230	126	52	189	104	35
			232	128	53	219	121	40
			235	129	53	279	154	52
			238	131	54	282	155	53
			240	132	54	286	157	53
			345	190	55	289	159	54
			664	365	57	292	160	54
						422	232	55
						929	511	57

Pile Design Table for East Abutment utilizing Boring #1

Nominal Required Bearing (Kips)	Factored Resistance Available (Kips)	Estimated Pile Length (Ft.)	Nominal Required Bearing (Kips)	Factored Resistance Available (Kips)	Estimated Pile Length (Ft.)	Nominal Required Bearing (Kips)	Factored Resistance Available (Kips)	Estimated Pile Length (Ft.)
Steel HP 8 X 36			Steel HP 12 X 53			Steel HP 14 X 73		
161	89	52	148	82	32	149	82	27
196	108	55	165	91	35	163	90	30
286	157	56	169	93	37	180	99	32
Steel HP 10 X 42			196	108	40	201	110	35
133	73	37	228	126	42	210	116	37
163	90	40	238	131	45	238	131	40
188	103	42	247	136	47	276	152	42
193	106	45	256	141	50	287	158	45
198	109	47	265	146	52	299	164	47
203	112	50	291	160	55	310	170	50
209	115	52	418	230	56	321	176	52
243	134	55	Steel HP 12 X 63			355	195	55
335	184	56	152	84	32	578	318	56
Steel HP 10 X 57			170	93	35	Steel HP 14 X 89		
137	75	37	170	94	37	152	84	27
168	92	40	201	110	40	167	92	30
193	106	42	233	128	42	184	101	32
198	109	45	243	133	45	205	113	35
203	112	47	252	139	47	213	117	37
209	115	50	261	144	50	244	134	40
214	118	52	269	148	52	282	155	42
252	138	55	300	165	55	293	161	45
454	250	57	497	273	56	304	167	47
			Steel HP 12 X 74			315	173	50
			155	85	32	326	179	52
			173	95	35	366	201	55
			173	95	37	705	388	57
			205	113	40	Steel HP 14 X 102		
			236	130	42	155	85	27
			246	135	45	170	93	30
			255	140	47	187	103	32
			265	146	50	209	115	35
			274	151	52	216	119	37
			307	169	55	248	136	40
			589	324	57	285	157	42
			Steel HP 12 X 84			296	163	45
			157	87	32	308	169	47
			175	96	35	319	175	50
			176	97	37	330	181	52
			208	115	40	374	206	55
			240	132	42	810	445	57
			249	137	45	Steel HP 14 X 117		
			258	142	47	158	87	27
			268	147	50	174	96	30
			277	153	52	191	105	32
			313	172	55	213	117	35
			664	365	57	219	121	37
						254	140	40
						290	160	42
						301	166	45
						313	172	47
						324	178	50
						335	184	52
						384	211	55
						929	511	58