HYDRAULIC REPORT

VOLUME 1

IL ROUTE 47 Culvert/Bridge over Blackberry Creek

IL ROUTE 47 AND MAIN ST. INTERSECTION IMPROVEMENTS

IDOT PROJECT NUMBER

P-91-449-09

PTB 152/14

ELBURN

KANE COUNTY, IL

STRUCTURE NUMBER:

EXISTING SN: 045-2000

PROPOSED SN: 045-2050

PREPARED FOR

Illinois Department of Transportation

DATE

November 2014

PREPARED BY

Globetrotters® Engineering Corporation

300 S. Wacker Drive, Suite 400

Chicago, IL 60606

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NARRATIVE

A. PROJECT DESCRIPTION

This project consists of the reconstruction of IL RT. 47, and the IL 47/Main Street intersection, in unincorporated Kane County, Illinois. The roadway reconstruction consists of the addition of turning lanes and traffic signalization. Interchange reconstruction will extend into the Main Street right of way, owned by Kane County.

IL Rt. 47 crosses Blackberry Creek just north of its intersection with Main Street via an existing 4 barrel culvert (Structure Number 045-2000). The preliminary design of the IL Rt. 47 roadway improvements impact this culvert. The 4 barrel culvert is undersized and would allow stormwater to encroach on the roadway pavement during design storm events. Also the geometry of the 4 barrel structure is prone to collecting debris. This hydraulic report details the hydraulic design of the replacement drainage structure; a 54' span 3-sided Arch Culvert (Structure Number 045-2050). Also, an alternate proposed drainage structure has been analyzed in this report; a steel beam/concrete deck 76' single span, open abutment bridge.

Just south of the IL RT. 47 drainage structure is the Main Street Bridge over Blackberry Creek. The Main Street Bridge is within this reports study reach and it affects the hydraulics of Blackberry Creek. The Main Street Bridge is undersized and scour critical and Kane County is working on the design of a replaced bridge. This report details proposed hydraulic conditions for Blackberry Creek using both Main Street Bridge conditions, one hydraulic analysis with the existing bridge and one hydraulic analysis for the proposed bridge.

The various hydraulic studies have been assembled into groups, for identification purposes, summarized as follows:

- Group 1 - is considered as a design model that investigates the effects on Blackberry Creek by modifying only the IL Rt. 47 structure and uses recent surveyed data. This is the hydraulic analysis for the following conditions: proposed IL Rt. 47 drainage structure as a 3-sided Arch Culvert, with the existing Main Street Bridge. This analysis is identified as Group 1 (See Section 15.1.A for hydraulic analysis). An alternate hydraulic analysis was prepared for the following condition: proposed IL Rt. 47 drainage structure as a steel beam/concrete deck single span, open abutment bridge, with the existing Main Street Bridge (See Section 15.1.i for the alternate IL Rt. 47 Bridge hydraulic analysis).

- Group 2 - is the other design model that investigates the effect on Blackberry Creek by using the proposed Main St bridge in conjunction with the proposed IL Rt. 47 structure. This hydraulic analysis was prepared for the following conditions: proposed IL Rt. 47 drainage structure as a 54-foot 3-sided Arch Culvert, with the proposed Main Street Bridge. This analysis can be found in Section 15.2.A and Section 15.2.i (IL Rt. 47 Bridge option).

- Group 3 - is the modified effective FIS model and is considered to be the "permit" model. This hydraulic analysis is for the following conditions: existing and proposed IL Rt. 47 structure used in place

of the structure used in the effective FIS model. This analysis can be found in Section 15.3.A and Section 15.3.i.

- Group 4 - is the modified effective FIS model and is considered to be an additional “permit” model. This hydraulic analysis was prepared for the following conditions: proposed Main St structure with the revised existing/proposed IL Rt. 47 structure. This analysis can be found in Section 15.4.A and Section 15.4.i (Bridge option) for hydraulic analysis).

The following is a summary of the finding of this report.

- The existing IL Rt. 47 drainage structure is undersized and is proposed to be replaced with a 3-sided concrete arch culvert.
- The existing Main St. structure does influence the headwater on the IL Rt. 47 structure in proposed and existing conditions.
- The proposed Main St. structure reduces the impact to the proposed IL Rt. 47 structure.
- There is a sensitive flood receptor located at the north east corner of the intersection of IL Rt. 47 and Main Street, the Blackberry Inn. However, this sensitive receptor will be removed and will be used for compensatory storage.
- Compensatory storage is required for roadway flood fill.

B. DESCRIPTION OF EXISTING STRUCTURE AND FLOODPLAIN

The existing IL Rt. 47 drainage structure is a 4 barrel reinforced concrete culvert, with wing walls installed at each face. There are two different barrel dimensions within the structure, the outer barrel dimensions are 6.5' H x 8.75' W, the inner barrel dimensions are 6.5' H x 10.42' W (See Section 12, Bridge Layout/Plan Drawing Plots for details). The IL Rt. 47 culvert accumulates debris on its upstream face and silt is accumulating downstream of the culvert. There were no signs of scour and the culvert had approximately one foot of silt over the bottom of the pipes. The existing vegetative cover of Blackberry creek is as follows: tree cover for the floodway limits and grass/pavement cover for the floodplain. The existing structure does not meet the current IDOT requirement for freeboard.

The existing Main Street bridge is a single pier, 2 span, 40 foot wide concrete closed abutment bridge. The bridge span is 18 feet per span with a 2 foot wide pier and perpendicular concrete walls underneath the structure (See Section 12, Bridge Layout/Plan Drawing Plots for details). The existing vegetative cover for the Main Street Bridge is similar to the IL Rt. 47 Bridge.

C. FIELD OBSERVATIONS

The IL Rt. 47 culvert visually appears to impede the flood flows. Debris, including logs and trees were observed at the upstream face of the culvert. No signs of scour were present during the site visit. Also, silt is accumulating at the downstream face of the structure.

D. HISTORICAL OBSERVATIONS / RECORDS

During the survey of cross-sections used in the HEC-RAS model the surveyor noted that a property owner at 43 W 659 Main Street (409 feet east of the intersection of Route 47 and Main St, south side of Main St.) disclosed that the floodwaters had crested the roadway twice in the last 30 years. However, the owner could not remember the dates of those flooding occurrences. The owner of the Blackberry Inn Bar & Grill mentioned to the cross-section surveyor that during a flood of one particular year there was about one foot of water inside the restaurant. The owner, however, could not remember the date of the event. The low entry elevation of the restaurant is at 730.12 feet; with an inside water depth of 1 foot (731.12 feet) the flood frequency must have been higher than the FIS 500-yr elevation of approximately 730.4 feet. The all-time water elevation used in this report will be 731.12 feet.

USGS records indicate that the all-time high water elevation at the structure was 728.20 in the October 1954 flood.

According to an IDOT Operations and Communications Center incident report number 94-2606 recorded in 1994, Route 47 was impassable due to flooding. In the memo (by Bureau of Programming) that included the incident report it was mentioned that the area has flooded numerous times rendering Route 47 impassable by roadway vehicles. (See Section 22, Correspondence Notes for details)

Kane County has also notified IDOT that flood waters overtopped the roadway during an extreme storm event in 1996.

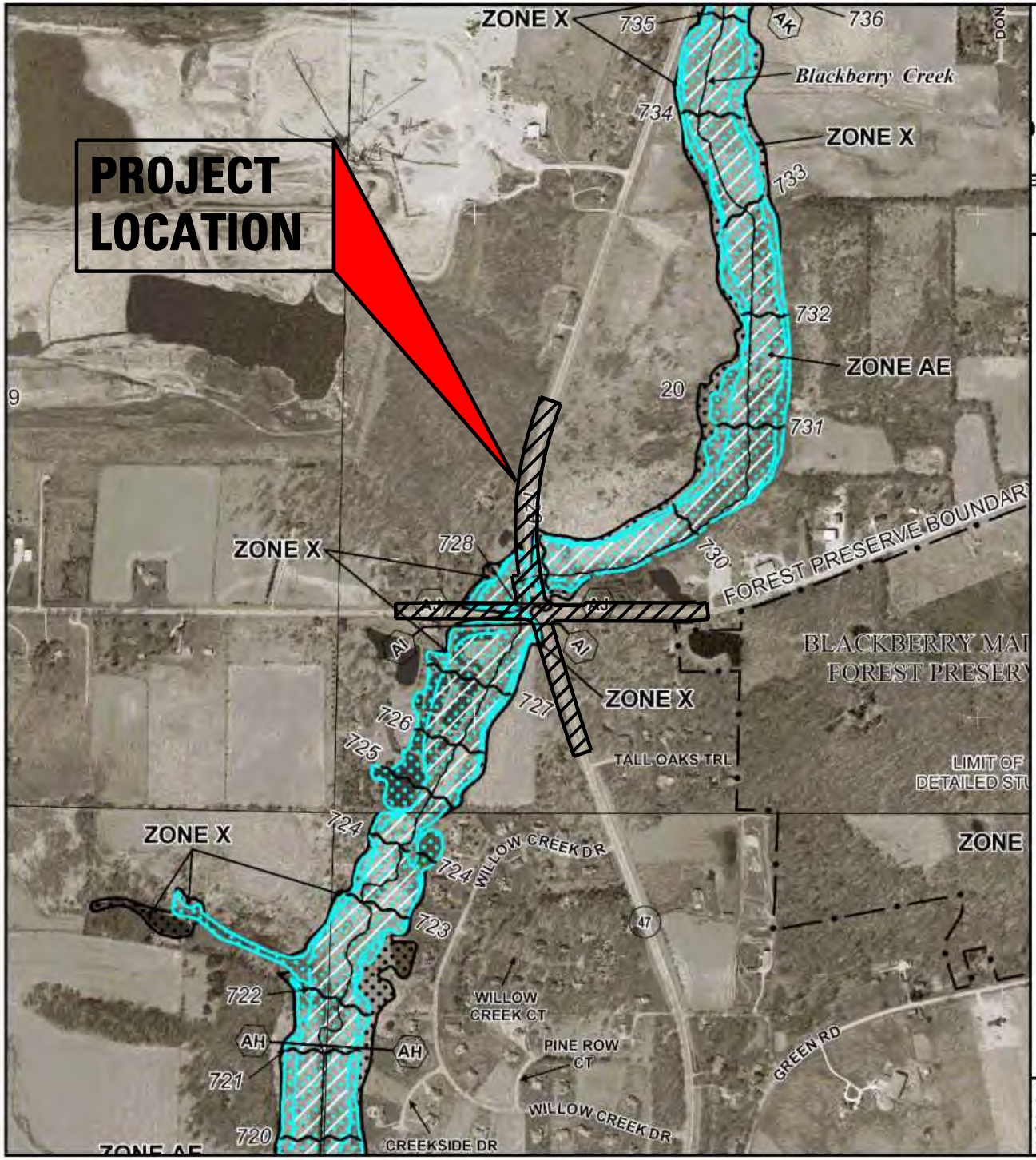
E. OTHER STUDIES AND AFFECTED AGENCIES

The Federal Emergency Management Agency (FEMA) has prepared a Flood Insurance Study (FIS) for Blackberry Creek. The HEC-RAS analysis contained in this report used the following information from the FIS study:

- Hydrologic data
- Starting water surface elevations
- Boundary conditions.

Cross sectional data was obtained from survey data preformed as part of this report. The location of the surveyed cross sections were correlated with the FIS cross section location, to calibrate this reports hydraulic models with the hydraulic models prepared for the FIS report (the FIS study was used as a reference/comparative tool for this report).

Kane County will also be affected by this project's roadway improvements.



MAP SCALE 1" = 1000'

0 1000 2000 FEET

METE

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0305H

FIRM

FLOOD INSURANCE RATE MAP

KANE COUNTY, ILLINOIS

AND INCORPORATED AREAS

PANEL 305 OF 410

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ELBURN, VILLAGE OF	171026	0305	H
KANE COUNTY	170896	0305	H

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
17089C0305H

MAP REVISED
AUGUST 3, 2009

Federal Emergency Management Agency

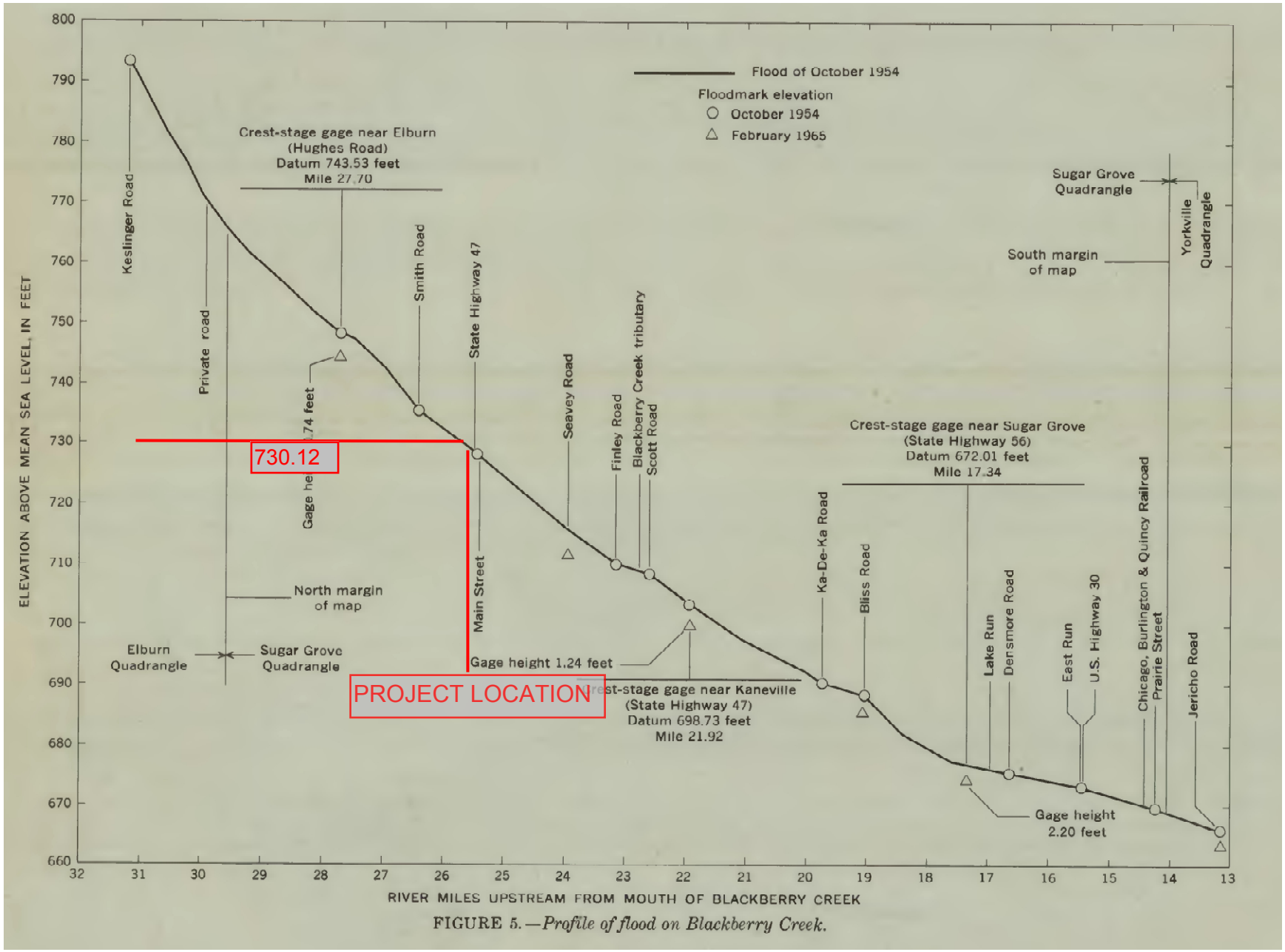
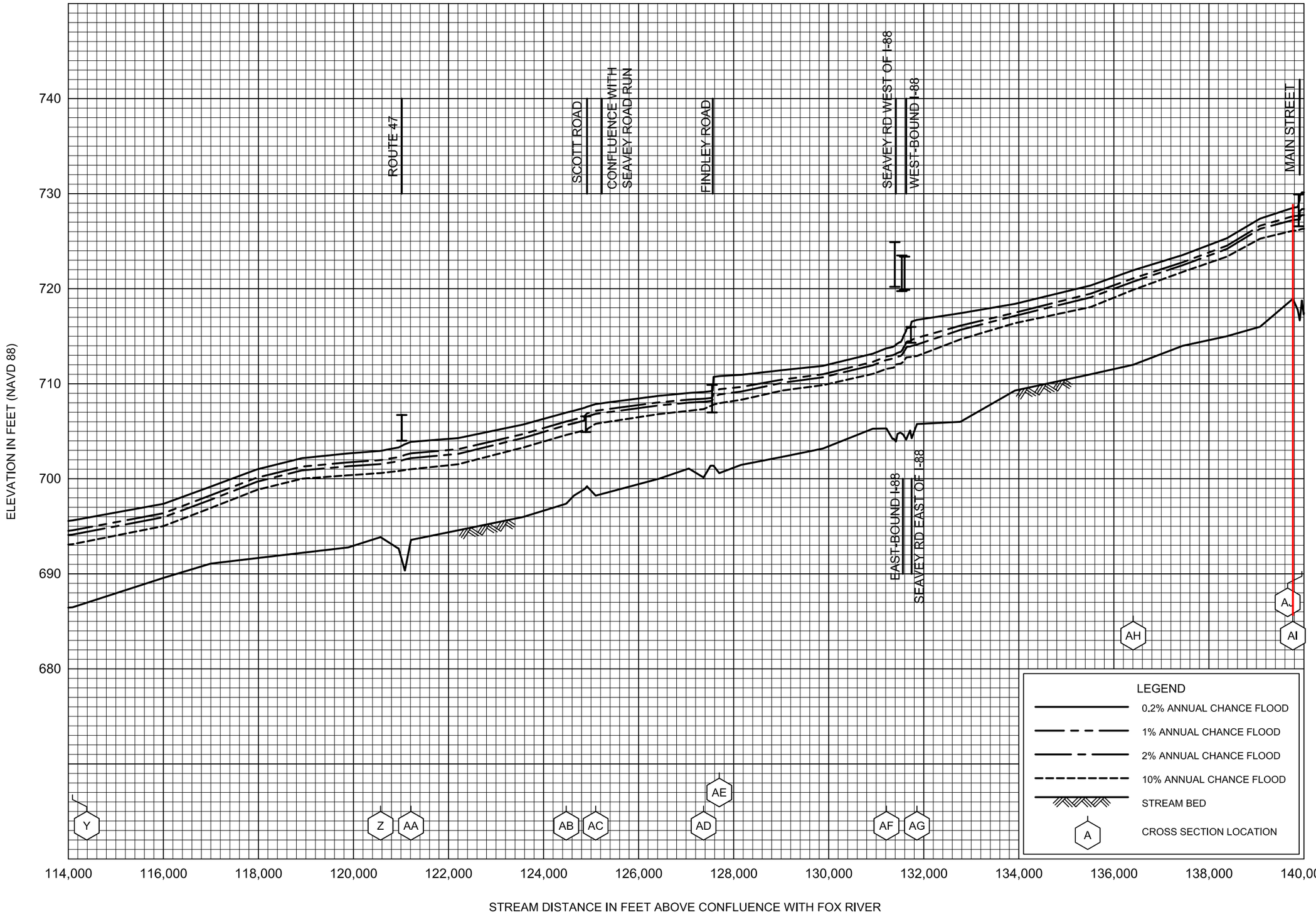


FIGURE 5.—*Profile of flood on Blackberry Creek.*



FLOOD PROFILES

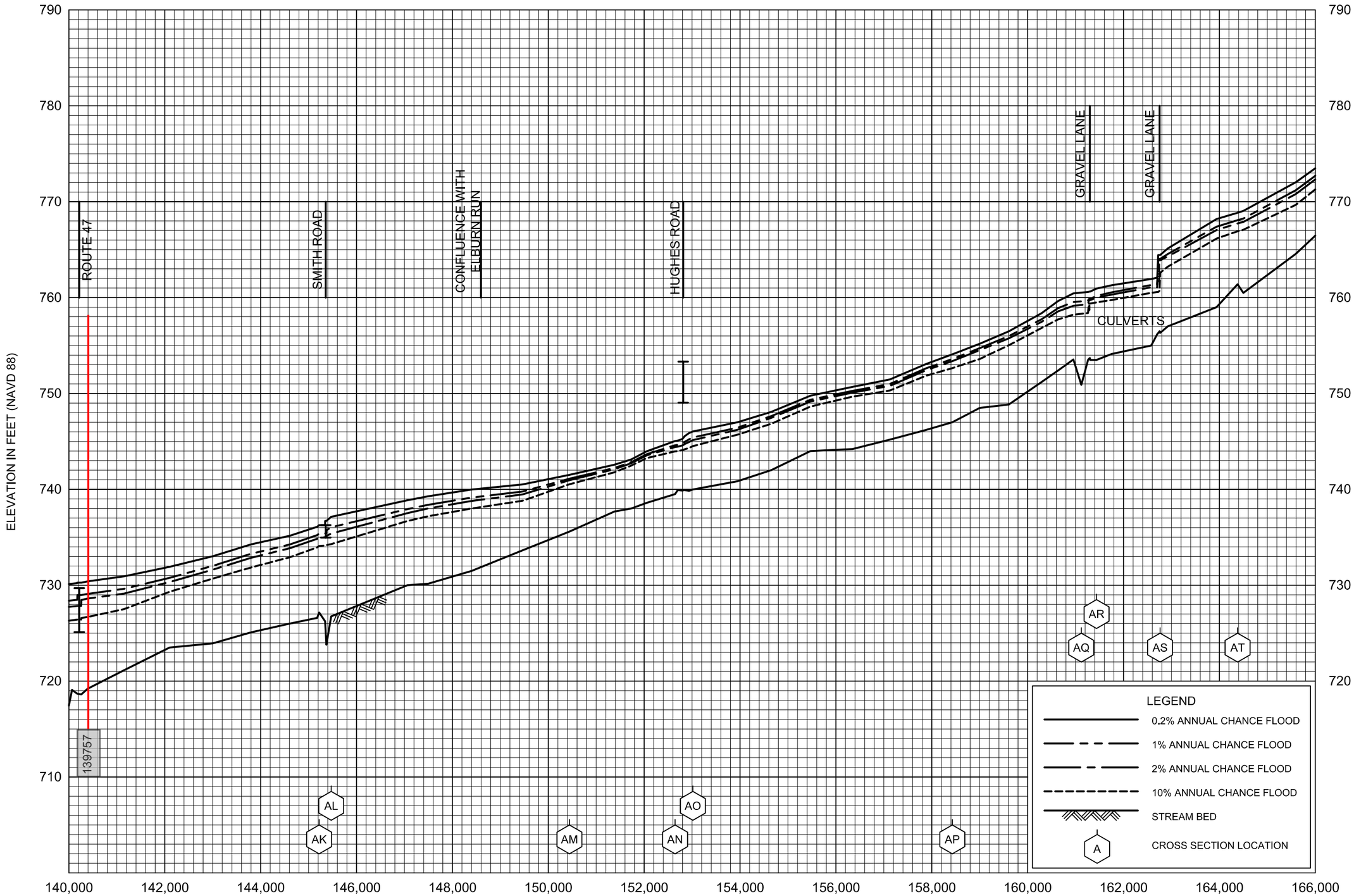
BLACKBERRY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

KANE COUNTY, IL

AND INCORPORATED AREAS

11P



FLOOD PROFILES

BLACKBERRY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

KANE COUNTY, IL

AND INCORPORATED AREAS

12P

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE (FEET)
Blackberry Creek (Continued)								
S	95,548[1]	969	3,443	1.7	677.3	677.3	677.4	0.0
T	96,310[1]	1912	6,742	1.0	677.8	677.8	677.9	0.1
U	104,948[1]	460	1,832	2.4	686.6	686.6	686.7	0.0
V	105,379[1]	482	2,757	1.6	688.3	688.3	688.3	0.0
W	108,915[1]	365	1,930	2.1	690.9	690.9	690.9	0.0
X	109,285[1]	412	2,292	1.5	691.5	691.5	691.5	0.0
Y	114,088[1]	467	2,331	2.0	694.6	694.6	694.6	0.0
Z	120,569[1]	683	3,884	1.4	702.0	702.0	702.0	0.0
AA	121,210[1]	615	2,724	1.6	702.7	702.7	702.7	0.0
AB	124,477[1]	621	1,952	2.6	706.0	706.0	706.1	0.0
AC	125,096[1]	1103	3,377	2.2	707.2	707.2	707.1	0.0
AD	127,367[1]	665	1,864	2.5	708.4	708.4	708.4	0.0
AE	127,697[1]	650	2,586	1.7	709.4	709.4	709.4	0.0
AF	131,215[1]	237	738	2.8	712.9	712.9	713.0	0.1
AG	131,857[1]	216	767	3.4	714.8	714.8	714.9	0.1
AH	136,407[1]	340	792	2.7	721.1	721.1	721.1	0.0
AI	139,767[1]	186	827	2.2	727.6	727.6	727.6	0.0
AJ	139,956[1]	348	1,788	1.6	728.4	728.4	728.4	0.0
AK	145,220[1]	208	849	2.5	735.4	735.4	735.4	0.0
AL	145,472[1]	240	994	2.3	736.1	736.1	736.1	0.0
AM	150,442[1]	624	538	2.8	741.1	741.1	741.1	0.0
AN	152,644[1]	343	762	2.1	744.6	744.6	744.6	0.0
AO	153,016[1]	268	623	2.4	745.4	745.4	745.5	0.1
AP	158,428[1]	247	527	1.3	753.6	753.6	753.6	0.0
AQ	161,120[1]	358	863	1.8	759.6	759.6	759.6	0.0

[1]Feet above confluence with Fox River

TABLE 12

FEDERAL EMERGENCY MANAGEMENT AGENCY

KANE COUNTY, IL AND INCORPORATED AREAS

FLOODWAY DATA

BLACKBERRY CREEK

Table 8 - Summary of Discharges (Continued)

Flooding Source and Location	*Drainage Area (square miles)*	*Peak Discharges (cubic feet per second)* 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
BLACKBERRY CREEK					
At intersection with US Highway 30	57.1	1,325	2,302	2,808	4,218
At confluence with Aurora Chain of Lakes (approximately 190 feet upstream of Jericho Road)	52.4	1,347	2,373	2,910	4,421
Approximately 80 feet downstream of Burlington Railroad	51.4	1,497	2,465	2,952	4,286
At upstream of confluence with East Run and approximately 300 feet upstream of Galena Road	45.9	1,401	2,286	2,742	3,984
At confluence with Lake Run (approximately 1800 feet downstream of Illinois Route 56)	31.9	1,037	1,681	2,003	2,875
At confluence with Prestbury Branch (approximately 2740 feet upstream of Illinois Route 56)	27.8	995	1,637	1,961	2,847
Approximately 140 feet upstream of Ke-De-Ka Road	25.5	1,003	1,675	2,018	2,961
Approximately 4140 feet downstream from Illinois Route 47	23.5	992	1,670	2,017	2,976
Approximately 550 feet upstream of Scott Road (90 feet upstream of junction with Seavey Road Run)	15.0	719	1,221	1,477	2,189
Approximately 240 feet upstream of Interstate 88	13.4	717	1,261	1,545	2,348
Approximately 50 feet upstream of Illinois Route 47	11.2	634	1,120	1,376	2,097
At confluence with Elburn Run (approximately 3200 feet upstream of Smith Road)	7.0	316	537	651	966
Approximately 125 feet upstream of Hughes Road	6.0	303	523	637	956

F. DATUM CORRELATION

The FIS study used as a basis for this study was correlated to the state's vertical datum.

Cross -Sections and streambed profiles, along with culvert cross sections, and roadway cross sections and profiles, were obtained by a topographic survey performed for this report.

The elevations used throughout this report, and in waterway information tables (WIT), corresponds to the projects vertical datum.

Survey controls in the watershed were established by the Illinois Department of Natural Resources-Office of Water Resources (IDNR-OWR) and benchmark points were established by Smith Engineering Consultants, Inc., using the differential (also known as real-time kinematic (RTK)) global positioning system technique (Bill Rice, Illinois Department of Natural Resources-Office of Water Resources, written commun., 2001). The benchmark network was referenced to present (2000-01) Kane County and Illinois Department of Transportation (IDOT) first-order control stations along with U.S. Geological Survey (USGS) benchmarks. The Kane County and IDOT stations were held in the adjustment using NAVD88 altitudes. The USGS benchmarks originally were established on NGVD29 and benchmark elevations were converted to NAVD88 using the CORPSCON program. The final survey control was based upon NAVD88 and checked within 0.1 foot with the available USGS benchmark NAVD88 values.

Blackberry Creek Control Survey, Kane County (survey by Smith Engineering Consultants, Inc. in 2001)

STATION NAME	LATITUDE (Degrees, Minutes, Decimal Seconds)	LONGITUDE (Degrees, Minutes, Decimal Seconds)	NAD83 (1997) NORTHING, feet	NAD83 (1997) EASTING, feet	NAVD88 ALTITUDE, feet	ELLIPSOID HEIGHT
KA01	41°54'13.02815"N	88°26'35.18503"W	1907487.76	954367.15	852.50	744.07
KA02	41°53'21.30201"N	88°26'35.56259"W	1902252.00	954331.89	819.61	711.22
KA03	41°52'53.82998"N	88°26'58.08045"W	1899473.49	952625.00	828.36	719.99
KA04	41°52'53.97877"N	88°27'42.87570"W	1899493.38	949236.56	815.02	706.66
KA05	41°52'05.80106"N	88°27'03.93830"W	1894612.56	952175.23	811.85	703.49
KA06	41°52'18.53974"N	88°27'37.92330"W	1895905.65	949605.86	814.61	706.25
KA07	41°51'11.10504"N	88°24'52.58298"W	1889064.66	962108.21	758.36	649.98
KA08	41°51'43.26010"N	88°24'52.88649"W	1892319.44	962088.32	785.67	677.28
KA09	41°51'58.22618"N	88°27'37.18117"W	1893849.40	949658.97	788.32	679.97
KA10	41°51'58.19769"N	88°28'03.67118"W	1893849.57	947654.69	801.06	692.72
KA11	41°50'44.69659"N	88°28'02.39124"W	1886409.58	947739.92	751.39	643.07
KA12	41°50'38.83648"N	88°25'28.78049"W	1885801.17	959365.42	761.25	652.90
KA13	41°50'38.11571"N	88°26'14.08465"W	1885732.11	955936.37	769.50	661.15
KA14	41°49'18.19860"N	88°28'29.87296"W	1877657.56	945645.51	717.19	608.88
KA15	41°48'46.75849"N	88°28'24.74761"W	1874474.55	946028.38	706.78	598.48
KA16	41°48'15.35408"N	88°27'09.06483"W	1871287.15	951754.99	710.22	601.92
KA17	41°47'53.08540"N	88°26'38.24596"W	1869030.00	954086.15	728.36	620.06
KA18	41°43'21.03030"N	88°22'33.21431"W	1841476.31	972631.65	666.23	557.98
KA19	41°44'29.98625"N	88°22'50.08442"W	1848456.60	971356.21	665.03	556.77
KA20	41°45'06.24804"N	88°22'51.59164"W	1852127.04	971243.99	670.85	562.59
KA21	41°46'08.78989"N	88°24'48.84912"W	1858464.07	962362.21	707.12	598.85
KA22	41°46'27.20391"N	88°24'43.62497"W	1860327.55	962759.78	680.23	571.95
KA23	41°46'51.50351"N	88°24'34.59360"W	1862786.53	963446.27	694.19	585.90
KA24	41°47'23.54176"N	88°24'24.63355"W	1866028.77	964203.63	686.68	578.39
KA25	41°48'37.33456"N	88°24'18.28677"W	1873497.65	964690.64	698.28	589.95
KA26	41°49'43.80006"N	88°24'07.84285"W	1880224.65	965486.92	702.70	594.35
KA27	41°50'47.64114"N	88°23'33.78626"W	1886684.74	968069.66	706.68	598.28
KA28	41°50'49.54554"N	88°24'01.08774"W	1886879.03	966003.51	726.69	618.30
KA29	41°50'44.04225"N	88°24'34.30474"W	1886324.08	963489.02	732.99	624.62

Kane County survey by Smith Engineering Consultants, Inc. in 2001

STATION NAME	LATITUDE (Degrees, Minutes, Decimal Seconds)	LONGITUDE (Degrees, Minutes, Decimal Seconds)	NAD83 (1997) NORTHING, feet	NAD83 (1997) EASTING, feet	NAVD88 ALTITUDE, feet	ELLIPSOID HEIGHT
KA30	41°49'39.30287"N	88°25'49.28516"W	1879776.85	957806.66	722.53	614.20
KA31	41°49'18.54602"N	88°27'01.40211"W	1877682.64	952344.04	715.55	607.23
KA32	41°48'57.09405"N	88°27'16.26922"W	1875512.83	951215.33	717.60	609.30
KA33	41°45'56.76918"N	88°22'41.65287"W	1857240.33	971999.98	676.79	568.51
KA34	41°46'34.62884"N	88°23'07.77987"W	1861073.57	970022.40	674.67	566.38

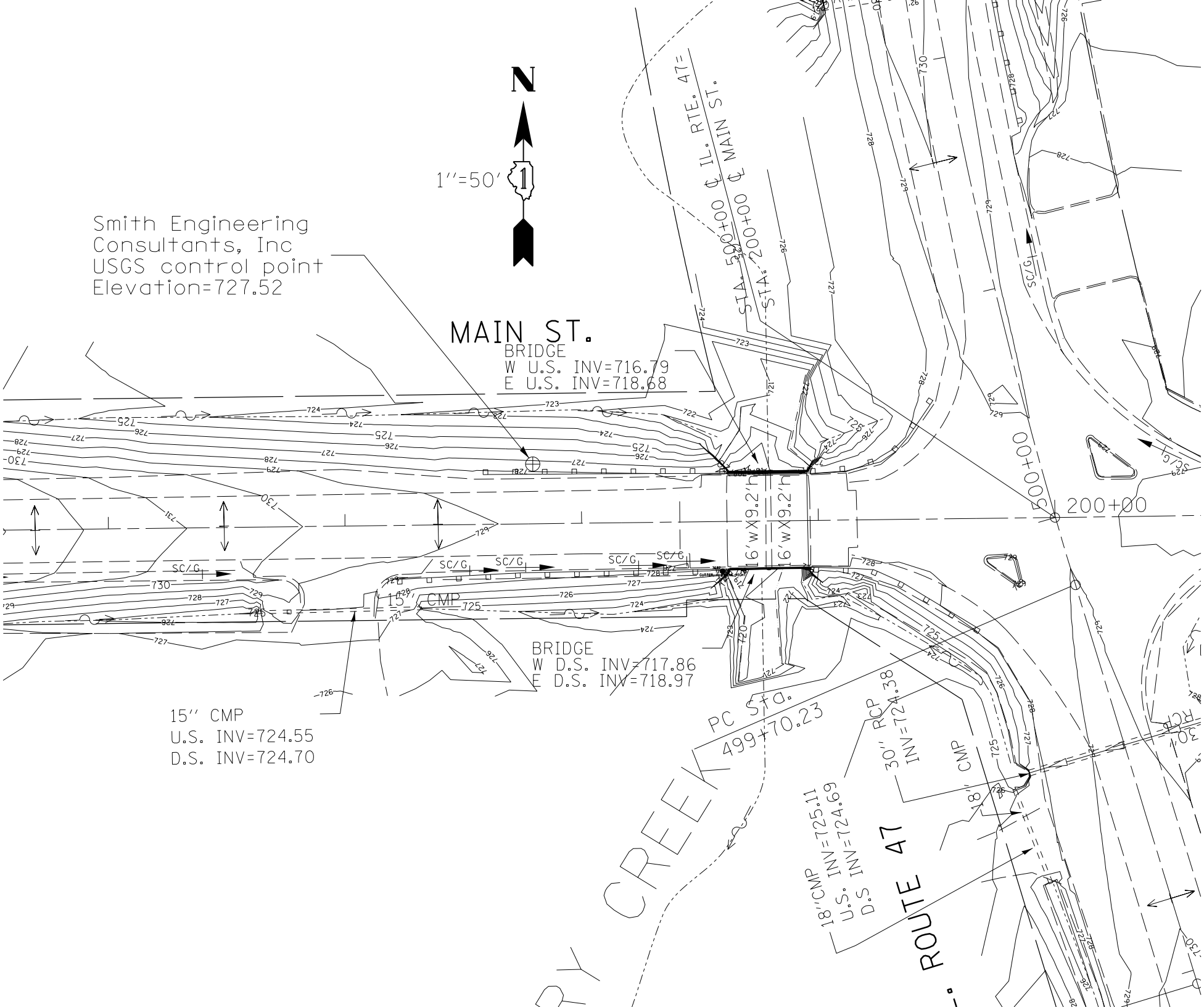
Kane County survey by Smith Engineering Consultants, Inc. in 2001 (cont.)

STATION NAME	LATITUDE (Degrees, Minutes, Decimal Seconds)	LONGITUDE (Degrees, Minutes, Decimal Seconds)	NAD83 (1997) NORTHING, feet	NAD83 (1997) EASTING, feet	NAVD88 ALTITUDE, feet	ELLIPSOID HEIGHT
KA35	41°47'12.51824"N	88°23'07.96989"W	1864908.72	970010.33	699.90	591.60
KA36	41°47'44.44423"N	88°22'32.32762"W	1868138.78	972712.01	700.46	592.14
KA37	41°48'26.05067"N	88°21'59.91354"W	1872349.09	975168.83	710.99	602.64
KA38	41°46'04.96245"N	88°24'14.20454"W	1858074.36	964987.11	704.51	596.24
IL-KANE-34-38-8	41°43'42.60815"N			6	668.57	560.30
IL-KANE-25-38-7	41°44'23.27295"N			8	667.77	559.52
SUGAR AZIMUTH	41°45'18.16117"N			4	696.16	587.88
IL-KANE-19-38-8	41°45'53.80400"N			5	671.38	563.10
KAN47-2B	41°47'29.71036"N			0	721.98	613.69
IL-KANE-6-38-7	41°47'41.61164"N			7	722.92	614.61
USGS 2RGW 1963	41°47'42.81799"N	88°22'45.85829"W	1867974.70	971687.04	704.60	596.28
IL-KANE-32-39-8	41°49'08.36242"N	88°20'39.80236"W	1876630.32	981236.28	730.81	622.42
IL-KANE-26-39-7	41°49'51.29294"N	88°24'49.08744"W	1880985.79	962365.19	734.64	626.29
IL-KANE-20-39-7	41°50'29.22552"N	88°28'07.37079"W	1884844.18	947360.57	727.52	619.21
IL-KANE-16-39-7	41°51'51.49034"N	88°26'52.76400"W	1893162.87	953018.73	748.29	639.93
IL-KANE-18-39-8	41°51'56.02211"N	88°22'19.75289"W	1893603.11	973675.98	707.91	599.46
IL-KANE-12-39-6	41°52'51.25425"N	88°30'11.50842"W	1899237.15	937992.95	839.50	731.16
KAN47-3A	41°54'04.80518"N	88°28'19.71427"W	1906666.87	946461.57	904.74	796.35

Benchmark station 80' west of the northwest corner of Main St Bridge, see Sketch for more details.

Kendall County, Illinois Department of Natural Resources-Office of Water Resources Survey in 2001

STATION NAME	LATITUDE (Degrees, Minutes, Decimal Seconds)	LONGITUDE (Degrees, Minutes, Decimal Seconds)	NAD 83 (1997) NORTHING, feet	NAD 83 (1997) EASTING, feet	NAVD 88 ALTITUDE, feet	ELLIPSOID HEIGHT
B50	41°41'12.37791"N	88°25'45.37334"W	1828466.081	958045.596	643.27	535.01
BRISTOL	41°40'00.76154"N	88°31'05.92808"W	1821256.894	933708.678	645.54	537.14
KA18	41°43'21.03029"N	88°22'33.21431"W	1841476.306	972631.654	666.17	557.92
IL-KANE-25-38-7	41°44'23.27294"N	88°23'11.12055"W	1847778.013	969761.084	667.66	559.40
KE01	41°42'55.14083"N	88°22'40.90849"W	1838856.114	972046.839	661.68	553.44
KE02	41°42'42.91773"N	88°23'03.73987"W	1837619.877	970314.593	662.17	553.93
KE03	41°42'24.24117"N	88°23'34.39712"W	1835730.963	967988.144	661.26	553.01
KE04	41°41'43.28699"N	88°24'26.06817"W	1831588.699	964065.377	651.76	543.51
KE05	41°41'29.50152"N	88°24'21.92063"W	1830193.096	964378.842	651.32	543.08
KE06	41°40'44.29038"N	88°24'36.12543"W	1825617.862	963297.091	646.86	538.63
KE07	41°40'32.21338"N	88°25'09.60703"W	1824397.855	960755.225	650.69	542.45
KE08	41°40'29.44330"N	88°26'39.00846"W	1824125.223	953970.565	646.53	538.25
KE09	41°40'09.87719"N	88°26'30.13042"W	1822143.934	954641.800	638.38	530.12
KE10	41°39'37.49002"N	88°27'32.90639"W	1818872.262	949872.752	635.17	526.89
KE11	41°39'28.72072"N	88°26'51.20695"W	1817980.250	953036.716	637.56	529.30
M20	41°31'54.71323"N	88°26'00.71974"W	1772022.598	956815.674	648.00	539.64
ZAUB	41°47'35.84882"N	88°19'50.01696"W	1867265.924	985006.189	692.95	584.60


N
1''=50'
Smith Engineering
Consultants, Inc
USGS control point
Elevation=727.52
MAIN ST.
BRIDGE
W U.S. INV=716.79
E U.S. INV=718.68
STA. 50+00 ℄ IL. RTE. 47=
STA. 200+00 ℄ MAIN ST.
6'WX9.2'H
6'WX9.2'H
200+00
SC/G
15'' CMP
BRIDGE
W D.S. INV=717.86
E D.S. INV=718.97
15'' CMP
U.S. INV=724.55
D.S. INV=724.70
PC Sta.
499+70.23
30'' RCP
INV=724.38
CMP
18''CMP
U.S. INV=725.11
D.S. INV=724.69
ROUTE 47

G. SENSITIVE FLOOD RECEPTOR

Currently there is one sensitive flood receptor, upstream of the Route 47 culvert, the Blackberry Inn Bar & Grill Restaurant (See Section 7, Photographs).

This structure was noted as being flooded on at least one occasion. The building's low entry elevation is 730.12 feet (100-year base flood elevation, BFE, is 729.10 feet).

It should be noted that this structure will be removed as part of this project and the property will be used for Compensatory Storage. With the removal of this structure the requirement for keeping the increase in floodwaters under 0.10 feet is no longer applicable.

H. HYDROLOGIC METHODOLOGY

No hydrologic study was performed for this project. Hydrologic data was obtained from the existing FIS study of Blackberry Creek.

I. HYDRAULIC METHODOLOGY

Hydraulic Engineering Center – River Analysis System (HEC-RAS) software was used to prepare the hydraulic analysis (the FIS study also used HEC-RAS software).

Blackberry Creek Cross sections weNŜ surveyed as part of this report.

N values were obtained from the FIS study, checked and modified, as required, to fit the surveyed cross sections.

Starting water surface elevations were obtained from the FIS study.

See Section 15 for detailed hydraulic analysis for all Groups.

J. SUMMARY OF NATURAL AND EXISTING HYDRAULIC ANALYSIS

Blackberry Creek in this reach appears to have not been altered by earthworks or channelization. Therefore, to approximate the natural conditions in the hydraulic analysis the natural condition model was prepared by removing the existing IL Rt. 47 drainage structure along with its upstream and downstream cross section. N values for the natural conditions were checked and adjusted as necessary.

The elevation shown on the WIT's were obtained from the output data of the HEC-RAS reports for the 10 yr, 50 yr, 100 yr and 500 year flood frequencies. The natural, existing and proposed elevations were taken at the upstream end of the drainage structures (existing and proposed conditions).

Waterway openings were obtained by calculating the cross sectional areas in Microstation. The area calculated was between the natural water level and the existing channel at the upstream face of the existing and proposed drainage structures.

The approach section was created by using a contraction ratio of 1:1 to a point where contraction was determined to begin. A new cross section was created at this point by interpolating the surveyed cross sections.

Created Head Calculation was determined by subtracting the existing and proposed water surface elevations from the natural conditions water surface elevations for each storm frequency. The natural condition model referenced is where both IL 47 and Main St structures and bounding cross-sections were removed.

Freeboard criteria used was a minimum 3' clearance from the water surface elevation of the design frequency storm, 50 yr, and the edge of the proposed roadway pavement (low side of the superelevated roadway section) at the southern upstream floodplain limits located at Sta. 501+17.

Freeboard criteria resulted in raising the roadway several feet. The impacts of the raised roadway include floodplain/floodway fills and right of way impacts. The Blackberry Creek Inn Bar and Restaurant property would be rendered inaccessible as the proposed driveway would end too close to the existing building for proper vehicle maneuvering.

The existing culvert impacts the natural conditions by raising the water surfaces elevation as follows:

- 10 yr. flood frequency has a created head of 0.07'
- 50 yr. flood frequency has a created head of 0.38'
- 100 yr. flood frequency has a created head of 0.32'
- 500 yr. flood frequency has a created head of 0.00' (overtopping IL-47)

HEC-RAS software Errors and Warnings were addressed during the development of the hydraulic analysis. Adjustments were made in the HEC-RAS models to eliminate the significant warnings messages.

K. PROPOSED STRUCTURE ANALYSIS

The location of the proposed structure is on the same center line as the existing structure. The proposed IL Rt. Route 47 drainage structure is a 3-sided Concrete Arch Culvert. The culvert span is proposed to be 54 feet with a 13 foot rise and the length will be 70 feet wide (headwall to headwall). The wingwall and abutment areas at the upstream face of the Arch Culvert will be armored with rip-rap as scour countermeasures (See Section 14, Culvert Section Plots-Proposed Conditions).

An alternate proposed structure was analyzed consisting of a 76 foot span, 66' long steel beam bridge for Phase II design and cost flexibility. The existing conditions upstream and downstream cross sections were adjusted for the proposed conditions. The shapes of these cross-sections were modified to detail the proposed structures geometry (76' clear opening with 2:1 side slopes). The low chord elevation is set at 730.1 feet, over 2' above the base flood elevation for the design storm (50 yr. flood frequency) in the Group 3 hydraulic analysis.

L. SCOUR ANALYSIS

A scour analysis was performed for the 54' x 13' 3-sided arch culvert. HEC-RAS software was used to develop abutment scour depth and manual HEC-18 calculations were used to calculate contraction scour depths (See Section 16, Scour Analysis, for details). The data used in the model is based on USGS soil data and field observations.

A summary of the scour analysis is as follows:

- Significant scour will occur for the Arch Culvert during 100 yr (18.79 ft) and the 500 yr (22 .74 ft).
- Soil Borings from 1976 for the Main street bridge were available and reveal that the soil strata varies from sand – gravel – silty clay – gravel. In one boring hole evidence of flowing sand was found at an elevation of approximately 714.8. Based on this initial information it appears that piers will be needed for any structure planned for this location.
- Given the potentially unstable strata of soil and possibly high scour depths it would be recommended to install piers/spread footing combination deep enough to minimize scour hazard. Once soil borings information is obtained in Phase 2, more precise scour depths can be calculated and foundation/pier designs can be completed.
- Wing walls will be incorporated into the design to allow for more efficient routing of floodwaters through the structure.
- Scour rip-rap design for the culvert will also be determined during Phase II work for the open abutment and low flow channel areas.
- The proposed bridge alternate requires rip-rap scour protection for the slopewalls.

M. COMPENSATORY STORAGE

Compensatory storage is required for this project and requires ROW acquisition. The IDOT criteria of 1:1 will be used for replacement of floodway storage. The location of the compensatory storage is proposed to be located on the current Blackberry Creek Inn site.

The locations of the proposed compensatory storage area, along with the supporting calculations are contained in Section 19, Compensatory Storage.

The required compensatory storage is 0 cubic yards of fill in the floodway for the 0-10 year flood frequency (Floodway excavation exceeds Floodway fill) and 759 cubic-yards of fill in the floodway for the 10-100 year flood frequency. The proposed compensatory storage provided is 1172 cubic-yards for the 0-10 year flood frequency and 2120 cubic-yards for the 10-100 year frequency. The compensatory storage provides storage for both floodway and floodplain fills. The compensatory storage will be situated on the current Blackberry Creek Inn property and is hydraulically connected to Blackberry Creek.

N. PERMIT REQUIREMENTS

A floodway permit will be necessary since replacement of the culvert with a 3-sided Arch Culvert is not considered maintenance under the IDNR/OWR Part 3708 rules (See Section 18 - Permit Summary Form). The project scope requires a new profile increase to meet freeboard requirements. The proposed 3-sided Arch Culvert is an appropriate use of the regulated floodway as it does not result in an increase of upstream flood stages by more than 0.1 foot when compared to the existing conditions for all flood events up to and including the 100-year frequency events. The current upstream structure, which has been damaged in the past, is being acquired due to geometry issues related to the profile increase that prevent access to the property from occurring. The structure (Blackberry Creek Inn Bar & Grill) on the property will be removed and the property will be utilized for compensatory storage for fill placed in the floodway.

The project also meets Part 3708 rules for appropriate uses and provides compensatory floodway storage that is available between the normal water elevation and the proposed 100-year flood elevation. All storage lost above the existing 10-year flood elevation is replaced above the proposed 10-year flood elevation.

The regulatory floodway velocities will also be kept at or lowered from existing conditions with the wider span of the proposed Arch Culvert.

O. FREEBOARD

The design of the proposed IL Rt. 47 3-sided Arch Culvert meets the requirements for freeboard, specifically:

- Freeboard criteria used was a minimum, 3’ clearance from the water surface elevation of the design frequency storm, 50 yr, and the edge of the proposed roadway pavement (low side of the super-elevated roadway section).

P. CONCLUSION

The conclusions of the reports are summarized as follows:

- The existing IL Rt. 47 drainage structure is undersized and is proposed to be replaced with a 3-sided concrete arch culvert.
- There is a sensitive flood receptor located at the north east corner of the intersection of IL Rt. 47 and Main Street, the Blackberry Inn. This sensitive flood receptor is proposed to be acquired and the subsequent property will be used as compensatory storage.
- Rip-Rap and foundation piles may be required for scour countermeasures.
- Compensatory storage is required for roadway floodplain fill.
- Water surface elevations in the proposed conditions will be lower than existing conditions.

Section 4: WATERWAY INFORMATION TABLE (WIT) SCENARIO TABLE

WIT	Scenario
Group #1 WIT Arch (Exhibit 1-03.2a)	• Existing Main Street bridge geometry used in all models (Natural, Existing, and Proposed) • Natural Condition uses Existing Main Street bridge and removes the Route 47 Structure • Existing Condition models the existing Route 47 Culvert • Proposed Condition models the Route 47 3-Sided Arch Culvert • Cross-Sections and stream geometry surveyed by Globetrotters Engineering
Group #1 WIT Bridge (Exhibit 1-03.2b)	• Existing Main Street bridge geometry used in all models (Natural, Existing, and Proposed) • Natural Condition uses Existing Main Street bridge and removes the Route 47 Structure • Existing Condition models the existing Route 47 Culvert • Proposed Condition models the proposed alternate Route 47 Bridge • Cross-Sections and stream geometry surveyed by Globetrotters Engineering
Group #2 WIT Arch (Exhibit 1-03.2a)	• Proposed Main Street bridge geometry used in all models (Natural, Existing, and Proposed) • Natural Condition uses Proposed Main Street bridge and removes the Route 47 Structure • Existing Condition models the existing Route 47 Culvert • Proposed Condition models the proposed Route 47 3-Sided Arch Culvert • Cross-Sections and stream geometry surveyed by Globetrotters Engineering
Group #2 WIT Bridge (Exhibit 1-03.2b)	• Proposed Main Street bridge geometry used in all models (Natural, Existing, and Proposed) • Natural Condition uses Proposed Main Street bridge and removes the Route 47 Structure • Existing Condition models the existing Route 47 Culvert • Proposed Condition models the proposed alternate Route 47 Bridge • Cross-Sections and stream geometry surveyed by Globetrotters Engineering
Group #3 WIT Arch (FIS) (Exhibit 1-03.2a)	• Existing Main Street bridge geometry used in all models (Natural, Existing, and Proposed) • Natural Condition uses Existing Main Street bridge and removes the Route 47 Structure • Existing Condition models the existing Route 47 Culvert • Proposed Condition models the proposed Route 47 3-Sided Arch Culvert • Cross-Sections and stream geometry surveyed by USGS consultants
Group #3 WIT Bridge (FIS) (Exhibit 1-03.2b)	• Existing Main Street bridge geometry used in all models (Natural, Existing, and Proposed) • Natural Condition uses Existing Main Street bridge and removes the Route 47 Structure • Existing Condition models the existing Route 47 Culvert • Proposed Condition models the proposed Route 47 Bridge • Cross-Sections and stream geometry surveyed by USGS consultants
Group #4 WIT Arch (FIS) (Exhibit 1-03.2a)	• Proposed Main Street bridge geometry used in all models (Natural, Existing, and Proposed) • Natural Condition uses Proposed Main Street bridge and removes the Route 47 Structure • Existing Condition models the existing Route 47 Culvert • Proposed Condition models the proposed Route 47 3-Sided Arch Culvert • Cross-Sections and stream geometry surveyed by USGS consultants
Group #4 WIT Bridge (FIS) (Exhibit 1-03.2b)	• Proposed Main Street bridge geometry used in all models (Natural, Existing, and Proposed) • Proposed Main Street bridge geometry used in all models (Natural, Existing, and Proposed) • Natural Condition uses Existing Main Street bridge and removes the Route 47 Structure • Existing Condition models the existing Route 47 Culvert • Proposed Condition models the proposed Route 47 Bridge • Cross-Sections and stream geometry surveyed by USGS consultants

HEC-RAS WATERWAY INFORMATION TABLE (Route 47 3-Sided Arch) (Exhibit 1-03.2a)

Group #1 WIT (Existing Main Street Bridge Geometry in place, Existing Culvert and Proposed Arch under 47)

Route:	IL Route 47	Existing S.N.:	045-2000		
Waterway:	Blackberry Creek - Main before D	Proposed S.N.:	045-2050		
Section:	107B-I-1	Prepared By:	SJS	Date:	Sep-14
County:	Kane	Checked By:	DH	Date:	Sep-14

Drainage Area = 11.3 sq mi

Existing Overtopping Elevation = 729.53 at Sta. 501+17

Proposed Overtopping Elevation = 733.97 at Sta. 501+17

Flood	Frequency Year	Existing Discharge (cfs)	Proposed Discharge (cfs)	Waterway Opening (sq. ft.)		Natural H.W.E.	Head (ft.)		Headwater Elev. (ft)	
				Existing	Proposed		Existing	Proposed	Existing	Proposed
	10	634	634	203.2	313.2	726.35	0.07	0.15	726.42	726.50
DESIGN	50	1120	1120	203.2	377.8	728.04	0.38	0.11	728.42	728.15
BASE	100	1376	1376	203.2	402.6	728.72	0.32	0.14	729.04	728.86
MAX. CALC.	500	2097	2097	957.0~	430.5	730.11	0.00	0.34	729.85	730.45

Datum: NAVD88

ALL - TIME H.W.E. & DATE: 731.12 ft, inside Blackberry Inn, July 16-18, 1996

Surveyed Normal Water Level: 719.83 ft

10 YEAR VELOCITY THROUGH EXISTING STRUCTURE = 3.14 ft/s

10 YEAR VELOCITY THROUGH PROPOSED ARCH = 2.02 ft/s

2-Yr. Flow Rate = 265 ft^3/s

EXISTING STRUCTURE

TYPE: RC Box Culvert

LENGTH/WIDTH: (2) 6.5' x 8.75' & (2) 6.5'x10.42'

 # SPANS/CELLS: 4

SKEW : 0 (relative to road)

LOW EOP: 728.59 @ 501+17 20' RT

FREEBOARD: 0.17 ft

CULVERT INV. 718.38 (U/S) 718.25 (D/S)

PROPOSED STRUCTURE

3-SIDED CULVERT TYPE: Pre-Cast Concrete Arch

LENGTH OF SPAN: 54'

 # CELLS: 1

TOP OF CROWN ELEVATION: 731.36

SKEW : 0 (relative to road)

FLOWLINE ELEV: 718.63 (u/s) 718.52 (d/s)

LOW EOP: 733.52 @ 501+17 60' RT

FREEBOARD: 5.41 ft

NOTES:
Proposed structure details are preliminary. Subject to refinement in TS&L stage.
Waterway openings are based on the natural H.W.E.
Natural HWE taken from cross-section 139757 in Group #1 Natural Conditions model.
The existing head is the difference in water surface elevations between existing and natural conditions.
The proposed head is the difference in water surface elevations between proposed and natural conditions
The freeboard is calculated from the edge of the proposed shoulder at 500+17
Existing Proposed Discharge Rates are based on USGS model used to develop the FIS profiles.
~ Waterway opening includes overtopping area (measured in Microstation) + Existing Culvert Area

Group #1 - Arch

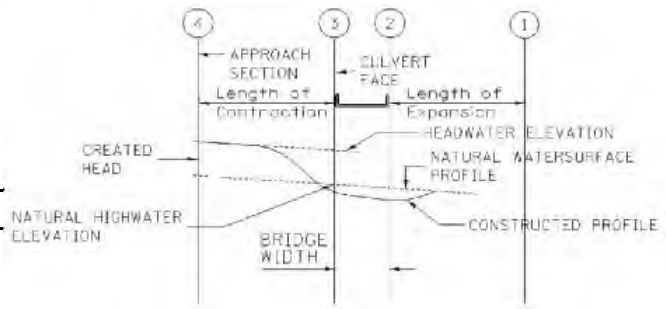
BACKUP CALCULATIONS: Group #1 WIT

Route: IL Rte 47 @ Main Street

Waterway: Blackberry Creek - Main before D

Calculated: SJS Date: Sep-14

Checked: DH Date: Sep-14



Natural WSE

Storm Event	Departure Section #1	Approach Section #4	Structure Face (at Section #4)
	(ft)	(ft)	(ft)
10-year	726.3	726.35	726.35
50-year	727.96	728.04	728.04
100-year	728.52	728.72	728.72
500-year	730.00	730.11	730.11

Section #1 : 139512[+]

Section #4 : 139757

Created Head

Storm Event	Natural Cond. Section #4 [1]	Ex. Cond. /Section #4 [2]	Proposed Cond./Section #4 [3]	Existing Created Head	Proposed Created Head
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.35	726.42	726.5	0.07	0.15
50-year	728.04	728.42	728.15	0.38	0.11
100-year	728.72	729.04	728.86	0.32	0.14
500-year	730.11	729.85	730.45	-0.26	0.34

Headwater Elevation

Storm Event	Natural Cond WSE 139757	Existing Created Head	Proposed Created Head	Existing H.W.E.	Proposed H.W.E.
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.35	0.07	0.15	726.42	726.50
50-year	728.04	0.38	0.11	728.42	728.15
100-year	728.72	0.32	0.14	729.04	728.86
500-year	730.11	-0.26	0.34	729.85	730.45

[1] Natural Condition - Group #1 - Natural Conditions HEC-RAS Model.

[2] Existing Condition - Group #1 - Existing Conditions HEC-RAS Model.

[3] Proposed Condition - Group #1 - Proposed Condition HEC-RAS Model.

[+] Section numbers listed at the top right represent stream stations in feet.

BACK-UP CALCULATIONS FOR WIT: Group #1 (continued)

CALCULATE FREEBOARD AND CLEARANCE

LOW ROAD ELEVATION (ft)			
Existing	**Station**	**Proposed**	**Station**
728.59	501+17	733.56	501+17
LOW BEAM ELEVATION (ft)			
Existing	**Station**	**Proposed**	**Station**
N/A	N/A	N/A	N/A
PROPOSED FREEBOARD (ft)			
10-Yr	**50-Yr**	**100-Yr**	**500-Yr**
7.06	5.41	4.70	3.11
PROPOSED CLEARANCE (ft)			
10-Yr	**50-Yr**	**100-Yr**	**500-Yr**
N/A	N/A	N/A	N/A

CALCULATE EFFECTIVE WATER OPENING AREA FOR CULVERT

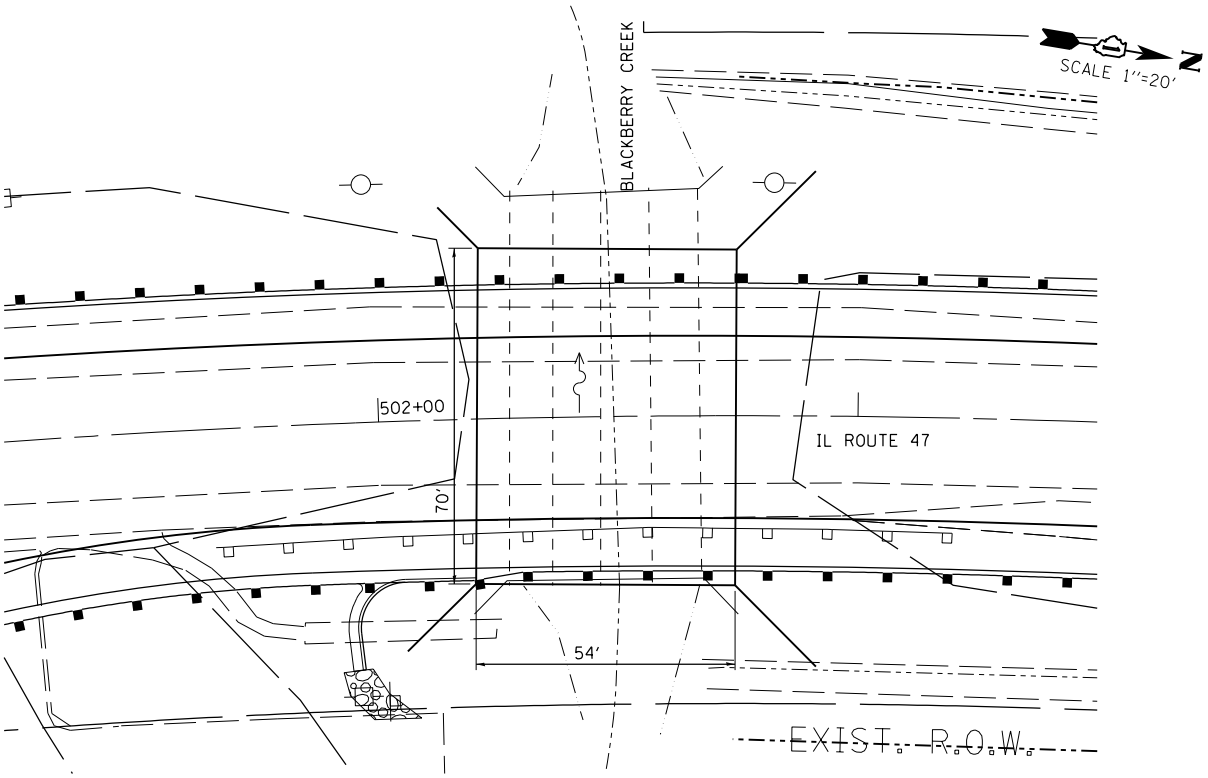
STRUCTURE SIZE (ft x ft)			
EXISTING WIDTH	**EXISTING HEIGHT**	**PROPOSED WIDTH**	**PROPOSED HEIGHT**
38.3	6.5	54	13
STRUCTURE INVERT ELEVATION (ft)			
EXISTING		**PROPOSED**	
U/S	D/S	U/S	D/S
718.38	718.25	718.63	718.52

WATERWAY OPENING AREA (ft^2)		
Frequency	**EXISTING**	**PROPOSED**
10-YR	203.2	313.2
50-YR	203.2	377.8
100-YR	203.2	402.6
500-YR	957.0	430.5

500-YR Existing Waterway Opening is the culvert area plus the overtopping area at the edge of existing pavement.

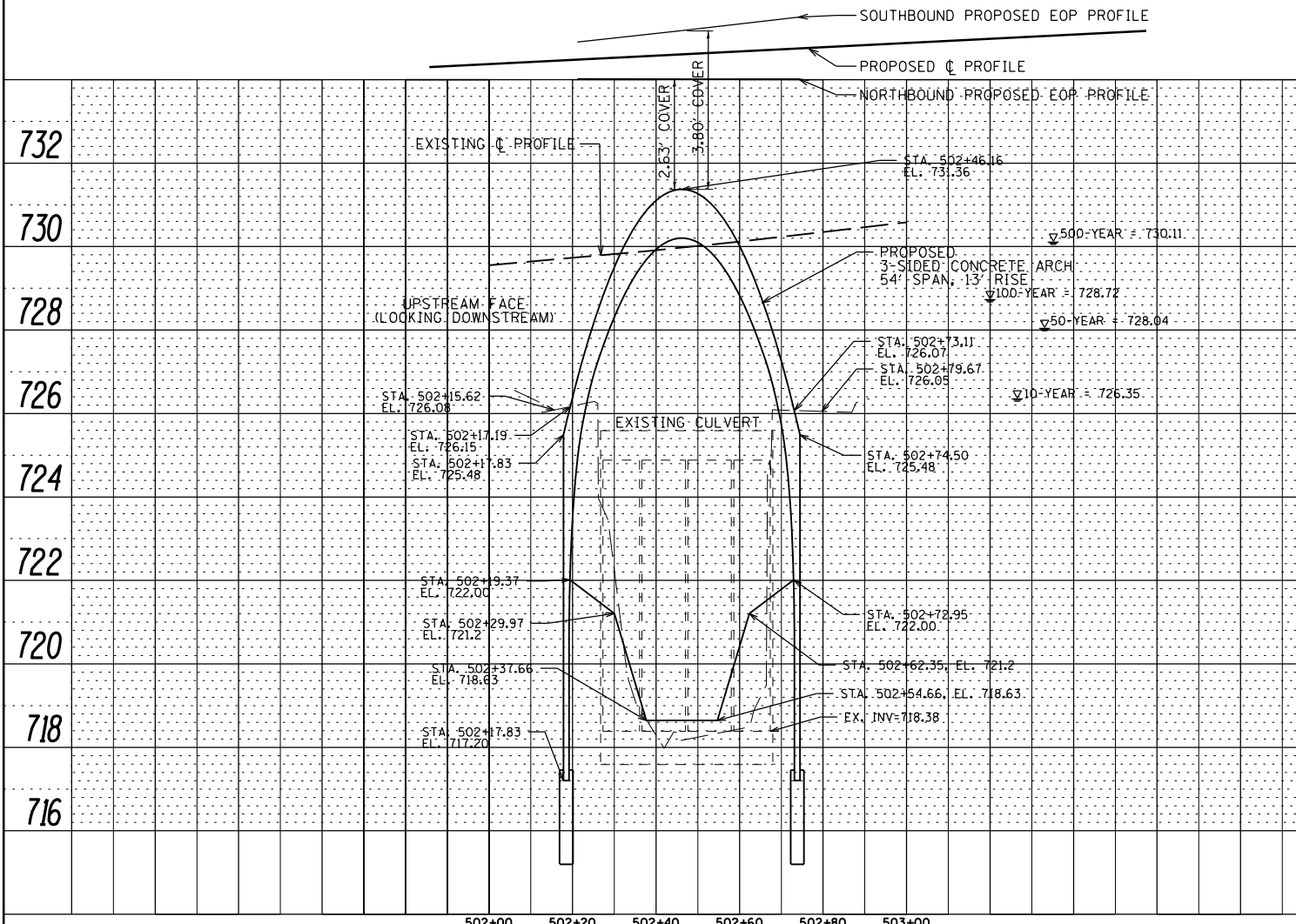
500-YR proposed Waterway Opening is above proposed concrete arch, and may result in pressure flow, no overtopping of pavement is expected.

Areas are measured in Microstation



PLAN

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



PROFILE

	BY	DATE
SURVEYED		
PLOTTED		
GRADES CHECKED		
B.M. NOTED		
STRUCTURE NOTATNS CH'KD		
NOTE BOOK		
NO.		

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	PLOT DATE = 9/3/2014	DATE -	REVISED -

STATE O
DEPARTMENT OF

Created Head - G#1 - Existing/Proposed Conditions - (Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: DH Date: Sep-14

(Proposed 3-sided Arch modeling is analyzed, 54' span)

Reach	River Sta		WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed Condition	Proposed Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	10-yr	729.15	729.15	0.00	729.15	0.00
Main Before D	140616		727.71	727.73	0.02	727.74	0.03
Main Before D	140504		727.54	727.55	0.01	727.57	0.03
Main Before D	140133		727.07	727.1	0.03	727.14	0.07
Main Before D	139757		726.35	726.42	0.07	726.50	0.15
Main Before D	139653		726.38	726.4	0.02	726.50	0.12
Main Before D	139628			726.36			
Main Before D	141476	50-yr	730.16	730.21	0.05	730.17	0.01
Main Before D	140616		729.01	729.18	0.17	729.05	0.04
Main Before D	140504		728.85	729.05	0.20	728.90	0.05
Main Before D	140133		728.47	728.75	0.28	728.55	0.08
Main Before D	139757		728.04	728.42	0.38	728.15	0.11
Main Before D	139653		728.04	728.34	0.30	728.10	0.06
Main Before D	139628			728.26			
Main Before D	141476	100-yr	730.64	730.7	0.06	730.67	0.03
Main Before D	140616		729.58	729.75	0.17	729.66	0.08
Main Before D	140504		729.43	729.62	0.19	729.52	0.09
Main Before D	140133		729.09	729.33	0.24	729.20	0.11
Main Before D	139757		728.72	729.04	0.32	728.86	0.14
Main Before D	139653		728.72	729.04	0.32	728.79	0.07
Main Before D	139628						
Main Before D	141476	500-yr	731.83	731.75	-0.08	731.95	0.12
Main Before D	140616		730.9	730.75	-0.15	731.14	0.24
Main Before D	140504		730.76	730.6	-0.16	731.01	0.25
Main Before D	140133		730.43	730.22	-0.21	730.72	0.29
Main Before D	139757		730.11	729.85	-0.26	730.45	0.34
Main Before D	139653		730.1	729.84	-0.26	730.32	0.22
Main Before D	139628						

Natural condition contains Existing Main St structure with 47 culvert removed
Existing condition contains Existing Main St structure and existing 47 culvert
Proposed condition contains Existing Main St structure and proposed 47 - 54' Arch Culvert

Created Head - G#1 - Existing/Proposed Conditions - 10-yr event (Exisitng Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed Condition	Proposed Created Head	WSEL G#1 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q10	729.15	729.15	0.00	729.15	0.00	729.15	0.00
Main Before D	140616	Q10	727.71	727.73	0.02	727.74	0.03	727.73	0.02
Main Before D	140504	Q10	727.54	727.55	0.01	727.57	0.03	727.56	0.02
Main Before D	140133	Q10	727.07	727.1	0.03	727.14	0.07	727.12	0.05
Main Before D	139757	Q10	726.35	726.42	0.07	726.50	0.15	726.45	0.10
Main Before D	139653	Q10	726.38	726.4	0.02	726.50	0.12	726.47	0.09
Main Before D	139628	Q10		726.36					
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545	Q10							
Main Before D	139512	Q10	726.3	726.23	-0.07	726.27	-0.03	726.27	-0.03
Main Before D	139364	Q10	726.12	726.12	0.00	726.06	-0.06	726.09	-0.03
Main Before D	139277	Q10	726	725.96	-0.04	725.90	-0.10	725.97	-0.03
Main Before D	139242	Q10	725.99	725.95	0.04	725.94	-0.05	725.96	-0.03
Main Before D	139250		Main Street Bridge						
Main Before D	139201	Q10	725.86	725.83	-0.03	725.93	0.07	725.83	-0.03
Main Before D	139180	Q10	725.72	725.71	-0.01	725.90	0.18	725.71	-0.01
Main Before D	139153	Q10	725.71	725.7	-0.01	725.83	0.12	725.70	-0.01
Main Before D	138370	Q10	724.87	724.87	0.00	725.00	0.13	724.87	0.00
Main Before D	138180	Q10	724.18	724.18	0.00	724.23	0.05	724.18	0.00
Main Before D	137750	Q10	723.29	723.29	0.00	723.36	0.07	723.29	0.00
Main Before D	136804	Q10	721.76	721.76	0.00	721.79	0.03	721.76	0.00

Natural condition contains Existing Main St structure with 47 culvert removed
Existing condition contains Existing Main St structure and existing 47 culvert
Proposed condition contains Existing Main St structure and proposed 47 - 54' Arch Culvert
Proposed BR condition contains Existing Main St structure and proposed 47 - Bridge

Created Head - G#1 - Existing/Proposed Conditions - 50-yr event (Exisitng Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed Condition	Proposed Created Head	WSEL G#1 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q50	730.16	730.21	0.05	730.17	0.01	730.17	0.01
Main Before D	140616	Q50	729.01	729.18	0.17	729.05	0.04	729.04	0.03
Main Before D	140504	Q50	728.85	729.05	0.20	728.90	0.05	728.88	0.03
Main Before D	140133	Q50	728.47	728.75	0.28	728.55	0.08	728.53	0.06
Main Before D	139757	Q50	728.04	728.42	0.38	728.15	0.11	728.12	0.08
Main Before D	139653	Q50	728.04	728.34	0.30	728.10	0.06	728.08	0.04
Main Before D	139628	Q50							
Main Before D	139600	Q50	Rt 47 Bridge or Culvert						
Main Before D	139545	Q50							
Main Before D	139512	Q50	727.96	727.81	-0.15	727.80	-0.16	727.86	-0.10
Main Before D	139364	Q50	727.76	727.74	-0.02	727.55	-0.21	727.67	-0.09
Main Before D	139277	Q50	727.56	727.48	-0.08	727.22	-0.34	727.46	-0.10
Main Before D	139242	Q50	727.5	727.42	0.08	727.30	-0.20	727.41	-0.09
Main Before D	139250	Q50	Main Street Bridge						
Main Before D	139201	Q50	727.16	727.08	0.08	727.04	-0.12	727.08	-0.08
Main Before D	139180	Q50	726.97	726.95	-0.02	726.96	-0.01	726.95	-0.02
Main Before D	139153	Q50	726.99	726.97	-0.02	726.97	-0.02	726.97	-0.02
Main Before D	138370	Q50	725.88	725.88	0.00	725.88	0.00	725.88	0.00
Main Before D	138180	Q50	725.07	725.07	0.00	725.07	0.00	725.07	0.00
Main Before D	137750	Q50	724.08	724.08	0.00	724.08	0.00	724.08	0.00
Main Before D	136804	Q50	722.47	722.47	0.00	722.47	0.00	722.47	0.00

Natural condition contains Existing Main St structure with 47 culvert removed
Existing condition contains Existing Main St structure and existing 47 culvert
Proposed condition contains Existing Main St structure and proposed 47 - 54' Arch Culvert
Proposed BR condition contains Existing Main St structure and proposed 47 - Bridge

Created Head - G#1 - Existing/Proposed Conditions - 100-yr event (Exisitng Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed Condition	Proposed Created Head	WSEL G#1 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q100	730.64	730.7	0.06	730.67	0.03	730.67	0.03
Main Before D	140616	Q100	729.58	729.75	0.17	729.66	0.08	729.68	0.10
Main Before D	140504	Q100	729.43	729.62	0.19	729.52	0.09	729.54	0.11
Main Before D	140133	Q100	729.09	729.33	0.24	729.20	0.11	729.23	0.14
Main Before D	139757	Q100	728.72	729.04	0.32	728.86	0.14	728.91	0.19
Main Before D	139653	Q100	728.72	729.04	0.32	728.79	0.07	728.86	0.14
Main Before D	139628	Q100							
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545	Q100							
Main Before D	139512	Q100	728.63	728.58	-0.05	728.45	-0.18	728.63	0.00
Main Before D	139364	Q100	728.42	728.54	0.12	728.17	-0.25	728.45	0.03
Main Before D	139277	Q100	728.18	728.25	0.07	727.77	-0.41	728.22	0.04
Main Before D	139242	Q100	728.08	728.15	0.07	727.86	-0.22	728.12	0.04
Main Before D	139250		Main Street Bridge						
Main Before D	139201	Q100	727.53	727.57	0.04	727.55	0.02	727.57	0.04
Main Before D	139180	Q100	727.29	727.45	0.16	727.47	0.18	727.45	0.16
Main Before D	139153	Q100	727.52	727.49	-0.03	727.49	-0.03	727.49	-0.03
Main Before D	138370	Q100	726.3	726.3	0.00	726.30	0.00	726.30	0.00
Main Before D	138180	Q100	725.44	725.44	0.00	725.44	0.00	725.44	0.00
Main Before D	137750	Q100	724.4	724.4	0.00	724.40	0.00	724.40	0.00
Main Before D	136804	Q100	722.78	722.78	0.00	722.78	0.00	722.78	0.00

Natural condition contains Existing Main St structure with 47 culvert removed
Existing condition contains Existing Main St structure and existing 47 culvert
Proposed condition contains Existing Main St structure and proposed 47 - 54' Arch Culvert
Proposed BR condition contains Existing Main St structure and proposed 47 - Bridge

Created Head - G#1 - Existing/Proposed Conditions - 500-yr event (Exisitng Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: CW Date: Sep-14

Reach	River Sta	Profile	WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed Condition	Proposed Created Head	WSEL G#1 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q500	731.83	731.75	-0.08	731.95	0.12	731.8	-0.03
Main Before D	140616	Q500	730.9	730.75	-0.15	731.14	0.24	730.85	-0.05
Main Before D	140504	Q500	730.76	730.6	-0.16	731.01	0.25	730.71	-0.05
Main Before D	140133	Q500	730.43	730.22	-0.21	730.72	0.29	730.36	-0.07
Main Before D	139757	Q500	730.11	729.85	-0.26	730.45	0.34	730.02	-0.09
Main Before D	139653	Q500	730.1	729.84	-0.26	730.32	0.22	729.93	-0.17
Main Before D	139628								
Main Before D	139600	Q500	Rt 47 Bridge or Culvert						
Main Before D	139545								
Main Before D	139512	Q500	730	729.66	-0.34	729.68	-0.32	729.61	-0.39
Main Before D	139364	Q500	729.91	729.56	-0.35	729.33	-0.58	729.54	-0.37
Main Before D	139277	Q500	729.89	729.53	-0.36	728.60	-1.29	729.52	-0.37
Main Before D	139242	Q500	729.33	729.18	0.15	728.76	-0.57	729.16	-0.17
Main Before D	139250	Q500	Main Street Bridge						
Main Before D	139201	Q500	728.3	728.41	-0.11	728.15	-0.15	728.41	0.11
Main Before D	139180	Q500	727.87	728.7	0.83	728.02	0.15	728.70	0.83
Main Before D	139153	Q500	728.4	728.66	0.26	728.40	0.00	728.66	0.26
Main Before D	138370	Q500	727.23	727.23	0.00	727.23	0.00	727.23	0.00
Main Before D	138180	Q500	726.28	726.28	0.00	726.28	0.00	726.28	0.00
Main Before D	137750	Q500	725.17	725.17	0.00	725.17	0.00	725.17	0.00
Main Before D	136804	Q500	723.54	723.54	0.00	723.54	0.00	723.54	0.00

Natural condition contains Existing Main St structure with 47 culvert removed
Existing condition contains Existing Main St structure and existing 47 culvert
Proposed condition contains Existing Main St structure and proposed 47 - 54' Arch Culvert
Proposed BR condition contains Existing Main St structure and proposed 47 - Bridge

Created Head - G#1 - Existing/Proposed Conditions - (both structures removed in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: DH Date: Sep-14

(Proposed 3-sided Arch modeling is analyzed, 54' span)

Reach	River Sta		WSEL G#1Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed Condition	Proposed Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	10-yr	729.16	729.15	-0.01	729.15	-0.01
Main Before D	140616		727.67	727.69	0.02	727.70	0.03
Main Before D	140504		727.49	727.51	0.02	727.52	0.03
Main Before D	140133		726.98	727.02	0.04	727.04	0.06
Main Before D	139757		726.08	726.2	0.12	726.25	0.17
Main Before D	139653		726.13	726.18	0.05	726.25	0.12
Main Before D	139628						
Main Before D	141476	50-yr	730.12	730.15	0.03	730.13	0.01
Main Before D	140616		728.82	728.94	0.12	728.88	0.06
Main Before D	140504		728.63	728.78	0.15	728.69	0.06
Main Before D	140133		728.14	728.37	0.23	728.25	0.11
Main Before D	139757		727.38	727.86	0.48	727.65	0.27
Main Before D	139653		727.41	727.78	0.37	727.58	0.17
Main Before D	139628						
Main Before D	141476	100-yr	730.55	730.63	0.08	730.58	0.03
Main Before D	140616		729.28	729.55	0.27	729.37	0.09
Main Before D	140504		729.08	729.39	0.31	729.19	0.11
Main Before D	140133		728.59	729.04	0.45	728.75	0.16
Main Before D	139757		727.88	728.63	0.75	728.20	0.32
Main Before D	139653		727.9	728.52	0.62	728.11	0.21
Main Before D	139628						
Main Before D	141476	500-yr	731.58	731.65	0.07	731.67	0.09
Main Before D	140616		730.35	730.53	0.18	730.59	0.24
Main Before D	140504		730.14	730.35	0.21	730.41	0.27
Main Before D	140133		729.63	729.92	0.29	729.99	0.36
Main Before D	139757		728.98	729.44	0.46	729.51	0.53
Main Before D	139653		728.98	729.43	0.45	729.35	0.37
Main Before D	139628					729.18	

Natural condition is with both structures removed
Existing Conditions is with no Main Street Structure and existing IL 47 culvert
Proposed is with no Main Street Structure and Proposed IL 47 - 54' Arch Culvert

Created Head - G#1 - Existing/Proposed Conditions - 10-yr event (both structures removed in Natural Cond)

Project Route: IL 47 and Main St.

Project Limits: Intersection Improvements — By: SJS — Date: Sep-14

County: Kane — Checked: DH — Date: Sep-14

Reach	River Sta	Profile	WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed Condition	Proposed Created Head	WSEL G#1 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q10	729.16	729.15	-0.01	729.15	-0.01	729.15	-0.01
Main Before D	140616	Q10	727.67	727.69	0.02	727.70	0.03	727.69	0.02
Main Before D	140504	Q10	727.49	727.51	0.02	727.52	0.03	727.51	0.02
Main Before D	140133	Q10	726.98	727.02	0.04	727.04	0.06	727.02	0.04
Main Before D	139757	Q10	726.08	726.2	0.12	726.25	0.17	726.21	0.13
Main Before D	139653	Q10	726.13	726.18	0.05	726.25	0.12	726.23	0.10
Main Before D	139628	Q10							
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545	Q10							
Main Before D	139512	Q10	726.03	726.02	-0.01	726.03	0.00	726.03	0.00
Main Before D	139364	Q10	725.88	725.88	0.00	725.88	0.00	725.88	0.00
Main Before D	139277	Q10	725.83	725.83	0.00	725.83	0.00	725.83	0.00
Main Before D	139250		Main Street Bridge						
Main Before D	139180	Q10	725.74	725.74	0.00	725.74	0.00	725.74	0.00
Main Before D	139153	Q10	725.67	725.67	0.00	725.67	0.00	725.67	0.00
Main Before D	138670	Q10	724.87	724.87	0.00	724.87	0.00	724.87	0.00
Main Before D	138180	Q10	724.18	724.18	0.00	724.18	0.00	724.18	0.00
Main Before D	137750	Q10	723.29	723.29	0.00	723.29	0.00	723.29	0.00
Main Before D	136804	Q10	721.76	721.76	0.00	721.76	0.00	721.76	0.00

Natural condition is with both structures removed

Existing Conditions is with no Main Street Structure and existing IL 47 culvert

Proposed is with no Main Street Structure and Proposed IL 47 - 54' Arch Culvert

Proposed BR condition is with no Main St structure and proposed 47 - Bridge

Created Head - G#1 - Existing/Proposed Conditions - 50-yr event (both structures removed in Natural Cond)

Project Route: IL 47 and Main St.

Project Limits: Intersection Improvements — By: SJS — Date: Sep-14

County: Kane — Checked: DH — Date: Sep-14

Reach	River Sta	Profile	WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed Condition	Proposed Created Head	WSEL G#1 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q50	730.12	730.15	0.03	730.13	0.01	730.13	0.01
Main Before D	140616	Q50	728.82	728.94	0.12	728.88	0.06	728.85	0.03
Main Before D	140504	Q50	728.63	728.78	0.15	728.69	0.06	728.67	0.04
Main Before D	140133	Q50	728.14	728.37	0.23	728.25	0.11	728.21	0.07
Main Before D	139757	Q50	727.38	727.86	0.48	727.65	0.27	727.56	0.18
Main Before D	139653	Q50	727.41	727.78	0.37	727.58	0.17	727.52	0.11
Main Before D	139628								
Main Before D	139600	Q50	Rt 47 Bridge or Culvert						
Main Before D	139545								
Main Before D	139512	Q50	727.28	727.25	-0.03	727.28	0.00	727.28	0.00
Main Before D	139364	Q50	727.13	727.13	0.00	727.13	0.00	727.13	0.00
Main Before D	139277	Q50	727.08	727.08	0.00	727.08	0.00	727.08	0.00
Main Before D	139264								
Main Before D	139250	Q50	Main Street Bridge						
Main Before D	139189								
Main Before D	139180	Q50	726.98	726.98	0.00	726.98	0.00	726.98	0.00
Main Before D	139153	Q50	726.9	726.9	0.00	726.90	0.00	726.90	0.00
Main Before D	138670	Q50	725.88	725.88	0.00	725.88	0.00	725.88	0.00
Main Before D	138180	Q50	725.07	725.07	0.00	725.07	0.00	725.07	0.00
Main Before D	137750	Q50	724.08	724.07	-0.01	724.07	-0.01	724.07	-0.01
Main Before D	136804	Q50	722.47	722.47	0.00	722.47	0.00	722.47	0.00

Natural condition is with both structures removed

Existing Conditions is with no Main Street Structure and existing IL 47 culvert

Proposed is with no Main Street Structure and Proposed IL 47 - 54' Arch Culvert

Proposed BR condition is with no Main St structure and proposed 47 - Bridge

Created Head - G#1 - Existing/Proposed Conditions - 100-yr event (both structures removed in Natural Cond)

Project Route: IL 47 and Main St.

Project Limits: Intersection Improvements — By: SJS — Date: Sep-14

County: Kane — Checked: DH — Date: Sep-14

Reach	River Sta	Profile	WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed Condition	Proposed Created Head	WSEL G#1 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q100	730.55	730.63	0.08	730.58	0.03	730.57	0.02
Main Before D	140616	Q100	729.28	729.55	0.27	729.37	0.09	729.33	0.05
Main Before D	140504	Q100	729.08	729.39	0.31	729.19	0.11	729.14	0.06
Main Before D	140133	Q100	728.59	729.04	0.45	728.75	0.16	728.69	0.10
Main Before D	139757	Q100	727.88	728.63	0.75	728.20	0.32	728.09	0.21
Main Before D	139653	Q100	727.9	728.52	0.62	728.11	0.21	728.03	0.13
Main Before D	139628								
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545								
Main Before D	139512	Q100	727.75	727.71	-0.04	727.75	0.00	727.75	0.00
Main Before D	139364	Q100	727.59	727.59	0.00	727.59	0.00	727.59	0.00
Main Before D	139277	Q100	727.54	727.54	0.00	727.54	0.00	727.54	0.00
Main Before D	139264								
Main Before D	139250		Main Street Bridge						
Main Before D	139189								
Main Before D	139180	Q100	727.45	727.45	0.00	727.45	0.00	727.45	0.00
Main Before D	139153	Q100	727.37	727.37	0.00	727.37	0.00	727.37	0.00
Main Before D	138670	Q100	726.3	726.3	0.00	726.30	0.00	726.30	0.00
Main Before D	138180	Q100	725.44	725.44	0.00	725.44	0.00	725.44	0.00
Main Before D	137750	Q100	724.4	724.4	0.00	724.40	0.00	724.40	0.00
Main Before D	136804	Q100	722.78	722.78	0.00	722.78	0.00	722.78	0.00

Natural condition is with both structures removed

Existing Conditions is with no Main Street Structure and existing IL 47 culvert

Proposed is with no Main Street Structure and Proposed IL 47 - 54' Arch Culvert

Proposed BR condition is with no Main St structure and proposed 47 - Bridge

Created Head - G#1 - Existing/Proposed Conditions - 500-yr event (both structures removed in Natural Cond)

Project Route: IL 47 and Main St.

Project Limits: Intersection Improvements — By: SJS — Date: Sep-14

County: Kane — Checked: CW — Date: Sep-14

Reach	River Sta	Profile	WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed Condition	Proposed Created Head	WSEL G#1 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q500	731.58	731.65	0.07	731.67	0.09	731.62	0.04
Main Before D	140616	Q500	730.35	730.53	0.18	730.59	0.24	730.46	0.11
Main Before D	140504	Q500	730.14	730.35	0.21	730.41	0.27	730.26	0.12
Main Before D	140133	Q500	729.63	729.92	0.29	729.99	0.36	729.80	0.17
Main Before D	139757	Q500	728.98	729.44	0.46	729.51	0.53	729.25	0.27
Main Before D	139653	Q500	728.98	729.43	0.45	729.35	0.37	729.15	0.17
Main Before D	139628								
Main Before D	139600	Q500	Rt 47 Bridge or Culvert						
Main Before D	139545								
Main Before D	139512	Q500	728.78	728.69	-0.09	728.78	0.00	728.78	0.00
Main Before D	139364	Q500	728.6	728.6	0.00	728.60	0.00	728.60	0.00
Main Before D	139277	Q500	728.55	728.55	0.00	728.55	0.00	728.55	0.00
Main Before D	139264								
Main Before D	139250	Q500	Main Street Bridge						
Main Before D	139189								
Main Before D	139180	Q500	728.45	728.45	0.00	728.45	0.00	728.45	0.00
Main Before D	139153	Q500	728.4	728.4	0.00	728.40	0.00	728.40	0.00
Main Before D	138670	Q500	727.23	727.23	0.00	727.23	0.00	727.23	0.00
Main Before D	138180	Q500	726.28	726.28	0.00	726.28	0.00	726.28	0.00
Main Before D	137750	Q500	725.17	725.17	0.00	725.17	0.00	725.17	0.00
Main Before D	136804	Q500	723.54	723.54	0.00	723.54	0.00	723.54	0.00

Natural condition is with both structures removed

Existing Conditions is with no Main Street Structure and existing IL 47 culvert

Proposed is with no Main Street Structure and Proposed IL 47 - 54' Arch Culvert

Proposed BR condition is with no Main St structure and proposed 47 - Bridge

HEC-RAS WATERWAY INFORMATION TABLE (Route 47 Bridge) (Exhibit 1-03.2b)

Group #1 WIT (Existing Main Street Bridge Geometry in place, Proposed 47 bridge and existing Culvert Conditions)

Route:	IL Route 47	Existing S.N.:	045-2000
Waterway:	Blackberry Creek - Main before D	Proposed S.N.:	045-2050
Section:	107B-I-1	Prepared By: SJS	Date: Jul-14
County:	Kane	Checked By: DH	Date: Jul-14

Drainage Area = 11.32 sq mi

Existing Overtopping Elevation = 729.53 at Sta. 501+17

Proposed Overtopping Elevation = 734.50 at Sta. 501+17

Flood	Frequency Year	Existing Discharge (cfs)	Proposed Discharge (cfs)	Waterway Opening (sq. ft.)		Natural H.W.E.	Head (ft.)		Headwater Elev. (ft)	
				Existing	Proposed		Existing	Proposed	Existing	Proposed
	10	634	634	203	340	726.35	0.07	0.10	726.42	726.45
DESIGN	50	1120	1120	203	450	728.04	0.38	0.08	728.42	728.12
BASE	100	1376	1376	203	491	728.72	0.32	0.04	729.04	728.76
MAX. CALC.	500	2097	2097	957.0~	611.0	730.11	0.00	0.00	729.85	730.11

Datum: NAVD88

ALL - TIME H.W.E. & DATE: 731.12 ft, inside Blackberry Inn, July 16-18, 1996

Surveyed Normal Water Level: 719.83 ft

10 YEAR VELOCITY THROUGH EXISTING STRUCTURE = 3.12 ft/s

10 YEAR VELOCITY THROUGH PROPOSED ARCH = 1.9 ft/s

2-Yr. Flow Rate = 265 ft^3/s

EXISTING STRUCTURE

TYPE: RC Box Culvert

LENGTH/WIDTH: (2) 6.5' x 8.75' & (2) 6.5'x10.42'

 # SPANS/CELLS: 4

SKEW : 0 (relative to road)

LOW EOP: 728.59 @ 501+17 20' RT

FREEBOARD: 0.11 ft

CULVERT INV. 718.38 (U/S) 718.25 (D/S)

PROPOSED STRUCTURE

TYPE: Open abutment with steel superstructure

LENGTH OF SPAN: 76 ft

 # SPANS: 1

LOW CHORD: 730.10

SKEW : 0 (relative to road)

CLEARANCE: 2.06 ft

BRIDGE FLOW LINE: 718.7 (U/S) 718.62 (D/S)

LOW EOP: 734.1 @501+17 22' RT

FREEBOARD: 4.18 ft

NOTES:

Proposed structure details are preliminary. Subject to refinement in TS&L stage.
Waterway openings are based on the natural H.W.E.
Natural HWE taken from cross-section 139653 in Group #1 Natural Conditions model.
The existing head is the difference in water surface elevations between existing and natural conditions.
The proposed head is the difference in water surface elevations between proposed and natural conditions
The freeboard is calculated from the edge of the proposed shoulder at 501+17
Existing Proposed Discharge Rates are based on USGS model used to develop the FIS profiles.
~ Waterway opening includes overtopping area (measured in Microstation) + Existing Culvert Area

Group #1 - Bridge

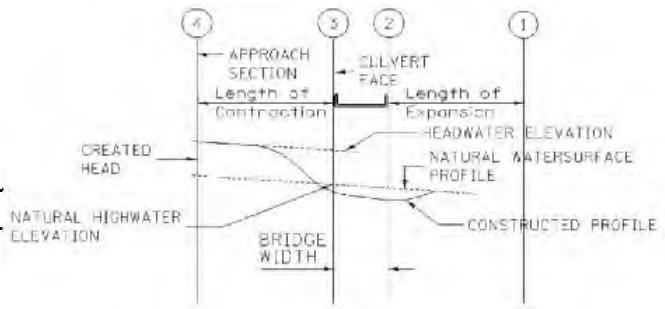
BACKUP CALCULATIONS: Group #1 WIT

Route: IL Rte 47 @ Main Street

Waterway: Blackberry Creek - Main before D

Calculated: SJS Date: Jul-14

Checked: DH Date: Jul-14



Natural WSE

Storm Event	Departure Section #1	Approach Section #4	Structure Face (at Section #4)
	(ft)	(ft)	(ft)
10-year	726.3	726.35	726.35
50-year	727.96	728.04	728.04
100-year	728.52	728.72	728.72
500-year	730.00	730.11	730.11

Section #1 : 139512[+]
Section #2 : 139545
Section #3 : 139653
Section #4 : 139757

Created Head

Storm Event	Natural Cond. Section #4 [1]	Ex. Cond. /Section #4 [2]	Proposed Cond./Section #4 [3]	Existing Created Head	Proposed Created Head
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.35	726.42	726.45	0.07	0.10
50-year	728.04	728.42	728.12	0.38	0.08
100-year	728.72	729.04	728.76	0.32	0.04
500-year	730.11	729.85	730.02	-0.26	-0.09

Headwater Elevation

Storm Event	Natural Cond WSE 139757	Existing Created Head	Proposed Created Head	Existing H.W.E.	Proposed H.W.E.
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.35	0.07	0.10	726.42	726.45
50-year	728.04	0.38	0.08	728.42	728.12
100-year	728.72	0.32	0.04	729.04	728.76
500-year	730.11	-0.26	-0.09	729.85	730.02

[1] Natural Condition - Group #1 - Natural Conditions HEC-RAS Model.

[2] Existing Condition - Group #1 - Existing Conditions HEC-RAS Model.

[3] Proposed Condition - Group #1 - Proposed Condition HEC-RAS Model.

[+] Section numbers listed at the top right represent stream stations in feet.

BACK-UP CALCULATIONS FOR WIT: Group #1 (continued)

CALCULATE FREEBOARD AND CLEARANCE

LOW ROAD ELEVATION (ft)			
Existing	**Station**	**Proposed**	**Station**
728.59	501+00	732.3	500+00
LOW BEAM ELEVATION (ft)			
Existing	**Station**	**Proposed**	**Station**
N/A	N/A	730.1	502+50
PROPOSED FREEBOARD (ft)			
10-Yr	**50-Yr**	**100-Yr**	**500-Yr**
5.85	4.18	3.54	2.28
PROPOSED CLEARANCE (ft)			
10-Yr	**50-Yr**	**100-Yr**	**500-Yr**
3.75	2.06	1.38	-0.01

CALCULATE EFFECTIVE WATER OPENING AREA FOR CULVERT

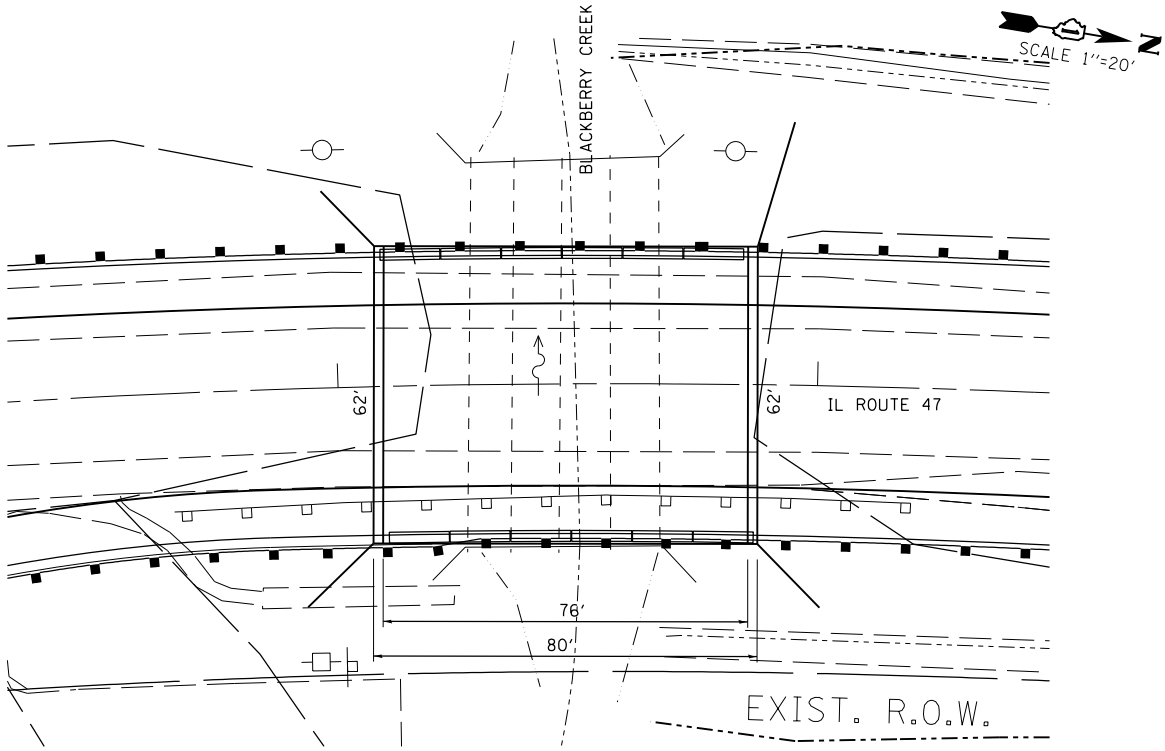
STRUCTURE SIZE (ft x ft)			
EXISTING WIDTH	**EXISTING HEIGHT**	**PROPOSED WIDTH**	**PROPOSED HEIGHT**
38.3	6.5	N/A	N/A
STRUCTURE INVERT ELEVATION (ft)			
EXISTING		**PROPOSED**	
U/S	D/S	U/S	D/S
718.38	718.25		

WATERWAY OPENING AREA (ft^2)		
Frequency	**EXISTING**	**PROPOSED**
10-YR	203.20	340.00
50-YR	203.20	450.00
100-YR	203.20	490.70
500-YR	957.00	611.00

500-YR Existing Waterway Opening is the culvert area plus the overtopping area at the edge of existing pavement.

500-YR proposed Waterway Opening is contained within the proposed Bridge, no overtopping of pavement is expected.

Areas are measured in Microstation



PLAN

	BY	DATE
SURVEYED		
PLOTTED		
ALIGNMENT CHECKED		
RT. OF WAY CHECKED		
CADD FILE NAME		
NOTE BOOK		
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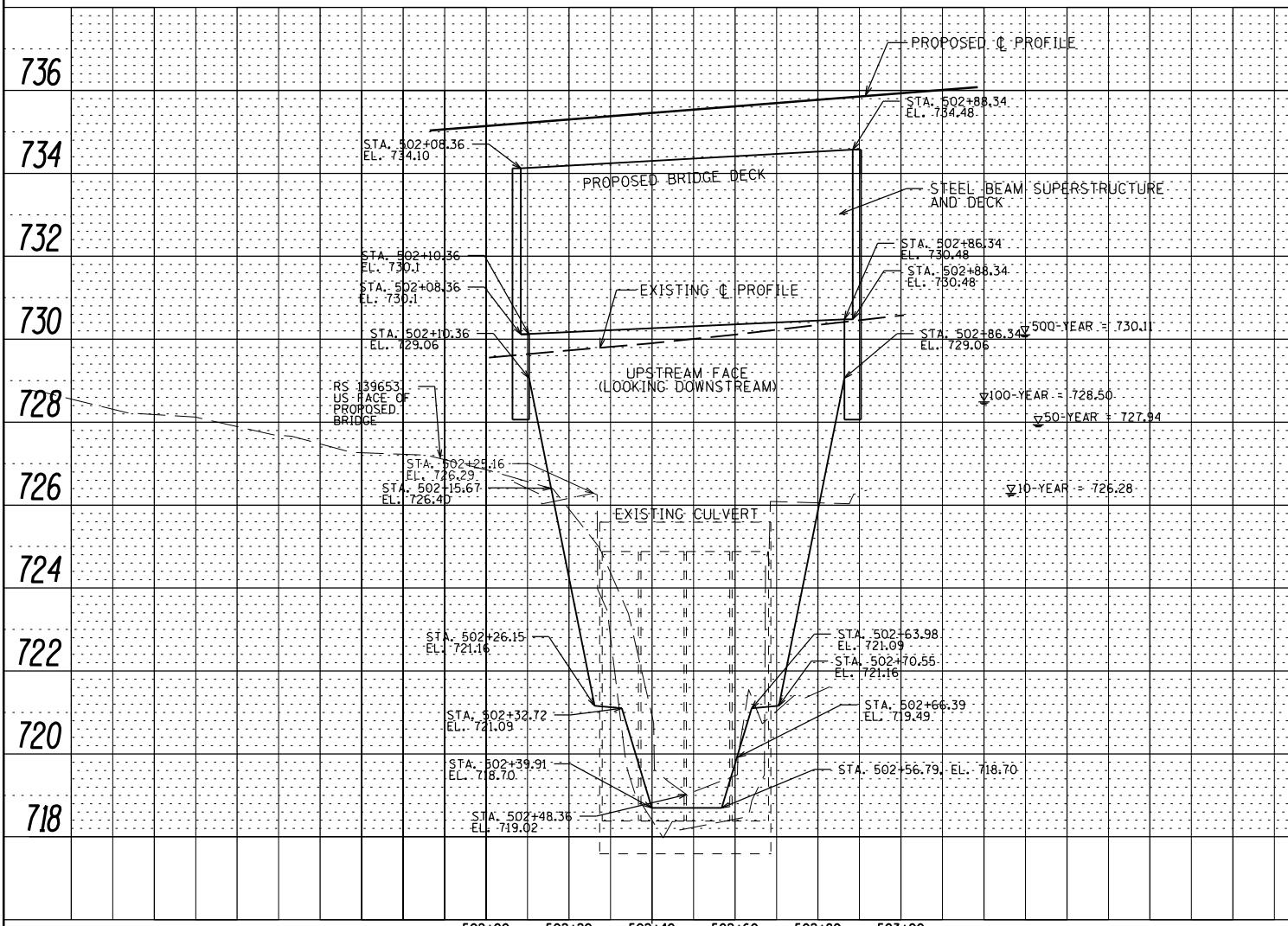

PROFILE

	BY	DATE
SURVEYED		
PLOTTED		
GRADES CHECKED		
B.M. NOTED		
STRUCTURE NOTATIONS CH'KD		
NOTE BOOK		
NO.		

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	PLOT DATE = 5/15/2014	DATE -	REVISED -

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Created Head - G#1 - Existing/Proposed Conditions - (both structures removed in Natural Cond)

Project Route: IL 47 and Main St.

Project Limits: Intersection Improvements — By: SJS — Date: July-14

County: Kane — Checked: DH — Date: July-14

(Proposed Bridge modeling is analyzed)

Reach	River Sta	Profile	WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	10-yr	729.16	729.15	-0.01	729.15	-0.01
Main Before D	140616		727.67	727.69	0.02	727.69	0.02
Main Before D	140504		727.49	727.51	0.02	727.51	0.02
Main Before D	140133		726.98	727.02	0.05	727.02	0.04
Main Before D	139757		726.08	726.2	0.14	726.21	0.13
Main Before D	139653		726.13	726.18	0.07	726.23	0.10
Main Before D	139628						0.00
Main Before D	141476	50-yr	730.12	730.15	0.03	730.13	0.01
Main Before D	140616		728.82	728.94	0.14	728.85	0.03
Main Before D	140504		728.63	728.78	0.16	728.67	0.04
Main Before D	140133		728.14	728.37	0.25	728.21	0.07
Main Before D	139757		727.38	727.86	0.51	727.56	0.18
Main Before D	139653		727.41	727.78	0.40	727.52	0.11
Main Before D	139628				727.73		0.00
Main Before D	141476	100-yr	730.55	730.63	0.08	730.57	0.02
Main Before D	140616		729.28	729.55	0.29	729.33	0.05
Main Before D	140504		729.08	729.39	0.33	729.14	0.06
Main Before D	140133		728.59	729.04	0.47	728.69	0.10
Main Before D	139757		727.88	728.63	0.79	728.09	0.21
Main Before D	139653		727.9	728.52	0.66	728.03	0.13
Main Before D	139628						0.00
Main Before D	141476	500-yr	731.83	731.65	0.07	731.62	-0.21
Main Before D	140616		730.9	730.53	0.19	730.46	-0.44
Main Before D	140504		730.76	730.35	0.22	730.26	-0.50
Main Before D	140133		730.43	729.92	0.29	729.80	-0.63
Main Before D	139757		730.11	729.44	0.47	729.25	-0.86
Main Before D	139653		730.1	729.43	0.46	729.15	-0.95
Main Before D	139628			729.23		729.02	729.02

Natural condition is with both structures removed

Existing Conditions is with no Main Street Structure and existing 47 culvert

Proposed is with no Main Street Structure and Proposed 47 bridge

Created Head - G#1 - Existing/Proposed Conditions - (Existing Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: July-14
Checked: DH Date: July-14

(Proposed Bridge modeling is analyzed)

Reach	River Sta	Profile	WSEL G#1 Natural Condition	WSEL G#1 Existing Condition	Existing Created Head	WSEL G#1 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	10-yr	729.15	729.15	0.00	729.15	0.00
Main Before D	140616		727.71	727.73	0.02	727.73	0.02
Main Before D	140504		727.54	727.55	0.01	727.56	0.02
Main Before D	140133		727.07	727.1	0.03	727.12	0.05
Main Before D	139757		726.35	726.42	0.07	726.45	0.10
Main Before D	139653		726.38	726.4	0.02	726.47	0.09
Main Before D	139628			726.36			
Main Before D	141476	50-yr	730.16	730.21	0.05	730.17	0.01
Main Before D	140616		729.01	729.18	0.17	729.04	0.03
Main Before D	140504		728.85	729.05	0.20	728.88	0.03
Main Before D	140133		728.47	728.75	0.28	728.53	0.06
Main Before D	139757		728.04	728.42	0.38	728.12	0.08
Main Before D	139653		728.04	728.34	0.30	728.08	0.04
Main Before D	139628			728.26			
Main Before D	141476	100-yr	730.64	730.7	0.06	730.67	0.03
Main Before D	140616		729.58	729.75	0.17	729.68	0.10
Main Before D	140504		729.43	729.62	0.19	729.54	0.11
Main Before D	140133		729.09	729.33	0.24	729.23	0.14
Main Before D	139757		728.72	729.04	0.32	728.91	0.19
Main Before D	139653		728.72	729.04	0.32	728.86	0.14
Main Before D	139628						
Main Before D	141476	500-yr	731.83	731.75	-0.08	731.8	-0.03
Main Before D	140616		730.9	730.75	-0.15	730.85	-0.05
Main Before D	140504		730.76	730.6	-0.16	730.71	-0.05
Main Before D	140133		730.43	730.22	-0.21	730.36	-0.07
Main Before D	139757		730.11	729.85	-0.26	730.02	-0.09
Main Before D	139653		730.1	729.84	-0.26	729.93	-0.17
Main Before D	139628						0.00

Natural condition contains Existing Main St structure with 47 bridge removed
Existing condition contains Existing Main St structure and existing 47 culvert
Proposed condition contains Existing Main St structure and proposed 47 bridge

HEC-RAS WATERWAY INFORMATION TABLE (Route 47 3-Sided Arch) (Exhibit 1-03.2a)

Group #2 WIT (Proposed Main St bridge in place, Existing Culvert and Proposed Arch under 47)

Route:	IL Route 47	Existing S.N.:	045-2000		
Waterway:	Blackberry Creek - Main before D	Proposed S.N.:	045-2050		
Section:	107B-I-1	Prepared By:	SJS	Date:	Sep-14
County:	Kane	Checked By:	DH	Date:	Sep-14

Drainage Area = 11.32 sq mi

Existing Overtopping Elevation = 729.53 at Sta. 501+17

Proposed Overtopping Elevation = 733.97 at Sta. 501+17

Flood	Frequency Year	Existing Discharge (cfs)	Proposed Discharge (cfs)	Waterway Opening (ft^2)		Natural H.W.E. (ft)	Head (ft.)		Headwater Elev. (ft)	
				Existing	Proposed		Existing	Proposed	Existing	Proposed
	10	634	634	203.2	312.3	726.33	0.12	0.17	726.45	726.50
DESIGN	50	1120	1120	203.2	376.7	727.91	0.48	0.24	728.39	728.15
BASE	100	1376	1376	203.2	394.3	728.44	0.51	0.42	728.95	728.86
MAX. CALC.	500	2097	2097	516.8~	428.0	729.88	0.04	0.57	729.92	730.45

Datum: NAVD88

ALL - TIME H.W.E. & DATE: 731.12 ft, inside Blackberry Inn, July 16-18, 1996

Surveyed Normal Water Level: 719.83 ft

10 YEAR VELOCITY THROUGH EXISTING STRUCTURE = 3.12 ft/s

10 YEAR VELOCITY THROUGH PROPOSED ARCH = 2.03 ft/s

2-Yr. Flow Rate = 265 ft^3/s

EXISTING STRUCTURE

TYPE: RC Box Culvert

LENGTH/WIDTH: (2) 6.5' x 8.75' & (2) 6.5'x10.42'

 # SPANS/CELLS: 4

SKEW : 0 (relative to road)

LOW EOP: 728.59 @ 501+00 20' RT

FREEBOARD: 0.2 ft

CULVERT INV. 718.38 (U/S) 718.25 (D/S)

PROPOSED STRUCTURE

3-SIDED CULVERT TYPE: Pre-Cast Concrete Arch

LENGTH OF SPAN: 54'

 # CELLS: 1

TOP OF CROWN ELEVATION: 731.36

SKEW : 0 (relative to road)

FLOWLINE ELEV: 718.63 (u/s) 718.52 (d/s)

LOW EOP: 733.52 @ 501+17 60' RT

FREEBOARD: 5.41 ft

NOTES:

Proposed structure details are preliminary. Subject to refinement in TS&L stage.
Waterway openings are based on the natural H.W.E.
Natural HWE taken from cross-section 139757 in Group #2 Natural Conditions model.
The existing head is the difference in water surface elevations between existing and natural conditions.
The proposed head is the difference in water surface elevations between proposed and natural conditions
Existing Proposed Discharge Rates are based on USGS model used to develop the FIS profiles.
Due to three sided structure design, 2 feet of the vertical wall portion will be embedded to provide protection from scour.
~ Waterway opening includes overtopping area (measured in Microstation) + Existing Culvert Area

Group #2 - Arch

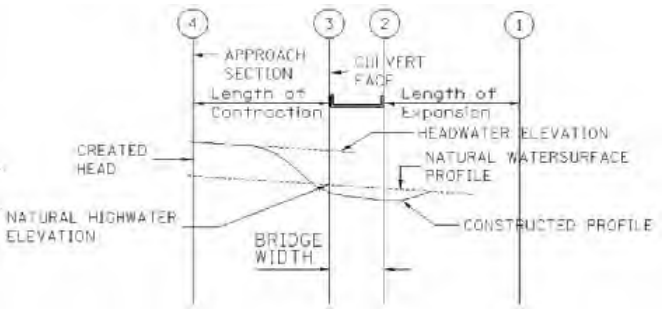
BACKUP CALCULATIONS: Group #2 WIT

Route: IL Rte 47 @ Main Street

Waterway: Blackberry Creek - Main before D

Calculated: SJS Date: Sep-14

Checked: DH Date: Sep-14



Natural WSE

Storm Event	Departure Section #1	Approach Section #4	Structure Face (at Section #4)
	(ft)	(ft)	(ft)
10-year	726.21	726.33	726.33
50-year	727.72	727.91	727.91
100-year	728.15	728.44	728.44
500-year	729.42	729.88	729.88

Section #1 : 139512[+]
Section #2 : 139545
Section #3 : 139653
Section #4 : 139757

Created Head

Storm Event	Natural Cond. Section #4 [1]	Ex. Cond. /Section #4 [2]	Proposed Cond./Section #4 [3]	Existing Created Head	Proposed Created Head
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.33	726.45	726.5	0.12	0.17
50-year	727.91	728.39	728.15	0.48	0.24
100-year	728.44	728.95	728.86	0.51	0.42
500-year	729.88	729.92	730.45	0.04	0.57

Headwater Elevation

Storm Event	Natural Cond WSE 139757	Existing Created Head	Proposed Created Head	Existing H.W.E.	Proposed H.W.E.
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.33	0.12	0.17	726.45	726.50
50-year	727.91	0.48	0.24	728.39	728.15
100-year	728.44	0.51	0.42	728.95	728.86
500-year	729.88	0.04	0.57	729.92	730.45

[1] Natural Condition - Group #2 - Natural Conditions HEC-RAS Model.

[2] Existing Condition - Group #2 - Existing Conditions HEC-RAS Model.

[3] Proposed Condition - Group #2 - Proposed Condition HEC-RAS Model.

[+] Section numbers listed at the top right represent stream stations in feet.

BACK-UP CALCULATIONS FOR WIT: Group #2 (continued)

CALCULATE FREEBOARD AND CLEARANCE

LOW ROAD ELEVATION (ft)			
Existing	**Station**	**Proposed**	**Station**
728.59	501+17	733.56	501+17
LOW BEAM ELEVATION (ft)			
Existing	**Station**	**Proposed**	**Station**
N/A	N/A	N/A	N/A
PROPOSED FREEBOARD (ft)			
10-Yr	**50-Yr**	**100-Yr**	**500-Yr**
3.11	5.41	4.70	3.11
PROPOSED CLEARANCE (ft)			
10-Yr	**50-Yr**	**100-Yr**	**500-Yr**
N/A	N/A	N/A	N/A

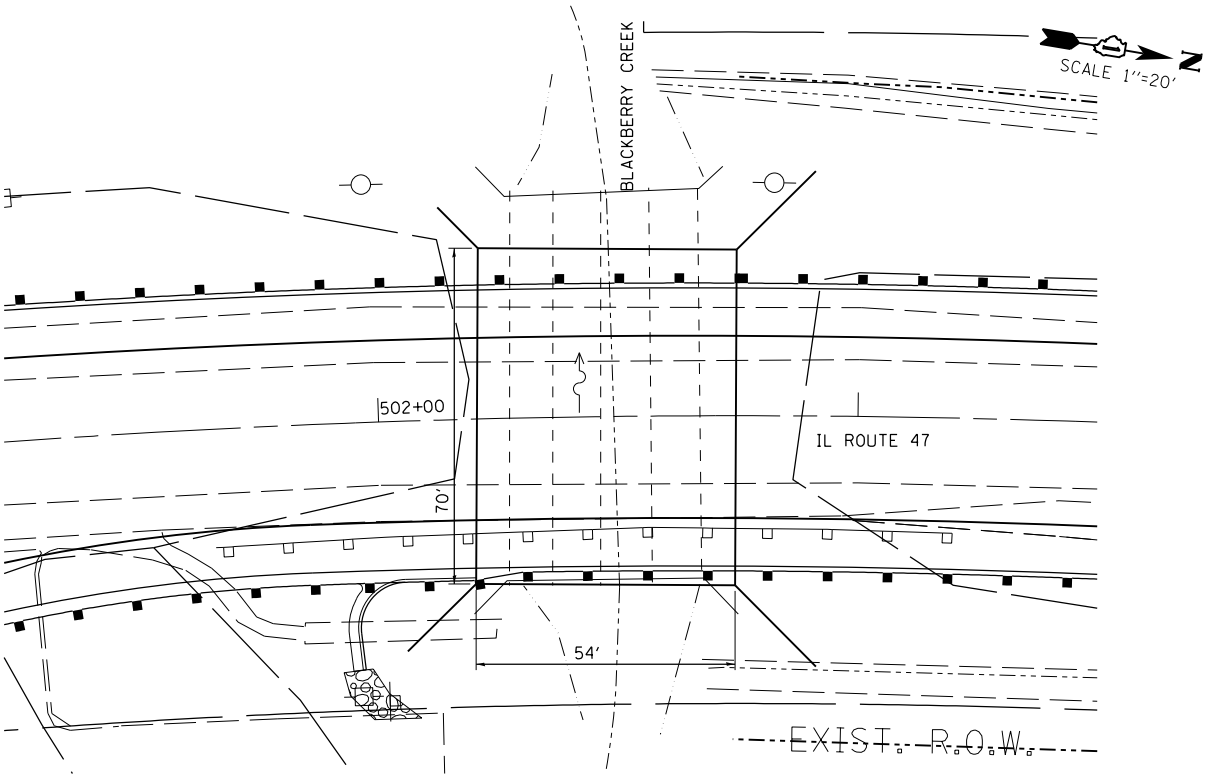
CALCULATE EFFECTIVE WATER OPENING AREA FOR CULVERT

STRUCTURE SIZE (ft x ft)			
EXISTING WIDTH	**EXISTING HEIGHT**	**PROPOSED WIDTH**	**PROPOSED HEIGHT**
38.3	6.5	54	13
STRUCTURE INVERT ELEVATION (ft)			
EXISTING		**PROPOSED**	
U/S	D/S	U/S	D/S
718.38	718.25	717.2	717.07

WATERWAY OPENING AREA (ft^2)		
Frequency	**EXISTING**	**PROPOSED**
10-YR	203.20	312.30
50-YR	203.20	376.70
100-YR	203.20	394.30
500-YR	516.80	428.00

500-YR Existing Waterway Opening is the culvert area plus the overtopping area at the edge of existing pavement.

500-YR proposed Waterway Opening is above proposed concrete arch, and may result in pressure flow, no overtopping of pavement is expected.



PLAN

	BY	DATE
SURVEYED		
PLOTTED		
ALIGNMENT CHECKED		
RT. OF WAY CHECKED		
CADD FILE NAME		
NOTE BOOK		
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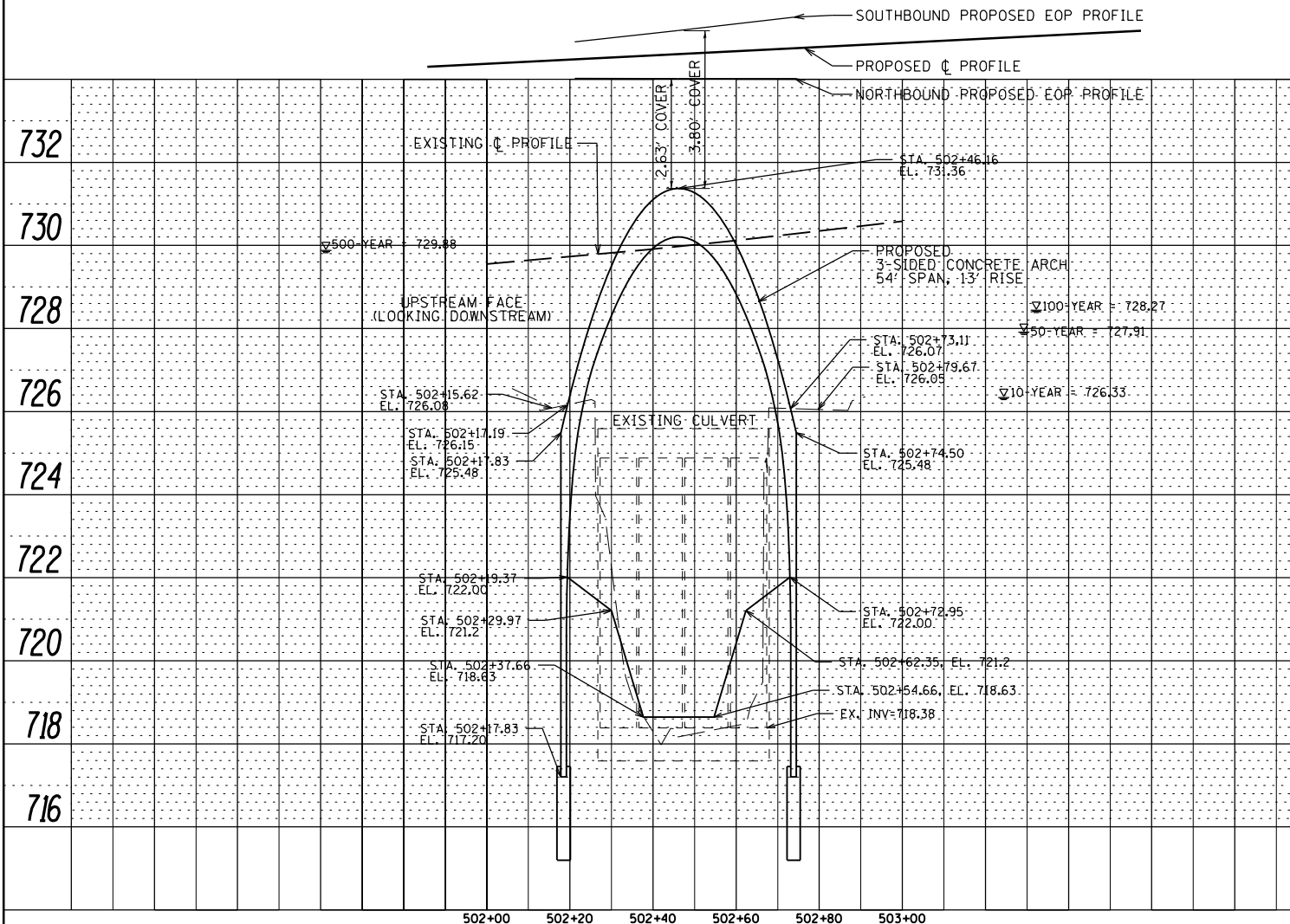

PROFILE

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SURVEYED		
PLOTTED		
GRADES CHECKED		
B.M. NOTED		
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NOTE BOOK		
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	PLOT DATE = 9/3/2014	DATE -	REVISED -

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DEPARTMENT OF

Created Head - G#2 - Existing/Proposed Conditions - (Proposed Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: DH Date: Sep-14

(Proposed 3-sided Arch modeling is analyzed, 54' span)

Reach	River Sta		WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed Condition	Proposed Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	10-yr	729.15	729.15	0.00	729.15	0.00
Main Before D	140616		727.71	727.73	0.02	727.74	0.03
Main Before D	140504		727.53	727.56	0.03	727.57	0.04
Main Before D	140133		727.06	727.12	0.06	727.14	0.08
Main Before D	139757		726.33	726.45	0.12	726.50	0.17
Main Before D	139653		726.36	726.43	0.07	726.50	0.14
Main Before D	139628						
Main Before D	141476	50-yr	730.15	730.21	0.06	730.17	0.02
Main Before D	140616		728.96	729.17	0.21	729.05	0.09
Main Before D	140504		728.79	729.03	0.24	728.90	0.11
Main Before D	140133		728.4	728.73	0.33	728.55	0.15
Main Before D	139757		727.91	728.39	0.48	728.15	0.24
Main Before D	139653		727.92	728.31	0.39	728.10	0.18
Main Before D	139628						
Main Before D	141476	100-yr	730.6	730.68	0.08	730.67	0.07
Main Before D	140616		729.45	729.7	0.25	729.66	0.21
Main Before D	140504		729.29	729.56	0.27	729.52	0.23
Main Before D	140133		728.89	729.26	0.37	729.20	0.31
Main Before D	139757		728.44	728.95	0.51	728.86	0.42
Main Before D	139653		728.44	728.94	0.50	728.79	0.35
Main Before D	139628						
Main Before D	141476	500-yr	731.76	731.77	0.01	731.95	0.19
Main Before D	140616		730.77	730.79	0.02	731.14	0.37
Main Before D	140504		730.61	730.64	0.03	731.01	0.40
Main Before D	140133		730.24	730.28	0.04	730.72	0.48
Main Before D	139757		729.88	729.92	0.04	730.45	0.57
Main Before D	139653		729.87	729.91	0.04	730.32	0.45
Main Before D	139628						

Natural condition contains Proposed Main St structure with 47 culvert removed
Existing condition contains Proposed Main St structure and existing 47 culvert
Proposed condition contains Proposed Main St structure and proposed 47 - 54' Arch Culvert

Created Head - G#2 - Existing/Proposed Conditions - 10-yr event (Proposed Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed Condition	Proposed Created Head	WSEL G#2 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q10	729.15	729.15	0.00	729.15	0.00	729.15	0.00
Main Before D	140616	Q10	727.71	727.73	0.02	727.74	0.03	727.74	0.03
Main Before D	140504	Q10	727.53	727.56	0.03	727.57	0.04	727.57	0.04
Main Before D	140133	Q10	727.06	727.12	0.06	727.14	0.08	727.13	0.07
Main Before D	139757	Q10	726.33	726.45	0.12	726.50	0.17	726.46	0.13
Main Before D	139653	Q10	726.36	726.43	0.07	726.50	0.14	726.47	0.11
Main Before D	139628	Q10							
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545	Q10							
Main Before D	139512	Q10	726.28	726.27	-0.01	726.27	-0.01	726.27	-0.01
Main Before D	139364	Q10	726.06	726.06	0.00	726.06	0.00	726.07	0.01
Main Before D	139277	Q10	725.9	725.9	0.00	725.90	0.00	725.90	0.00
Main Before D	139264	Q10	725.94	725.94	0.00	725.94	0.00	725.95	0.01
Main Before D	139250		Main Street Bridge						
Main Before D	139189	Q10	725.79	725.79	0.00	725.79	0.00	725.79	0.00
Main Before D	139180	Q10	725.72	725.72	0.00	725.72	0.00	725.72	0.00
Main Before D	139153	Q10	725.7	725.7	0.00	725.70	0.00	725.70	0.00
Main Before D	138670	Q10	724.87	724.87	0.00	724.87	0.00	724.87	0.00
Main Before D	138180	Q10	724.18	724.18	0.00	724.18	0.00	724.18	0.00
Main Before D	137750	Q10	723.29	723.29	0.00	723.29	0.00	723.29	0.00
Main Before D	136804	Q10	721.76	721.76	0.00	721.76	0.00	721.76	0.00

Natural condition contains Proposed Main St structure with 47 culvert removed
Existing condition contains Proposed Main St structure and existing 47 culvert
Proposed condition contains Proposed Main St structure and proposed 47 - 54' Arch Culvert
Proposed BR condition contains Proposed Main St structure and proposed 47 - Bridge

Created Head - G#2 - Existing/Proposed Conditions - 50-yr event (Proposed Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed Condition	Proposed Created Head	WSEL G#2 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q50	730.15	730.21	0.06	730.17	0.02	730.16	0.01
Main Before D	140616	Q50	728.96	729.17	0.21	729.05	0.09	729.02	0.06
Main Before D	140504	Q50	728.79	729.03	0.24	728.90	0.11	728.87	0.08
Main Before D	140133	Q50	728.4	728.73	0.33	728.55	0.15	728.50	0.10
Main Before D	139757	Q50	727.91	728.39	0.48	728.15	0.24	728.08	0.17
Main Before D	139653	Q50	727.92	728.31	0.39	728.10	0.18	728.05	0.13
Main Before D	139628	Q50							
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545	Q50							
Main Before D	139512	Q50	727.83	727.78	-0.05	727.80	-0.03	727.80	-0.03
Main Before D	139364	Q50	727.55	727.54	-0.01	727.55	0.00	727.55	0.00
Main Before D	139277	Q50	727.22	727.22	0.00	727.22	0.00	727.22	0.00
Main Before D	139264	Q50	727.3	727.3	0.00	727.30	0.00	727.30	0.00
Main Before D	139250		Main Street Bridge						
Main Before D	139189	Q50	727.04	727.04	0.00	727.04	0.00	727.04	0.00
Main Before D	139180	Q50	726.96	726.96	0.00	726.96	0.00	726.96	0.00
Main Before D	139153	Q50	726.97	726.97	0.00	726.97	0.00	726.97	0.00
Main Before D	138670	Q50	725.88	725.88	0.00	725.88	0.00	725.88	0.00
Main Before D	138180	Q50	725.07	725.07	0.00	725.07	0.00	725.07	0.00
Main Before D	137750	Q50	724.08	724.08	0.00	724.08	0.00	724.08	0.00
Main Before D	136804	Q50	722.47	722.47	0.00	722.47	0.00	722.47	0.00

Natural condition contains Proposed Main St structure with 47 culvert removed
Existing condition contains Proposed Main St structure and existing 47 culvert
Proposed condition contains Proposed Main St structure and proposed 47 - 54' Arch Culvert
Proposed BR condition contains Proposed Main St structure and proposed 47 - Bridge

Created Head - G#2 - Existing/Proposed Conditions - 100-yr event (Proposed Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed Condition	Proposed Created Head	WSEL G#2 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q100	730.6	730.68	0.08	730.67	0.07	730.65	0.05
Main Before D	140616	Q100	729.45	729.7	0.25	729.66	0.21	729.60	0.15
Main Before D	140504	Q100	729.29	729.56	0.27	729.52	0.23	729.46	0.17
Main Before D	140133	Q100	728.89	729.26	0.37	729.20	0.31	729.12	0.23
Main Before D	139757	Q100	728.44	728.95	0.51	728.86	0.42	728.76	0.32
Main Before D	139653	Q100	728.44	728.94	0.50	728.79	0.35	728.71	0.27
Main Before D	139628	Q100							
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545	Q100							
Main Before D	139512	Q100	728.33	728.27	-0.06	728.45	0.12	728.45	0.12
Main Before D	139364	Q100	728	728	0.00	728.17	0.17	728.18	0.18
Main Before D	139277	Q100	727.56	727.55	-0.01	727.77	0.21	727.77	0.21
Main Before D	139264	Q100							
Main Before D	139250		Main Street Bridge						
Main Before D	139189	Q100							
Main Before D	139180	Q100	727.21	727.21	0.00	727.47	0.26	727.47	0.26
Main Before D	139153	Q100	727.37	727.37	0.00	727.49	0.12	727.49	0.12
Main Before D	138670	Q100	726.3	726.3	0.00	726.30	0.00	726.30	0.00
Main Before D	138180	Q100	725.44	725.44	0.00	725.44	0.00	725.44	0.00
Main Before D	137750	Q100	724.4	724.4	0.00	724.40	0.00	724.40	0.00
Main Before D	136804	Q100	722.78	722.78	0.00	722.78	0.00	722.78	0.00

Natural condition contains Proposed Main St structure with 47 culvert removed
Existing condition contains Proposed Main St structure and existing 47 culvert
Proposed condition contains Proposed Main St structure and proposed 47 - 54' Arch Culvert
Proposed BR condition contains Proposed Main St structure and proposed 47 - Bridge

Created Head - G#2 - Existing/Proposed Conditions - 500-yr event (Proposed Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed Condition	Proposed Created Head	WSEL G#2 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q500	731.76	731.77	0.01	731.95	0.19	731.83	0.07
Main Before D	140616	Q500	730.77	730.79	0.02	731.14	0.37	730.91	0.14
Main Before D	140504	Q500	730.61	730.64	0.03	731.01	0.40	730.77	0.16
Main Before D	140133	Q500	730.24	730.28	0.04	730.72	0.48	730.44	0.20
Main Before D	139757	Q500	729.88	729.92	0.04	730.45	0.57	730.11	0.23
Main Before D	139653	Q500	729.87	729.91	0.04	730.32	0.45	730.03	0.16
Main Before D	139628	Q500							
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545	Q500							
Main Before D	139512	Q500	729.75	729.74	-0.01	729.68	-0.07	729.68	-0.07
Main Before D	139364	Q500	729.34	729.32	-0.02	729.33	-0.01	729.33	-0.01
Main Before D	139277	Q500	728.61	728.59	-0.02	728.60	-0.01	728.60	-0.01
Main Before D	139264	Q500							
Main Before D	139250		Main Street Bridge						
Main Before D	139189	Q500							
Main Before D	139180	Q500	728.02	728.02	0.00	728.02	0.00	728.01	-0.01
Main Before D	139153	Q500	728.4	728.4	0.00	728.40	0.00	728.40	0.00
Main Before D	138670	Q500	727.23	727.23	0.00	727.23	0.00	727.23	0.00
Main Before D	138180	Q500	726.28	726.28	0.00	726.28	0.00	726.28	0.00
Main Before D	137750	Q500	725.17	725.17	0.00	725.17	0.00	725.17	0.00
Main Before D	136804	Q500	723.54	723.54	0.00	723.54	0.00	723.54	0.00

Natural condition contains Proposed Main St structure with 47 culvert removed
Existing condition contains Proposed Main St structure and existing 47 culvert
Proposed condition contains Proposed Main St structure and proposed 47 - 54' Arch Culvert
Proposed BR condition contains Proposed Main St structure and proposed 47 - Bridge

Created Head - G#2 - Existing/Proposed Conditions - (both structures removed in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: DH Date: Sep-14

(Proposed 3-sided Arch modeling is analyzed, 54' span)

Reach	River Sta		WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed Condition	Proposed Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	10-yr	729.16	729.15	-0.01	729.15	-0.01
Main Before D	140616		727.68	727.69	0.01	727.70	0.02
Main Before D	140504		727.49	727.51	0.02	727.52	0.03
Main Before D	140133		726.99	727.02	0.03	727.04	0.05
Main Before D	139757		726.07	726.2	0.13	726.26	0.19
Main Before D	139653		726.13	726.18	0.05	726.26	0.13
Main Before D	139628						
Main Before D	141476	50-yr	730.12	730.15	0.03	730.13	0.01
Main Before D	140616		728.82	728.94	0.12	728.88	0.06
Main Before D	140504		728.63	728.78	0.15	728.70	0.07
Main Before D	140133		728.15	728.37	0.22	728.26	0.11
Main Before D	139757		727.38	727.86	0.48	727.66	0.28
Main Before D	139653		727.41	727.78	0.37	727.60	0.19
Main Before D	139628						
Main Before D	141476	100-yr	730.56	730.63	0.07	730.58	0.02
Main Before D	140616		729.28	729.55	0.27	729.37	0.09
Main Before D	140504		729.09	729.39	0.30	729.20	0.11
Main Before D	140133		728.6	729.04	0.44	728.76	0.16
Main Before D	139757		727.88	728.63	0.75	728.21	0.33
Main Before D	139653		727.9	728.52	0.62	728.12	0.22
Main Before D	139628						
Main Before D	141476	500-yr	731.58	731.65	0.07	731.68	0.10
Main Before D	140616		730.35	730.53	0.18	730.59	0.24
Main Before D	140504		730.15	730.35	0.20	730.42	0.27
Main Before D	140133		729.63	729.92	0.29	730.00	0.37
Main Before D	139757		728.99	729.44	0.45	729.53	0.54
Main Before D	139653		728.98	729.43	0.45	729.37	0.39
Main Before D	139628						

Natural condition is with both structures removed
Existing Conditions is with no Main Street Structure and existing IL 47 culvert
Proposed is with no Main Street Structure and Proposed IL 47 - 54' Arch Culvert

Created Head - G#2 - Existing/Proposed Conditions - 10-yr event (both structures removed in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed Condition	Proposed Created Head	WSEL G#2 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q10	729.16	729.15	-0.01	729.15	-0.01	729.15	-0.01
Main Before D	140616	Q10	727.68	727.69	0.01	727.7	0.02	727.69	0.01
Main Before D	140504	Q10	727.49	727.51	0.02	727.52	0.03	727.51	0.02
Main Before D	140133	Q10	726.99	727.02	0.03	727.04	0.05	727.03	0.04
Main Before D	139757	Q10	726.07	726.2	0.13	726.26	0.19	726.21	0.14
Main Before D	139653	Q10	726.13	726.18	0.05	726.26	0.13	726.24	0.11
Main Before D	139628	Q10							
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545	Q10							
Main Before D	139512	Q10	726.03	726.02	-0.01	726.02	-0.01	726.02	-0.01
Main Before D	139364	Q10	725.88	725.88	0.00	725.88	0.00	725.88	0.00
Main Before D	139277	Q10	725.84	725.83	-0.01	725.83	-0.01	725.83	-0.01
Main Before D	139264	Q10							
Main Before D	139250		Main Street Bridge						
Main Before D	139189	Q10			0.00				
Main Before D	139180	Q10	725.74	725.74	0.00	725.74	0.00	725.74	0.00
Main Before D	139153	Q10	725.67	725.67	0.00	725.67	0.00	725.67	0.00
Main Before D	138370	Q10	724.87	724.87	0.00	724.87	0.00	724.87	0.00
Main Before D	138180	Q10	724.18	724.18	0.00	724.18	0.00	724.18	0.00
Main Before D	137750	Q10	723.29	723.29	0.00	723.29	0.00	723.29	0.00
Main Before D	136804	Q10	721.76	721.76	0.00	721.76	0.00	721.76	0.00

Natural condition is with both structures removed
Existing Conditions is with no Main Street Structure and existing IL 47 culvert
Proposed is with no Main Street Structure and Proposed IL 47 - 54' Arch Culvert
Proposed BR condition contains No Main St structure and proposed 47 - Bridge

Created Head - G#2 - Existing/Proposed Conditions - 50-yr event (both structures removed in Natural Cond)

Project Route: IL 47 and Main St.

Project Limits: Intersection Improvements — By: SJS — Date: Sep-14

County: Kane — Checked: DH — Date: Sep-14

Reach	River Sta	Profile	WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed Condition	Proposed Created Head	WSEL G#2 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q50	730.12	730.15	0.03	730.13	0.01	730.13	0.01
Main Before D	140616	Q50	728.82	728.94	0.12	728.88	0.06	728.86	0.04
Main Before D	140504	Q50	728.63	728.78	0.15	728.7	0.07	728.67	0.04
Main Before D	140133	Q50	728.15	728.37	0.22	728.26	0.11	728.22	0.07
Main Before D	139757	Q50	727.38	727.86	0.48	727.66	0.28	727.57	0.19
Main Before D	139653	Q50	727.41	727.78	0.37	727.6	0.19	727.54	0.13
Main Before D	139628	Q50							
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545	Q50							
Main Before D	139512	Q50	727.28	727.25	-0.03	727.26	-0.02	727.26	-0.02
Main Before D	139364	Q50	727.13	727.12	-0.01	727.12	-0.01	727.12	-0.01
Main Before D	139277	Q50	727.08	727.08	0.00	727.08	0.00	727.08	0.00
Main Before D	139264	Q50							
Main Before D	139250		Main Street Bridge						
Main Before D	139189	Q50							
Main Before D	139180	Q50	726.98	726.98	0.00	726.98	0.00	726.98	0.00
Main Before D	139153	Q50	726.9	726.9	0.00	726.90	0.00	726.90	0.00
Main Before D	138370	Q50	725.88	725.88	0.00	725.88	0.00	725.88	0.00
Main Before D	138180	Q50	725.07	725.07	0.00	725.07	0.00	725.07	0.00
Main Before D	137750	Q50	724.08	724.07	-0.01	724.07	-0.01	724.07	-0.01
Main Before D	136804	Q50	722.47	722.47	0.00	722.47	0.00	722.47	0.00

Natural condition is with both structures removed

Existing Conditions is with no Main Street Structure and existing IL 47 culvert

Proposed is with no Main Street Structure and Proposed IL 47 - 54' Arch Culvert

Proposed BR condition contains No Main St structure and proposed 47 - Bridge

Created Head - G#2 - Existing/Proposed Conditions - 100-yr event (both structures removed in Natural Cond)

Project Route: IL 47 and Main St.

Project Limits: Intersection Improvements — By: SJS — Date: Sep-14

County: Kane — Checked: DH — Date: Sep-14

Reach	River Sta	Profile	WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed Condition	Proposed Created Head	WSEL G#2 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q100	730.56	730.63	0.07	730.58	0.02	730.57	0.01
Main Before D	140616	Q100	729.28	729.55	0.27	729.37	0.09	729.34	0.06
Main Before D	140504	Q100	729.09	729.39	0.30	729.2	0.11	729.15	0.06
Main Before D	140133	Q100	728.6	729.04	0.44	728.76	0.16	728.70	0.10
Main Before D	139757	Q100	727.88	728.63	0.75	728.21	0.33	728.10	0.22
Main Before D	139653	Q100	727.9	728.52	0.62	728.12	0.22	728.05	0.15
Main Before D	139628	Q100							
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545	Q100							
Main Before D	139512	Q100	727.75	727.71	-0.04	727.73	-0.02	727.73	-0.02
Main Before D	139364	Q100	727.6	727.59	-0.01	727.59	-0.01	727.59	-0.01
Main Before D	139277	Q100	727.55	727.54	-0.01	727.54	-0.01	727.54	-0.01
Main Before D	139264	Q100							
Main Before D	139250		Main Street Bridge						
Main Before D	139189	Q100							
Main Before D	139180	Q100	727.45	727.45	0.00	727.45	0.00	727.45	0.00
Main Before D	139153	Q100	727.37	727.37	0.00	727.37	0.00	727.37	0.00
Main Before D	138670	Q100	726.3	726.3	0.00	726.30	0.00	726.30	0.00
Main Before D	138180	Q100	725.44	725.44	0.00	725.44	0.00	725.44	0.00
Main Before D	137750	Q100	724.4	724.4	0.00	724.40	0.00	724.40	0.00
Main Before D	136804	Q100	722.78	722.78	0.00	722.78	0.00	722.78	0.00

Natural condition is with both structures removed

Existing Conditions is with no Main Street Structure and existing IL 47 culvert

Proposed is with no Main Street Structure and Proposed IL 47 - 54' Arch Culvert

Proposed BR condition contains No Main St structure and proposed 47 - Bridge

Created Head - G#2 - Existing/Proposed Conditions - 500-yr event (both structures removed in Natural Cond)

Project Route: IL 47 and Main St.

Project Limits: Intersection Improvements — By: SJS — Date: Sep-14

County: Kane — Checked: DH — Date: Sep-14

Reach	River Sta	Profile	WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed Condition	Proposed Created Head	WSEL G#2 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q500	731.58	731.65	0.07	731.68	0.10	731.62	0.04
Main Before D	140616	Q500	730.35	730.53	0.18	730.59	0.24	730.46	0.11
Main Before D	140504	Q500	730.15	730.35	0.20	730.42	0.27	730.27	0.12
Main Before D	140133	Q500	729.63	729.92	0.29	730	0.37	729.81	0.18
Main Before D	139757	Q500	728.99	729.44	0.45	729.53	0.54	729.26	0.27
Main Before D	139653	Q500	728.98	729.43	0.45	729.37	0.39	729.16	0.18
Main Before D	139628	Q500							
Main Before D	139600		Rt 47 Bridge or Culvert						
Main Before D	139545	Q500							
Main Before D	139512	Q500	728.78	728.69	-0.09	728.72	-0.06	728.73	-0.05
Main Before D	139364	Q500	728.6	728.6	0.00	728.60	0.00	728.60	0.00
Main Before D	139277	Q500	728.55	728.54	-0.01	728.54	-0.01	728.54	-0.01
Main Before D	139264	Q500							
Main Before D	139250		Main Street Bridge						
Main Before D	139189	Q500							
Main Before D	139180	Q500	728.45	728.45	0.00	728.45	0.00	728.45	0.00
Main Before D	139153	Q500	728.4	728.4	0.00	728.40	0.00	728.40	0.00
Main Before D	138370	Q500	727.23	727.23	0.00	727.23	0.00	727.23	0.00
Main Before D	138180	Q500	726.28	726.28	0.00	726.28	0.00	726.28	0.00
Main Before D	137750	Q500	725.17	725.17	0.00	725.17	0.00	725.17	0.00
Main Before D	136804	Q500	723.54	723.54	0.00	723.54	0.00	723.54	0.00

Natural condition is with both structures removed

Existing Conditions is with no Main Street Structure and existing IL 47 culvert

Proposed is with no Main Street Structure and Proposed IL 47 - 54' Arch Culvert

Proposed BR condition contains Existing Main St structure and proposed 47 - Bridge

HEC-RAS WATERWAY INFORMATION TABLE (Route 47 Bridge) (Exhibit 1-03.2b)

Group #2 WIT (Proposed Main Street Bridge Geometry in place, Proposed 47 bridge and existing Culvert Conditions)

Route:	IL Route 47	Existing S.N.:	045-2000		
Waterway:	Blackberry Creek - Main before D	Proposed S.N.:	045-2050		
Section:	107B-I-1	Prepared By:	SJS	Date:	Jul-14
County:	Kane	Checked By:	DH	Date:	Jul-14

Drainage Area = 11.32 sq mi

Existing Overtopping Elevation = 729.53 at Sta. 501+17

Proposed Overtopping Elevation = 734.50 at Sta. 501+17

Flood	Frequency Year	Existing Discharge (cfs)	Proposed Discharge (cfs)	Waterway Opening (sq. ft.)		Natural H.W.E.	Head (ft.)		Headwater Elev. (ft)	
				Existing	Proposed		Existing	Proposed	Existing	Proposed
	10	634	634	203.2	334.5	726.33	0.12	0.13	726.45	726.46
DESIGN	50	1120	1120	203.2	439.7	727.91	0.48	0.17	728.39	728.08
BASE	100	1376	1376	203.2	472.8	728.44	0.51	0.32	728.95	728.76
MAX. CALC.	500	2097	2097	516.8~	570.3	729.88	0.04	0.23	729.92	730.11

Datum: NAVD88

ALL - TIME H.W.E. & DATE: 731.12 ft, inside Blackberry Inn, July 16-18, 1996

Surveyed Normal Water Level: 719.83 ft

10 YEAR VELOCITY THROUGH EXISTING STRUCTURE = 3.12 ft/s

10 YEAR VELOCITY THROUGH PROPOSED ARCH = 1.90 ft/s

2-Yr. Flow Rate = 265 ft^3/s

EXISTING STRUCTURE

TYPE: RC Box Culvert

LENGTH/WIDTH: (2) 6.5' x 8.75' & (2) 6.5'x10.42'

 # SPANS/CELLS: 4

SKEW : 0 (relative to road)

LOW EOP: 728.59 @ 501+17 20' RT

FREEBOARD: 0.11 ft

CULVERT INV. 718.38 (U/S) 718.25 (D/S)

PROPOSED STRUCTURE

TYPE: Open abutment with steel superstructure

LENGTH OF SPAN: 76 ft

 # SPANS: 1

LOW CHORD: 730.10

SKEW : 0 (relative to road)

CLEARANCE: 2.19 ft

BRIDGE FLOW LINE: 718.7 (U/S) 718.62 (D/S)

LOW EOP: 734.1 @501+17 22' RT

FREEBOARD: 6.05 ft

NOTES:
Proposed structure details are preliminary. Subject to refinement in TS&L stage.
Waterway openings are based on the natural H.W.E.
Natural HWE taken from cross-section 139653 in Group #2 Natural Conditions model.
The existing head is the difference in water surface elevations between existing and natural conditions.
The proposed head is the difference in water surface elevations between proposed and natural conditions
The freeboard is calculated from the edge of the shoulder at 501+17
Existing Proposed Discharge Rates are based on USGS model used to develop the FIS profiles.
~ Waterway opening includes overtopping area (measured in Microstation) + Existing Culvert Area

Group #2 - Bridge

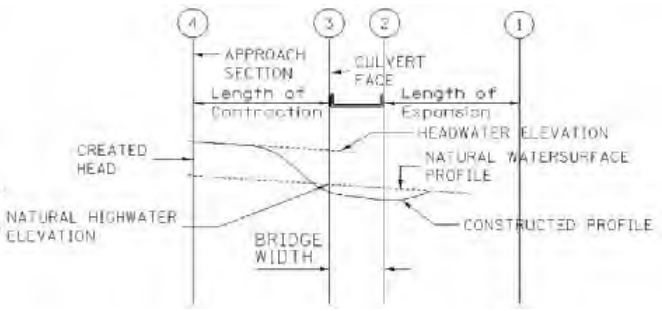
BACKUP CALCULATIONS: Group #2 WIT

Route: IL Rte 47 @ Main Street

Waterway: Blackberry Creek - Main before D

Calculated: SJS Date: Jul-14

Checked: DH Date: Jul-14



Natural WSE

Storm Event	Departure Section #1	Approach Section #4	Structure Face (at Section #4)
	(ft)	(ft)	(ft)
10-year	726.21	726.33	726.33
50-year	727.72	727.91	727.91
100-year	728.15	728.44	728.44
500-year	729.42	729.88	729.88

Section #1 : 139512[+]
Section #2 : 139545
Section #3 : 139653
Section #4 : 139757

Created Head

Storm Event	Natural Cond. Section #4 [1]	Ex. Cond. /Section #4 [2]	Proposed Cond./Section #4 [3]	Existing Created Head	Proposed Created Head
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.33	726.45	726.46	0.12	0.13
50-year	727.91	728.39	728.08	0.48	0.17
100-year	728.44	728.95	728.76	0.51	0.32
500-year	729.88	729.92	730.11	0.04	0.23

Headwater Elevation

Storm Event	Natural Cond WSE 139757	Existing Created Head	Proposed Created Head	Existing H.W.E.	Proposed H.W.E.
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.33	0.12	0.13	726.45	726.46
50-year	727.91	0.48	0.17	728.39	728.08
100-year	728.44	0.51	0.32	728.95	728.76
500-year	729.88	0.04	0.23	729.92	730.11

[1] Natural Condition - Group #2 - Natural Conditions HEC-RAS Model.

[2] Existing Condition - Group #2 - Existing Conditions HEC-RAS Model.

[3] Proposed Condition - Group #2 - Proposed Condition HEC-RAS Model.

[+] Section numbers listed at the top right represent stream stations in feet.

BACK-UP CALCULATIONS FOR WIT: Group #2 (continued)

CALCULATE FREEBOARD AND CLEARANCE

LOW ROAD ELEVATION (ft)			
Existing	**Station**	**Proposed**	**Station**
728.59	501+17	734.13	501+17
LOW BEAM ELEVATION (ft)			
Existing	**Station**	**Proposed**	**Station**
N/A	N/A	730.1	502+50
PROPOSED FREEBOARD (ft)			
10-Yr	**50-Yr**	**100-Yr**	**500-Yr**
7.67	6.05	5.37	4.02
PROPOSED CLEARANCE (ft)			
10-Yr	**50-Yr**	**100-Yr**	**500-Yr**
3.77	2.19	1.66	0.22

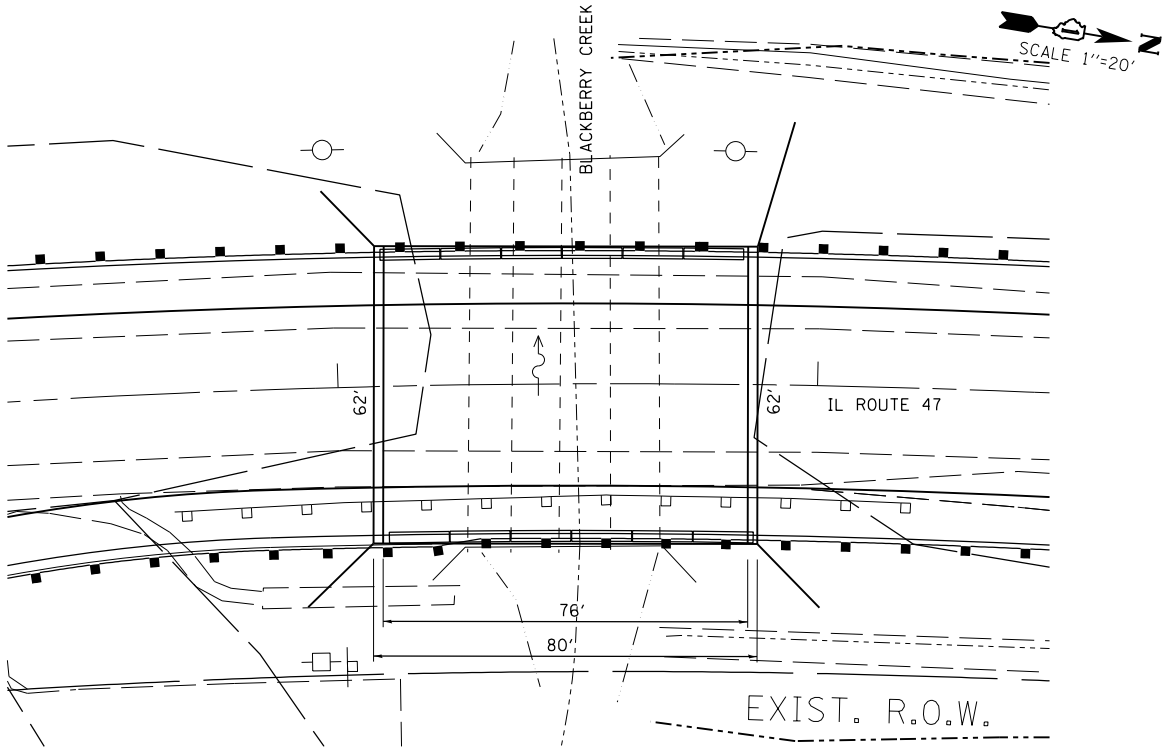
CALCULATE EFFECTIVE WATER OPENING AREA FOR CULVERT

STRUCTURE SIZE (ft x ft)			
EXISTING WIDTH	**EXISTING HEIGHT**	**PROPOSED WIDTH**	**PROPOSED HEIGHT**
38.3	6.5	N/A	N/A
STRUCTURE INVERT ELEVATION (ft)			
EXISTING		**PROPOSED**	
U/S	D/S	U/S	D/S
718.38	718.25		

WATERWAY OPENING AREA (ft^2)		
Frequency	**EXISTING**	**PROPOSED**
10-YR	203.20	334.50
50-YR	203.20	439.70
100-YR	203.20	472.80
500-YR	516.80	570.30

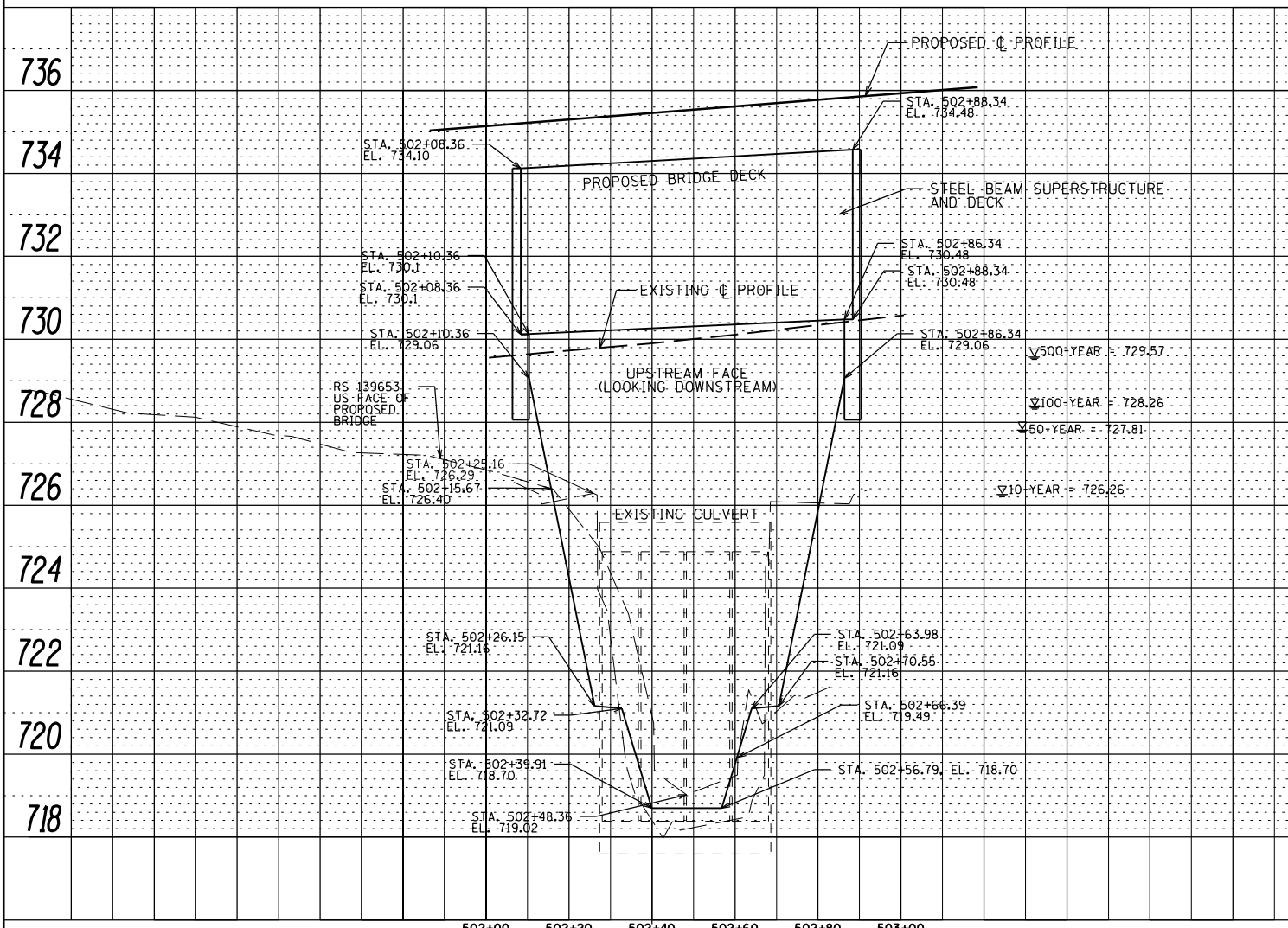
500-YR Existing Waterway Opening is the culvert area plus the overtopping area at the edge of existing pavement.

500-YR proposed Waterway Opening is contained within the proposed bridge no overtopping of pavement is expected.



PLAN

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



PROFILE

	BY	DATE
SURVEYED		
PLOTTED		
GRADES CHECKED		
B.M. NOTED		
STRUCTURE NOTATNS CH'KD		
NOTE BOOK		
NO.		

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	PLOT DATE = 5/15/2014	DATE -	REVISED -

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Created Head - G#2 - Existing/Proposed Conditions - (both structures removed in Natural Cond)

Project Route: IL 47 and Main St.

Project Limits: Intersection Improvements — By: SJS — Date: July-14

County: Kane — Checked: DH — Date: July-14

(Proposed Bridge modeling is analyzed)

Reach	River Sta	Profile	WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	10-yr	729.16	729.15	-0.01	729.15	-0.01
Main Before D	140616		727.68	727.69	0.01	727.69	0.01
Main Before D	140504		727.49	727.51	0.02	727.51	0.02
Main Before D	140133		726.99	727.02	0.03	727.02	0.03
Main Before D	139757		726.07	726.2	0.13	726.21	0.14
Main Before D	139653		726.13	726.18	0.05	726.23	0.10
Main Before D	139628						
Main Before D	141476	50-yr	730.12	730.15	0.03	730.13	0.01
Main Before D	140616		728.82	728.94	0.12	728.85	0.03
Main Before D	140504		728.63	728.78	0.15	728.67	0.04
Main Before D	140133		728.15	728.37	0.22	728.21	0.06
Main Before D	139757		727.38	727.86	0.48	727.56	0.18
Main Before D	139653		727.41	727.78	0.37	727.52	0.11
Main Before D	139628						
Main Before D	141476	100-yr	730.56	730.63	0.07	730.57	0.01
Main Before D	140616		729.28	729.55	0.27	729.33	0.05
Main Before D	140504		729.09	729.39	0.30	729.14	0.05
Main Before D	140133		728.6	729.04	0.44	728.69	0.09
Main Before D	139757		727.88	728.63	0.75	728.09	0.21
Main Before D	139653		727.9	728.52	0.62	728.03	0.13
Main Before D	139628						
Main Before D	141476	500-yr	731.58	731.65	0.07	731.62	0.04
Main Before D	140616		730.35	730.53	0.18	730.46	0.11
Main Before D	140504		730.15	730.35	0.20	730.26	0.11
Main Before D	140133		729.63	729.92	0.29	729.80	0.17
Main Before D	139757		728.99	729.44	0.45	729.25	0.26
Main Before D	139653		728.98	729.43	0.45	729.15	0.17
Main Before D	139628						

Natural condition is with both structures removed

Existing Conditions is with no Main Street Structure and existing 47 culvert

Proposed is with no Main Street Structure and Proposed 47 bridge

Created Head - G#2 - Existing/Proposed Conditions - (Proposed Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: July-14
Checked: DH Date: July-14

(Proposed Bridge modeling is analyzed)

Reach	River Sta	Profile	WSEL G#2 Natural Condition	WSEL G#2 Existing Condition	Existing Created Head	WSEL G#2 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	141476	Q10	729.15	729.15	0.00	729.15	0.00
Main Before D	140616	Q10	727.7	727.73	0.03	727.74	0.04
Main Before D	140504	Q10	727.52	727.56	0.04	727.57	0.05
Main Before D	140133	Q10	727.04	727.12	0.08	727.13	0.09
Main Before D	139757	Q10	726.26	726.45	0.19	726.46	0.20
Main Before D	139653	Q10	726.3	726.43	0.13	726.47	0.17
Main Before D	139628	Q10					
Main Before D	141476	Q50	730.14	730.22	0.08	730.16	0.02
Main Before D	140616	Q50	728.93	729.2	0.27	729.02	0.09
Main Before D	140504	Q50	728.75	729.07	0.32	728.87	0.12
Main Before D	140133	Q50	728.34	728.78	0.44	728.50	0.16
Main Before D	139757	Q50	727.81	728.46	0.65	728.08	0.27
Main Before D	139653	Q50	727.81	728.38	0.57	728.05	0.24
Main Before D	139628	Q50					
Main Before D	141476	Q100	730.58	730.75	0.17	730.65	0.07
Main Before D	140616	Q100	729.39	729.86	0.47	729.60	0.21
Main Before D	140504	Q100	729.21	729.75	0.54	729.46	0.25
Main Before D	140133	Q100	728.79	729.49	0.70	729.12	0.33
Main Before D	139757	Q100	728.26	729.22	0.96	728.76	0.50
Main Before D	139653	Q100	728.27	729.12	0.85	728.71	0.44
Main Before D	139628	Q100					
Main Before D	141476	Q500	731.68	731.77	0.09	731.83	0.15
Main Before D	140616	Q500	730.6	730.8	0.20	730.91	0.31
Main Before D	140504	Q500	730.43	730.65	0.22	730.77	0.34
Main Before D	140133	Q500	730.01	730.29	0.28	730.44	0.43
Main Before D	139757	Q500	729.57	729.94	0.37	730.11	0.54
Main Before D	139653	Q500	729.56	729.93	0.37	730.03	0.47
Main Before D	139628	Q500					

Natural condition contains Proposed Main St structure with 47 bridge removed
Existing condition contains Proposed Main St structure and existing 47 culvert
Proposed condition contains Proposed Main St structure and propose 47 bridge

HEC-RAS WATERWAY INFORMATION TABLE (Route 47 3-Sided Arch) (Exhibit 1-03.2a)

Group #3 WIT (Permit Case - No added GEC survey sections, Existing Culvert and Proposed Arch, Existing Main St bridge in place)

Route:	IL Route 47	Existing S.N.:	045-2000		
Waterway:	Blackberry Creek - Main before D	Proposed S.N.:	045-2050		
Section:	107B-I-1	Prepared By:	SJS	Date:	Sep-14
County:	Kane	Checked By:	DH	Date:	Sep-14

Drainage Area = 11.32 sq mi

Existing Overtopping Elevation = 729.53 at Sta. 501+17

Proposed Overtopping Elevation = 733.97 at Sta. 501+17

Flood	Frequency Year	Existing Discharge (cfs)	Proposed Discharge (cfs)	Waterway Opening (sq. ft.)		Natural H.W.E.	Head (ft.)		Headwater Elev. (ft)	
				Existing	Proposed		Existing	Proposed	Existing	Proposed
	10	634	634	203.2	325.1	726.61	0.03	0.06	726.64	726.67
DESIGN	50	1120	1120	203.2	379.8	728.00	0.44	0.18	728.44	728.18
BASE	100	1376	1376	203.2	399.8	728.62	0.40	0.24	729.02	728.86
MAX. CALC.	500	2097	2097	1053.4~	430.8	730.35	0.06	0.67	730.41	731.02

Datum: NAVD88

ALL - TIME H.W.E. & DATE: 731.12 ft, inside Blackberry Inn, July 16-18, 1996

Surveyed Normal Water Level: 719.83 ft

10 YEAR VELOCITY THROUGH EXISTING STRUCTURE = 3.12 ft/s

10 YEAR VELOCITY THROUGH PROPOSED ARCH = 1.95 ft/s

2-Yr. Flow Rate = 265 ft^3/s

EXISTING STRUCTURE

TYPE: RC Box Culvert

LENGTH/WIDTH: (2) 6.5' x 8.75' & (2) 6.5'x10.42'

 # SPANS/CELLS: 4

SKEW : 0 (relative to road)

LOW EOP: 728.59 @ 501+17 20' RT

FREEBOARD: 0.11 ft

CULVERT INV. 718.38 (U/S) 718.25 (D/S)

PROPOSED STRUCTURE

3-SIDED CULVERT TYPE: Pre-Cast Concrete Arch

LENGTH OF SPAN: 54 ft

 # CELLS: 1

TOP OF CROWN ELEVATION: 731.36

SKEW : 0 (relative to road)

FLOWLINE ELEV: 718.63 (u/s) 718.52 (d/s)

LOW EOP: 733.52 @ 501+17 60' RT

FREEBOARD: 5.38 ft

NOTE: Proposed structure details are preliminary. Subject to refinement in TS&L stage.
Waterway openings are based on the natural H.W.E.
Natural HWE taken from cross-section 139750 in Group #3 Natural Conditions model.
The existing head is the difference in water surface elevations between existing and natural conditions.
The proposed head is the difference in water surface elevations between proposed and natural conditions
The freeboard is calculated from the edge of the proposed shoulder at 500+17
Existing Proposed Discharge Rates are based on USGS model used to develop the FIS profiles.
~ Waterway opening includes overtopping area (measured in Microstation) + Existing Culvert Area

Group #3 - Arch

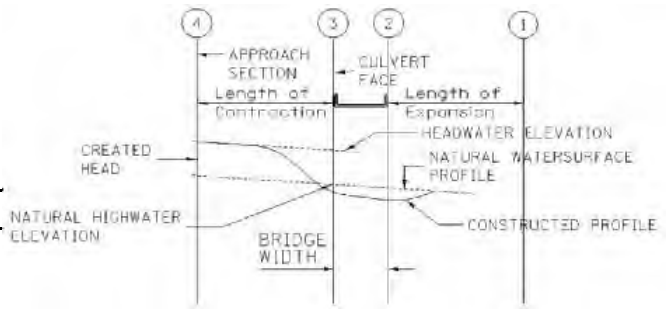
BACKUP CALCULATIONS: Group #3 WIT

Route: IL Rte 47 @ Main Street

Waterway: Blackberry Creek - Main before D

Calculated: SJS Date: Sep-14

Checked: DH Date: Sep-14



Natural WSE

Storm Event	Departure Section #1	Approach Section #4	Structure Face (at Section #4)
	(ft)	(ft)	(ft)
10-year	726.35	726.61	726.61
50-year	727.79	728.00	728.00
100-year	728.42	728.62	728.62
500-year	730.17	730.35	730.35

Section #1 : 139478[+]
Section #2 : 139536
Section #3 : 139620
Section #4 : 139750

*Note: In FIS model the culvert is modeled as a bridge

Created Head

Storm Event	Natural Cond. Section #4 [1]	Ex. Cond. /Section #4 [2]	Proposed Cond./Section #4 [3]	Existing Created Head	Proposed Created Head
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.61	726.64	726.67	0.03	0.06
50-year	728.00	728.44	728.18	0.44	0.18
100-year	728.62	729.02	728.86	0.40	0.24
500-year	730.35	730.41	731.02	0.06	0.67

Headwater Elevation

Storm Event	Natural Cond WSE 139750	Existing Created Head	Proposed Created Head	Existing H.W.E.	Proposed H.W.E.
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.61	0.03	0.06	726.64	726.67
50-year	728.00	0.44	0.18	728.44	728.18
100-year	728.62	0.40	0.24	729.02	728.86
500-year	730.35	0.06	0.67	730.41	731.02

[1] Natural Condition - Group #3 - Natural Conditions HEC-RAS Model.

[2] Existing Condition - Group #3 - Existing Conditions HEC-RAS Model.

[3] Proposed Condition - Group #3 - Proposed Condition HEC-RAS Model, does not include raised IL-47 profile.

[+] Section numbers listed at the top right represent stream stations in feet.

BACK-UP CALCULATIONS FOR WIT: Group #3 (continued)

CALCULATE FREEBOARD AND CLEARANCE

LOW ROAD ELEVATION (ft)			
Existing	**Station**	**Proposed**	**Station**
728.59	501+17	733.56	501+17
LOW BEAM ELEVATION (ft)			
Existing	**Station**	**Proposed**	**Station**
N/A	N/A	N/A	N/A
PROPOSED FREEBOARD (ft)			
10-Yr	**50-Yr**	**100-Yr**	**500-Yr**
6.89	5.38	4.70	2.54
PROPOSED CLEARANCE (ft)			
10-Yr	**50-Yr**	**100-Yr**	**500-Yr**
N/A	N/A	N/A	N/A

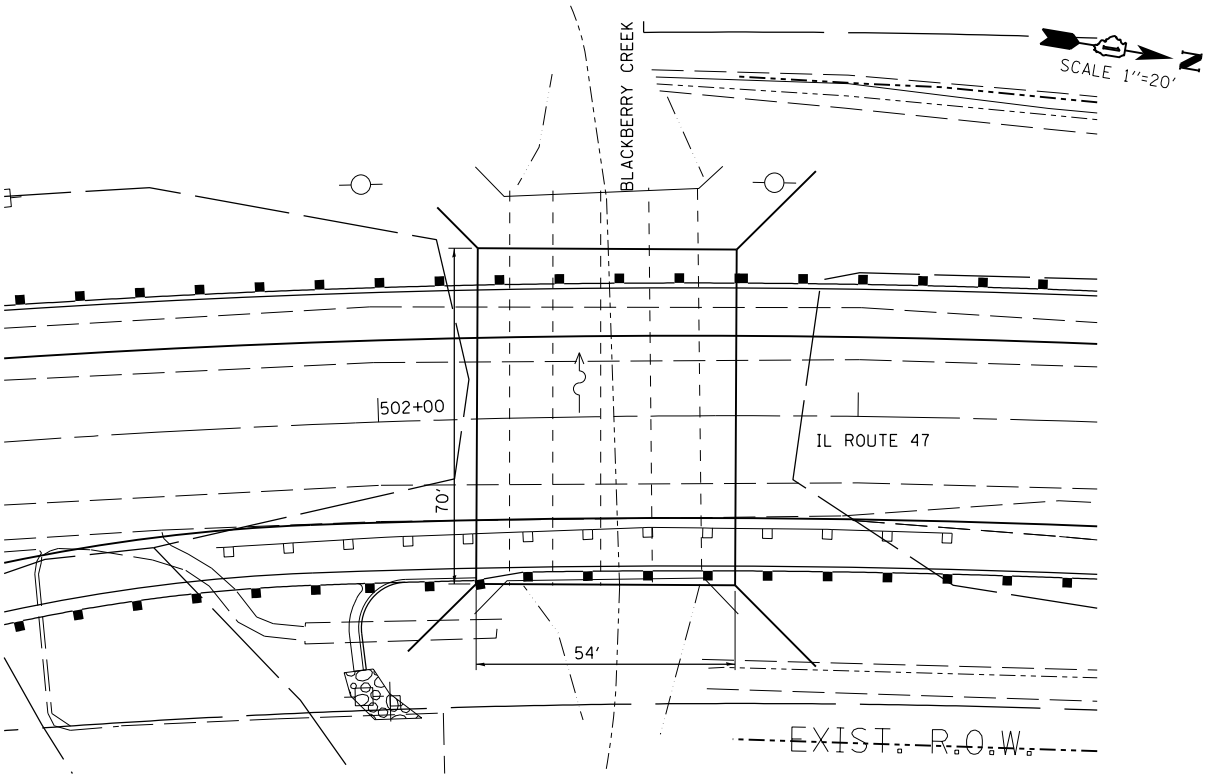
CALCULATE EFFECTIVE WATER OPENING AREA FOR CULVERT

STRUCTURE SIZE (ft x ft)			
EXISTING WIDTH	**EXISTING HEIGHT**	**PROPOSED WIDTH**	**PROPOSED HEIGHT**
38.3	6.5	54	13
STRUCTURE INVERT ELEVATION (ft)			
EXISTING		**PROPOSED**	
U/S	D/S	U/S	D/S
718.38	718.25	717.27	717.07

WATERWAY OPENING AREA (ft^2)		
Frequency	**EXISTING**	**PROPOSED**
10-YR	203.20	325.10
50-YR	203.20	379.80
100-YR	203.20	399.80
500-YR	1053.40	430.80

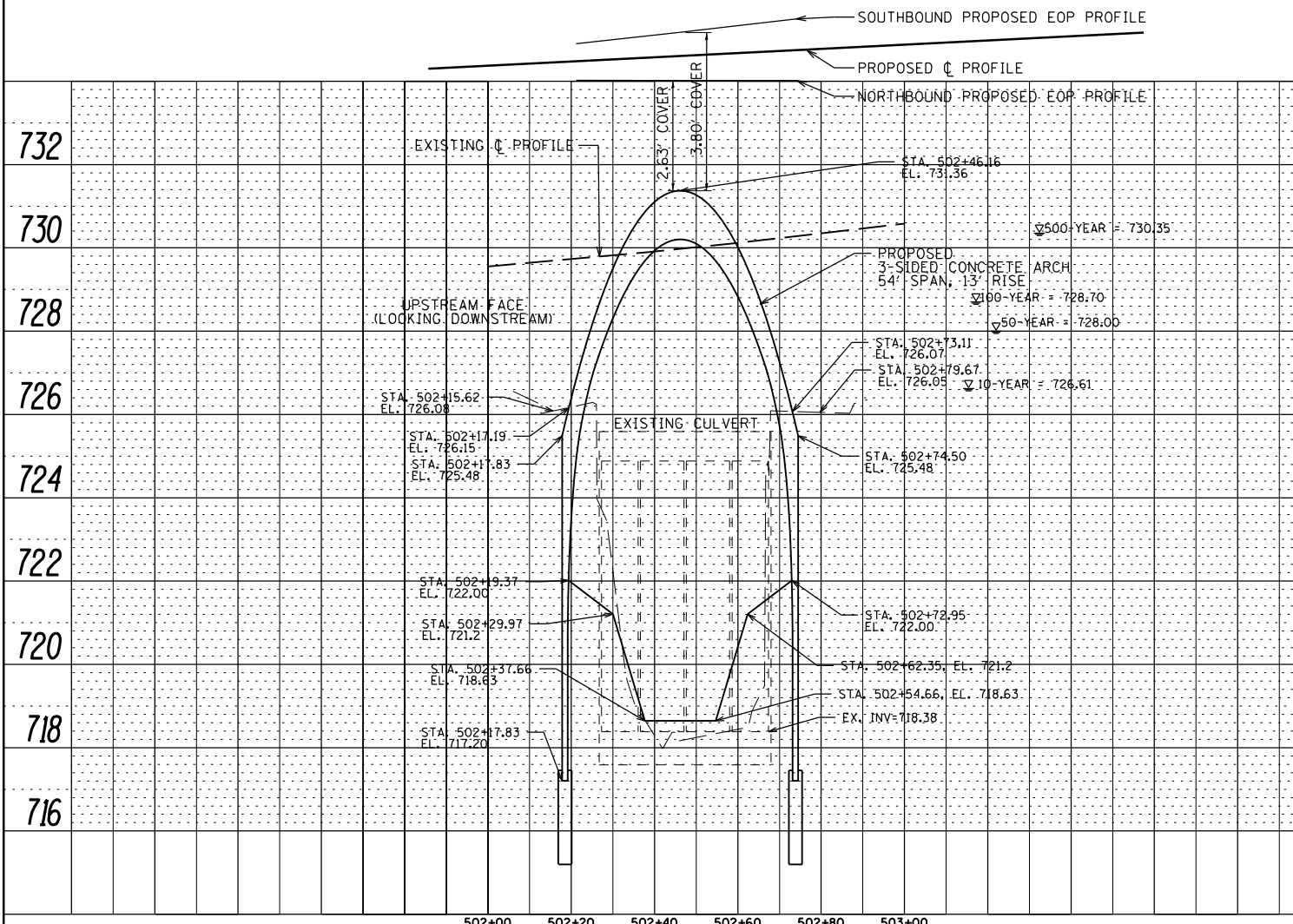
500-YR Existing Waterway Opening is the culvert area plus the overtopping area at the edge of existing pavement - area measured in Microstation

500-YR proposed Waterway Opening is above proposed concrete arch, and may result in pressure flow, no overtopping of pavement is expected.



PLAN

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



PROFILE

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	PLOT DATE = 9/3/2014	DATE -	REVISED -

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DEPARTMENT OF

Created Head - G#3 - Existing/Proposed Conditions - (Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: DH Date: Sep-14

(Proposed 3-sided Arch modeling is analyzed, 54' span)

Reach	River Sta		WSEL G#3 Natural Condition	WSEL G#3 Existing Condition	Existing Created Head	WSEL G#3 Proposed Condition	Proposed Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	10-yr	729.32	729.32	0.00	729.32	0.00
Main Before D	140504		727.47	727.49	0.02	727.50	0.03
Main Before D	139750		726.61	726.64	0.03	726.67	0.06
Main Before D	139620						
Main Before D	140600	50-yr	730.25	730.3	0.05	730.27	0.02
Main Before D	140504		728.75	729.02	0.27	728.85	0.10
Main Before D	139750		728	728.44	0.44	728.18	0.18
Main Before D	139620						
Main Before D	140600	100-yr	730.69	730.76	0.07	730.72	0.03
Main Before D	140504		729.32	729.58	0.26	729.47	0.15
Main Before D	139750		728.62	729.02	0.40	728.86	0.24
Main Before D	139620						
Main Before D	140600	500-yr	731.89	731.92	0.03	732.22	0.33
Main Before D	140504		730.89	730.93	0.04	731.43	0.54
Main Before D	139750		730.35	730.41	0.06	731.02	0.67
Main Before D	139620						

Natural condition contains existing Main St structure with 47 culvert removed
Existing condition contains Existing Main St structure and existing 47 culvert
Proposed condition contains Existing Main St structure and proposed 47 - 54' Arch Culvert

Created Head - G#3 - Existing/Proposed Conditions - 10-yr event (Existing Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#3 Natural Condition	WSEL G#3 Existing Condition	Existing Created Head	WSEL G#3 Proposed Condition	Proposed Created Head	WSEL G#3 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	Q10	729.32	729.32	0.00	729.32	0.00	729.32	0.00
Main Before D	140504	Q10	727.47	727.49	0.02	727.50	0.03	727.47	0.00
Main Before D	139750	Q10	726.61	726.64	0.03	726.67	0.06	726.61	0.00
Main Before D	139620	Q10							
Main Before D	139600								
Main Before D	139536	Q10							
Main Before D	139478	Q10	726.35	726.35	0.00	726.35	0.00	726.35	0.00
Main Before D	139355	Q10	726.3	726.3	0.00	726.30	0.00	726.30	0.00
Main Before D	139297	Q10	726.29	726.29	0.00	726.29	0.00	726.29	0.00
Main Before D	139256	Q10	726.22	726.22	0.00	726.22	0.00	726.22	0.00
Main Before D	139250								
Main Before D	139206	Q10	726.14	726.14	0.00	726.14	0.00	726.14	0.00
Main Before D	139158	Q10	726.1	726.1	0.00	726.10	0.00	726.10	0.00
Main Before D	138418	Q10	725.26	725.26	0.00	725.26	0.00	725.26	0.00
Main Before D	137750	Q10	723.37	723.37	0.00	723.37	0.00	723.37	0.00
Main Before D	136804	Q10	721.76	721.76	0.00	721.76	0.00	721.76	0.00

River stations 139254 and 139208 are used for the natural conditions, not 139256 and 139206.
Natural condition contains Existing Main St structure with 47 culvert removed
Existing condition contains Existing Main St structure and existing 47 culvert
Proposed condition contains Existing Main St structure and proposed 47 - 54' Arch Culvert
Proposed BR condition contains Existing Main St structure and proposed 47 - Bridge

Created Head - G#3 - Existing/Proposed Conditions - 50-yr event (Existing Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#3 Natural Condition	WSEL G#3 Existing Condition	Existing Created Head	WSEL G#3 Proposed Condition	Proposed Created Head	WSEL G#3 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	Q50	730.25	730.3	0.05	730.27	0.02	730.26	0.01
Main Before D	140504	Q50	728.75	729.02	0.27	728.85	0.10	728.79	0.04
Main Before D	139750	Q50	728	728.44	0.44	728.18	0.18	728.08	0.08
Main Before D	139620	Q50							
Main Before D	139600								
Main Before D	139536	Q50							
Main Before D	139478	Q50	727.79	727.75	-0.04	727.75	-0.04	727.76	-0.03
Main Before D	139355	Q50	727.74	727.71	-0.03	727.71	-0.03	727.71	-0.03
Main Before D	139297	Q50	727.74	727.7	-0.04	727.70	-0.04	727.70	-0.04
Main Before D	139256	Q50	727.58	727.54	-0.04	727.54	-0.04	727.54	-0.04
Main Before D	139250								
Main Before D	139206	Q50	727.27	727.24	-0.03	727.24	-0.03	727.24	-0.03
Main Before D	139158	Q50	727.22	727.22	0.00	727.22	0.00	727.22	0.00
Main Before D	138418	Q50	726.3	726.3	0.00	726.30	0.00	726.30	0.00
Main Before D	137750	Q50	724.18	724.18	0.00	724.18	0.00	724.18	0.00
Main Before D	136804	Q50	722.47	722.47	0.00	722.47	0.00	722.47	0.00

River stations 139254 and 139208 are used for the natural conditions, not 139256 and 139206.
Natural condition contains Existing Main St structure with 47 culvert removed
Existing condition contains Existing Main St structure and existing 47 culvert
Proposed condition contains Existing Main St structure and proposed 47 - 54' Arch Culvert
Proposed BR condition contains Existing Main St structure and proposed 47 - Bridge

Created Head - G#3 - Existing/Proposed Conditions - 100-yr event (Existing Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#3 Natural Condition	WSEL G#3 Existing Condition	Existing Created Head	WSEL G#3 Proposed Condition	Proposed Created Head	WSEL G#3 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	Q100	730.69	730.76	0.07	730.72	0.03	730.7	0.01
Main Before D	140504	Q100	729.32	729.58	0.26	729.47	0.15	729.38	0.06
Main Before D	139750	Q100	728.62	729.02	0.40	728.86	0.24	728.71	0.09
Main Before D	139620	Q100							
Main Before D	139600								
Main Before D	139536	Q100							
Main Before D	139478	Q100	728.42	728.36	-0.06	728.36	-0.06	728.36	-0.06
Main Before D	139355	Q100	728.37	728.32	-0.05	728.32	-0.05	728.32	-0.05
Main Before D	139297	Q100	728.37	728.32	-0.05	728.32	-0.05	728.32	-0.05
Main Before D	139256	Q100	728.16	728.1	-0.06	728.10	-0.06	728.10	-0.06
Main Before D	139250								
Main Before D	139206	Q100	727.67	727.62	-0.05	727.62	-0.05	727.62	-0.05
Main Before D	139158	Q100	727.61	727.61	0.00	727.61	0.00	727.61	0.00
Main Before D	138418	Q100	726.63	726.63	0.00	726.63	0.00	726.63	0.00
Main Before D	137750	Q100	724.52	724.52	0.00	724.53	0.01	724.52	0.00
Main Before D	136804	Q100	722.78	722.78	0.00	722.78	0.00	722.78	0.00

River stations 139254 and 139208 are used for the natural conditions, not 139256 and 139206.
Natural condition contains Existing Main St structure with 47 culvert removed
Existing condition contains Existing Main St structure and existing 47 culvert
Proposed condition contains Existing Main St structure and proposed 47 - 54' Arch Culvert
Proposed BR condition contains Existing Main St structure and proposed 47 - Bridge

Created Head - G#3 - Existing/Proposed Conditions - 500-yr event (Existing Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#3 Natural Condition	WSEL G#3 Existing Condition	Existing Created Head	WSEL G#3 Proposed Condition	Proposed Created Head	WSEL G#3 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	Q500	731.89	731.92	0.03	732.22	0.33	731.97	0.08
Main Before D	140504	Q500	730.89	730.93	0.04	731.43	0.54	731.03	0.14
Main Before D	139750	Q500	730.35	730.41	0.06	731.02	0.67	730.52	0.17
Main Before D	139620	Q500							
Main Before D	139600								
Main Before D	139536	Q500							
Main Before D	139478	Q500	730.17	730.18	0.01	730.18	0.01	730.18	0.01
Main Before D	139355	Q500	730.14	730.14	0.00	730.14	0.00	730.14	0.00
Main Before D	139297	Q500	730.14	730.15	0.01	730.15	0.01	730.15	0.01
Main Before D	139256	Q500	729.78	729.78	0.00	729.78	0.00	729.78	0.00
Main Before D	139250								
Main Before D	139206	Q500	728.59	728.45	-0.14	728.45	-0.14	728.45	-0.14
Main Before D	139158	Q500	728.5	728.5	0.00	728.50	0.00	728.50	0.00
Main Before D	138418	Q500	727.37	727.37	0.00	727.37	0.00	727.37	0.00
Main Before D	137750	Q500	725.31	725.3	0.01	725.30	-0.01	725.30	-0.01
Main Before D	136804	Q500	723.54	723.54	0.00	723.54	0.00	723.54	0.00

River stations 139254 and 139208 are used for the natural conditions, not 139256 and 139206.
Natural condition contains Existing Main St structure with 47 culvert removed
Existing condition contains Existing Main St structure and existing 47 culvert
Proposed condition contains Existing Main St structure and proposed 47 - 54' Arch Culvert
Proposed BR condition contains Existing Main St structure and proposed 47 - Bridge

HEC-RAS WATERWAY INFORMATION TABLE (Route 47 Bridge) (Exhibit 1-03.2b)

Group #3 WIT (Permit Case - No added GEC survey sections, Existing Culvert and Proposed Bridge, with Existing Main St bridge in place)

Route:	IL Route 47	Existing S.N.:	045-2000		
Waterway:	Blackberry Creek - Main before D	Proposed S.N.:	045-2050		
Section:	107B-I-1	Prepared By:	SJS	Date:	Jul-14
County:	Kane	Checked By:	DH	Date:	Jul-14

Drainage Area = 11.32 sq mi

Existing Overtopping Elevation = 729.53 at Sta. 501+17

Proposed Overtopping Elevation = 734.50 at Sta. 501+17

Flood	Frequency Year	Existing Discharge (cfs)	Proposed Discharge (cfs)	Waterway Opening (sq. ft.)		Natural H.W.E.	Head (ft.)		Headwater Elev. (ft)	
				Existing	Proposed		Existing	Proposed	Existing	Proposed
	10	634	634	203.2	349.9	726.61	0.03	0.00	726.64	726.61
DESIGN	50	1120	1120	203.2	452.9	728.00	0.44	0.08	728.44	728.08
BASE	100	1376	1376	203.2	498.2	728.62	0.40	0.09	729.02	728.71
MAX. CALC.	500	2097	2097	1053.4~	619.4	730.35	0.06	0.17	730.41	730.52

Datum: NAVD88

ALL - TIME H.W.E. & DATE: 731.12 ft, inside Blackberry Inn, July 16-18, 1996

Surveyed Normal Water Level: 719.83 ft

10 YEAR VELOCITY THROUGH EXISTING STRUCTURE = 3.12 ft/s

10 YEAR VELOCITY THROUGH PROPOSED ARCH = 1.81 ft/s

2-Yr. Flow Rate = 265 ft^3/s

EXISTING STRUCTURE

TYPE: RC Box Culvert

LENGTH/WIDTH: (2) 6.5' x 8.75' & (2) 6.5'x10.42'

 # SPANS/CELLS: 4

SKEW : 0 (relative to road)

LOW EOP: 728.59 @ 501+17 20' RT

FREEBOARD: 0.11 ft

CULVERT INV. 718.38 (U/S) 718.25 (D/S)

PROPOSED STRUCTURE

TYPE: Open abutment with steel superstructure

LENGTH OF SPAN: 76 ft

 # SPANS: 1

LOW CHORD: 730.10

SKEW : 0 (relative to road)

CLEARANCE: 2.10 ft

BRIDGE FLOW LINE: 718.7 (U/S) 718.62 (D/S)

LOW EOP: 734.1 @501+17 22' RT

FREEBOARD: 6.02 ft

NOTE: Proposed structure details are preliminary. Subject to refinement in TS&L stage.
Waterway openings are based on the natural H.W.E.
Natural HWE taken from cross-section 139750 in Group #3 Natural Conditions model.
The existing head is the difference in water surface elevations between existing and natural conditions.
The proposed head is the difference in water surface elevations between proposed and natural conditions
The freeboard is calculated from the edge of the proposed shoulder at 501+17
Existing Proposed Discharge Rates are based on USGS model used to develop the FIS profiles.
~ Waterway opening includes overtopping area (measured in Microstation) + Existing Culvert Area

Group #3 Bridge

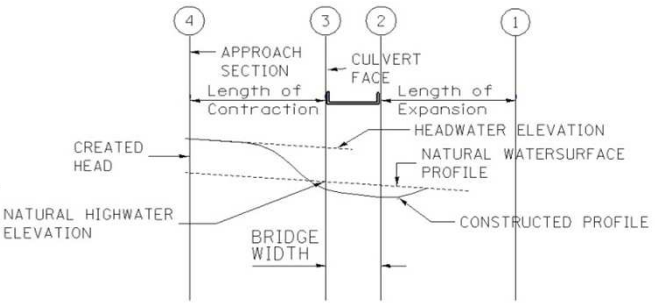
BACKUP CALCULATIONS: Group #3 WIT

Route: IL Rte 47 @ Main Street

Waterway: Blackberry Creek - Main before D

Calculated: SJS Date: Jul-14

Checked: DH Date: Jul-14



Natural WSE

Storm Event	Departure Section #1	Approach Section #4	Structure Face (at Section #4)
	(ft)	(ft)	(ft)
10-year	726.35	726.61	726.61
50-year	727.79	728.00	728.00
100-year	728.42	728.62	728.62
500-year	730.17	730.35	730.35

Section #1 : 139478[+]
Section #2 : 139536
Section #3 : 139620
Section #4 : 139750

*Note: In FIS model the culvert is modeled as a bridge

Created Head

Storm Event	Natural Cond. Section #4 [1]	Ex. Cond. /Section #4 [2]	Proposed Cond./Section #4 [3]	Existing Created Head	Proposed Created Head
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.61	726.64	726.61	0.03	0
50-year	728	728.44	728.08	0.44	0.08
100-year	728.62	729.02	728.71	0.40	0.09
500-year	730.35	730.41	730.52	0.06	0.17

Headwater Elevation

Storm Event	Natural Cond WSE 139750	Existing Created Head	Proposed Created Head	Existing H.W.E.	Proposed H.W.E.
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.61	0.03	0	726.64	726.61
50-year	728.00	0.44	0.08	728.44	728.08
100-year	728.62	0.40	0.09	729.02	728.71
500-year	730.35	0.06	0.17	730.41	730.52

[1] Natural Condition - Group #3 - Natural Conditions HEC-RAS Model.

[2] Existing Condition - Group #3 - Existing Conditions HEC-RAS Model.

[3] Proposed Condition - Group #3 - Proposed Condition HEC-RAS Model, with Raised 47 profile

[+] Section numbers listed at the top right represent stream stations in feet.

BACK-UP CALCULATIONS FOR WIT: Group #3 (continued)

CALCULATE FREEBOARD AND CLEARANCE

LOW ROAD ELEVATION (ft)			
Existing	**Station**	**Proposed**	**Station**
728.59	501+00	732.3	500+00
LOW BEAM ELEVATION (ft)			
Existing	**Station**	**Proposed**	**Station**
N/A	N/A	730.1	502+50
PROPOSED FREEBOARD (ft)			
10-Yr	**50-Yr**	**100-Yr**	**500-Yr**
5.69	4.22	3.59	1.78
PROPOSED CLEARANCE (ft)			
10-Yr	**50-Yr**	**100-Yr**	**500-Yr**
3.49	2.10	1.48	-0.25

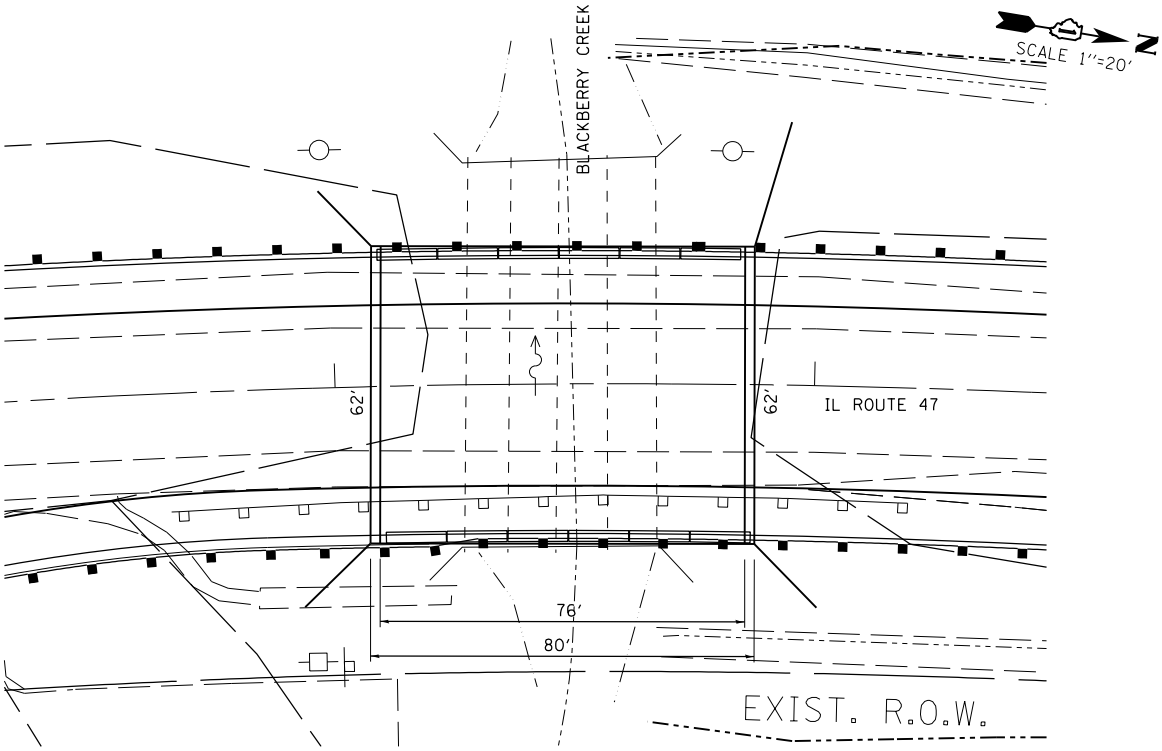
CALCULATE EFFECTIVE WATER OPENING AREA FOR CULVERT

STRUCTURE SIZE (ft x ft)			
EXISTING WIDTH	**EXISTING HEIGHT**	**PROPOSED WIDTH**	**PROPOSED HEIGHT**
38.3	6.5	N/A	N/A
STRUCTURE INVERT ELEVATION (ft)			
EXISTING		**PROPOSED**	
U/S	D/S	U/S	D/S
718.38	718.25		

WATERWAY OPENING AREA (ft^2)		
Frequency	**EXISTING**	**PROPOSED**
10-YR	203.20	349.90
50-YR	203.20	452.90
100-YR	203.20	498.20
500-YR	1053.40	619.40

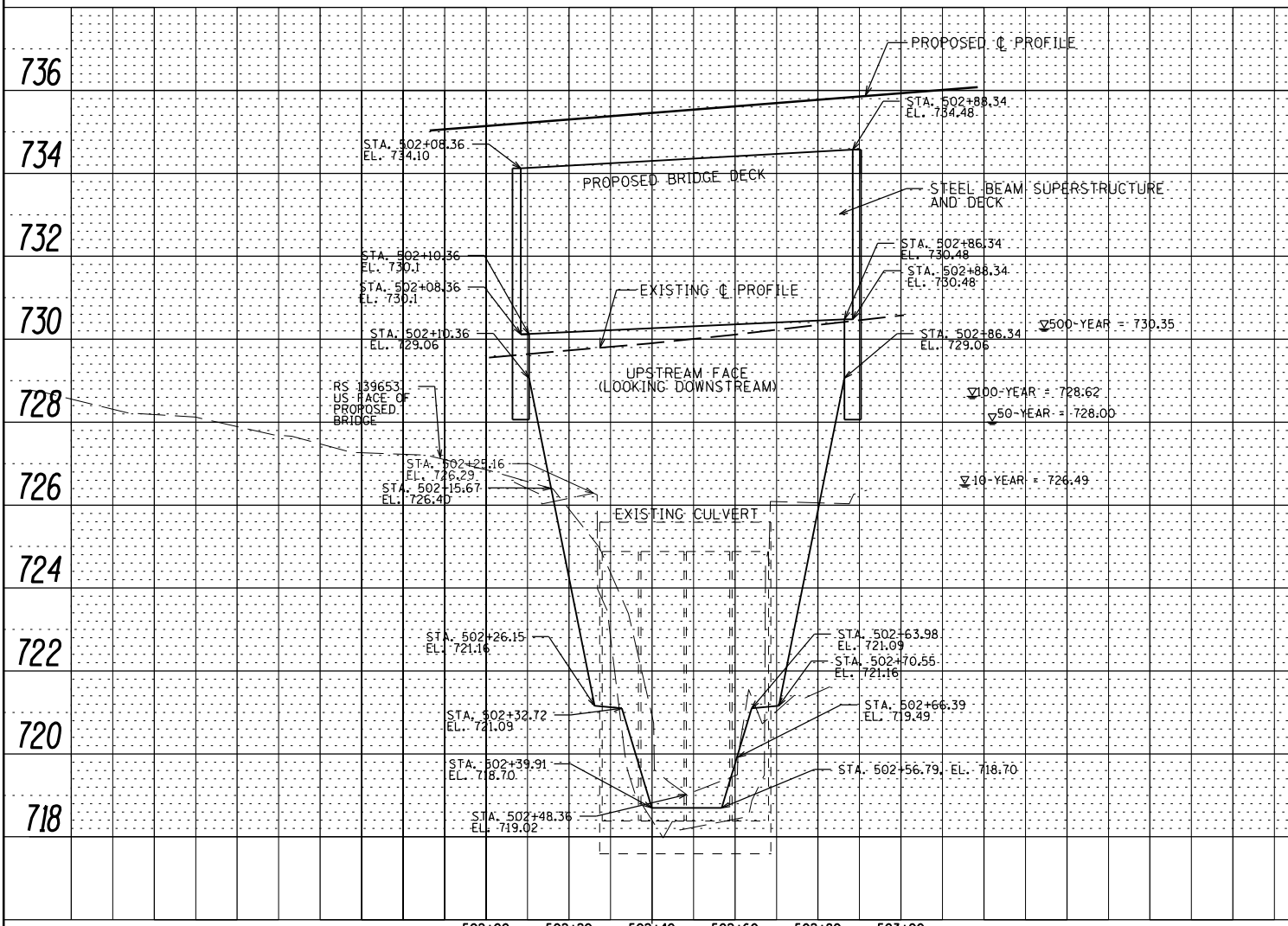
500-YR Existing Waterway Opening is the culvert area plus the overtopping area at the edge of existing pavement - area measured in Microstation

500-YR proposed Waterway Opening is contained within the proposed Bridge, no overtopping of pavement is expected - area measured in Microstation



PLAN

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



PROFILE

	BY	DATE
SURVEYED		
PLOTTED		
GRADES CHECKED		
B.M. NOTED		
STRUCTURE NOTATIONS CH'KD		
NOTE BOOK		
NO.		

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		DRAWN -	REVISED -
	PLOT SCALE = 40.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 5/15/2014	DATE -	REVISED -

STATE O
DEPARTMENT OF

Created Head - G#3 - Existing/Proposed Conditions - (Existing Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: July-14
Checked: DH Date: July-14

(Proposed Bridge modeling is analyzed)

Reach	River Sta		WSEL G#3 Natural Condition	WSEL G#3 Existing Condition	Existing Created Head	WSEL G#3 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	10-yr	729.32	729.32	0.00	729.32	0.00
Main Before D	140504		727.47	727.49	0.02	727.47	0.00
Main Before D	139750		726.61	726.64	0.03	726.61	0.00
Main Before D	139620			726.55		726.51	
Main Before D	140600	50-yr	730.25	730.3	0.05	730.26	0.01
Main Before D	140504		728.75	729.02	0.27	728.79	0.04
Main Before D	139750		728	728.44	0.44	728.08	0.08
Main Before D	139620			728.28		727.93	
Main Before D	140600	100-yr	730.69	730.76	0.07	730.7	0.01
Main Before D	140504		729.32	729.58	0.26	729.38	0.06
Main Before D	139750		728.62	729.02	0.40	728.71	0.09
Main Before D	139620			728.90		728.54	
Main Before D	140600	500-yr	731.89	731.92	0.03	731.97	0.08
Main Before D	140504		730.89	730.93	0.04	731.03	0.14
Main Before D	139750		730.35	730.41	0.06	730.52	0.17
Main Before D	139620			730.27		730.29	

Natural condition contains Existing Main St structure with 47 bridge removed
Existing condition contains Existing Main St structure and existing 47 culvert
Proposed condition contains Existing Main St structure and propose 47 bridge

HEC-RAS WATERWAY INFORMATION TABLE (Route 47 3-Sided Arch) (Exhibit 1-03.2a)

Group #4 WIT (Permit Case - No added GEC survey sections, Existing Culvert and Proposed Arch, Proposed Main St bridge in place)

Route:	IL Route 47	Existing S.N.:	045-2000		
Waterway:	Blackberry Creek - Main before D	Proposed S.N.:	045-2050		
Section:	107B-I-1	Prepared By:	SJS	Date:	Sep-14
County:	Kane	Checked By:	DH	Date:	Sep-14

Drainage Area = 11.32 sq mi

Existing Overtopping Elevation = 729.53 at Sta. 501+17

Proposed Overtopping Elevation = 733.97 at Sta. 501+17

Flood	Frequency Year	Existing Discharge (cfs)	Proposed Discharge (cfs)	Waterway Opening (sq. ft.)		Natural H.W.E.	Head (ft.)		Headwater Elev. (ft)	
				Existing	Proposed		Existing	Proposed	Existing	Proposed
	10	634	634	203.2	330.8	726.56	0.03	0.00	726.59	726.54
DESIGN	50	1120	1120	203.2	371.2	727.79	0.44	0.15	728.23	727.94
BASE	100	1376	1376	203.2	395.6	728.28	0.72	0.23	729.00	728.51
MAX. CALC.	500	2097	2097	1053.4~	420.5	729.44	0.38	0.58	729.82	730.02

Datum: NAVD88

ALL - TIME H.W.E. & DATE: 731.12 ft, inside Blackberry Inn, July 16-18, 1996

Surveyed Normal Water Level: 719.83 ft

10 YEAR VELOCITY THROUGH EXISTING STRUCTURE = 3.12 ft/s

10 YEAR VELOCITY THROUGH PROPOSED ARCH = 1.92 ft/s

2-Yr. Flow Rate = 265 ft^3/s

EXISTING STRUCTURE

TYPE: RC Box Culvert
LENGTH/WIDTH: (2) 6.5' x 8.75' & (2) 6.5'x10.42'
 # SPANS/CELLS: 4
SKEW : 0 (relative to road)
LOW EOP: 728.59 @ 501+17 20' RT
FREEBOARD: 0.11 ft
CULVERT INV. 718.38 (U/S) 718.25 (D/S)

PROPOSED STRUCTURE

3-SIDED CULVERT TYPE: Pre-Cast Concrete Arch
LENGTH OF SPAN: 54 ft
 # CELLS: 1
TOP OF CROWN ELEVATION: 731.36
SKEW : 0 (relative to road)
FLOWLINE ELEV: 718.63 (u/s) 718.52 (d/s)
LOW EOP: 733.52 @ 501+17 60' RT
FREEBOARD: 5.62 ft

NOTE: Proposed structure details are preliminary. Subject to refinement in TS&L stage.
Waterway openings are based on the natural H.W.E.
Natural HWE taken from cross-section 139750 in Group #4 Natural Conditions model.
The existing head is the difference in water surface elevations between existing and natural conditions.
The proposed head is the difference in water surface elevations between proposed and natural conditions
The freeboard is calculated from the edge of the proposed shoulder at 500+17
Existing Proposed Discharge Rates are based on USGS model used to develop the FIS profiles.
~ Waterway opening includes overtopping area (measured in Microstation) + Existing Culvert Area

Group #4 - Arch

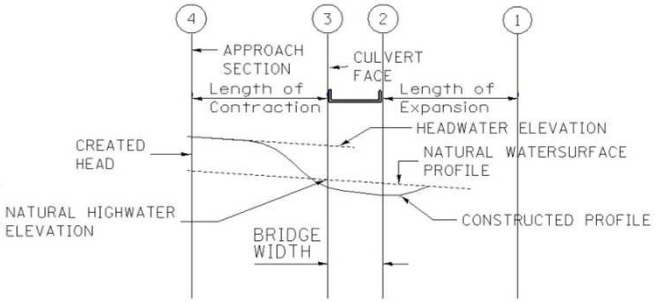
BACKUP CALCULATIONS: Group #4 WIT

Route: IL Rte 47 @ Main Street

Waterway: Blackberry Creek - Main before D

Calculated: SJS Date: Sep-14

Checked: DH Date: Sep-14



Natural WSE

Storm Event	Departure Section #1	Approach Section #4	Structure Face (at Section #4)
	(ft)	(ft)	(ft)
10-year	726.29	726.56	726.56
50-year	727.53	727.79	727.79
100-year	728.01	728.28	728.28
500-year	729.15	729.44	729.44

Section #1 : 139478[+]
Section #2 : 139536
Section #3 : 139620
Section #4 : 139750

*Note: In FIS model the culvert is modeled as a bridge

Created Head

Storm Event	Natural Cond. Section #4 [1]	Ex. Cond. /Section #4 [2]	Proposed Cond./Section #4 [3]	Existing Created Head	Proposed Created Head
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.56	726.59	726.54	0.03	-0.02
50-year	727.79	728.23	727.94	0.44	0.15
100-year	728.28	729	728.51	0.72	0.23
500-year	729.44	729.82	730.02	0.38	0.58

Headwater Elevation

Storm Event	Natural Cond WSE 139750	Existing Created Head	Proposed Created Head	Existing H.W.E.	Proposed H.W.E.
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.56	0.03	-0.02	726.59	726.54
50-year	727.79	0.44	0.15	728.23	727.94
100-year	728.28	0.72	0.23	729.00	728.51
500-year	729.44	0.38	0.58	729.82	730.02

[1] Natural Condition - Group #4 - Natural Conditions HEC-RAS Model.

[2] Existing Condition - Group #4 - Existing Conditions HEC-RAS Model.

[3] Proposed Condition - Group #4 - Proposed Condition HEC-RAS Model, does not include raised IL-47 profile.

[+] Section numbers listed at the top right represent stream stations in feet.

BACK-UP CALCULATIONS FOR WIT: Group #3 (continued)

CALCULATE FREEBOARD AND CLEARANCE

LOW ROAD ELEVATION (ft)			
Existing	**Station**	**Proposed**	**Station**
728.59	501+17	733.56	501+17
LOW BEAM ELEVATION (ft)			
Existing	**Station**	**Proposed**	**Station**
N/A	N/A	N/A	N/A
PROPOSED FREEBOARD (ft)			
10-Yr	**50-Yr**	**100-Yr**	**500-Yr**
7.02	5.62	5.05	3.54
PROPOSED CLEARANCE (ft)			
10-Yr	**50-Yr**	**100-Yr**	**500-Yr**
N/A	N/A	N/A	N/A

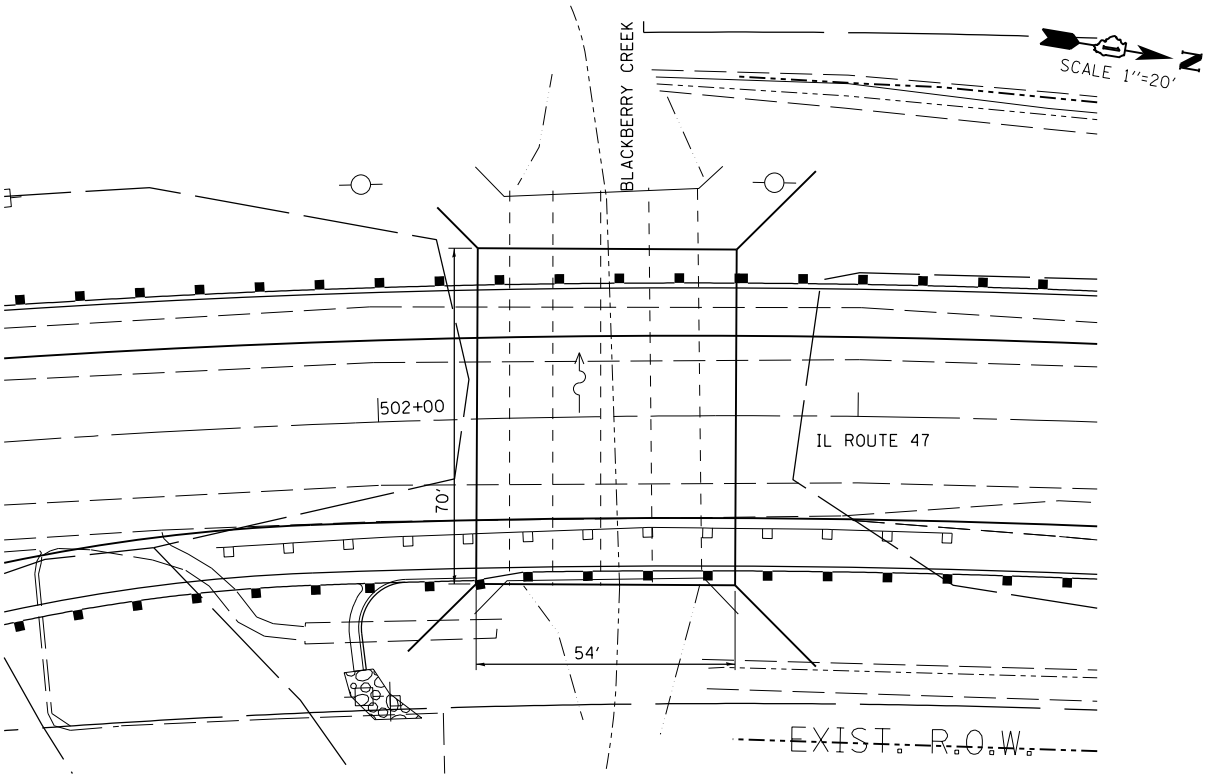
CALCULATE EFFECTIVE WATER OPENING AREA FOR CULVERT

STRUCTURE SIZE (ft x ft)			
EXISTING WIDTH	**EXISTING HEIGHT**	**PROPOSED WIDTH**	**PROPOSED HEIGHT**
38.3	6.5	54	13
STRUCTURE INVERT ELEVATION (ft)			
EXISTING		**PROPOSED**	
U/S	D/S	U/S	D/S
718.38	718.25	717.27	717.07

WATERWAY OPENING AREA (ft^2)		
Frequency	**EXISTING**	**PROPOSED**
10-YR	203.20	330.80
50-YR	203.20	371.20
100-YR	203.20	395.60
500-YR	1053.40	420.50

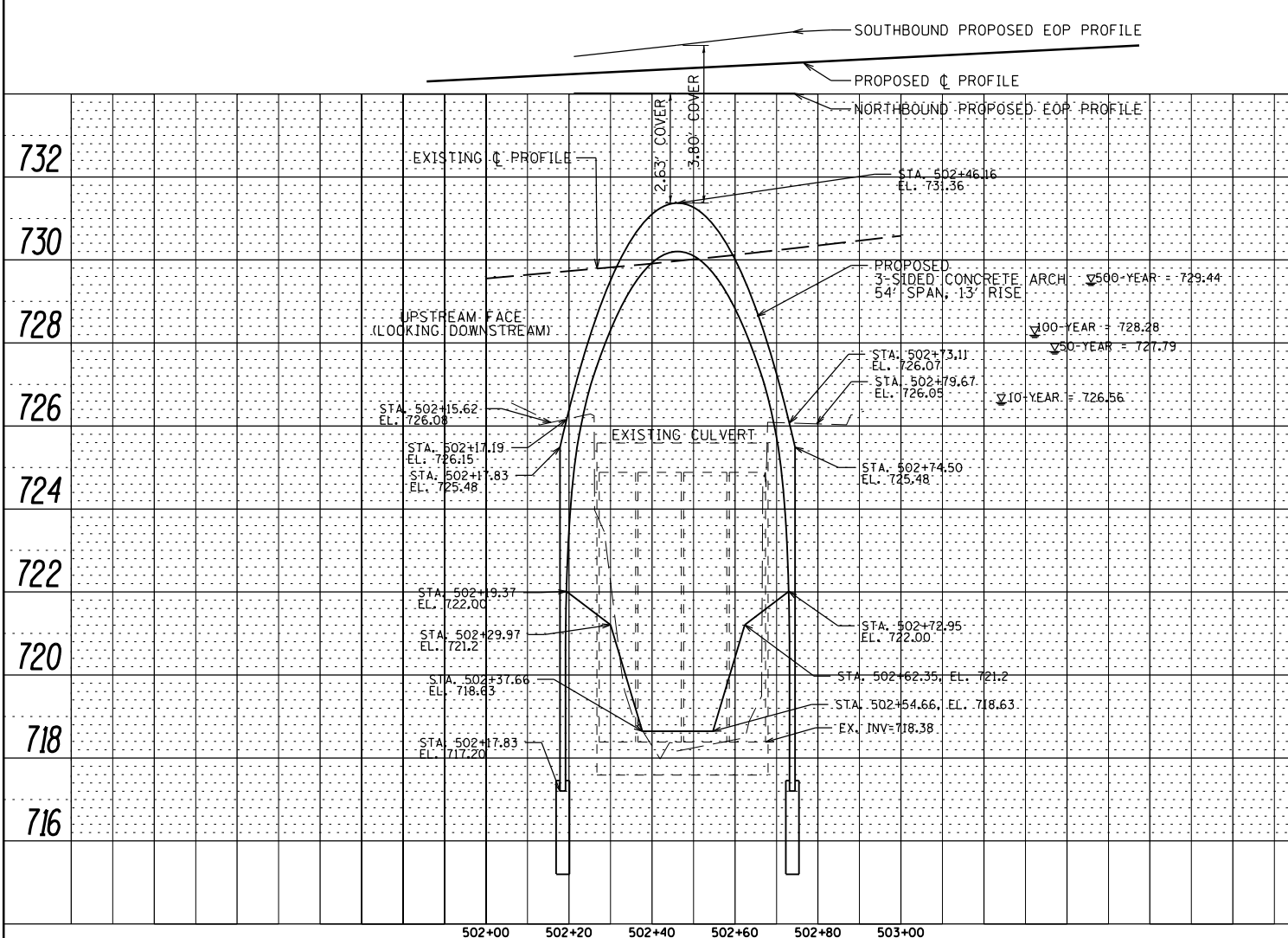
500-YR Existing Waterway Opening is the culvert area plus the overtopping area at the edge of existing pavement - area measured in Microstation

500-YR proposed Waterway Opening is above proposed concrete arch, and may result in pressure flow, no overtopping of pavement is expected.



PLAN

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



PROFILE

NOTE BOOK	SURVEYED	BY	DATE
NO.	PLOTTED		
	GRADES CHECKED		
	B.M. NOTED		
	STRUCTURE NOTATNS CH'KD		

FILE NAME = P:\projects\09020\200\C\IL47\CADD\CADDsheets\D144909-sht-drain-struc_plnprf-EX-2-CONSP.dgn	USER NAME = stephen.schuh	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 40.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 9/3/2014	DATE -	REVISED -

STATE O
DEPARTMENT OF

Created Head - G#4 - Existing/Proposed Conditions - (Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: DH Date: Sep-14

(Proposed 3-sided Arch modeling is analyzed, 54' span)

Reach	River Sta		WSEL G#4 Natural Condition	WSEL G#4 Existing Condition	Existing Created Head	WSEL G#4 Proposed Condition	Proposed Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	10-yr	729.32	729.32	0.00	729.32	0.00
Main Before D	140504		727.45	727.46	0.01	727.44	-0.01
Main Before D	139750		726.56	726.59	0.03	726.54	-0.02
Main Before D	139620						
Main Before D	140600	50-yr	730.24	730.27	0.03	730.25	0.01
Main Before D	140504		728.64	728.89	0.25	728.71	0.07
Main Before D	139750		727.79	728.23	0.44	727.94	0.15
Main Before D	139620						
Main Before D	140600	100-yr	730.65	730.75	0.10	730.67	0.02
Main Before D	140504		729.12	729.56	0.44	729.25	0.13
Main Before D	139750		728.28	729.00	0.72	728.51	0.23
Main Before D	139620						
Main Before D	140600	500-yr	731.65	731.73	0.08	731.79	0.14
Main Before D	140504		730.28	730.52	0.24	730.65	0.37
Main Before D	139750		729.44	729.82	0.38	730.02	0.58
Main Before D	139620						

Natural condition contains Proposed Main St structure with 47 culvert removed
Existing condition contains Proposed Main St structure and existing 47 culvert
Proposed condition contains Proposed Main St structure and proposed 47 - 54' Arch Culvert

Created Head - G#4 - Existing/Proposed Conditions - 10-yr event (Proposed Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#4 Natural Condition	WSEL G#4 Existing Condition	Existing Created Head	WSEL G#4 Proposed Condition	Proposed Created Head	WSEL G#4 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	Q10	729.32	729.32	0.00	729.32	0.00	729.32	0.00
Main Before D	140504	Q10	727.45	727.46	0.01	727.44	-0.01	727.45	0.00
Main Before D	139750	Q10	726.56	726.59	0.03	726.54	-0.02	726.56	0.00
Main Before D	139620	Q10							
Main Before D	139600								
Main Before D	139536	Q10							
Main Before D	139478	Q10	726.29	726.29	0.00	726.31	0.02	726.30	0.01
Main Before D	139355	Q10	726.23	726.23	0.00	726.25	0.02	726.24	0.01
Main Before D	139297	Q10	726.22	726.22	0.00	726.24	0.02	726.23	0.01
Main Before D	139256	Q10	726.19	726.18	-0.01	726.21	0.02	726.18	-0.01
Main Before D	139250								
Main Before D	139206	Q10	726.12	726.12	0.00	726.15	0.03	726.12	0.00
Main Before D	139158	Q10	726.1	726.1	0.00	726.10	0.00	726.10	0.00
Main Before D	138418	Q10	725.26	725.26	0.00	725.26	0.00	725.26	0.00
Main Before D	137750	Q10	723.37	723.37	0.00	723.37	0.00	723.37	0.00
Main Before D	136804	Q10	721.76	721.76	0.00	721.76	0.00	721.76	0.00

River stations 139254 and 139208 are used for the natural conditions, not 139256 and 139206.
Natural condition contains Proposed Main St structure with 47 culvert removed
Existing condition contains Proposed Main St structure and existing 47 culvert
Proposed condition contains Proposed Main St structure and proposed 47 - 54' Arch Culvert
Proposed BR condition contains Proposed Main St structure and proposed 47 - Bridge

Created Head - G#4 - Existing/Proposed Conditions - 50-yr event (Proposed Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#4 Natural Condition	WSEL G#4 Existing Condition	Existing Created Head	WSEL G#4 Proposed Condition	Proposed Created Head	WSEL G#4 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	Q50	730.24	730.27	0.03	730.25	0.01	730.25	0.01
Main Before D	140504	Q50	728.64	728.89	0.25	728.71	0.07	728.69	0.05
Main Before D	139750	Q50	727.79	728.23	0.44	727.94	0.15	727.89	0.10
Main Before D	139620	Q50							
Main Before D	139600								
Main Before D	139536	Q50							
Main Before D	139478	Q50	727.53	727.53	0.00	727.56	0.03	727.54	0.01
Main Before D	139355	Q50	727.47	727.47	0.00	727.50	0.03	727.48	0.01
Main Before D	139297	Q50	727.47	727.46	-0.01	727.50	0.03	727.47	0.00
Main Before D	139256	Q50	727.36	727.36	0.00	727.39	0.03	727.36	0.00
Main Before D	139250								
Main Before D	139206	Q50	727.23	727.23	0.00	727.27	0.04	727.23	0.00
Main Before D	139158	Q50	727.22	727.22	0.00	727.22	0.00	727.22	0.00
Main Before D	138418	Q50	726.3	726.3	0.00	726.30	0.00	726.30	0.00
Main Before D	137750	Q50	724.18	724.18	0.00	724.18	0.00	724.18	0.00
Main Before D	136804	Q50	722.47	722.47	0.00	722.47	0.00	722.47	0.00

River stations 139254 and 139208 are used for the natural conditions, not 139256 and 139206.
Natural condition contains Proposed Main St structure with 47 culvert removed
Existing condition contains Proposed Main St structure and existing 47 culvert
Proposed condition contains Proposed Main St structure and proposed 47 - 54' Arch Culvert
Proposed BR condition contains Proposed Main St structure and proposed 47 - Bridge

Created Head - G#4 - Existing/Proposed Conditions - 100-yr event (Proposed Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#4 Natural Condition	WSEL G#4 Existing Condition	Existing Created Head	WSEL G#4 Proposed Condition	Proposed Created Head	WSEL G#4 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	Q100	730.65	730.75	0.10	730.67	0.02	730.66	0.01
Main Before D	140504	Q100	729.12	729.56	0.44	729.25	0.13	729.20	0.08
Main Before D	139750	Q100	728.28	729	0.72	728.51	0.23	728.41	0.13
Main Before D	139620	Q100							
Main Before D	139600								
Main Before D	139536	Q100							
Main Before D	139478	Q100	728.01	728	-0.01	728.04	0.03	728.01	0.00
Main Before D	139355	Q100	727.94	727.94	0.00	727.98	0.04	727.95	0.01
Main Before D	139297	Q100	727.94	727.93	-0.01	727.97	0.03	727.95	0.01
Main Before D	139256	Q100	727.79	727.78	-0.01	727.83	0.04	727.78	-0.01
Main Before D	139250								
Main Before D	139206	Q100	727.62	727.61	-0.01	727.66	0.04	727.61	-0.01
Main Before D	139158	Q100	727.61	727.61	0.00	727.61	0.00	727.61	0.00
Main Before D	138418	Q100	726.63	726.63	0.00	726.63	0.00	726.63	0.00
Main Before D	137750	Q100	724.52	724.53	-0.01	724.52	0.00	724.52	0.00
Main Before D	136804	Q100	722.78	722.78	0.00	722.78	0.00	722.78	0.00

River stations 139254 and 139208 are used for the natural conditions, not 139256 and 139206.
Natural condition contains Proposed Main St structure with 47 culvert removed
Existing condition contains Proposed Main St structure and existing 47 culvert
Proposed condition contains Proposed Main St structure and proposed 47 - 54' Arch Culvert
Proposed BR condition contains Proposed Main St structure and proposed 47 - Bridge

Created Head - G#4 - Existing/Proposed Conditions - 500-yr event (Proposed Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: Sep-14
Checked: DH Date: Sep-14

Reach	River Sta	Profile	WSEL G#4 Natural Condition	WSEL G#4 Existing Condition	Existing Created Head	WSEL G#4 Proposed Condition	Proposed Created Head	WSEL G#4 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	Q500	731.65	731.73	0.08	731.79	0.14	731.7	0.05
Main Before D	140504	Q500	730.28	730.52	0.24	730.65	0.37	730.43	0.15
Main Before D	139750	Q500	729.44	729.82	0.38	730.02	0.58	729.68	0.24
Main Before D	139620	Q500							
Main Before D	139600								
Main Before D	139536	Q500							
Main Before D	139478	Q500	729.15	729.13	-0.02	729.19	0.04	729.15	0.00
Main Before D	139355	Q500	729.08	729.07	-0.01	729.13	0.05	729.09	0.01
Main Before D	139297	Q500	729.08	729.07	-0.01	729.13	0.05	729.09	0.01
Main Before D	139256	Q500	728.79	728.77	-0.02	728.84	0.05	728.77	-0.02
Main Before D	139250								
Main Before D	139206	Q500	728.48	728.46	-0.02	728.53	0.05	728.46	-0.02
Main Before D	139158	Q500	728.5	728.5	0.00	728.50	0.00	728.50	0.00
Main Before D	138418	Q500	727.37	727.37	0.00	727.37	0.00	727.37	0.00
Main Before D	137750	Q500	725.3	725.3	0.00	725.30	0.00	725.30	0.00
Main Before D	136804	Q500	723.54	723.54	0.00	723.54	0.00	723.54	0.00

River stations 139254 and 139208 are used for the natural conditions, not 139256 and 139206.
Natural condition contains Proposed Main St structure with 47 culvert removed
Existing condition contains Proposed Main St structure and existing 47 culvert
Proposed condition contains Proposed Main St structure and proposed 47 - 54' Arch Culvert
Proposed BR condition contains Proposed Main St structure and proposed 47 - Bridge

HEC-RAS WATERWAY INFORMATION TABLE (Route 47 Bridge) (Exhibit 1-03.2b)

Group #4 WIT (Permit Case - No added GEC survey sections, Existing Culvert and Proposed Bridge, with Proposed Main St bridge in place)

Route:	IL Route 47	Existing S.N.:	045-2000		
Waterway:	Blackberry Creek - Main before D	Proposed S.N.:	045-2050		
Section:	107B-I-1	Prepared By:	SJS	Date:	Jul-14
County:	Kane	Checked By:	DH	Date:	Jul-14

Drainage Area = 11.32 sq mi

Existing Overtopping Elevation = 729.53 at Sta. 501+17

Proposed Overtopping Elevation = 734.50 at Sta. 501+17

Flood	Frequency Year	Existing Discharge (cfs)	Proposed Discharge (cfs)	Waterway Opening (sq. ft.)		Natural H.W.E.	Head (ft.)		Headwater Elev. (ft)	
				Existing	Proposed		Existing	Proposed	Existing	Proposed
	10	634	634	203.2	354.0	726.56	0.03	0.00	726.59	726.56
DESIGN	50	1120	1120	203.2	438.2	727.79	0.44	0.10	728.23	727.89
BASE	100	1376	1376	203.2	473.4	728.28	0.72	0.13	729.00	728.41
MAX. CALC.	500	2097	2097	1053.4~	559.6	729.44	0.38	0.24	729.82	729.68

Datum: NAVD88

ALL - TIME H.W.E. & DATE: 731.12 ft, inside Blackberry Inn, July 16-18, 1996

Surveyed Normal Water Level: 719.83 ft

10 YEAR VELOCITY THROUGH EXISTING STRUCTURE = 3.12 ft/s

10 YEAR VELOCITY THROUGH PROPOSED ARCH = 1.80 ft/s

2-Yr. Flow Rate = 265 ft^3/s

EXISTING STRUCTURE

TYPE: RC Box Culvert

LENGTH/WIDTH: (2) 6.5' x 8.75' & (2) 6.5'x10.42'

 # SPANS/CELLS: 4

SKEW : 0 (relative to road)

LOW EOP: 728.59 @ 501+17 20' RT

FREEBOARD: 0.11 ft

CULVERT INV. 718.38 (U/S) 718.25 (D/S)

PROPOSED STRUCTURE

TYPE: Open abutment with steel superstructure

LENGTH OF SPAN: 76 ft

 # SPANS: 1

LOW CHORD: 730.10

SKEW : 0 (relative to road)

CLEARANCE: 2.31 ft

BRIDGE FLOW LINE: 718.7 (U/S) 718.62 (D/S)

LOW EOP: 734.1 @501+17 22' RT

FREEBOARD: 6.21 ft

NOTE: Proposed structure details are preliminary. Subject to refinement in TS&L stage.
Waterway openings are based on the natural H.W.E.
Natural HWE taken from cross-section 139750 in Group #4 Natural Conditions model.
The existing head is the difference in water surface elevations between existing and natural conditions.
The proposed head is the difference in water surface elevations between proposed and natural conditions
The freeboard is calculated from the edge of the proposed shoulder at 501+17
Existing Proposed Discharge Rates are based on USGS model used to develop the FIS profiles.
~ Waterway opening includes overtopping area (measured in Microstation) + Existing Culvert Area

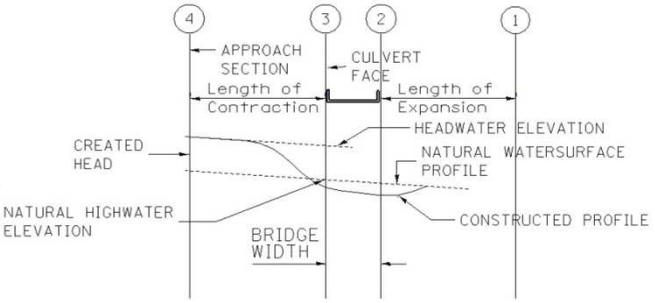
BACKUP CALCULATIONS: Group #4 WIT

Route: IL Rte 47 @ Main Street

Waterway: Blackberry Creek - Main before D

Calculated: SJS Date: Jul-14

Checked: DH Date: Jul-14



Natural WSE

Storm Event	Departure Section #1	Approach Section #4	Structure Face (at Section #4)
	(ft)	(ft)	(ft)
10-year	726.29	726.56	726.56
50-year	727.53	727.79	727.79
100-year	728.01	728.28	728.28
500-year	729.15	729.44	729.44

Section #1 : 139478[+]
Section #2 : 139536
Section #3 : 139620
Section #4 : 139750

*Note: In FIS model the culvert is modeled as a bridge

Created Head

Storm Event	Natural Cond. Section #4 [1]	Ex. Cond. /Section #4 [2]	Proposed Cond./Section #4 [3]	Existing Created Head	Proposed Created Head
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.56	726.59	726.56	0.03	0
50-year	727.79	728.23	727.89	0.44	0.1
100-year	728.28	729	728.41	0.72	0.13
500-year	729.44	729.82	729.68	0.38	0.24

Headwater Elevation

Storm Event	Natural Cond WSE 139750	Existing Created Head	Proposed Created Head	Existing H.W.E.	Proposed H.W.E.
	(ft)	(ft)	(ft)	(ft)	(ft)
10-year	726.56	0.03	0	726.59	726.56
50-year	727.79	0.44	0.1	728.23	727.89
100-year	728.28	0.72	0.13	729.00	728.41
500-year	729.44	0.38	0.24	729.82	729.68

[1] Natural Condition - Group #3 - Natural Conditions HEC-RAS Model.

[2] Existing Condition - Group #3 - Existing Conditions HEC-RAS Model.

[3] Proposed Condition - Group #3 - Proposed Condition HEC-RAS Model, with Raised 47 profile

[+] Section numbers listed at the top right represent stream stations in feet.

BACK-UP CALCULATIONS FOR WIT: Group #4 (continued)

CALCULATE FREEBOARD AND CLEARANCE

LOW ROAD ELEVATION (ft)			
Existing	**Station**	**Proposed**	**Station**
728.59	501+17	734.1	501+17
LOW BEAM ELEVATION (ft)			
Existing	**Station**	**Proposed**	**Station**
N/A	N/A	730.1	502+50
PROPOSED FREEBOARD (ft)			
10-Yr	**50-Yr**	**100-Yr**	**500-Yr**
7.54	6.21	5.69	4.42
PROPOSED CLEARANCE (ft)			
10-Yr	**50-Yr**	**100-Yr**	**500-Yr**
3.54	2.31	1.82	0.66

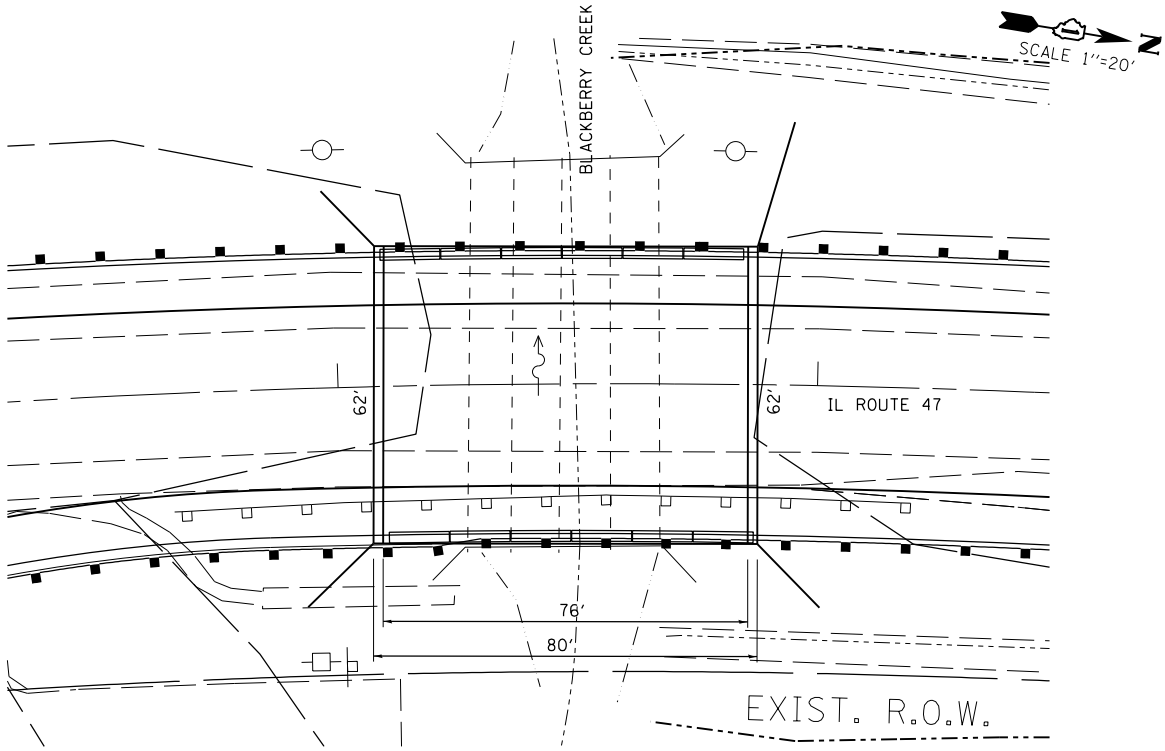
CALCULATE EFFECTIVE WATER OPENING AREA FOR CULVERT

STRUCTURE SIZE (ft x ft)			
EXISTING WIDTH	**EXISTING HEIGHT**	**PROPOSED WIDTH**	**PROPOSED HEIGHT**
38.3	6.5	N/A	N/A
STRUCTURE INVERT ELEVATION (ft)			
EXISTING		**PROPOSED**	
U/S	D/S	U/S	D/S
718.38	718.25		

WATERWAY OPENING AREA (ft^2)		
Frequency	**EXISTING**	**PROPOSED**
10-YR	203.20	354.00
50-YR	203.20	438.20
100-YR	203.20	473.40
500-YR	1053.40	559.60

500-YR Existing Waterway Opening is the culvert area plus the overtopping area at the edge of existing pavement - area measured in Microstation

500-YR proposed Waterway Opening is contained within the proposed Bridge, no overtopping of pavement is expected - area measured in Microstation



PLAN

	BY	DATE
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ALIGNMENT CHECKED		
RT. OF WAY CHECKED		
CADD FILE NAME		
NOTE BOOK		
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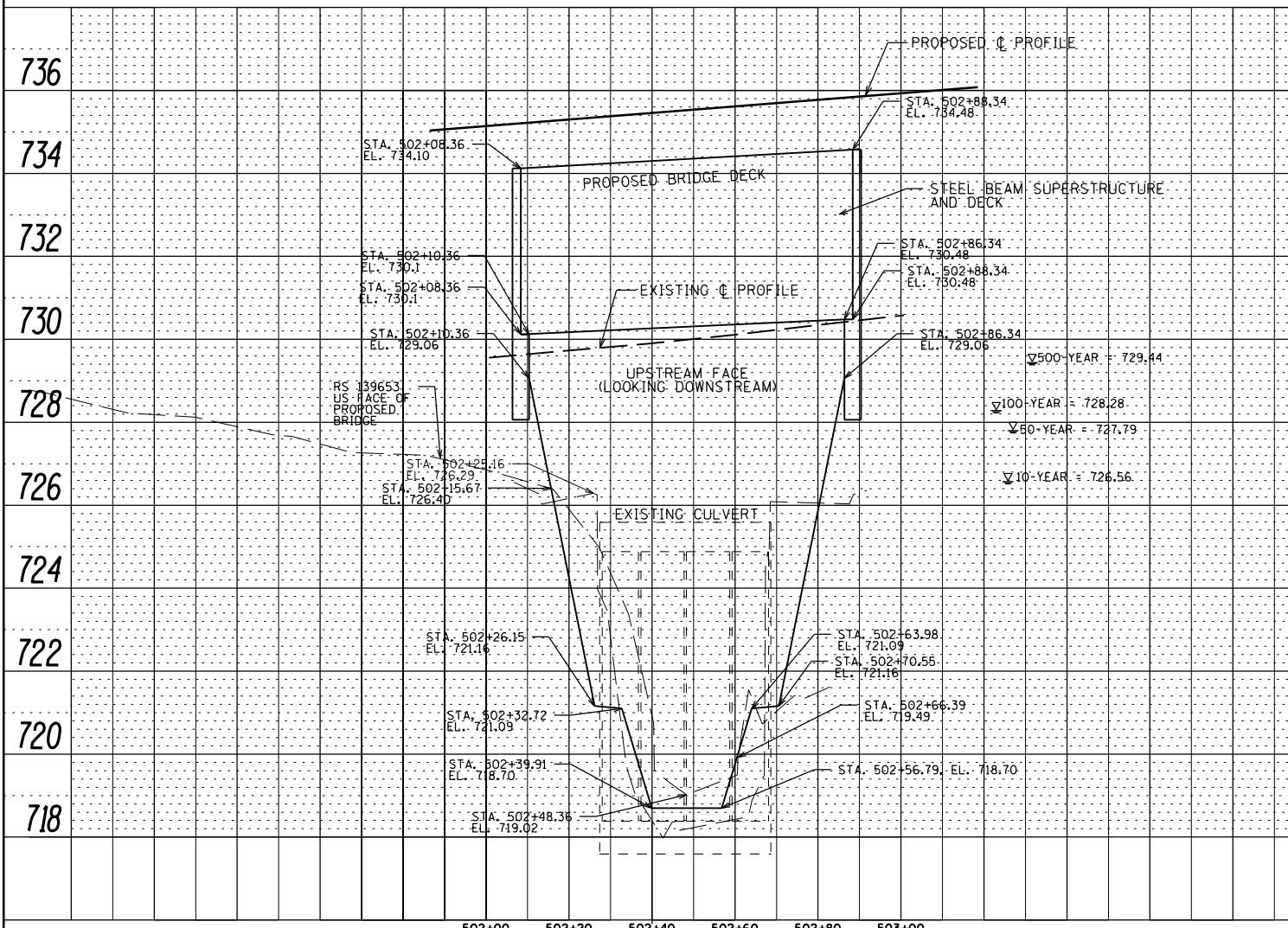
PROFILE

	BY	DATE
SURVEYED		
PLOTTED		
GRADES CHECKED		
B.M. NOTED		
STRUCTURE NOTATIONS CH'KD		
NOTE BOOK		
NO.		



FILE NAME =	USER NAME = stephen.schuh	DESIGNED -	REVISED -	**STATE O**
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	PLOT SCALE = 40.0000 ' / in.	CHECKED -	REVISED -	
	PLOT DATE = 5/15/2014	DATE -	REVISED -	

Created Head - G#4 - Existing/Proposed Conditions - (Proposed Main St structure in Natural Cond)

Project Route: IL 47 and Main St.
Project Limits: Intersection Improvements
County: Kane

By: SJS Date: July-14
Checked: DH Date: July-14

(Proposed Bridge modeling is analyzed)

Reach	River Sta		WSEL G#4 Natural Condition	WSEL G#4 Existing Condition	Existing Created Head	WSEL G#4 Proposed BR Condition	Proposed BR Created Head
			(ft)	(ft)	(ft)	(ft)	(ft)
Main Before D	140600	10-yr	729.32	729.32	0.00	729.32	0.00
Main Before D	140504		727.45	727.46	0.01	727.45	0.00
Main Before D	139750		726.56	726.59	0.03	726.56	0.00
Main Before D	139620			726.49		726.46	
Main Before D	140600	50-yr	730.24	730.27	0.03	730.25	0.01
Main Before D	140504		728.64	728.89	0.25	728.69	0.05
Main Before D	139750		727.79	728.23	0.44	727.89	0.10
Main Before D	139620			728.06		727.73	
Main Before D	140600	100-yr	730.65	730.75	0.10	730.66	0.01
Main Before D	140504		729.12	729.56	0.44	729.20	0.08
Main Before D	139750		728.28	729.00	0.72	728.41	0.13
Main Before D	139620			728.87		728.22	
Main Before D	140600	500-yr	731.65	731.73	0.08	731.7	0.05
Main Before D	140504		730.28	730.52	0.24	730.43	0.15
Main Before D	139750		729.44	729.82	0.38	729.68	0.24
Main Before D	139620			729.62		729.38	

Natural condition contains Proposed Main St structure with 47 bridge removed
Existing condition contains Proposed Main St structure and existing 47 culvert
Proposed condition contains Proposed Main St structure and proposed 47 bridge

Illinois Department of Transportation

Hydraulic Report Data Sheets

Route	IL Route 47 and Main Street	P or D #	P-91-449-09
Section		PTB #	152
County	Kane		
Exist SN	045-2000		
Prop SN	045-2050		

General Information

1. Name of the Stream: Blackberry Creek

2. Location of the Structure: SE ¼ of the ¼ of Section 20, Township 39N, Range 7E of the 3rd P.M.

3. Hydraulic Report Prepared By: ☒ Consultant Globetrotter's Engineering Corporation
   ☐ District

4. Hydraulic Report Approval Authority: ☐ District – Post PDF of HR to BBS Hydraulics SharePoint Server
   ☒ BBS Hydraulics - Submit 2 hard copies of HR to BBS Hydraulics

Site Design Data

5. Drainage Area (sq. mi.): 11.3

6. Highway Classification:
   ☒ Rural ☐ Urban ☐ Other
   ☒ Principal Arterial ☐ Minor Arterial ☐ Collector ☐ Local

7. Design Frequency: ☐ 30 yr ☒ 50 Yr. ☐ Other

8. Number of Waterway Information Tables (WIT): 8
   If more than one, explain: Two Design WIT and one Permit (FIS) WIT were developed, due to the downstream Main Street Structure replacement/modeling.

Hydrologic & Hydraulic Analysis

9. Hydrology Modeling (check all that apply): ☐ USGS/Stream Stats ☒ FIS ☐ Gage Data
   ☐ Other

10. Hydraulic Modeling (check all that apply):
    a. Method: ☒ HEC-RAS ☐ WSPRO ☐ Other
    b. Manning's "n" values determined as per IDOT DM CH.5? ☒ Yes ☐ No
       If no, explain:
    c. Source of Starting WSE: FIS
    d. Non- IDOT encroachments in Survey? ☒ Yes ☐ No
       If yes, are they accounted for? ☒ Yes ☐ No
    e. Does the Tailwater Control? ☒ Yes ☐ No
       If yes, list:
    f. Were the Expansion/Contraction cones properly addressed? ☒ Yes ☐ No ☐ N/A
       If No or N/A, explain:

g. What Expansion and Contraction Rates were used? Expansion: .3 (X:1)
Contraction .5 (X:1)

IDNR – OWR Floodway Permit

11. Is area experiencing urbanization or expected to urbanize within 10 years? ☒ Yes ☐ No

12. Are there any sensitive flood receptors located upstream within possible backwater influence? ☒ Yes ☐ No
If yes, list and describe critical upstream flood damageable properties and their elevations.
1) (To Be Removed) 82' S of IL47 structure, Low Opening 730.12 feet, Blackberry Creek Inn Bar and Grill.
2) (To Be Removed) Outside of the 500-yr floodplain, listed due to proximity to floodplain, Low Opening 734.3 feet.

13. Is there any History of Flooding or Overtopping problems? ☒ Yes ☐ No
Sources of Observed Highwater:
Blackberry Inn observed 1 foot depth in restaurant (731.12 feet) during the major 1996 event. Road was overtopped.

14. Is the structure hydraulically connected to or within the floodway of an IDNR-OWR designated Public Body of Water? ☐ Yes ☒ No

15. Required IDNR - OWR Permit type:
☐ Individual ☐ SWP #2 ☐ SWP #12 ☒ Floodway
☐ None ☐ Other

Proposed Structure Data

16. Project Scope (check all that apply):
a. ☒ Complete Replacement
b. ☐ Superstructure Replacement
c: ☐ Superstructure Widening; Length of Pier Extension in the water:
U/S D/S
d. ☐ Bridge ☒ Culvert
e. ☐ New Alignment
f. Work Planned Below Q_{100} HWE? ☒ Yes ☐ No
g. ☒ Profile Raise

17. If a bridge is proposed, supply:
Flow line elevation (ft): Abutment type:
Preliminary low beam elevation (ft): Skew (degrees):
Width of deck (ft): Number of spans:
Total length from face to face of abutment (ft)

18. If a culvert is proposed, supply:
Type and size: Length (ft):
Upstream invert elevation (ft): Entrance type:
Downstream invert elevation (ft): Skew (degrees):
Note: Upstream and downstream elevations should reflect the elevations before the 3" drop is applied

19. If a three-sided structure is proposed, supply:
Flow line elevation (ft): 717.2 Skew (degrees): 0
Span (ft): 54 Length (ft): 70
Height (ft): 13 Number of spans: 1

20. a. Is the IDOT Clearance Policy Met? ☐ Yes ☐ No ☒ NA Value (ft):
b. Is the IDOT Freeboard Policy Met? ☒ Yes ☐ No ☐ NA Value (ft): 4.69

21. Type of streambed soil : ☐ Clay ☐ Silt ☐ Sand ☒ Loam ☒ Muck

22. Scour/ Migration Problems: ☒ None/Minimal ☐ Significant ☐ Severe
Comments: Site inspection reveals some scour around locations where debris has collected.

Ice Concerns: ☒ None/Minimal ☐ Significant ☐ Severe
Comments:

Debris Concerns: ☐ None/Minimal ☒ Significant ☐ Severe
Comments: fallen timbers and other collected debris are present at the upstream face of the existing culvert.

Countermeasures Proposed: Remove all debris and accumulated silt

Existing Structure Data

		Structure U/S	Subject Structure	Structure D/S
23.	Distance from proposed structure: (ft.)	5012'	0'	283'
24.	Type of structure:	Bridge	Culvert	Bridge
25.	Low beam elevation:	734.85	718.38 (inv)	726.67
26.	Flow line elevation:	727.15	719.02	718.96
27.	Maximum known high water elevation:	736.1	731.12	727.6
28.	Date of maximum high water:	July 1996	July 1996	July 1996
29.	Cause (backwater, headwater, etc.):	Backwater	Headwater	Backwater
30.	Does structure carry entire design flood flow?	☒ Yes ☐ No	☐ Yes ☒ No	☐ Yes ☒ No
	If not, state area of additional waterway opening: (ft^2)		584	133
31.	Type and size of existing overflow structures:		Roadway overflow	Roadway overflow
32.	Has adverse scour occurred under or adjacent to the structure?		no	yes
33.	Classify type of scour and/or aggradation / degradation:		aggradation at D/S and U/S	severe scour at U/S face

Required Additional Data

34. Deviations from the General Procedures presented in IDOT DM CH. 2, CH.6, and CH.7:

35. Information regarding high water from other streams, reservoirs, flood control projects, proposed channel changes, or other controls affecting proposed waterway area:

36. Site Inspection made by: Stephen Schuh Date: 9-07-2010

Remarks:

37. Prepared by: Stephen Schuh Date 7/28/2014

Signed (QA/QC): DAVID HANDWERK Date 7/30/2014

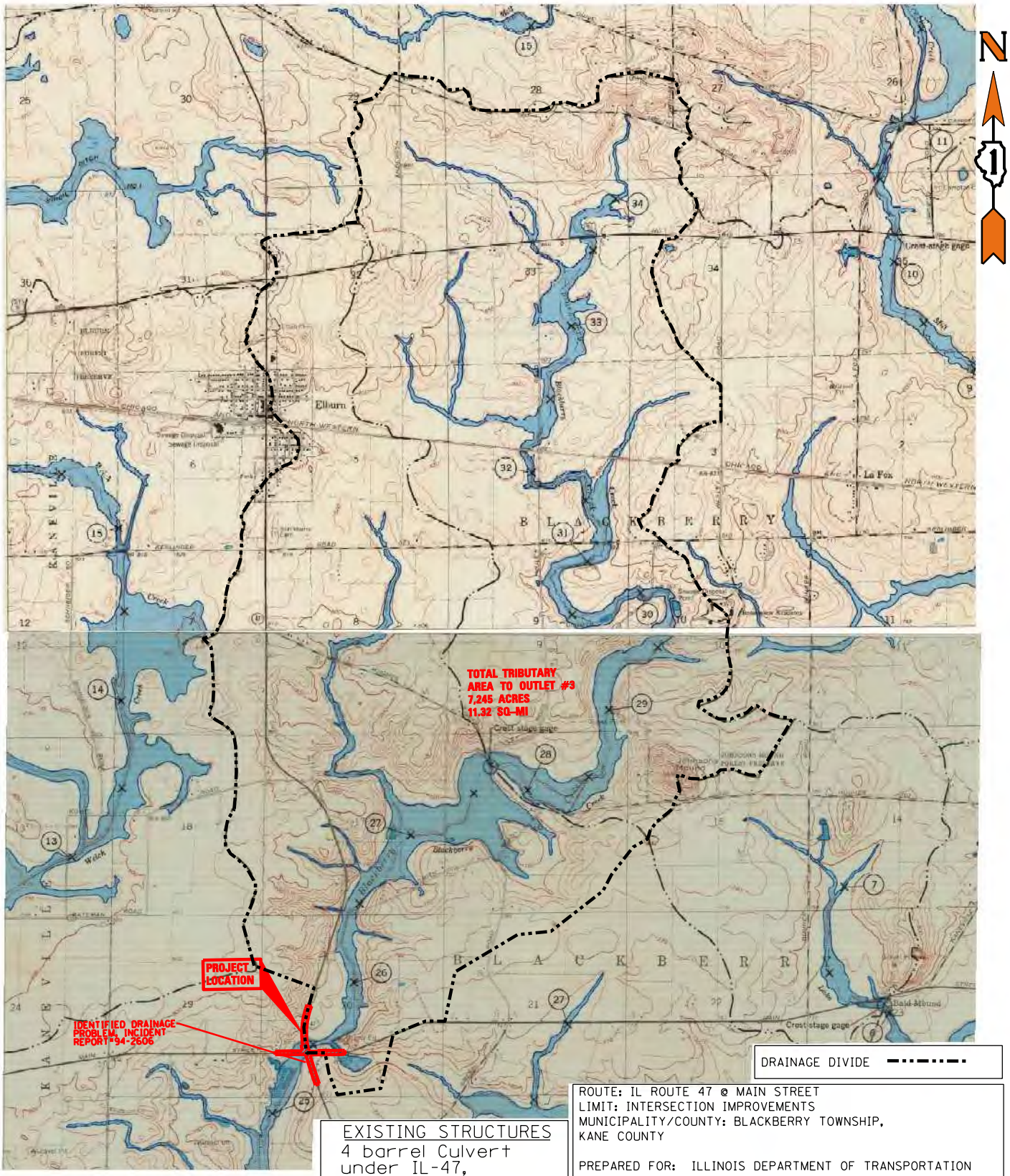
Hydraulic Report Checklist

The District or Consultant should complete the following checklist before submitting the Hydraulic Report for approval.

1. ☒ Title Page
2. ☒ Table of Contents
3. ☒ Narrative - (as outlined in Section 2-601.01 Item #3)
4. ☒ Waterway Information Table (WIT) - (as outlined in Section 2-601.01 Item #4)
5. ☒ Hydraulic Report Data Sheets
6. ☒ Location Map - should show the subject structure along with nearby location defining landmarks (cities, roads, highways, etc.)
7. ☒ USGS Hydraulic Investigation Map (District 1 only)
8. ☒ Photographs - (Minimum: U/S & D/S Structure Faces, Up & Down Channel, Up & Down Roadway Across Structure)
9. ☒ Hydrology (map and calculations)
10. ☒ Streambed Profile
11. ☒ Roadway Profile (existing and proposed)
12. ☒ Cross Section Plots - with plan layout preferably overlayed upon an aerial photo with the contours
13. ☒ Bridge Opening Plots
14. ☒ Natural Condition Analysis
15. ☒ Existing Condition Analysis
16. ☒ Proposed Condition Analysis

When HEC-RAS modeling is being used, ALL Plans (Natural, Existing, & Proposed) shall be included in ONE Project File.

17. ☒ Scour Analysis – Existing and Proposed Conditions
18. ☒ Compensatory Storage Calculations (if required)
19. ☒ Survey Notes (if available, No Electronic Point Files)
20. ☒ Correspondence Notes
21. ☒ CD with Project Files (Include pdf copy of the Hydraulic Report)



EXISTING STRUCTURES
4 barrel Culvert
under IL-47,
46' Bridge (Main St.)

ROUTE: IL ROUTE 47 @ MAIN STREET
LIMIT: INTERSECTION IMPROVEMENTS
MUNICIPALITY/COUNTY: BLACKBERRY TOWNSHIP, KANE COUNTY

PREPARED FOR: ILLINOIS DEPARTMENT OF TRANSPORTATION
PREPARED BY: GLOBETROTTERS ENGINEERING CORPORATION
DATE: 10/8/2010

Globetrotters®
Engineering Corporation
ENGINEERS ARCHITECTS
300 South Wacker Drive
Chicago, Illinois 60606

EXHIBIT 1-00a
GENERAL LOCATION DRAINAGE MAP

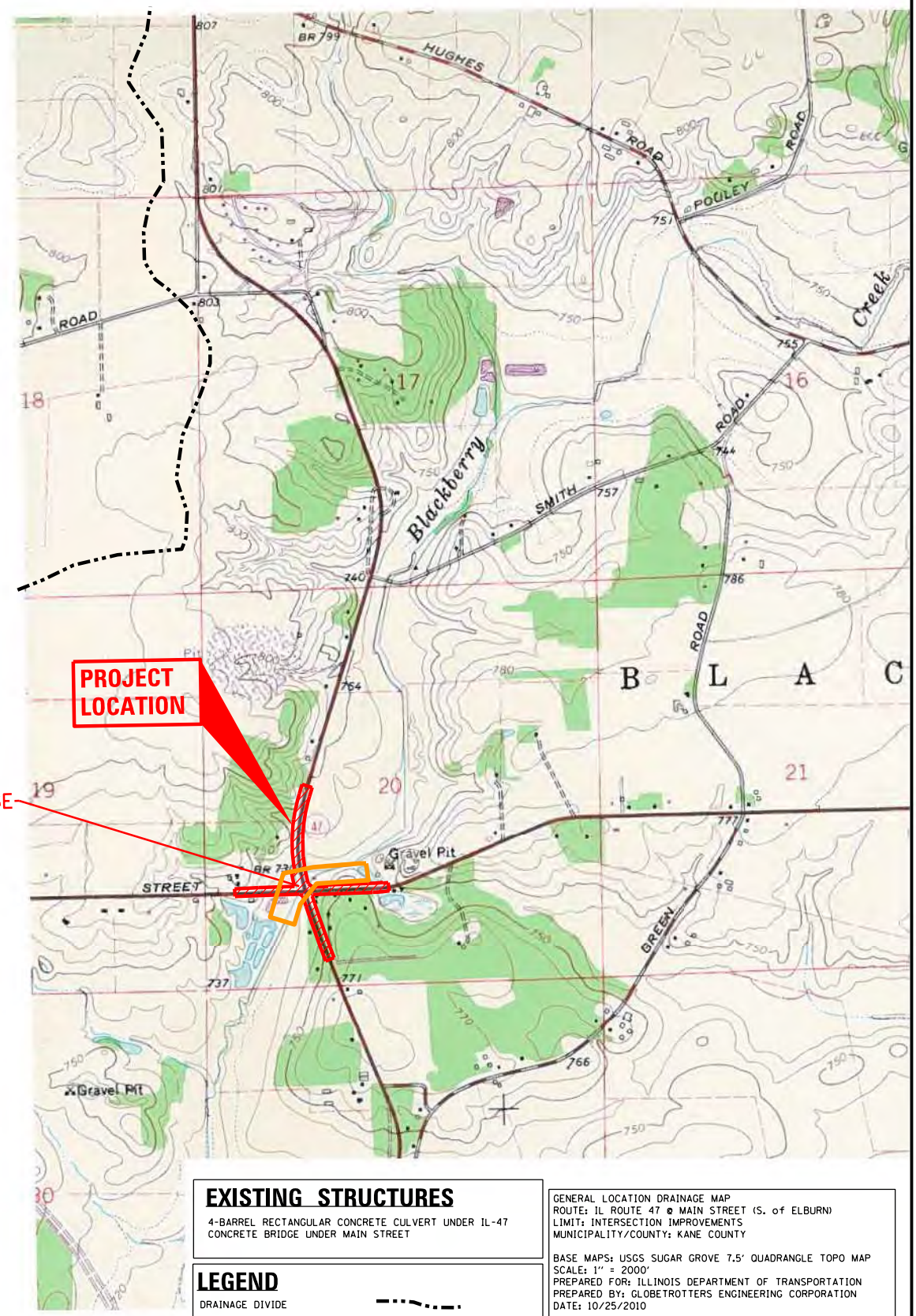
ILLINOIS RTE 47 AND MAIN STREET

HYDROLOGIC ATLAS:
HA-227&229, Sugar Grove & Elburn

DATED:
1966

SCALE: 1'' = 4000'

SHEET NO. 1 of 1



EXISTING STRUCTURES

4-BARREL RECTANGULAR CONCRETE CULVERT UNDER IL-47
CONCRETE BRIDGE UNDER MAIN STREET

LEGEND

DRAINAGE DIVIDE

FLOODPLAIN ENCROACHMENT

GENERAL LOCATION DRAINAGE MAP
ROUTE: IL ROUTE 47 @ MAIN STREET (S. of ELBURN)
LIMIT: INTERSECTION IMPROVEMENTS
MUNICIPALITY/COUNTY: KANE COUNTY

BASE MAPS: USGS SUGAR GROVE 7.5' QUADRANGLE TOPO MAP
SCALE: 1" = 2000'
PREPARED FOR: ILLINOIS DEPARTMENT OF TRANSPORTATION
PREPARED BY: GLOBETROTTERS ENGINEERING CORPORATION
DATE: 10/25/2010

Globetrotters®
Engineering Corporation
ENGINEERS ARCHITECTS
300 South Wacker Drive
Chicago, Illinois 60606

EXHIBIT 1-00a
GENERAL LOCATION DRAINAGE MAP

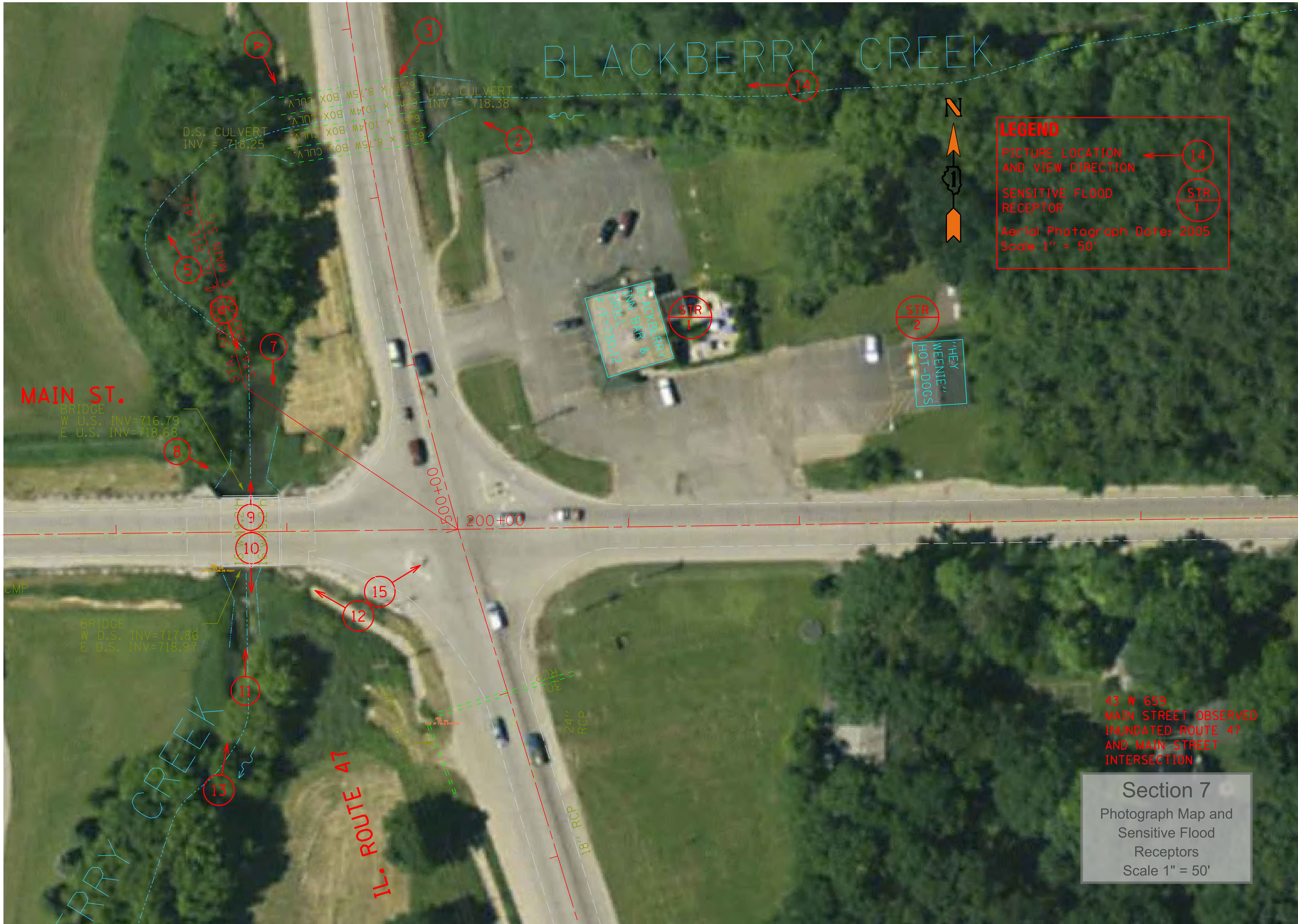
ILLINOIS RTE 47 AND MAIN STREET

USGS Topo Map:
7.5' Sugar Grove Quadrangle

DATED:
1993

SCALE: 1" = 2000'

SHEET NO. 1 of 1


BLACKBERRY CREEK
U.S. CULVERT
INV = 718.38
D.S. CULVERT
INV = 718.25
LEGEND
PICTURE LOCATION AND VIEW DIRECTION
SENSITIVE FLOOD RECEPTOR
STR 1
Aerial Photograph Date: 2005
Scale 1" = 50'
N
MAIN ST.
BRIDGE
W U.S. INV=716.79
E U.S. INV=718.68
BRIDGE
W D.S. INV=717.86
E D.S. INV=718.97
BLACKBERRY INN BAR & GRILL
"HEY WEENIE" HOT-DOGS
STR 1
STR 2
200+00
500+00
IL. ROUTE 47
24" RCP
18" RCP
43 W 659
MAIN STREET OBSERVED
INUNDATED ROUTE 47
AND MAIN STREET
INTERSECTION
Section 7
Photograph Map and
Sensitive Flood
Receptors
Scale 1" = 50'

#1 : Looking east from the east (upstream) side of Rte. 47 culvert.

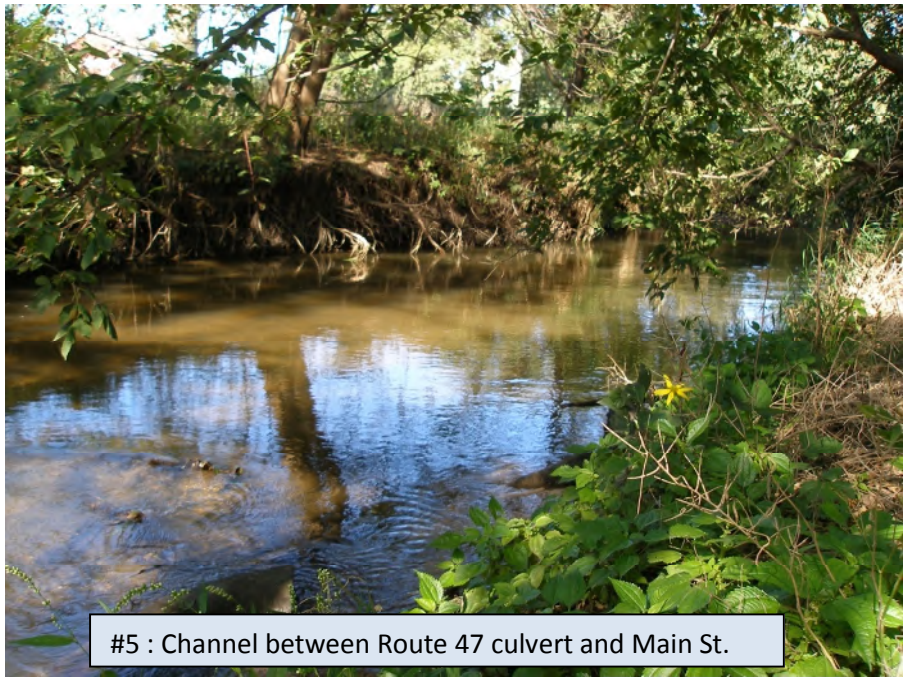
#3 : Debris at the upstream face of the Route 47 culvert.

#2 : Looking west from the east (upstream) side of Rte. 47 culvert.

#4 : Downstream face of the Route 47 culvert. (large silt deposit)

Section 7

Photographs



#5 : Channel between Route 47 culvert and Main St.

#7 : Looking south from the south (downstream) side of Main St bridge.

#6 : Channel to the upstream face of the Main St. bridge.

Section 7
Photographs

#8 : Looking southeast at the north (upstream) side of Main St bridge.

#9 : Looking north from the north (upstream) side of Main St bridge.

#11 : Looking North at the downstream face of Main St bridge

#10 : Looking South from upstream face of Main St

Section 7
Photographs

#12 : Looking northwest at the south (downstream) side of Main St

#13 : Looking North at the downstream face of Main St bridge.

#14 : Debris and collapsed bridge +/- 300’ upstream of route 47 culvert

Section 7
Photographs

#15: Blackberry Inn Restaurant (Sensitive Flood Receptor mentioned in Exhibit F). “Hey Weenie”, Structure 2 is higher than the 500-year Floodplain elevation. It may not be a sensitive flood receptor, but was included as it is near the 500-yr floodplain.

Google Earth View with FEMA Floodway (Hatching) and FEMA known BFE's shown. Aerial Photo Date 2009

Microsoft Bing Map Looking North at IL Rte 47 and Main Street. Aerial Photo Date: 2009

Section 7
Photographs

Microsoft Bing Map Looking West at Main St and IL Route 47. Aerial Photo Date : 2009.

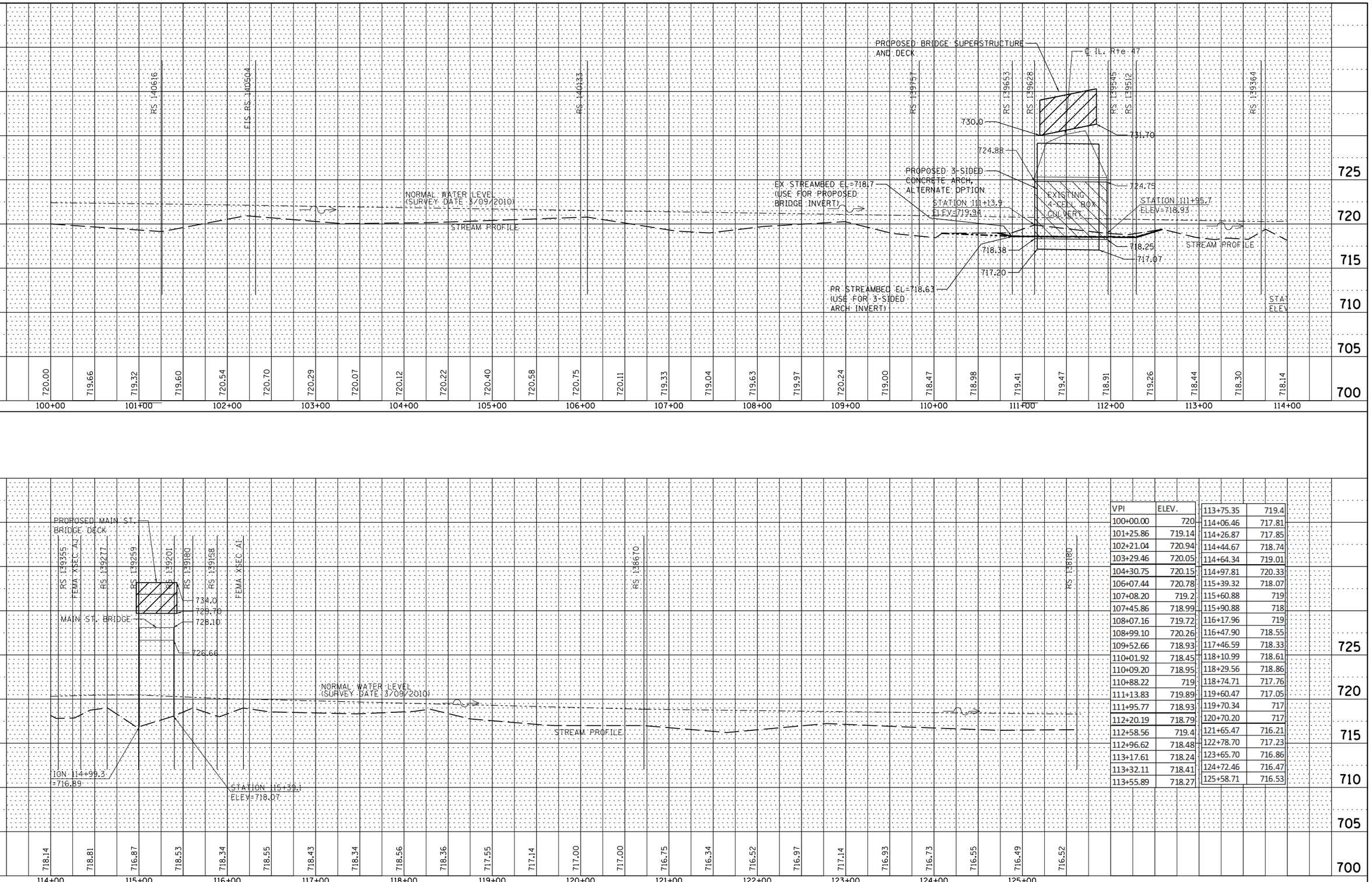
Section 7
Photographs

Table 8 - Summary of Discharges (Continued)

Flooding Source and Location	*Drainage Area (square miles)*	*Peak Discharges (cubic feet per second)* 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
BLACKBERRY CREEK					
At intersection with US Highway 30	57.1	1,325	2,302	2,808	4,218
At confluence with Aurora Chain of Lakes (approximately 190 feet upstream of Jericho Road)	52.4	1,347	2,373	2,910	4,421
Approximately 80 feet downstream of Burlington Railroad	51.4	1,497	2,465	2,952	4,286
At upstream of confluence with East Run and approximately 300 feet upstream of Galena Road	45.9	1,401	2,286	2,742	3,984
At confluence with Lake Run (approximately 1800 feet downstream of Illinois Route 56)	31.9	1,037	1,681	2,003	2,875
At confluence with Prestbury Branch (approximately 2740 feet upstream of Illinois Route 56)	27.8	995	1,637	1,961	2,847
Approximately 140 feet upstream of Ke-De-Ka Road	25.5	1,003	1,675	2,018	2,961
Approximately 4140 feet downstream from Illinois Route 47	23.5	992	1,670	2,017	2,976
Approximately 550 feet upstream of Scott Road (90 feet upstream of junction with Seavey Road Run)	15.0	719	1,221	1,477	2,189
Approximately 240 feet upstream of Interstate 88	13.4	717	1,261	1,545	2,348
Approximately 50 feet upstream of Illinois Route 47	11.2	634	1,120	1,376	2,097
At confluence with Elburn Run (approximately 3200 feet upstream of Smith Road)	7.0	316	537	651	966
Approximately 125 feet upstream of Hughes Road	6.0	303	523	637	956

PLAN

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



PROFILE

BY	DATE
SURVEYED	
PLOTTED	
ALIGNMENT CHECKED	
R.O.W. NOTED	
B.M. NOTED	
STRUCTURE NOTATNS CHKD	
NOTE BOOK	
NO.	

VPI	ELEV.
100+00.00	720
101+25.86	719.14
102+21.04	720.94
103+29.46	720.05
104+30.75	720.15
106+07.44	720.78
107+08.20	719.2
107+45.86	718.99
108+07.16	719.72
108+99.10	720.26
109+52.66	718.93
110+01.92	718.45
110+09.20	718.95
110+88.22	719
111+13.83	719.89
111+95.77	718.93
112+20.19	718.79
112+58.56	719.4
112+96.62	718.48
113+17.61	718.24
113+32.11	718.41
113+55.89	718.27
113+75.35	719.4
114+06.46	717.81
114+26.87	717.85
114+44.67	718.74
114+64.34	719.01
114+97.81	720.33
115+39.32	718.07
115+60.88	719
115+90.88	718
116+17.96	719
116+47.90	718.55
117+46.59	718.33
118+10.99	718.61
118+29.56	718.86
118+74.71	717.76
119+60.47	717.05
119+70.34	717
120+70.20	717
121+65.47	716.21
122+78.70	717.23
123+65.70	716.86
124+72.46	716.47
125+58.71	716.53

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	PLOT SCALE = 100.0000 ' / in.	DRAWN -	REVISED -
	PLOT DATE = 9/5/2014	CHECKED -	REVISED -
		DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

1"=10'V
SCALE: 1"=50'H

IL ROUTE 47 – MAIN ST.
BLACKBERRY CREEK PROFILE

SHEET NO. 1 OF 1 SHEETS STA. 140600 TO STA. 138180

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		KANE	1	1
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 64	107B-I-1	Kane	27	4
STA. 199+00		TO STA. 214+00		
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		

*Note: The posts for Steel Plate Beam Guard Rail on the top of the box culvert shall be installed accordance to the detail of "Post anchor at piers" in the Standard 2230-Z. The length of posts shall be cut to conform with the requirement of the Standard. The extra work and materials to install the posts on top of the box culvert shall be considered incidental to Steel Plate Beam Guard Rail.

Note: The Contractor shall remove and store the existing handrail at the location designated by the Engineer. The handrail shall be picked up by State Maintenance Crew.

Stabilized Shoulders (Bituminous Aggregate Mixture) 6"
Sta. 207+00.00 - 208+00.00 = 222 Sq. Yd.

Steel Plate Beam Guard Rail*
Sta 206+87.00 - 208+12.00 = 125 Lin. Ft.

F.A. Route 64 Curve Data
Δ = 34°-24'
D = 2°-42.91'
T = 653.45'
L = 1,267.00'
R = 2,110.96'
E = 96.64'
S = 0.075% (Prop.)
P.C. = 197+19.80
P.I. = 203+73.25
P.C.C. = 209+86.60

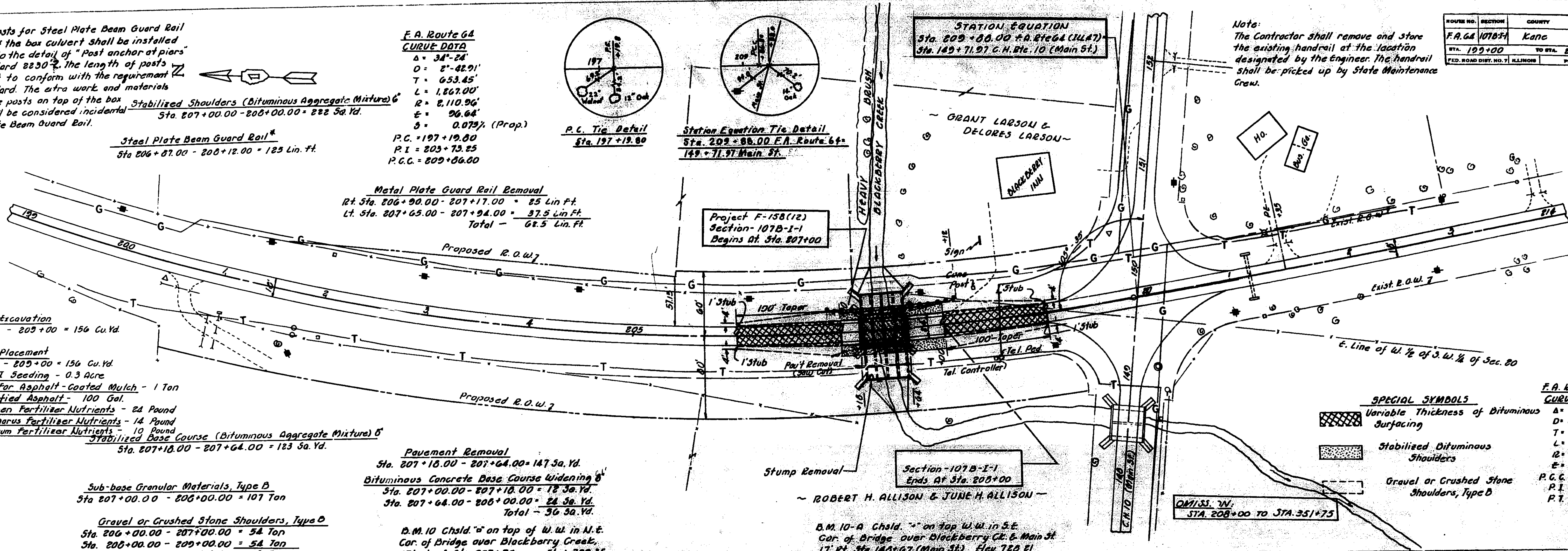
P.C. Tie Detail
Sta. 197+19.80

Station Equation Tie Detail
Sta. 209+88.00 F.A. Route 64 = 149+71.97 Main St.

Station Equation
Sta. 209+88.00 F.A. Rte 64 (SBI 47) = Sta. 149+71.97 C.H. Rte. 10 (Main St.)

Metal Plate Guard Rail Removal
Rt. Sta. 206+90.00 - 207+17.00 = 25 Lin Ft.
Lt. Sta. 207+65.00 - 207+94.00 = 37.5 Lin Ft.
Total - 62.5 Lin. Ft.

Project F-158(12)
Section-107B-I-1
Begins At Sta. 207+00



Top Soil Excavation
Sta. 206+00 - 209+00 = 156 Cu. Yd.

Top Soil Placement
Sta. 206+00 - 209+00 = 156 Cu. Yd.
Class I Seeding - 0.3 Acre
Straw For Asphalt-Coated Mulch - 1 Ton
Emulsified Asphalt - 100 Gal.
Nitrogen Fertilizer Nutrients - 24 Pound
Phospharus Fertilizer Nutrients - 14 Pound
Patassium Fertilizer Nutrients - 10 Pound

Stabilized Base Course (Bituminous Aggregate Mixture) 6"
Sta. 207+18.00 - 207+64.00 = 123 Sq. Yd.

Pavement Removal
Sta. 207+18.00 - 207+64.00 = 147 Sq. Yd.

Bituminous Concrete Base Course Widening 8"
Sta. 207+00.00 - 207+18.00 = 12 Sq. Yd.
Sta. 207+64.00 - 208+00.00 = 24 Sq. Yd.
Total - 36 Sq. Yd.

Sub-base Granular Materials, Type B
Sta 207+00.00 - 208+00.00 = 107 Ton

Gravel or Crushed Stone Shoulders, Type B
Sta. 206+00.00 - 207+00.00 = 54 Ton
Sta. 208+00.00 - 209+00.00 = 54 Ton
Total 108 Ton

B.M. 10 Chsld. "□" on top of W.W. in N.E. Cor. of Bridge over Blackberry Creek, 17' Lt. of Sta. 207+20 Elev. 729.35

B.M. 10-A Chsld. "+" on top W.W. in S.E. Cor. of Bridge over Blackberry Ck. & Main St. 17' Rt. Sta. 148+67 (Main St.) Elev. 728.21

Special Symbols
Variable Thickness of Bituminous Surfacing
Stabilized Bituminous Shoulders
Gravel or Crushed Stone Shoulders, Type B

F.A. Route 64 Curve Data
Δ = 5°-16'
D = 0°-21.9'
T = 721.70'
L = 1,442.25'
R = 15,692.50'
E = 16.98'
P.C.C. = 209+86.60
P.I. = 217+08.50
P.T. = 224+29.05

Earthwork Calculation

Station	Earth Excavation Cu. Yd.	Embankment Cu. Yd.	Borrow Excavation Cu. Yd.
206+00 - 209+00	172	748	815

Bituminous Materials Schedule

Station	Length Ft.	Width Ft.	Area Sq. Yd.	Bit. Mat'l Pr. Ct. Gal.	Aggre. (Pr. Ct.) Ton	Level Bind Mach. M. Ton	Binder Course Ton	Surface Course Ton
206+00.00 - 207+00.00	100.00	20 to 24	245	42	0.5		37.6	13.8
207+00.00 - 207+18.00	18.00	24	48	5	0.1	1.4	11.0	3.4
207+18.00 - 207+64.00	46.00	24	123	12	0.3		19.4	8.9
207+64.00 - 208+00.00	36.00	24	96	10	0.2	2.7	20.6	7.0
208+00.00 - 209+00.00	100.00	20 to 24	245	40	0.5		44.6	14.0
Total				111	1.6	4.1	133.2	47.1

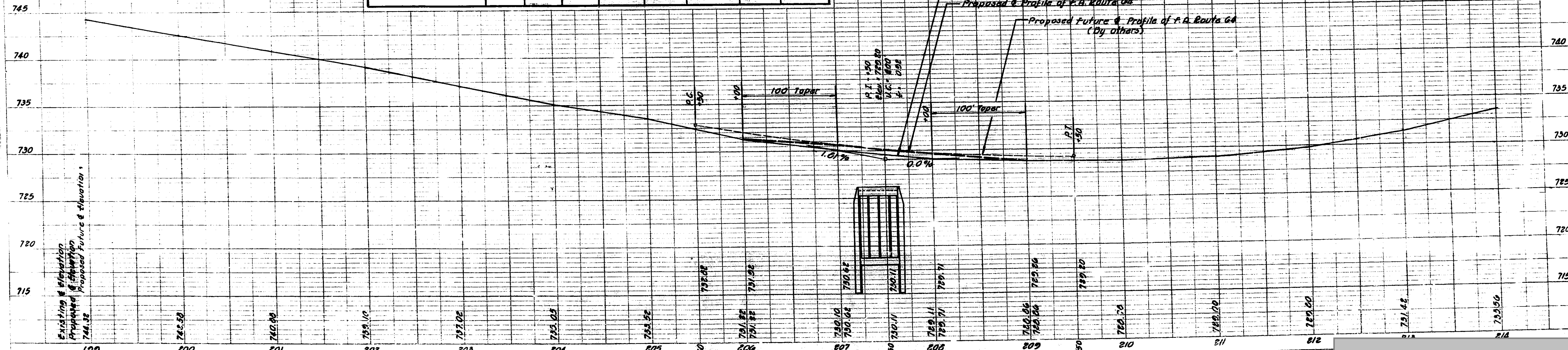


PLATE 1—PLAN PROFILE B. P.R. STANDARD
THE FREDERICK POST CO., Chicago

Rte. 47 Culvert Plans - 1967

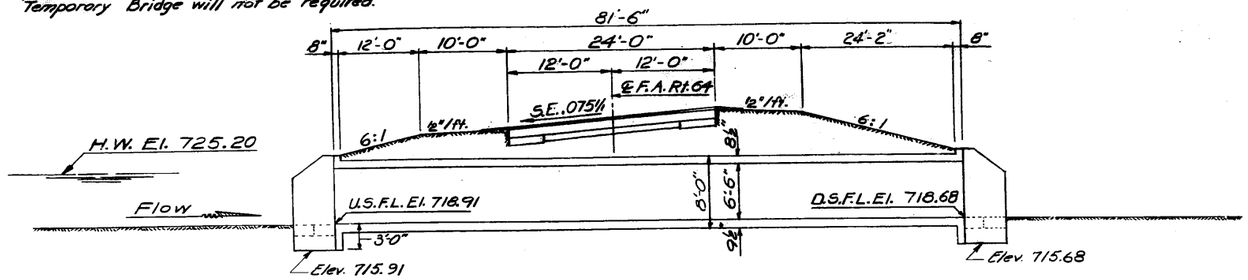
B.M.: Chiseled "+" on top wing wall in Southeast corner of the bridge over Blackberry Creek of C.H. Rte. 10, 17' Rt. of Sta 148+67 (C.H. Rte. 10) - Elev. = 728.21.

Existing Culvert is to be removed by contractor at the beginning of construction and replaced with a new structure. Handrail shall be salvaged by District Maintenance.
Temporary Bridge will not be required.

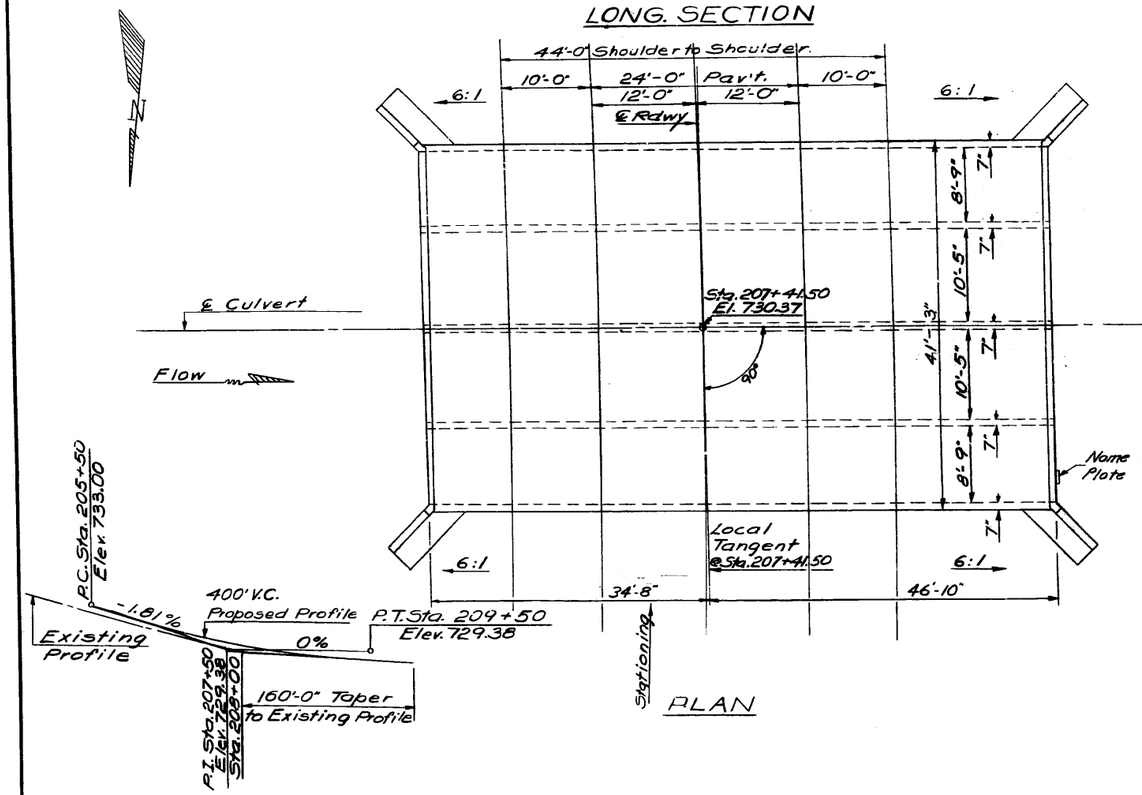
STATE OF ILLINOIS
DEPARTMENT OF PUBLIC WORKS & BUILDINGS
DIVISION OF HIGHWAYS

F.A.P. 64	107B-1	KANE	27	11
		ILLINOIS	FED. AID PROJECT	F-158(12)

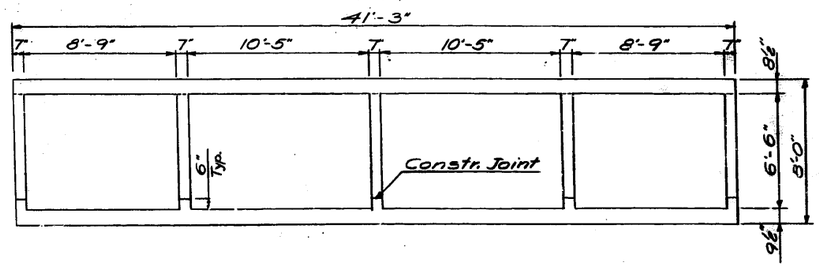
SHEET NO. 1
3 SHEETS



LONG. SECTION



PLAN



SECTION THRU BARREL

STATION 207+41.50
BUILT 19 BY
STATE OF ILLINOIS
F.A. RT. 64 SEC. 107B-I-1
LOADING HS 20

NAME PLATE
See Std 2113-1

GENERAL NOTES

Class X Concrete shall be used throughout.
Exposed edges shall be beveled ¾".
For backfilling and embankment see Std. Spec's.
All bars shall be lapped 20 diameters unless otherwise specified.
The top of the culvert, the backs of the sidewalls above the lower construction joint and backs of the wings above the tops of the footings shall be waterproofed in accordance with Art. 51.21 of the Std. Spec's.
Nonmetallic water seal used in the wingwall joints shall extend from the top of the footing to within 6" of the top of the headwall.
Any excavation needed to construct the culvert will not be paid separately but will be included to Class "X" Concrete.

F.A. RTE. 64 CURVE DATA

Δ = 34°-24'
D = 2°-42.91'
T = 653.45'
L = 1,267.00
R = 2,110.95
E = 96.64
S = 0.075%, (Prop.)
P.C. = 197+19.80
P.I. = 203+73.25
P.C.C. = 209+86.80

TOTAL BILL OF MATERIAL

Item	Unit	Total
Class X Concrete	Cu. Yds.	267.0
Reinforcement Bars	Lbs.	54,840
Name Plates	Each	1
Removal of Existing Structures	Each	1

DESIGNED	Jim King
CHECKED	Suresh T. Desai
	I.K.
DRAWN	D. Derringer
	S.D.
CHECKED	

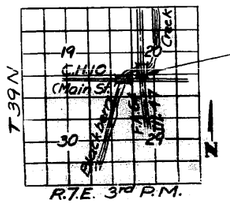
EXAMINED — June 11 1967
PASSED — H.E. Baumann
APPROVED — V.E. Stoffel

WATERWAY INFORMATION

Drainage Area	7,680 acres
Character: rolling, wooded,	cultivated
Required Opening	240 Sq. Ft. 50 Years frequency
Present Opening	240 Sq. Ft.
Proposed Opening	240 Sq. Ft.

Ordinary Water Elev. - 720.50

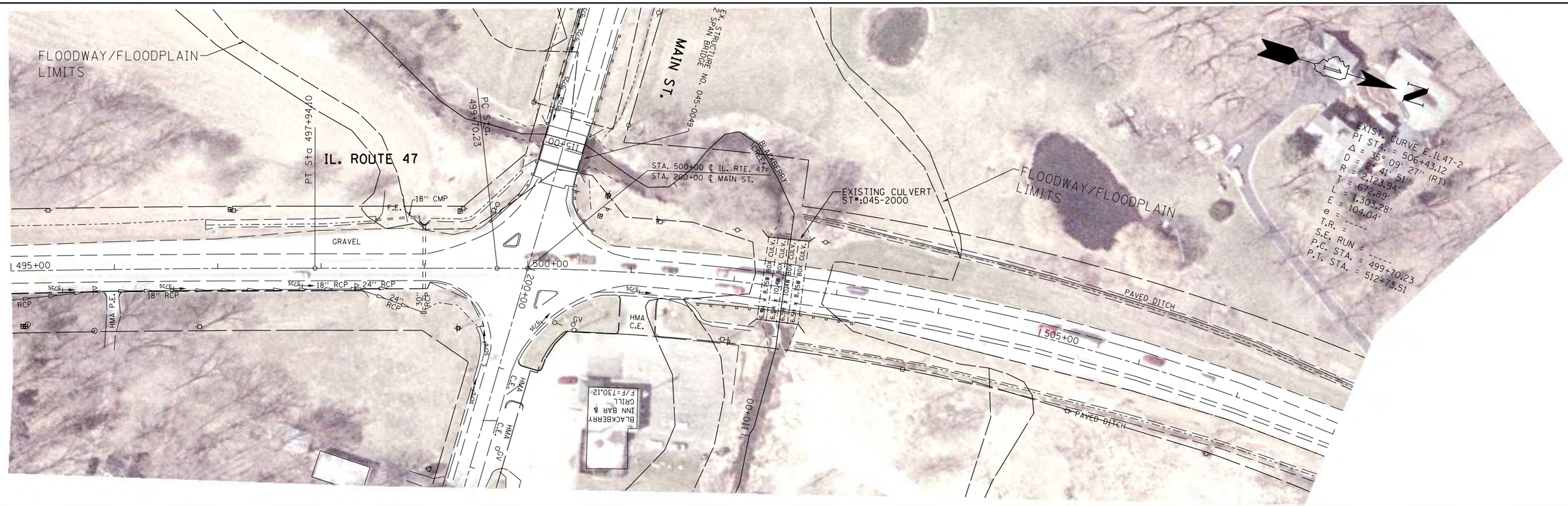
High Water Elev. - 725.20



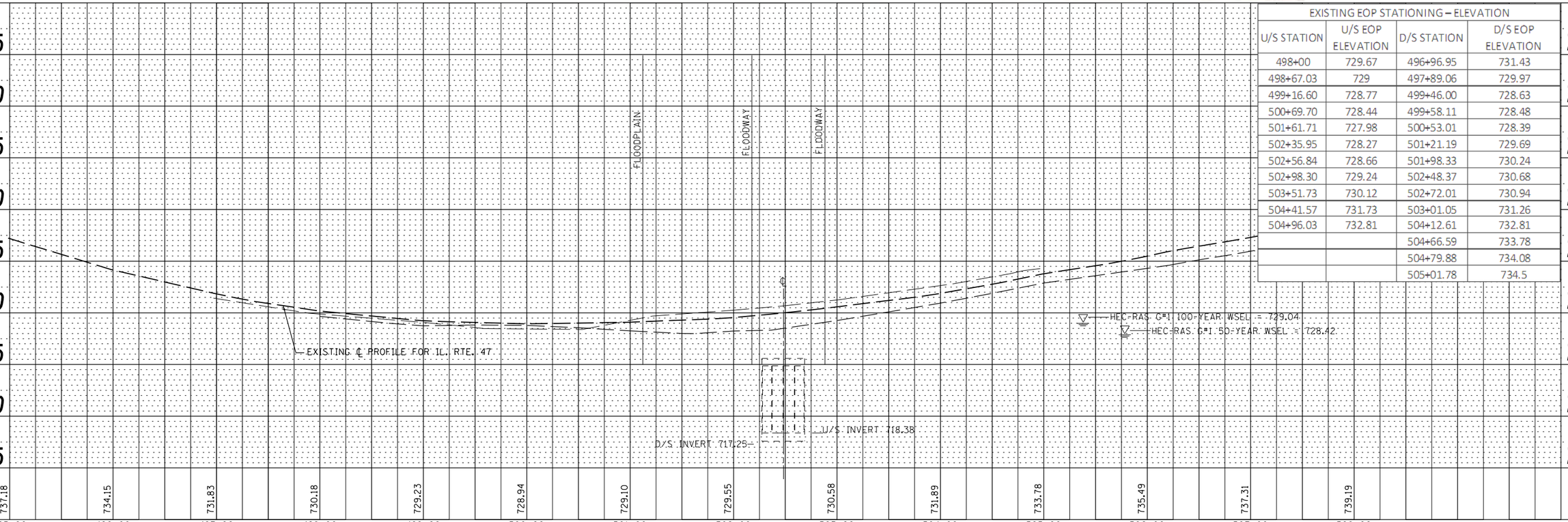
LOCATION SKETCH

GENERAL PLAN & ELEVATION
PROJECT: F-158(12)
F.A. RT. 64 SECTION 107B-I-1
KANE COUNTY
STA. 207+41.50

Rte. 47 Culvert Plans - 1967



EXISTING EOP STATIONING – ELEVATION			
U/S STATION	U/S EOP ELEVATION	D/S STATION	D/S EOP ELEVATION
498+00	729.67	496+96.95	731.43
498+67.03	729	497+89.06	729.97
499+16.60	728.77	499+46.00	728.63
500+69.70	728.44	499+58.11	728.48
501+61.71	727.98	500+53.01	728.39
502+35.95	728.27	501+21.19	729.69
502+56.84	728.66	501+98.33	730.24
502+98.30	729.24	502+48.37	730.68
503+51.73	730.12	502+72.01	730.94
504+41.57	731.73	503+01.05	731.26
504+96.03	732.81	504+12.61	732.81
		504+66.59	733.78
		504+79.88	734.08
		505+01.78	734.5



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PROFILE: SURVEYED; PLOTTED; GRADES CHECKED; B.M. NOTED; STRUCTURE NOTATNS CHKD; NOTE BOOK; NO.; BY; DATE

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	PLOT DATE = 7/28/2014	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

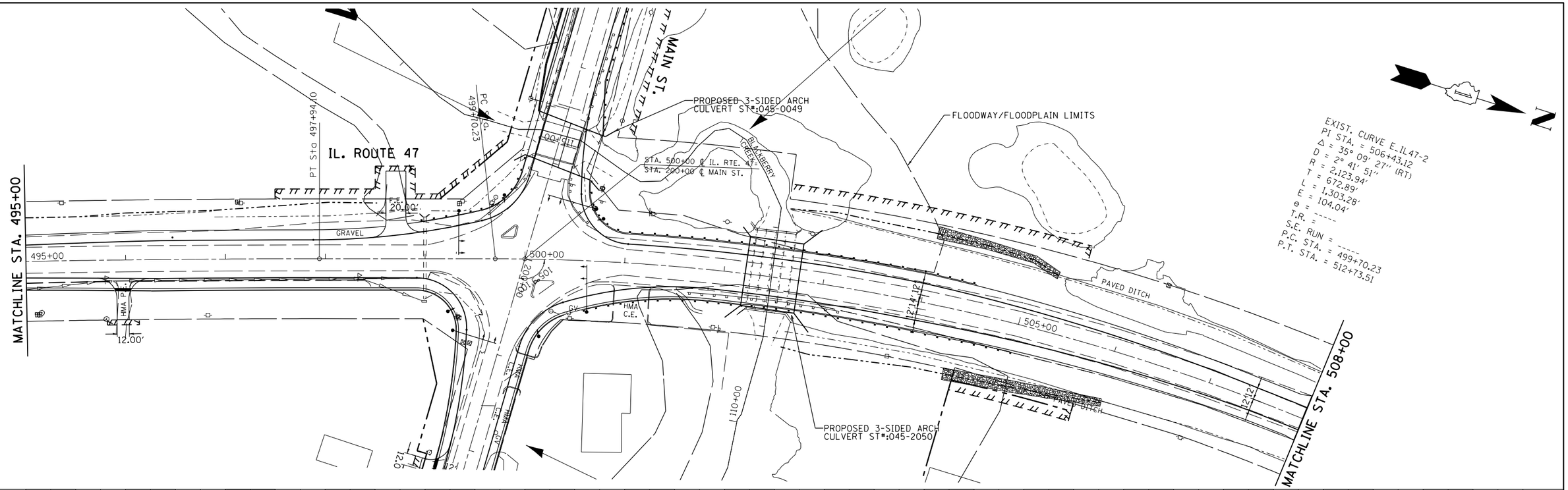
IL ROUTE 47 OVER BLACKBERRY CREEK
EXISITNG IL ROUTE 47 CENTERLINE PROFILE

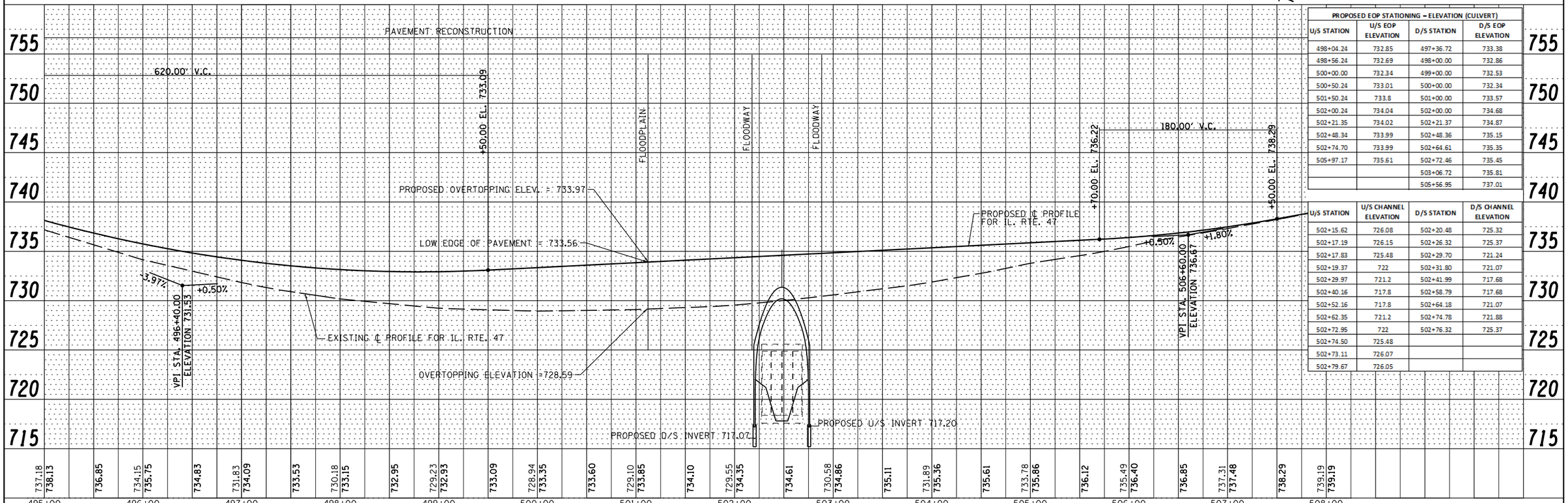
SCALE: | SHEET NO. OF SHEETS | STA. 495+00 TO STA. 508+00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326		KANE		
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		

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

PROFILE
SURVEYED
PLOTTED
GRADES CHECKED
B.M. NOTED
STRUCTURE NOTATNS CHKD
NOTE BOOK
NO.
BY
DATE





PROPOSED EOP STATIONING – ELEVATION (CULVERT)

U/S STATION	U/S EOP ELEVATION	D/S STATION	D/S EOP ELEVATION
498+04.24	732.85	497+36.72	733.38
498+56.24	732.69	498+00.00	732.86
500+00.00	732.34	499+00.00	732.53
500+50.24	733.01	500+00.00	732.34
501+50.24	733.8	501+00.00	733.57
502+00.24	734.04	502+00.00	734.68
502+21.35	734.02	502+21.37	734.87
502+48.34	733.99	502+48.36	735.15
502+74.70	733.99	502+64.61	735.35
505+97.17	735.61	502+72.46	735.45
		503+06.72	735.81
		505+56.95	737.01

U/S STATION	U/S CHANNEL ELEVATION	D/S STATION	D/S CHANNEL ELEVATION
502+15.62	726.08	502+20.48	725.32
502+17.19	726.15	502+26.32	725.37
502+17.83	725.48	502+29.70	721.24
502+19.37	722	502+31.80	721.07
502+29.97	721.2	502+41.99	717.68
502+40.16	717.8	502+58.79	717.68
502+52.16	717.8	502+64.18	721.07
502+62.35	721.2	502+74.78	721.88
502+72.95	722	502+76.32	725.37
502+74.50	725.48		
502+73.11	726.07		
502+79.67	726.05		

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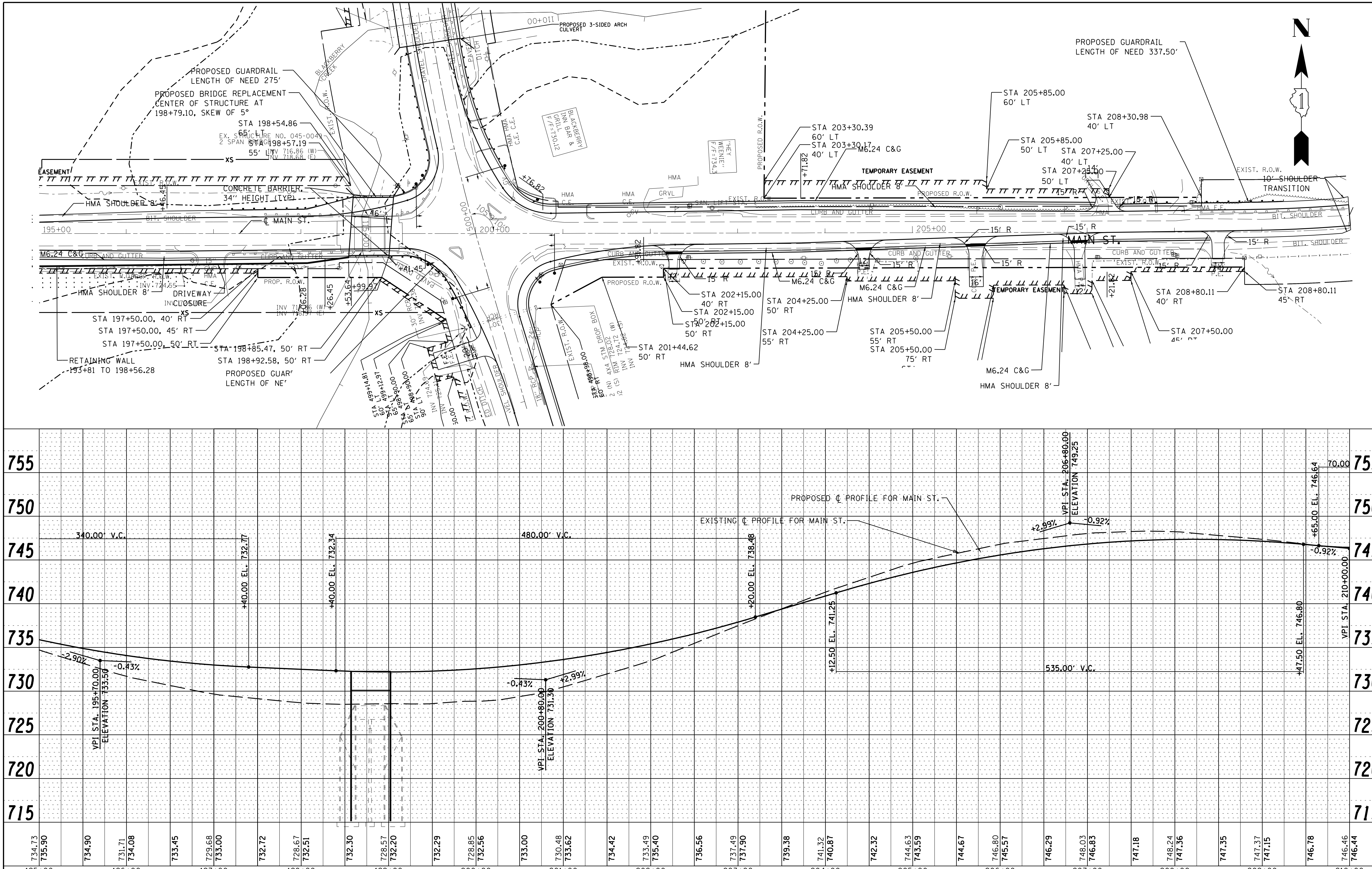
	PLOT DATE = 7/28/2014	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

IL ROUTE 47 OVER BLACKBERRY CREEK
PROPOSED CULVERT PLAN AND PROFILE

SCALE: 1'' = 100' | SHEET NO. OF SHEETS | STA. 495+00 TO STA. 508+00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326		KANE		
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		



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	PLOT DATE = 11/27/2013	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

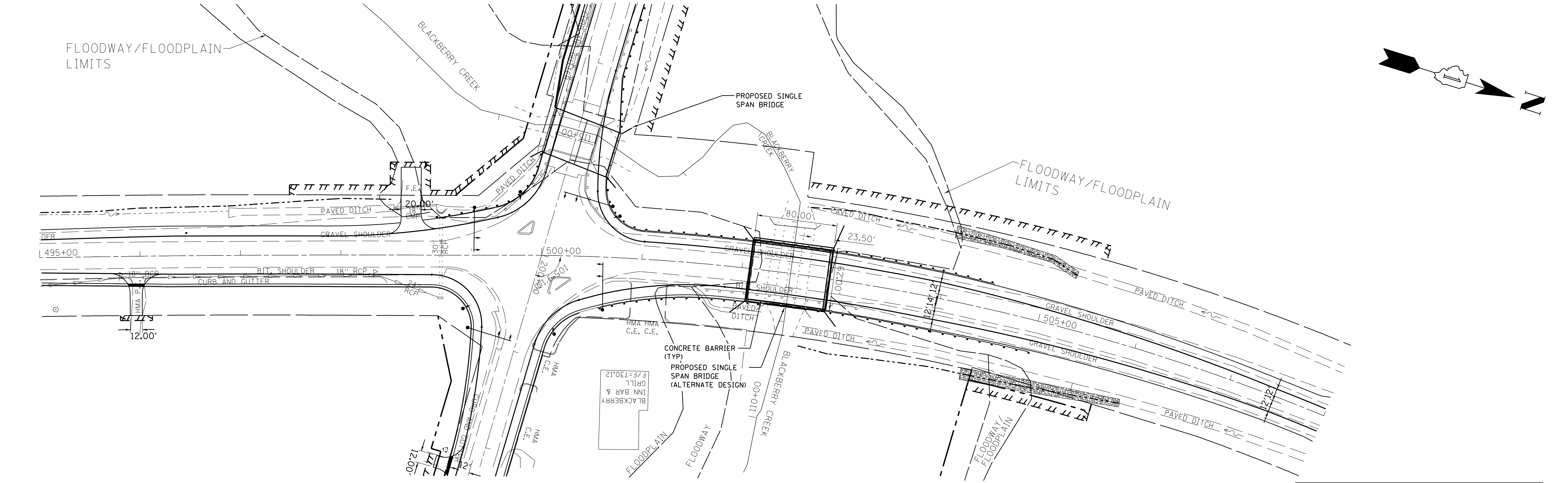
MAIN ST OVER BLACKBERRY CREEK
MAIN ST CENTERLINE PROFILE (IL RTE 47 ARCH PROFILE)

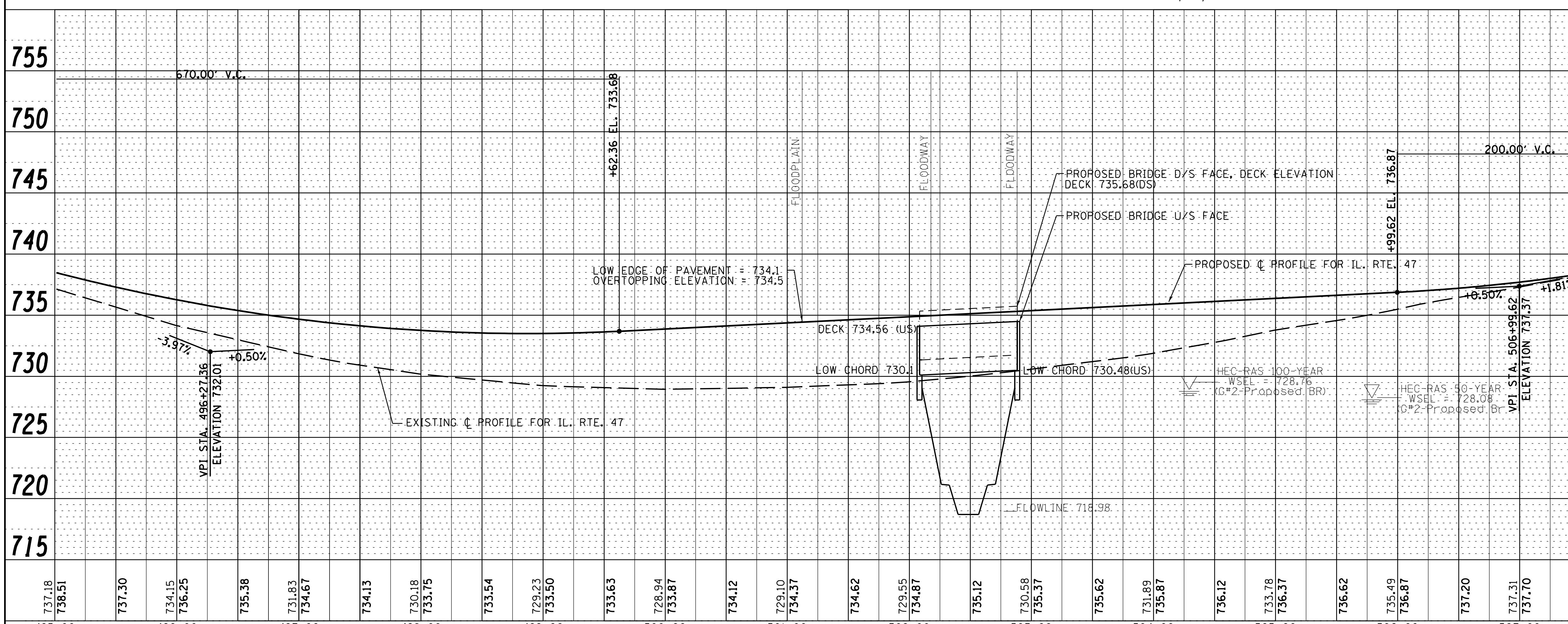
SCALE: | SHEET NO. OF SHEETS | STA. 195+00 TO STA. 210+00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326		KANE		

CONTRACT NO.

ILLINOIS FED. AID PROJECT





IL-47 OVER BLACKBERRY CREEK PROPOSED CONDITIONS					
PROPOSED BRIDGE DECK EOP STATIONING – ELEVATION					
U/S STATION	U/S EOP ELEVATION	U/S LOW CHORD ELEVATION	D/S STATION	D/S EOP ELEVATION	U/S LOW CHORD ELEVATION
498+00	733.47		496+96.95	734.43	
499+16.60	733.17		497+89.06	733.58	
500+69.70	733.72		499+46.00	733.11	
501+61.71	734.37		499+58.11	733.08	
502+10.37	734.56	730.1	500+53.01	733.63	
502+35.95	734.69	730.23	501+21.19	734.33	
502+48.37	734.75	730.33	501+98.33	735.17	
502+56.84	734.8	730.48	502+10.37	735.29	731.34
502+86.37	734.95		502+48.37	735.48	731.53
502+98.30	734.94		502+63.06	735.67	731.73
503+51.73	734.91		503+01.05	735.83	
504+41.57	735.17		504+12.61	736.89	
504+96.03	735.5		504+66.59	737.1	
505+95.27	736.09		504+79.88	737.14	
			505+01.78	737.2	
			505+59.75	737.67	

U/S STATION	CHANNEL ELEVATION	D/S STATION	D/S CHANNEL ELEVATION
502+15.62	726.08	502+25.25	725.32
502+25.16	726.29	502+22.99	723.88
502+26.17	723.97	502+26.16	721.17
502+28.50	723.45	502+29.7	721.24
502+32.04	719.62	502+26.16	721.17
502+35.15	719.06	502+34.12	719.82
502+41.96	717.98	502+48.72	718.92
502+44.20	718.37	502+53.44	718.27
502+45.21	718.36	502+58.79	719.84
502+46.38	718.16	502+68.21	720.44
502+62.38	718.48	502+68.86	722.54
502+63.37	718.88	502+84.66	724.32
502+66.39	719.49	502+90.17	724.95
502+67.83	726.09		
502+79.67	726.05		

PLAN: NOTE BOOK NO. / SURVEYED / PLOTTED / ALIGNMENT CHECKED / R.O.W. CHECKED / CADD FILE NAME / BY / DATE

PROFILE: NOTE BOOK NO. / SURVEYED / PLOTTED / GRADES CHECKED / B.M. NOTED / STRUCTURE NOTATNS CHKD / BY / DATE

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PLOT DATE = 7/28/2014

DESIGNED -
DRAWN -
CHECKED -
DATE -

REVISED -
REVISED -
REVISED -
REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

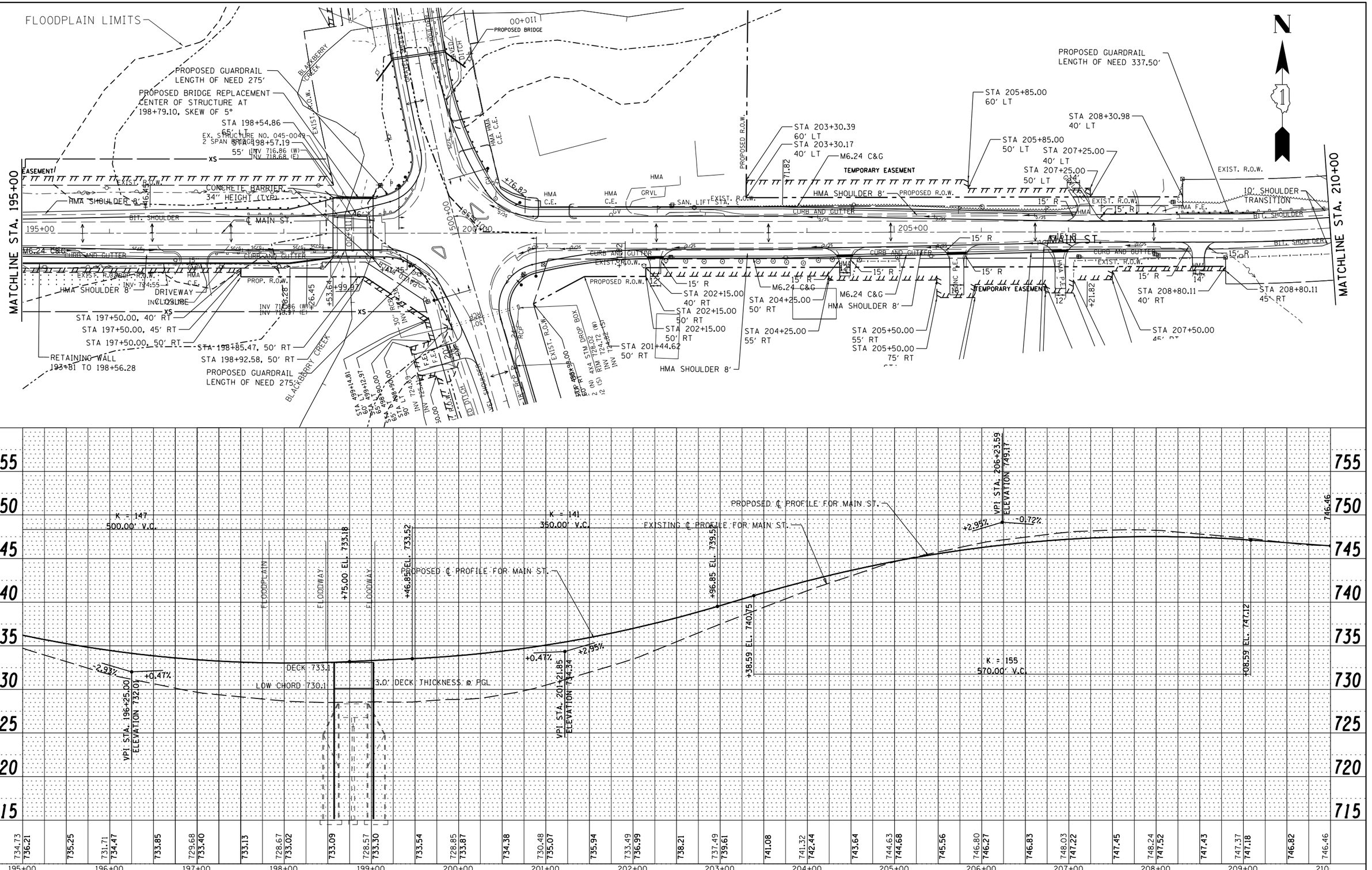
IL ROUTE 47 OVER BLACKBERRY CREEK
PROPOSED BRIDGE PLAN AND PROFILE

SCALE: 1"=50' | SHEET NO. OF SHEETS | STA. 495+00 TO STA. 508+00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326		KANE		

CONTRACT NO.

ILLINOIS FED. AID PROJECT



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NOTE BOOK
NO.
SURVEYED
PLOTTED
ALIGNMENT CHECKED
R.O.W. CHECKED
CADD FILE NAME
BY
DATE

PROFILE
NOTE BOOK
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SURVEYED
PLOTTED
GRADES CHECKED
DIM. NOTED
STRUCTURE NOTATIONS CHKD
BY
DATE

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	PLOT SCALE = 100.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 11/27/2013	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

MAIN ST OVER BLACKBERRRY CREEK
MAIN ST CENTERLINE PROFILE (IL RTE 47 BRIDGE PROFILE)

SCALE:	SHEET NO. OF SHEETS	STA. 195+00	TO STA. 210+00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326		KANE		
CONTRACT NO.				
ILLINOIS FED. AID PROJECT				

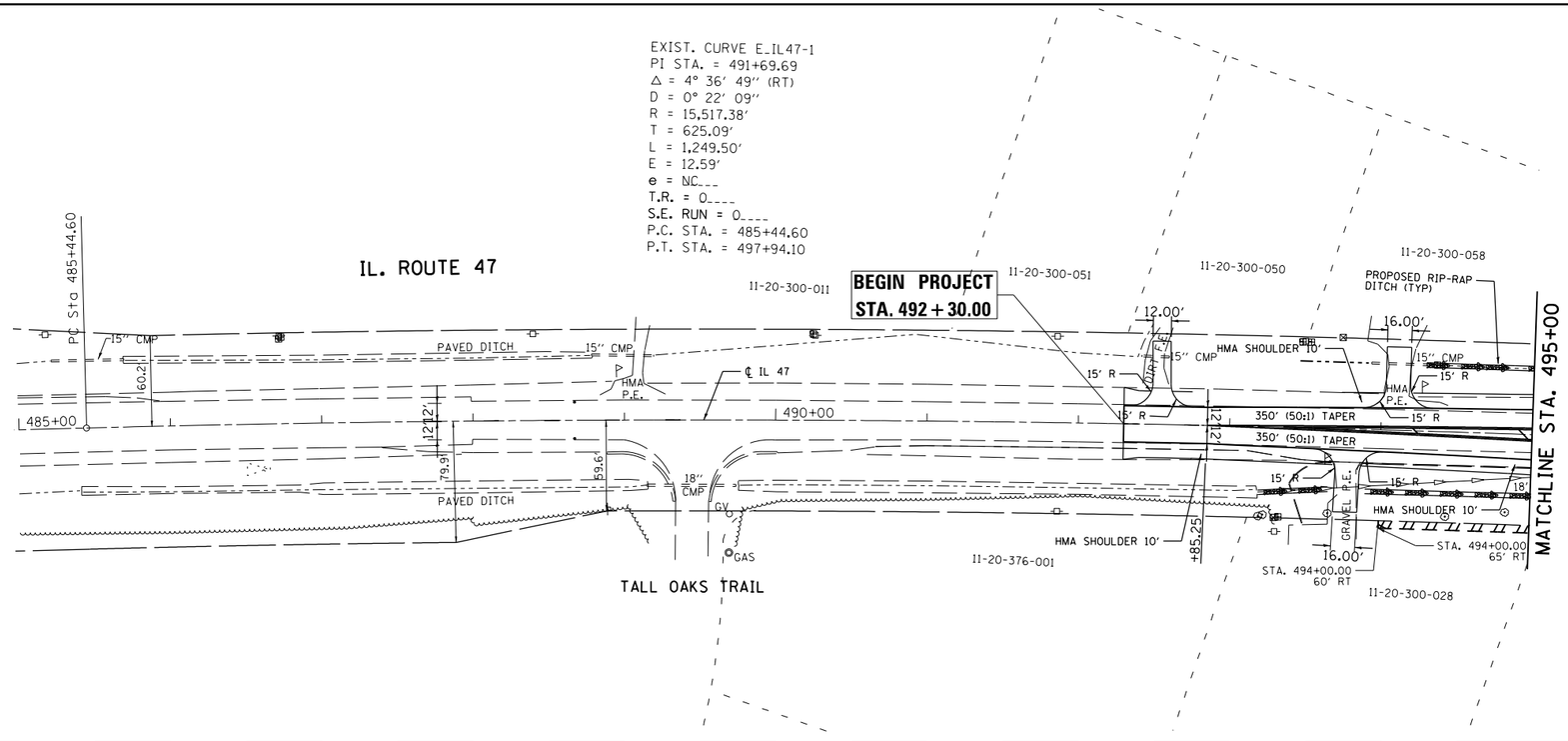
SECTION 10:

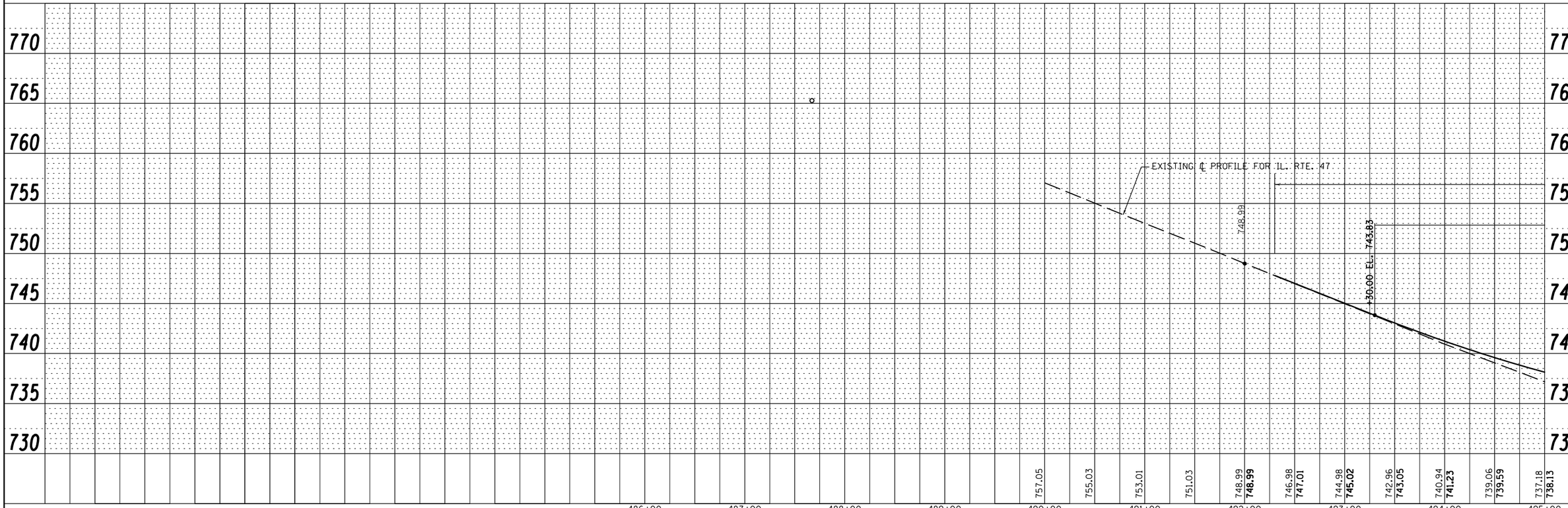
PROPOSED ROADWAY PLANS

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

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

EXIST. CURVE E_IL47-1
PI STA. = 491+69.69
Δ = 4° 36′ 49″ (RT)
D = 0° 22′ 09″
R = 15,517.38′
T = 625.09′
L = 1,249.50′
E = 12.59′
e = NC___
T.R. = 0____
S.E. RUN = 0____
P.C. STA. = 485+44.60
P.T. STA. = 497+94.10





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	PLOT DATE = 9/3/2014	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

IL. RTE. 47
ROADWAY PLAN & PROFILE

SCALE: 1"=50' | SHEET NO. 7 OF 12 SHEETS | STA. 486+00 TO STA. 495+00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326		KANE	12	7
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		

PLAN	BY	DATE
SURVEYED		
PLOTTED		
ALIGNMENT CHECKED		
R/W & PROPERTY CHECKED		
CADD FILE NAME		
NOTE BOOK NO.		

IL 47 MAIN STREET INTERSECTION LAYOUT

PT	STA	OFFSET
A	497+88.02	19.00' LT
B	499+56.91	38.33' LT
C	199+18.67	19.00' RT
D	198+01.39	19.00' LT
E	199+21.81	36.08' LT
F	501+02.40	19.00' LT
G	501+85.89	19.00' RT
H	500+39.49	42.54' RT
I	200+85.91	19.00' LT
J	202+27.58	19.00' RT
K	200+84.58	36.29' RT
L	498+91.62	19.00' RT

EXIST. CURVE E_IL47-2
PI STA. = 506+43.12
Δ = 35° 09' 27" (RT)
D = 2° 41' 51"
R = 2,123.94'
T = 672.89'
L = 1,303.28'
E = 104.04'
e = 5.25%
T.R. = 42'
S.E. RUN = 175'
P.C. STA. = 499+70.23
P.T. STA. = 512+73.51

PROFILE	BY	DATE
SURVEYED		
PLOTTED		
GRADES CHECKED		
B.M. NOTED		
STRUCTURE NOTATIONS CHECKED		
NOTE BOOK NO.		

FILE NAME =	USER NAME = stephen.schuh	DESIGNED -	REVISED -
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	PLOT SCALE = 100.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 9/3/2014	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

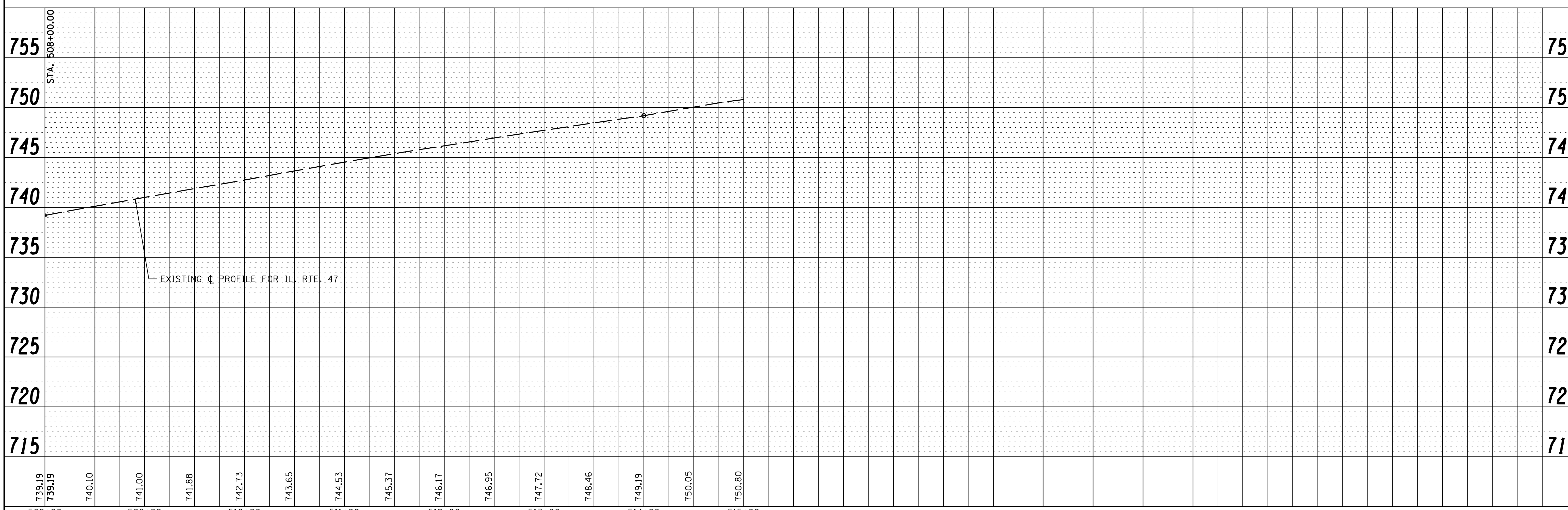
IL. RTE. 47
ROADWAY PLAN & PROFILE

SCALE: 1"=50' | SHEET NO. 8 OF 12 SHEETS | STA. 495+00 TO STA. 508+00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326		KANE	12	8

CONTRACT NO.

ILLINOIS FED. AID PROJECT



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PROFILE — NOTE BOOK NO. ____ — SURVEYED / PLOTTED / GRADES CHECKED / BM. NOTED / STRUCTURE NOTATN'S CHKD — BY — DATE

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	PLOT SCALE = 100.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 9/3/2014	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

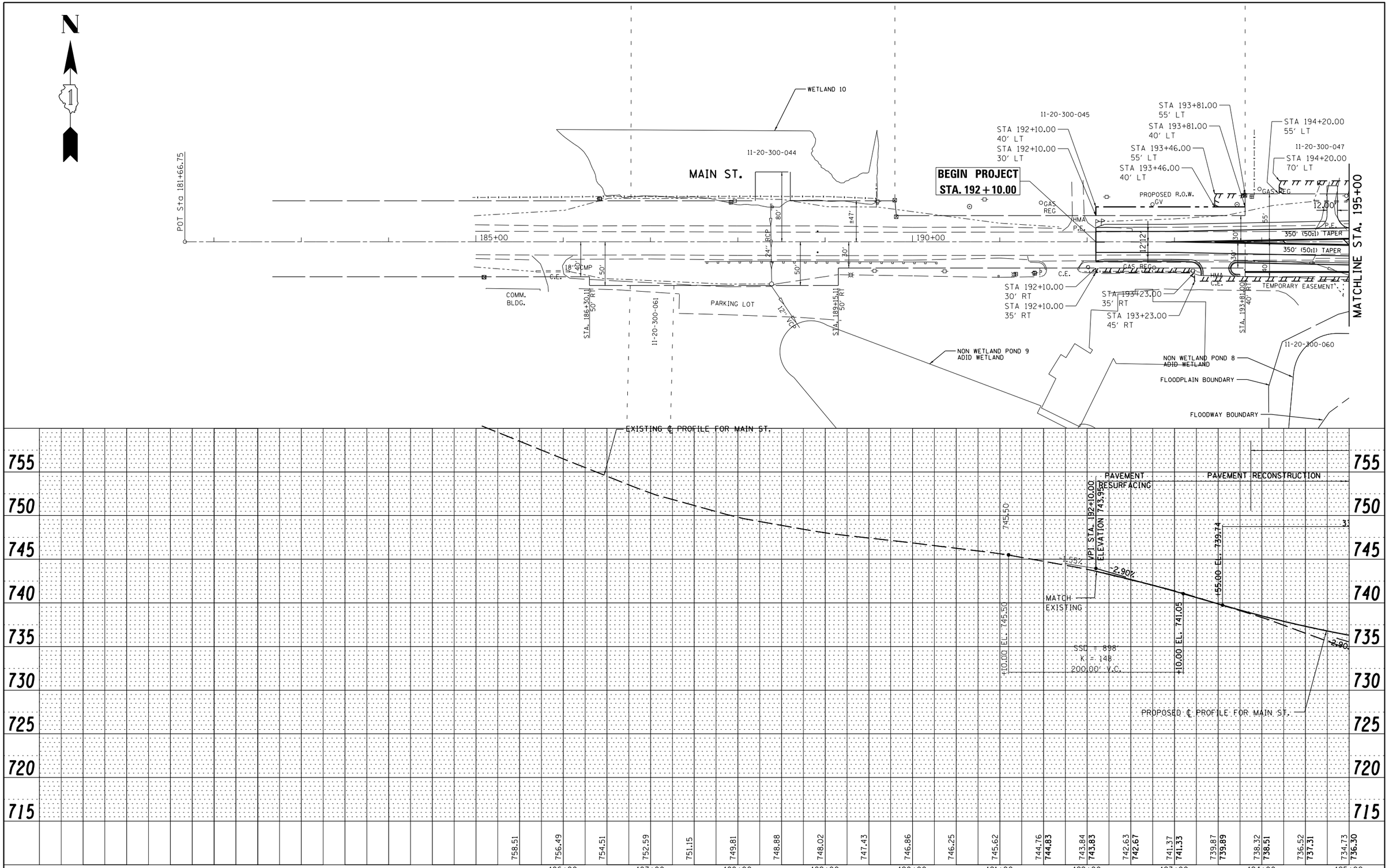
IL. RTE. 47
ROADWAY PLAN & PROFILE

SCALE: 1"=50' | SHEET NO. 9 OF 12 SHEETS | STA. 508+00 TO STA. 513+00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326		KANE	12	9

CONTRACT NO.

ILLINOIS | FED. AID PROJECT



PLAN

DATE	BY	
		SURVEYED
		PLOTTED
		ALIGNMENT CHECKED
		RT. OF WAY CHECKED
		CADD FILE NAME

NOTE BOOK
NO.

PROFILE

DATE	BY	
		SURVEYED
		PLOTTED
		GRADES CHECKED
		B.M. NOTED
		STRUCTURE NOTATNS CHKD

NOTE BOOK
NO.

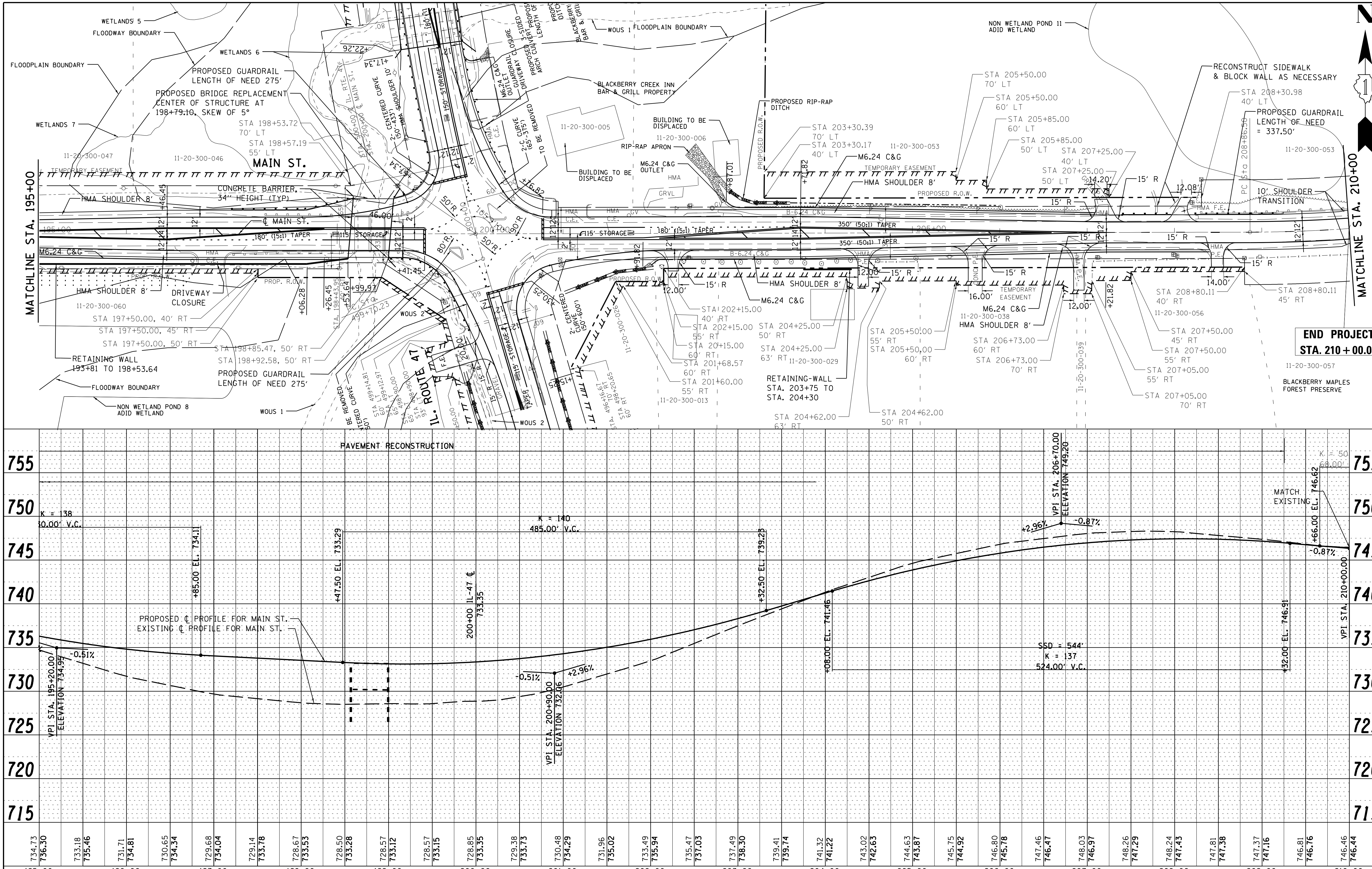
FILE NAME = P:\projects\09020\200\C\IL47\CADD\CADDsheets\D144909-sht-plnprf.dgn	USER NAME = stephen.schuh	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 100.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 9/3/2014	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

MAIN ST.
ROADWAY PLAN & PROFILE

SCALE: 1"=50' | SHEET NO. 10 OF 12 SHEETS | STA. 186+00 TO STA. 195+00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326		KANE	12	10
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		



FILE NAME =	USER NAME = stephen.schuh	DESIGNED -	REVISED -
P:\projects\09020\200\C\IL47\CADD\CADDsheets\D144909-sht-plnprf.dgn		DRAWN -	REVISED -
	PLOT SCALE = 100.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 9/3/2014	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

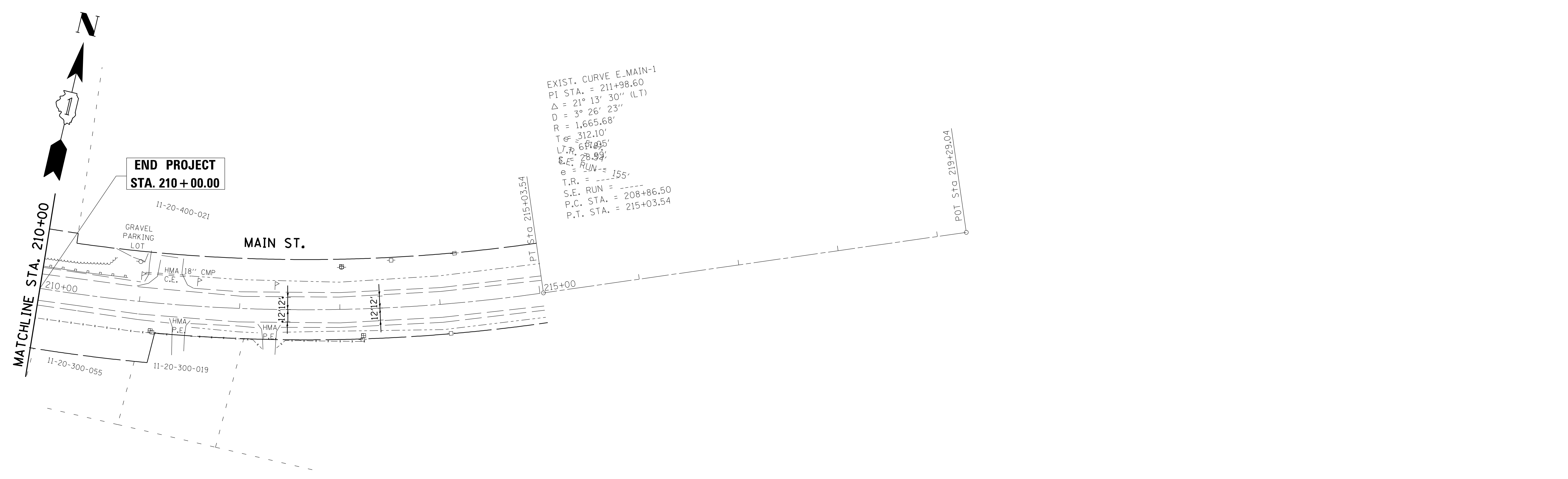
MAIN ST.
ROADWAY PLAN & PROFILE

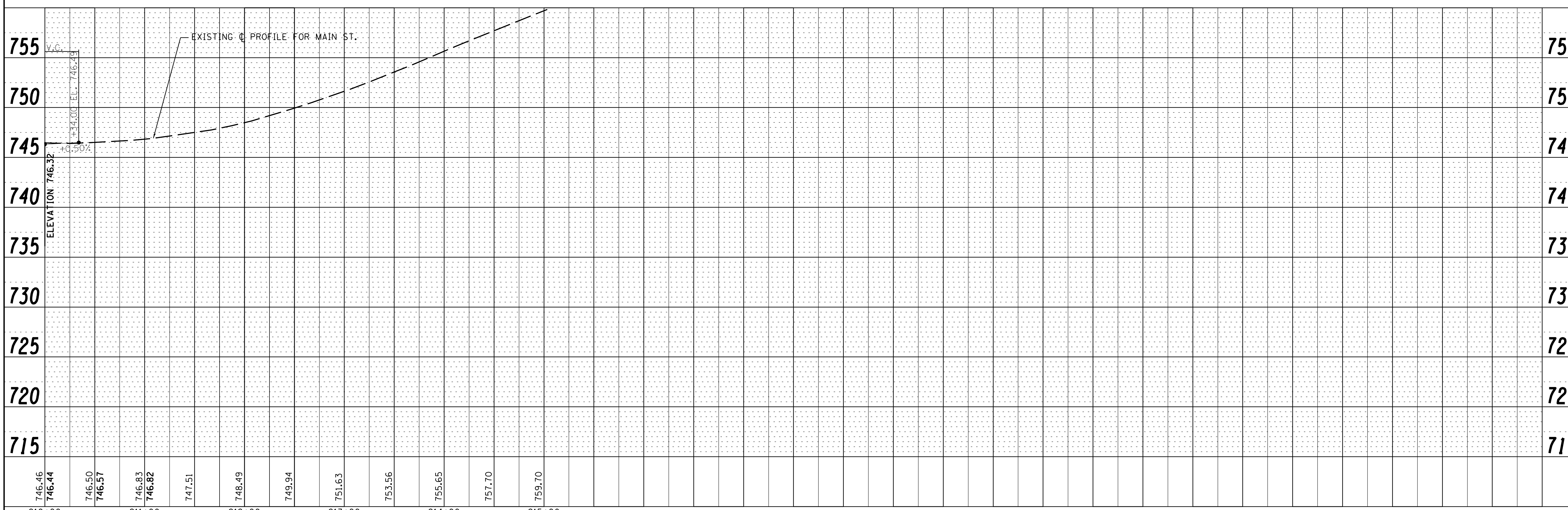
SCALE: 1"=50' | SHEET NO. 11 OF 12 SHEETS | STA. 195+00 TO STA. 210+00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326		KANE	12	11

CONTRACT NO.

ILLINOIS FED. AID PROJECT





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		DRAWN -	REVISED -
	PLOT SCALE = 100.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 9/3/2014	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

MAIN ST.
ROADWAY PLAN & PROFILE

SCALE: 1"=50' | SHEET NO. 12 OF 12 SHEETS | STA. 210+00 TO STA. 211+00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326		KANE	12	12

CONTRACT NO.

ILLINOIS FED. AID PROJECT

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

PROFILE: SURVEYED, PLOTTED, GRADES CHECKED, BM. NOTED, STRUCTURE NOTAT'NS CH'KD; NOTE BOOK NO. ____; BY; DATE

N

LEGEND

GEC Cross-Sections — 141476

USGS Cross-Sections — 140504

Aerial Photo Date: 2005

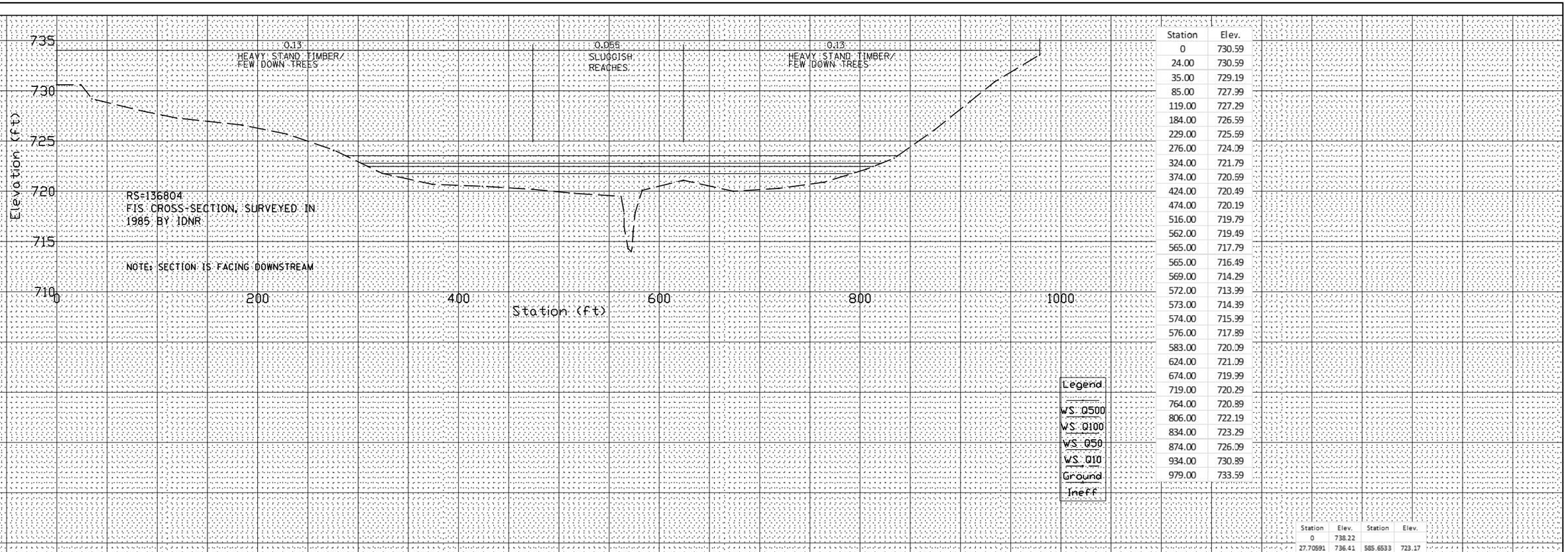
FILE NAME = P:\projects\89020\200\C\IL47\CADD\CADDsheets\D144909-sht-drain.dgn	USER NAME = stephen.schuh	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 200.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 11/29/2013	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

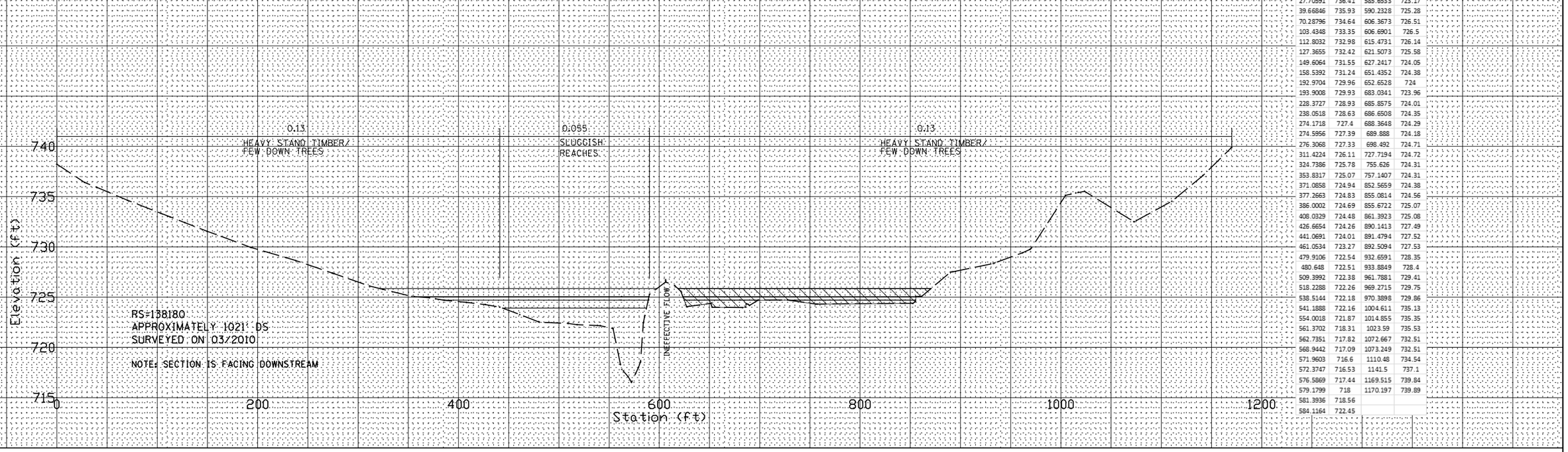
CROSS-SECTION LAYOUT
IL ROUTE 47 MAIN ST.

SCALE: 1"=200' | SHEET NO. 1 OF 1 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326		KANE	1	1
		CONTRACT NO.		
	ILLINOIS	FED. AID PROJECT		



Station	Elev.
0	730.59
24.00	730.59
35.00	729.19
85.00	727.39
119.00	727.29
184.00	726.59
229.00	725.59
276.00	724.09
324.00	721.79
374.00	720.59
424.00	720.49
474.00	720.19
516.00	719.79
562.00	719.49
565.00	717.79
565.00	716.49
569.00	714.29
572.00	713.99
573.00	714.39
574.00	715.99
576.00	717.89
583.00	720.09
624.00	721.09
674.00	719.99
719.00	720.29
764.00	720.89
806.00	722.19
834.00	723.29
874.00	726.09
934.00	730.89
979.00	733.59



Station	Elev.	Station	Elev.
0	738.22		
27.70591	736.41	585.6533	723.17
39.66846	735.93	590.2328	725.28
70.28796	734.64	606.3673	726.51
103.4348	733.35	606.6901	726.5
112.8032	732.98	615.4731	726.14
127.3655	732.42	621.5073	725.58
149.6064	731.55	627.2417	724.05
158.5392	731.24	651.4352	724.38
192.9704	729.96	652.6528	724
193.9008	729.93	683.0341	723.96
228.3727	728.93	685.8575	724.01
238.0518	728.63	686.6508	724.35
274.1718	727.4	688.3648	724.29
274.5956	727.39	689.888	724.18
276.3068	727.33	698.492	724.71
311.4224	726.11	727.7194	724.72
324.7386	725.78	755.626	724.31
353.8317	725.07	757.1407	724.31
371.0858	724.94	852.5659	724.38
377.2663	724.83	855.0814	724.56
386.0002	724.69	855.6722	725.07
408.0329	724.48	861.3923	725.08
426.6654	724.26	890.1413	727.49
441.0691	724.01	891.4794	727.52
461.0534	723.27	892.5094	727.53
479.9106	722.54	932.6591	728.35
480.648	722.51	933.8849	728.4
509.3992	722.38	961.7881	729.41
518.2288	722.26	969.2715	729.75
538.5144	722.18	970.3898	729.86
541.1888	722.16	1004.611	735.13
554.0018	721.87	1014.855	735.35
561.3702	718.31	1023.59	735.53
562.7351	717.82	1072.667	732.51
568.9442	717.09	1073.249	732.51
571.9603	716.6	1110.48	734.54
572.3747	716.53	1141.5	737.1
576.5869	717.44	1169.515	739.84
579.1799	718	1170.197	739.89
581.3936	718.56		
584.1164	722.45		

FINAL SURVEY | NOTE BOOK | NO. | SURVEYED | PLOTTED | TEMPLATE | AREAS | AREAS CHECKED | BY | DATE

ORIGINAL SURVEY | NOTE BOOK | NO. | SURVEYED | PLOTTED | TEMPLATE | AREAS | AREAS CHECKED | BY | DATE

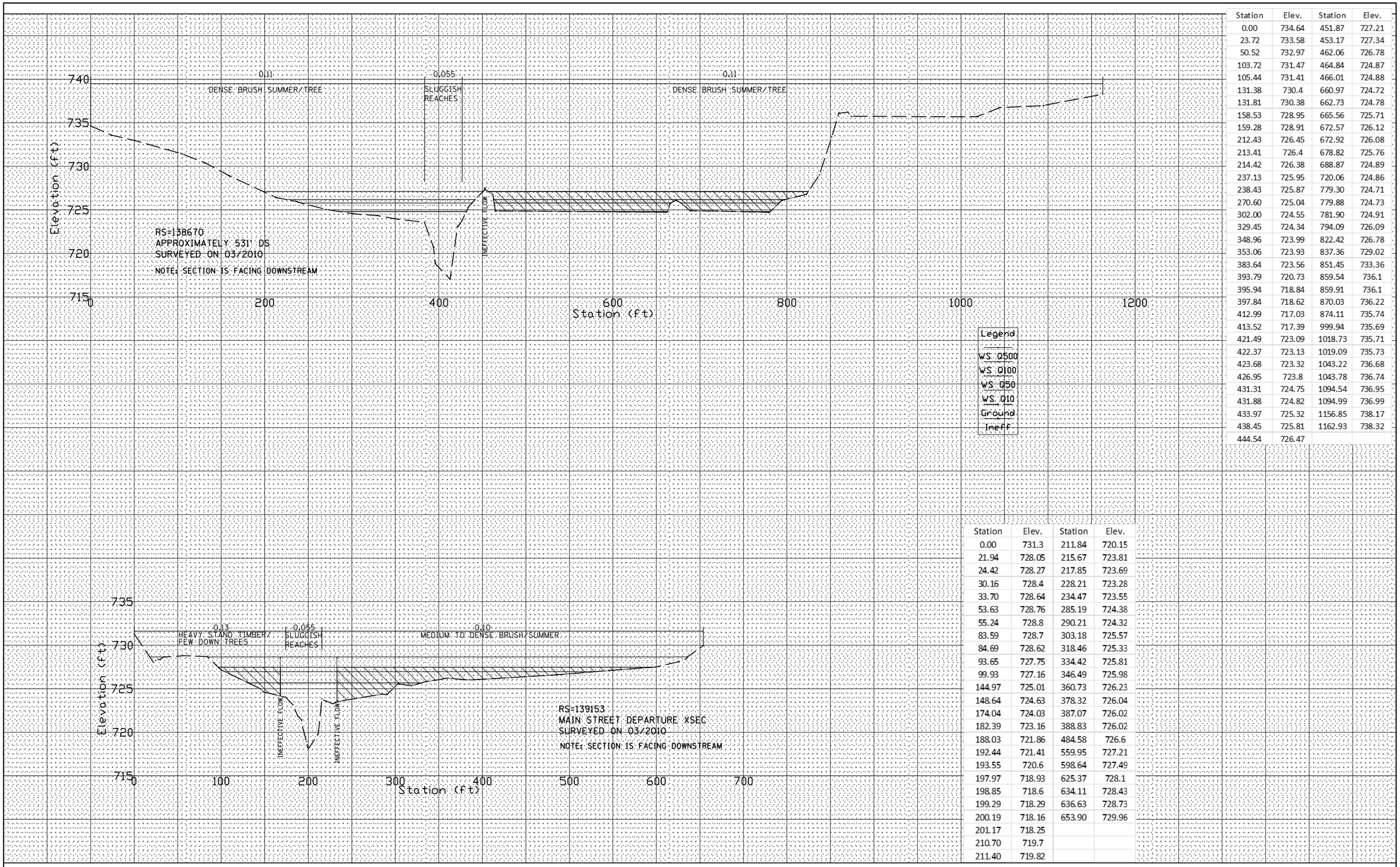
FILE NAME = $FILE1$	USER NAME = stephen.schuh	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 100.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 4/9/2012	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

BLACKBERRY CREEK SURVEYED CROSS-SECTIONS

SCALE: | SHEET 1 OF 9 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		KANE	9	1
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		



Station	Elev.	Station	Elev.
0.00	734.64	451.87	727.21
23.72	733.58	453.17	727.34
50.52	732.97	462.06	726.78
103.72	731.47	464.84	724.87
105.44	731.41	466.01	724.88
131.38	730.4	660.97	724.72
131.81	730.38	662.73	724.78
158.53	728.95	665.56	725.71
159.28	728.91	672.57	726.12
212.43	726.45	672.92	726.08
213.41	726.4	678.82	725.76
214.42	726.38	688.87	724.89
237.13	725.95	720.06	724.86
238.43	725.87	779.30	724.71
270.60	725.04	779.88	724.73
302.00	724.55	781.90	724.91
329.45	724.34	794.09	726.09
348.96	723.99	822.42	726.78
353.06	723.93	837.36	729.02
383.64	723.56	851.45	733.36
393.79	720.73	859.54	736.1
395.94	718.84	859.91	736.1
397.84	718.62	870.03	736.22
412.99	717.03	874.11	735.74
413.52	717.39	999.94	735.69
421.49	723.09	1018.73	735.71
422.37	723.13	1019.09	735.73
423.68	723.32	1043.22	736.68
426.95	723.8	1043.78	736.74
431.31	724.75	1094.54	736.95
431.88	724.82	1094.99	736.99
433.97	725.32	1156.85	738.17
438.45	725.81	1162.93	738.32
444.54	726.47		

Station	Elev.	Station	Elev.
0.00	731.3	211.84	720.15
21.94	728.05	215.67	723.81
24.42	728.27	217.85	723.69
30.16	728.4	228.21	723.28
33.70	728.64	234.47	723.55
53.63	728.76	285.19	724.38
55.24	728.8	290.21	724.32
83.59	728.7	303.18	725.57
84.69	728.62	318.46	725.33
93.65	727.75	334.42	725.81
99.93	727.16	346.49	725.98
144.97	725.01	360.73	726.23
148.64	724.63	378.32	726.04
174.04	724.03	387.07	726.02
182.39	723.16	388.83	726.02
188.03	721.86	484.58	726.6
192.44	721.41	559.95	727.21
193.55	720.6	598.64	727.49
197.97	718.93	625.37	728.1
198.85	718.6	634.11	728.43
199.29	718.29	636.63	728.73
200.19	718.16	653.90	729.96
201.17	718.25		
210.70	719.7		
211.40	719.82		

FINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

ORIGINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

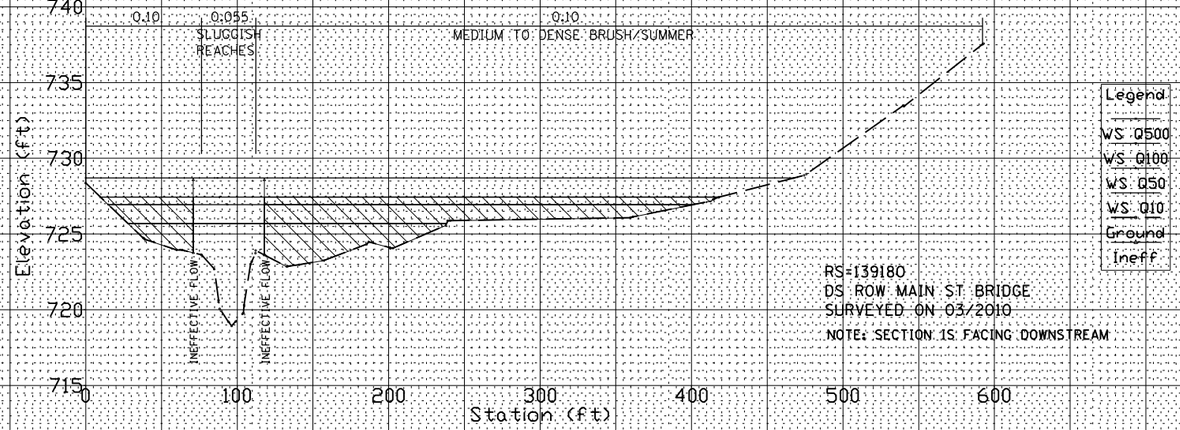
FILE NAME = $FILEL$	USER NAME = stephen.schuh	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 100.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 4/9/2012	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

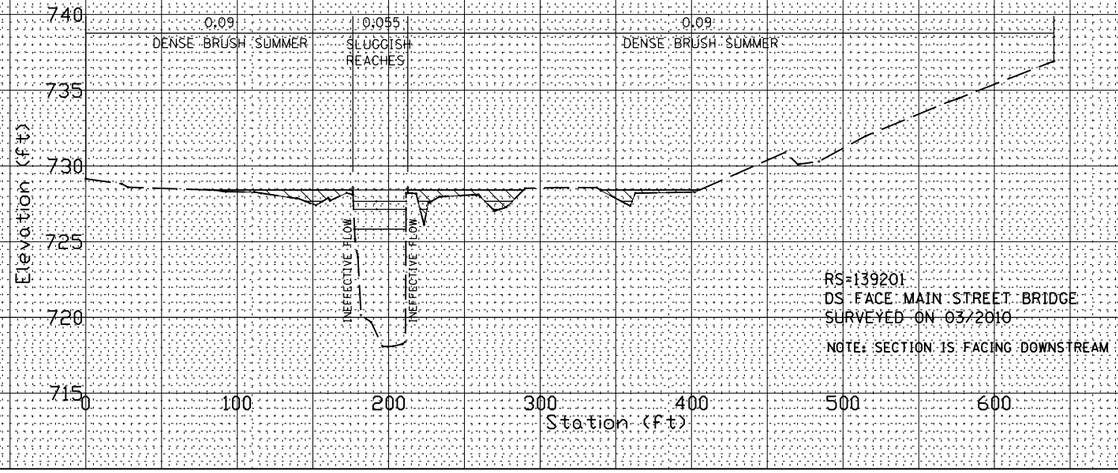
BLACKBERRY CREEK SURVEYED CROSS-SECTIONS

SCALE: | SHEET 2 OF 9 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		KANE	9	1
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		



Station	Elev.	Station	Elev.
0.00	728.36	140.95	722.97
37.86	724.74	157.35	723.25
38.57	724.7	185.43	724.32
39.19	724.64	186.88	724.48
59.94	723.95	200.82	724.1
63.84	723.94	202.81	724.06
76.25	723.63	237.83	725.57
76.65	723.61	239.03	725.87
84.91	722.68	240.75	725.88
87.70	720.62	359.71	726.08
88.46	720.06	361.34	726.13
89.37	719.93	412.61	727.17
94.15	719.21	414.30	727.28
96.36	718.93	415.09	727.32
98.99	719.22	417.81	727.42
103.44	719.72	474.37	728.87
104.16	719.79	475.94	728.96
104.52	720.3	539.66	733.47
108.89	723.01	540.15	733.45
109.60	723.18	540.52	733.44
112.06	723.73	592.18	737.52
112.25	723.91	592.91	737.57
132.65	722.85		
133.01	722.87		
133.45	722.87		



Station	Elev.	Station	Elev.
0.00	729.15	223.36	726.12
23.71	728.82	226.26	727.62
27.89	728.59	227.13	727.59
81.48	728.42	233.61	727.97
92.50	728.3	233.95	727.96
111.31	728.28	237.78	727.99
115.57	728.2	255.43	728.09
138.90	727.86	257.70	728.08
139.77	727.87	258.15	728.09
151.97	727.4	259.20	728.11
160.17	727.89	260.18	728.01
160.81	727.79	270.07	727.03
161.24	727.71	277.61	727.28
172.24	728.22	290.18	728.52
176.33	728.11	311.06	728.56
176.36	728.3	337.43	728.57
176.72	727.36	340.29	728.37
177.47	725.82	359.57	727.36
177.78	725.18	362.90	728.21
177.96	725.08	402.16	728.27
178.92	724.37	461.94	730.9
179.75	723.97	470.33	730.1
181.74	720.15	471.73	730.13
188.45	719.69	484.19	730.3
195.99	718.08	514.94	731.97
202.94	718.09	570.08	734.25
208.88	718.24	575.29	734.42
211.16	718.4	576.88	734.48
211.56	728.21	635.22	736.76
212.70	728.22	638.47	736.89
215.38	728.2	639.25	736.91
218.17	728.17		

FINAL SURVEY | ORIGINAL SURVEY
SURVEYED | PLOTTED | TEMPLATE | AREAS | AREAS CHECKED
NOTE BOOK
NO. | BY | DATE

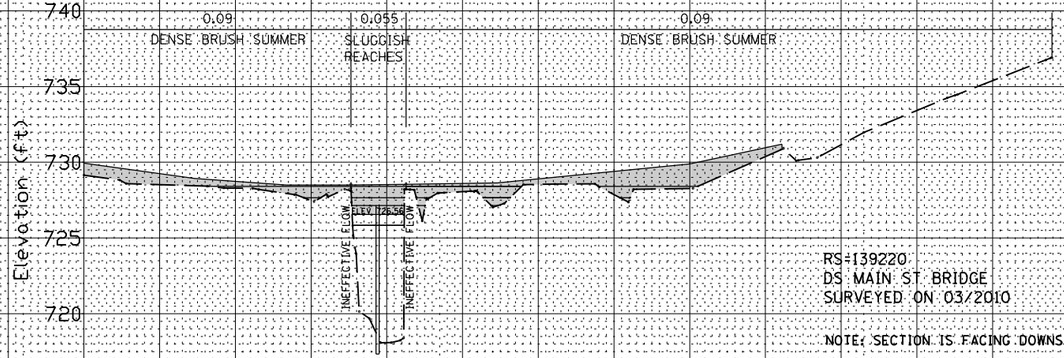
FILE NAME = $FILE1$	USER NAME = stephen.schuh	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 100.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 4/9/2012	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

BLACKBERRY CREEK SURVEYED CROSS-SECTIONS

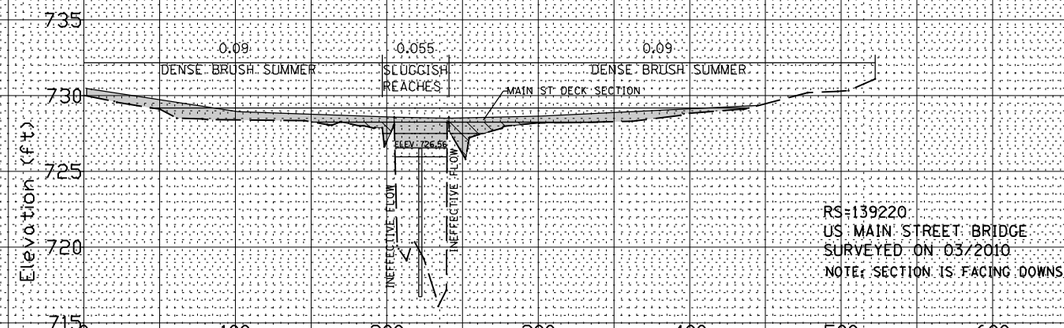
SCALE: | SHEET 3 OF 9 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		KANE	9	3
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		



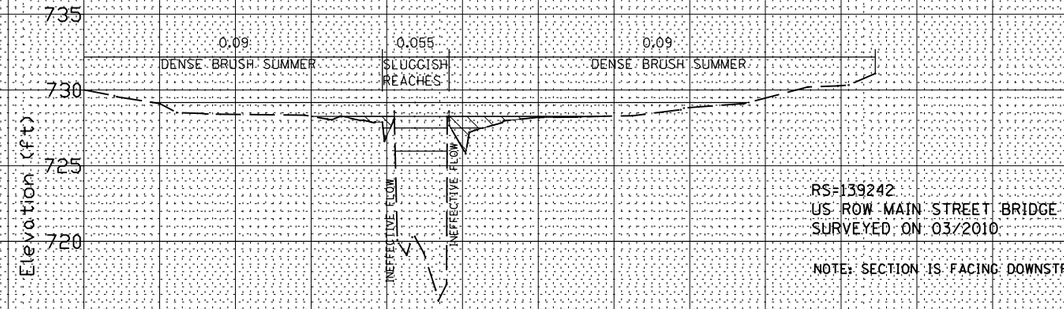
RS=139220
DS MAIN ST BRIDGE
SURVEYED ON 03/2010

NOTE: SECTION IS FACING DOWNSTREAM



RS=139220
US MAIN STREET BRIDGE
SURVEYED ON 03/2010

NOTE: SECTION IS FACING DOWNSTREAM



RS=139242
US ROW MAIN STREET BRIDGE
SURVEYED ON 03/2010

NOTE: SECTION IS FACING DOWNSTREAM

Legend

WS Q500
WS Q100
WS Q50
WS Q10
Ground
Ineff

Station	Elev.	Station	Elev.
0.00	730.01	224.42	719.24
0.75	730	232.17	716.82
20.15	729.62	234.04	716.09
21.78	729.56	239.43	717.17
44.05	729.2	239.84	728.23
49.99	729.11	240.56	728.24
61.35	728.51	241.02	728.24
78.32	728.46	241.21	727.66
81.67	728.42	252.01	725.8
145.55	728.35	253.83	726.88
160.73	728.08	254.42	727.21
163.69	728.04	257.97	727.35
169.42	728.27	276.07	727.85
170.03	728.26	277.22	727.97
182.39	727.99	300.25	728.21
184.58	728.01	300.62	728.19
191.55	727.85	327.96	728.22
192.04	727.87	343.47	728.27
192.39	727.89	362.17	728.3
197.02	727.88	394.07	728.7
198.35	726.62	396.21	728.81
204.98	728.09	433.38	729.1
206.88	720.1	435.53	729.09
207.87	719.88	478.01	730.2
213.09	719.1	497.82	730.28
213.47	719.24	505.02	730.33
216.73	720.28	522.57	731.1
218.48	720.33		

FINAL SURVEY / ORIGINAL SURVEY

NO.	NOTE BOOK	BY	DATE
	AREAS CHECKED		
	TEMPLATE		
	PLOTTED		
	SURVEYED		

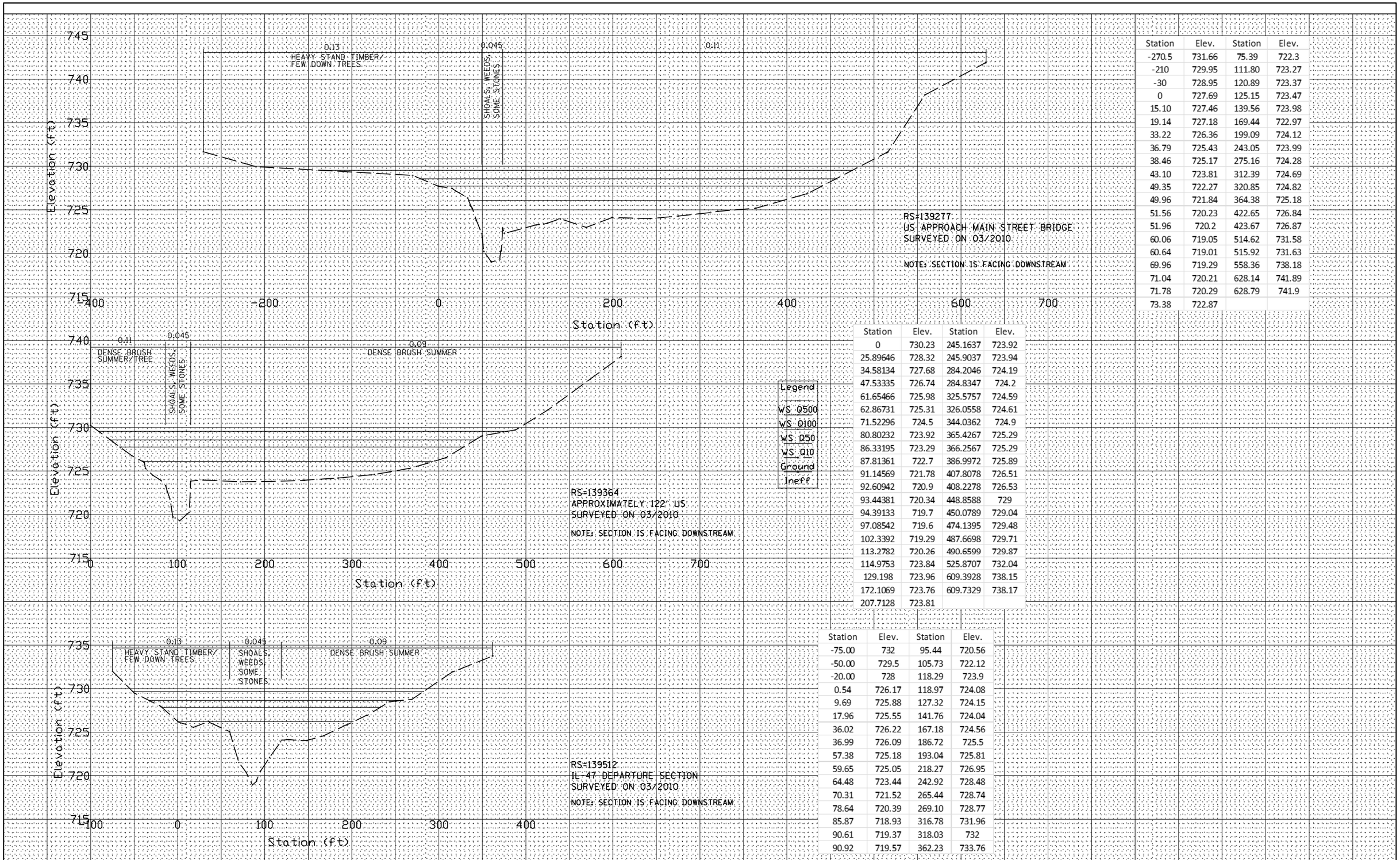
FILE NAME = $FILEL$	USER NAME = stephen.schuh	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 100.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 4/9/2012	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

BLACKBERRY CREEK SURVEYED CROSS-SECTIONS

SCALE: | SHEET 4 OF 9 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		KANE	9	4
		CONTRACT NO.		
		ILLINOIS	FED. AID PROJECT	



RS=139277
US APPROACH MAIN STREET BRIDGE
SURVEYED ON 03/2010

NOTE: SECTION IS FACING DOWNSTREAM

Station	Elev.	Station	Elev.
-270.5	731.66	75.39	722.3
-210	729.95	111.80	723.27
-30	728.95	120.89	723.37
0	727.69	125.15	723.47
15.10	727.46	139.56	723.98
19.14	727.18	169.44	722.97
33.22	726.36	199.09	724.12
36.79	725.43	243.05	723.99
38.46	725.17	275.16	724.28
43.10	723.81	312.39	724.69
49.35	722.27	320.85	724.82
49.96	721.84	364.38	725.18
51.56	720.23	422.65	726.84
51.96	720.2	423.67	726.87
60.06	719.05	514.62	731.58
60.64	719.01	515.92	731.63
69.96	719.29	558.36	738.18
71.04	720.21	628.14	741.89
71.78	720.29	628.79	741.9
73.38	722.87		

RS=139364
APPROXIMATELY 122' US
SURVEYED ON 03/2010

NOTE: SECTION IS FACING DOWNSTREAM

Station	Elev.	Station	Elev.
0	730.23	245.1637	723.92
25.89646	728.32	245.9037	723.94
34.58134	727.68	284.2046	724.19
47.53335	726.74	284.8347	724.2
61.65466	725.98	325.5757	724.59
62.86731	725.31	326.0558	724.61
71.52296	724.5	344.0362	724.9
80.80232	723.92	365.4267	725.29
86.33195	723.29	366.2567	725.29
87.81361	722.7	386.9972	725.89
91.14569	721.78	407.8078	726.51
92.60942	720.9	408.2278	726.53
93.44381	720.34	448.8588	729
94.39133	719.7	450.0789	729.04
97.08542	719.6	474.1395	729.48
102.3392	719.29	487.6698	729.71
113.2782	720.26	490.6599	729.87
114.9753	723.84	525.8707	732.04
129.198	723.96	609.3928	738.15
172.1069	723.76	609.7329	738.17
207.7128	723.81		

RS=139512
IL 47 DEPARTURE SECTION
SURVEYED ON 03/2010

NOTE: SECTION IS FACING DOWNSTREAM

Station	Elev.	Station	Elev.
-75.00	732	95.44	720.56
-50.00	729.5	105.73	722.12
-20.00	728	118.29	723.9
0.54	726.17	118.97	724.08
9.69	725.88	127.32	724.15
17.96	725.55	141.76	724.04
36.02	726.22	167.18	724.56
36.99	726.09	186.72	725.5
57.38	725.18	193.04	725.81
59.65	725.05	218.27	726.95
64.48	723.44	242.92	728.48
70.31	721.52	265.44	728.74
78.64	720.39	269.10	728.77
85.87	718.93	316.78	731.96
90.61	719.37	318.03	732
90.92	719.57	362.23	733.76

FINAL SURVEY / ORIGINAL SURVEY
NOTE BOOK
NO.
SURVEYED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
BY
DATE

FILE NAME = $FILEL$	USER NAME = stephen.schuh	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 100.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 4/9/2012	DATE -	REVISED -

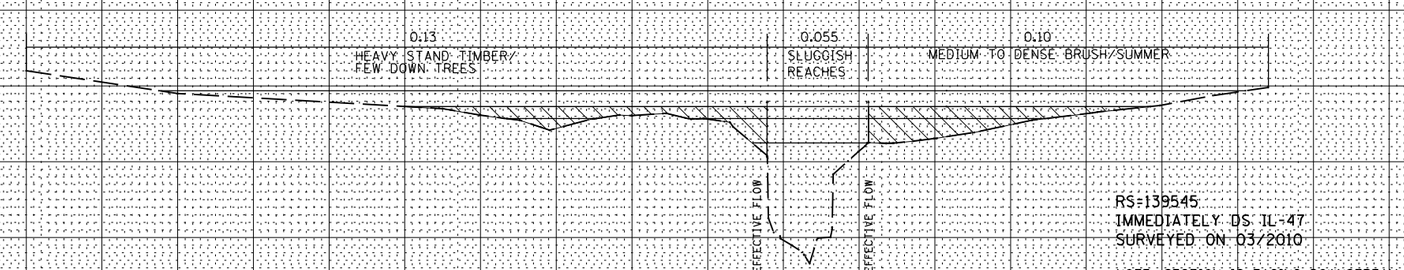
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

BLACKBERRY CREEK SURVEYED CROSS-SECTIONS

SCALE: | SHEET 5 OF 9 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		KANE	9	5
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		

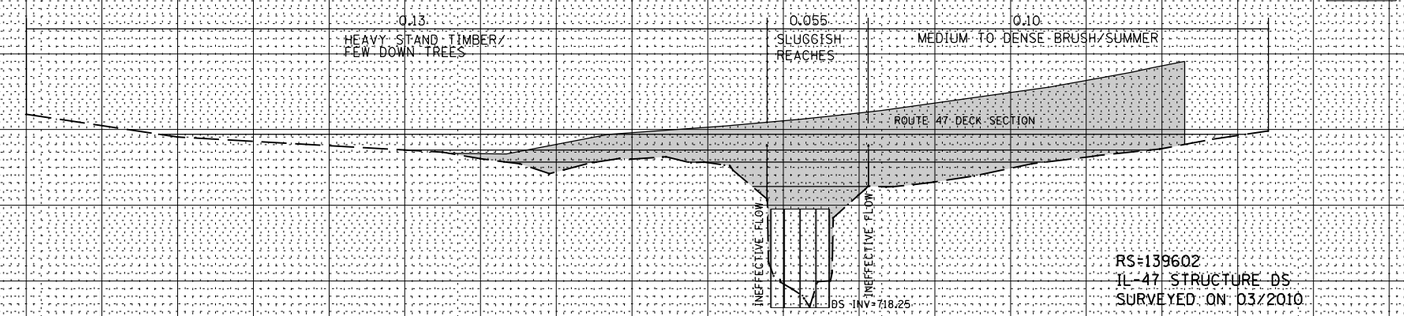
Station	Elev.	Station	Elev.
-300.00	731	205.95	719.46
-200.00	729.5	212.65	719.03
-25.00	728.5	213.52	718.87
0.00	728.07	213.81	718.83
15.59	727.87	217.37	718.27
25.99	727.74	222.04	719.83
45.51	727.08	222.73	719.95
55.17	727.33	231.06	720.01
75.38	727.83	232.14	720.54
91.86	728.09	232.23	720.67
99.54	728.05	232.86	724.17
120.43	728.18	242.69	725.05
122.49	728.2	249.60	725.67
139.10	727.8	254.10	726.06
147.48	727.85	255.97	726.26
164.56	727.62	267.89	726.21
164.88	727.57	285.97	726.36
166.69	727.31	295.25	726.48
189.18	725.42	299.36	726.53
189.42	725.29	326.06	726.93
190.09	721.27	364.14	727.74
193.62	720.33	407.48	728.28
197.82	720.09	448.73	728.71
198.06	719.93	483.73	729.37
205.51	719.49	520.23	729.91



RS=139545
IMMEDIATELY DS IL-47
SURVEYED ON 03/2010

NOTE: SECTION IS FACING DOWNSTREAM

Legend
WS Q500
WS Q100
WS Q50
WS Q10
Ground
Ineff



RS=139602
IL-47 STRUCTURE DS
SURVEYED ON 03/2010

NOTE: SECTION IS FACING DOWNSTREAM

FINAL SURVEY / ORIGINAL SURVEY
NOTE BOOK
NO.
SURVEYED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
BY
DATE

FILE NAME = $FILEL$	USER NAME = stephen.schuh	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 100.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 4/9/2012	DATE -	REVISED -

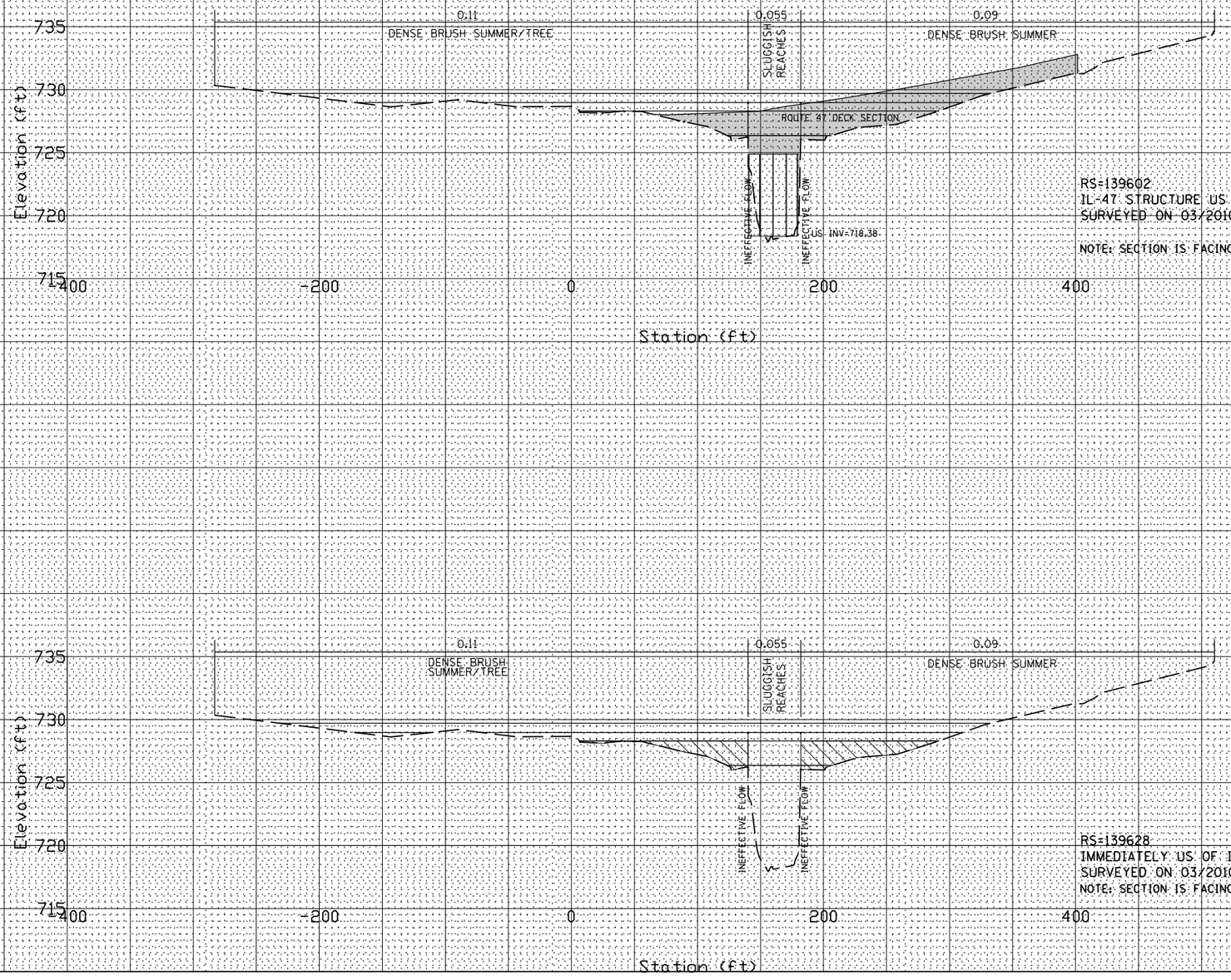
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

BLACKBERRY CREEK SURVEYED CROSS-SECTIONS

SCALE: | SHEET 6 OF 9 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		KANE	9	6
		CONTRACT NO.		
	ILLINOIS	FED. AID PROJECT		

Station	Elev.	Station	Elev.
-283.00	730.34	158.35	718.33
-143.00	728.62	159.36	718.32
-90.00	729.20	160.17	718.12
-44.00	728.64	162.16	718.16
0.00	728.66	176.53	718.44
6.10	728.38	176.97	718.58
7.26	728.20	177.52	718.84
24.43	728.13	180.53	719.45
41.81	728.30	181.59	724.48
58.13	728.21	181.98	726.05
89.09	727.44	201.01	725.99
126.27	726.23	202.06	726.22
126.88	725.98	225.18	726.93
139.31	726.24	226.06	726.98
140.02	726.21	257.99	727.24
140.20	726.20	280.16	727.94
140.32	723.93	298.00	728.54
142.65	723.41	327.20	729.57
145.06	721.44	397.97	731.25
146.85	720.00	415.06	731.72
147.51	719.58	421.63	732.15
149.30	719.02	508.17	734.32
156.11	717.93	510.23	734.63



RS=139602
IL-47 STRUCTURE US
SURVEYED ON 03/2010

NOTE: SECTION IS FACING DOWNSTREAM

Legend
WS Q500
WS Q100
WS Q50
WS Q10
Ground
Ineff

RS=139628
IMMEDIATELY US OF IL-47
SURVEYED ON 03/2010
NOTE: SECTION IS FACING DOWNSTREAM

FINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS, AREAS CHECKED — NOTE BOOK — NO. — BY — DATE

ORIGINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS, AREAS CHECKED — NOTE BOOK — NO. — BY — DATE

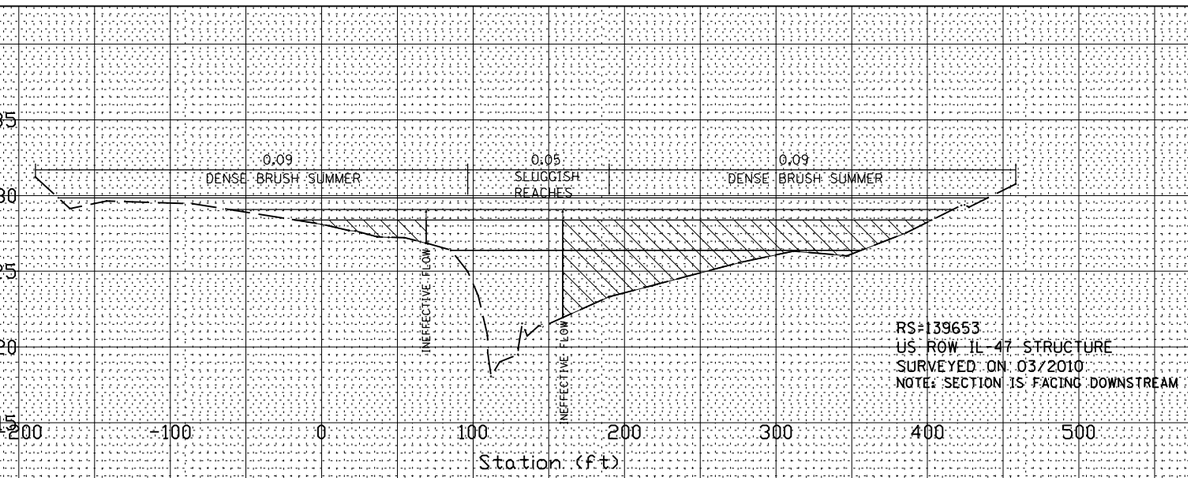
FILE NAME = $FILEL$	USER NAME = stephen.schuh	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 100.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 4/9/2012	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

BLACKBERRY CREEK SURVEYED CROSS-SECTIONS

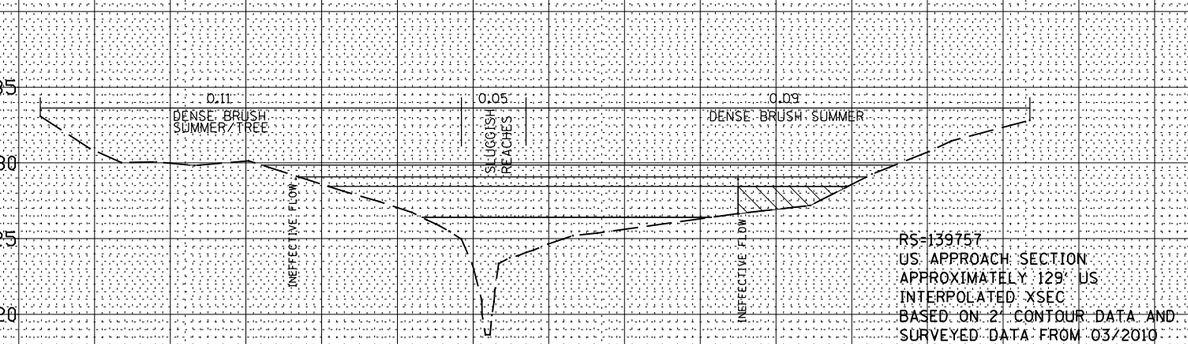
SCALE: | SHEET 7 OF 9 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		KANE	9	7
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		



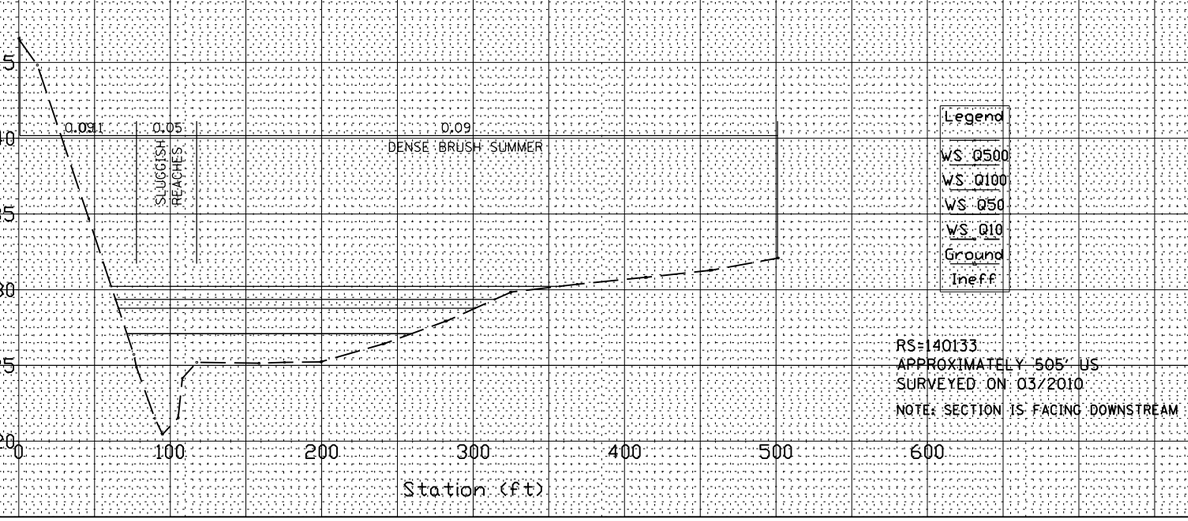
RS=139653
US ROW IL 47 STRUCTURE
SURVEYED ON 03/2010
NOTE: SECTION IS FACING DOWNSTREAM

Station	Elev.	Station	Elev.
-189.00	731.22	111.88	718.06
-166.20	729.14	117.49	719.02
-142.00	729.64	129.72	719.5
-85.00	729.45	129.82	719.92
0.00	728.1	132.45	721.55
17.89	727.69	135.72	720.73
22.27	727.66	143.42	721.41
36.69	727.27	145.99	721.35
44.32	727.24	190.77	723.34
54.69	727.21	220.10	724.11
70.14	726.83	275.54	725.56
70.14	726.83	311.63	726.33
85.30	726.39	344.06	726.05
96.44	724.98	385.95	727.54
103.45	723.38	422.48	729.35
109.52	720.75	458.34	730.76
109.70	719.62		



RS=139757
US APPROACH SECTION
APPROXIMATELY 129' US
INTERPOLATED XSEC
BASED ON 2' CONTOUR DATA AND
SURVEYED DATA FROM 03/2010
NOTE: SECTION IS FACING DOWNSTREAM

Station	Elev.	Station	Elev.
-185.75	733.08	108.17	718.65
-153.16	730.95	111.17	718.65
-132.29	730.02	112.41	719.94
-109.38	730.06	113.8	720.84
-83.93	729.82	114.3	721.6
-48.29	730.13	116.86	723.35
14.33	728.13	124.22	723.74
38.25	727.44	134.98	724.08
59.64	726.73	165.91	725.2
69.31	726.24	182.06	725.36
77.45	725.87	275.32	726.65
84.07	725.49	322.52	727.19
92.33	724.96	363.41	729.26
99.53	723.3	401.16	730.75
105.43	721.02	415.87	731.45
105.75	720.89	467.58	732.81
105.94	720		



RS=140133
APPROXIMATELY 505' US
SURVEYED ON 03/2010
NOTE: SECTION IS FACING DOWNSTREAM

Station	Elev.	Station	Elev.
0.00	746.59	240.46	726.41
0.66	746.44	241.44	726.44
12.27	744.83	281.73	727.91
46.10	734.70	282.36	727.93
75.94	725.73	324.49	729.82
77.66	724.88	325.10	729.84
89.80	721.50	368.71	730.36
94.87	720.45	413.59	730.81
105.28	721.54	414.24	730.82
108.04	724.14	456.24	731.28
117.50	725.20	456.74	731.29
158.66	725.14	457.62	731.29
175.44	725.20	501.06	732.08
199.38	725.23	501.50	732.09
200.06	725.25		

FINAL SURVEY
NOTE BOOK
NO.
SURVEYED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
BY
DATE

ORIGINAL SURVEY
NOTE BOOK
NO.
SURVEYED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
BY
DATE

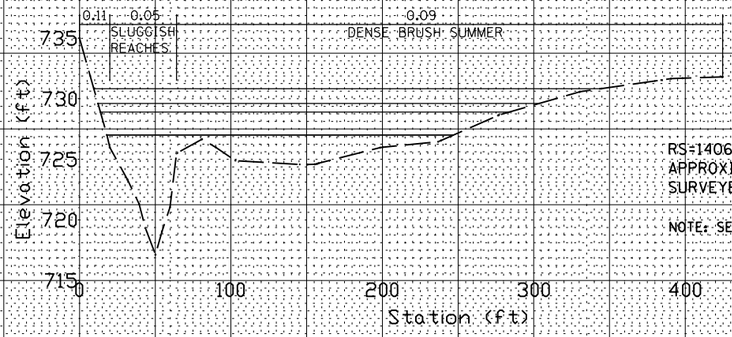
FILE NAME = $FILEL$	USER NAME = stephen.schuh	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 100.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 4/9/2012	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

BLACKBERRY CREEK SURVEYED CROSS-SECTIONS

SCALE: | SHEET 8 OF 9 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		KANE	9	8
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		



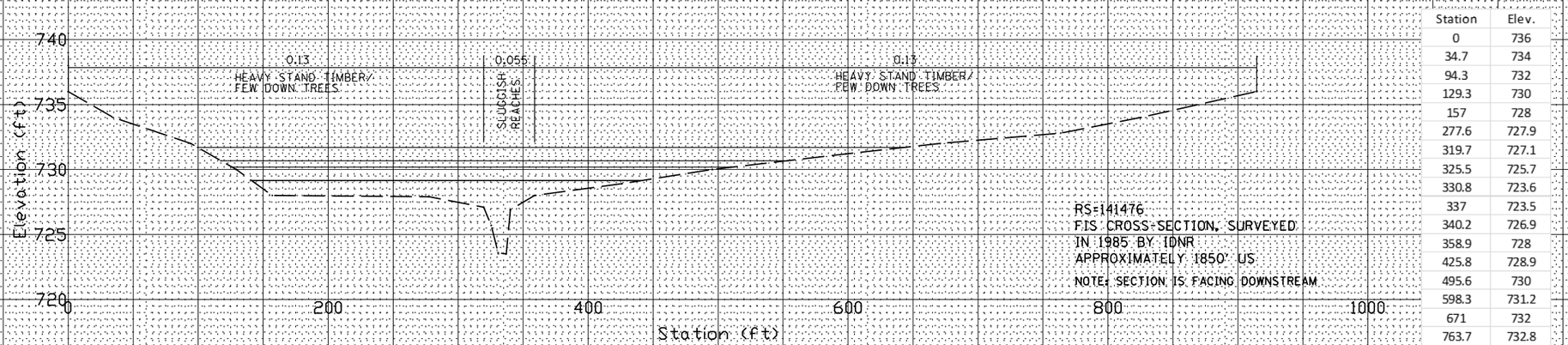
RS=140616
APPROXIMATELY 988' U.S.
SURVEYED ON 03/2010

NOTE: SECTION IS FACING DOWNSTREAM

Legend

WS Q500
WS Q100
WS Q50
WS Q10
Ground
Ineff

Station	Elev.
0.00	734
18.15	727.61
20.01	726.78
31.70	724.65
39.43	723.05
43.50	721.46
50.22	719.7
54.46	721.24
59.86	722.83
64.14	726.39
80.94	727.32
90.15	726.78
103.06	725.91
145.48	725.66
150.69	725.65
155.39	725.67
156.87	725.7
157.90	725.74
198.54	726.77
200.25	726.8
236.89	727.16
238.76	727.24
276.41	728.89
277.04	728.92
330.29	730.45
330.60	730.46
384.22	731.23
390.70	731.32
398.28	731.35
424.37	731.43
424.80	731.44



RS=141476
F.I.S. CROSS-SECTION, SURVEYED
IN 1985 BY IDNR
APPROXIMATELY 1850' US

NOTE: SECTION IS FACING DOWNSTREAM

Station	Elev.
0	736
34.7	734
94.3	732
129.3	730
157	728
277.6	727.9
319.7	727.1
325.5	725.7
330.8	723.6
337	723.5
340.2	726.9
358.9	728
425.8	728.9
495.6	730
598.3	731.2
671	732
763.7	732.8
825.4	734
914.1	736

FINAL SURVEY	BY	DATE
NOTE BOOK		
NO.		

SURVEYED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED

ORIGINAL SURVEY	BY	DATE
NOTE BOOK		
NO.		

SURVEYED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED

FILE NAME = $FILEL$	USER NAME = stephen.schuh	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = 100.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 4/9/2012	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

BLACKBERRY CREEK SURVEYED CROSS-SECTIONS

SCALE: | SHEET 9 OF 9 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		KANE	9	9
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 64	107B-I-1	Kane	27	4
STA. 199+00		TO STA. 214+00		
FED. ROAD DIST. NO. 7	ILLINOIS		PROJECT	

*Note: The posts for Steel Plate Beam Guard Rail on the top of the box culvert shall be installed accordance to the detail of "Post anchor at piers" in the Standard 2230-2. The length of posts shall be cut to conform with the requirement of the Standard. The extra work and materials to install the posts on top of the box culvert shall be considered incidental to Steel Plate Beam Guard Rail.

Note: The Contractor shall remove and store the existing handrail at the location designated by the Engineer. The handrail shall be picked up by State Maintenance Crew.

F.A. Route 64 Curve Data
Δ = 34°-24'
D = 2°-42.91'
T = 653.45'
L = 1,267.00'
R = 2,110.96'
E = 96.64'
e = 0.0797 (Prop.)
P.C. = 197+19.80
P.I. = 203+73.25
P.C.C. = 209+86.80

Stabilized Shoulders (Bituminous Aggregate Mixture) 6"
Sta. 207+00.00 - 208+00.00 = 222 Sq. Yd.

Steel Plate Beam Guard Rail*
Sta 206+87.00 - 208+12.00 = 125 Lin. Ft.

Metal Plate Guard Rail Removal
Rt. Sta. 206+90.00 - 207+17.00 = 25 Lin Ft.
Lt. Sta. 207+65.00 - 207+94.00 = 37.5 Lin Ft.
Total - 62.5 Lin. Ft.

Top Soil Excavation
Sta. 206+00 - 209+00 = 156 Cu. Yd.

Top Soil Placement
Sta. 206+00 - 209+00 = 156 Cu. Yd.
Class I Seeding - 0.3 Acre
Straw for Asphalt-Coated Mulch - 1 Ton
Emulsified Asphalt - 100 Gal.
Nitrogen Fertilizer Nutrients - 24 Pound
Phosphorus Fertilizer Nutrients - 14 Pound
Potassium Fertilizer Nutrients - 10 Pound

Stabilized Base Course (Bituminous Aggregate Mixture) 6"
Sta. 207+18.00 - 207+64.00 = 123 Sq. Yd.

Pavement Removal
Sta. 207+18.00 - 207+64.00 = 147 Sq. Yd.

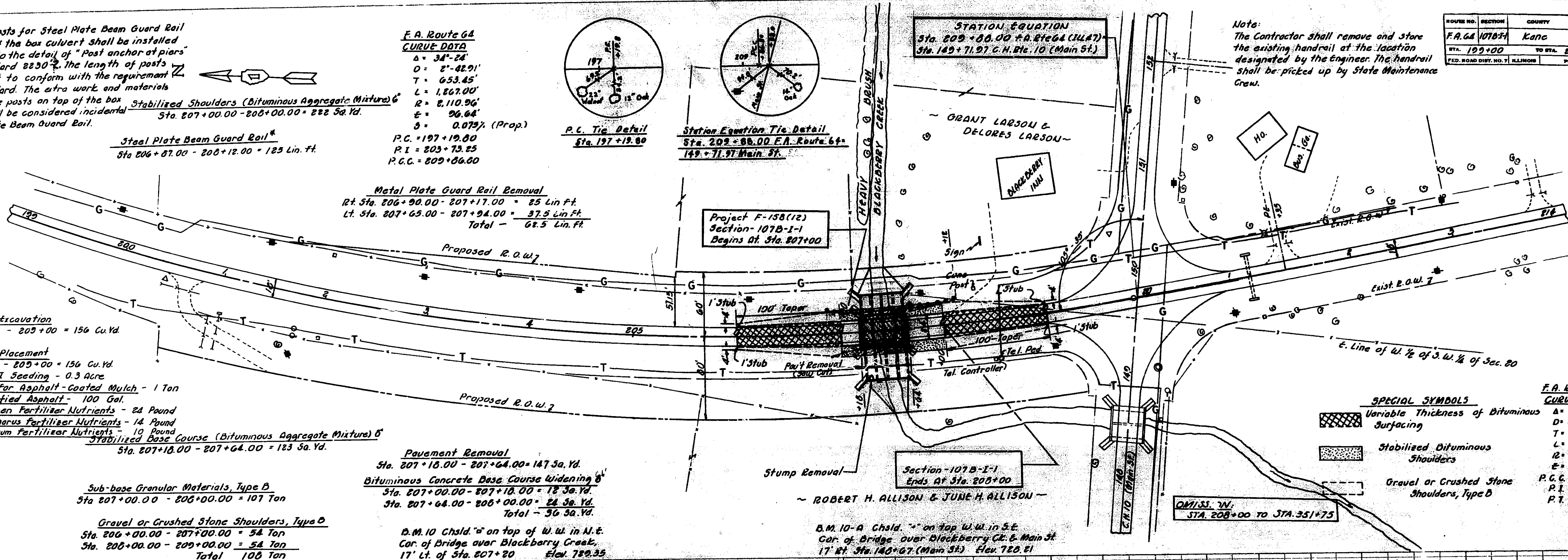
Bituminous Concrete Base Course Widening 8"
Sta. 207+00.00 - 207+18.00 = 12 Sq. Yd.
Sta. 207+64.00 - 208+00.00 = 24 Sq. Yd.
Total - 36 Sq. Yd.

Sub-base Granular Materials, Type B
Sta 207+00.00 - 208+00.00 = 107 Ton

Gravel or Crushed Stone Shoulders, Type B
Sta. 206+00.00 - 207+00.00 = 54 Ton
Sta. 208+00.00 - 209+00.00 = 54 Ton
Total 108 Ton

B.M. 10 Chsld. "□" on top of W.W. in N.E. Cor. of Bridge over Blackberry Creek, 17' Lt. of Sta. 207+20 Elev. 729.35

B.M. 10-A Chsld. "+" on top W.W. in S.E. Cor. of Bridge over Blackberry Ck. & Main St 17' Rt. Sta. 140+07 (Main St.) Elev. 720.81



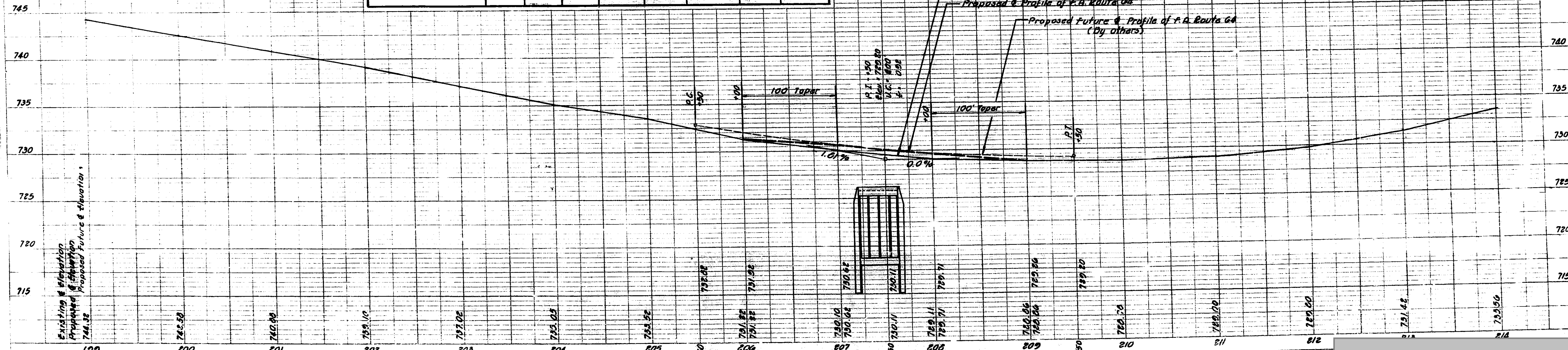
F.A. Route 64 Curve Data
Δ = 5°-16'
D = 0°-21.9'
T = 781.70'
L = 1,442.25'
R = 15,692.50'
E = 16.98'
P.C.C. = 209+86.80
P.I. = 217+68.50
P.T. = 224+29.05

EARTHWORK CALCULATION

Station	Earth Excavation Cu. Yd.	Embankment Cu. Yd.	Borrow Excavation Cu. Yd.
206+00 - 209+00	172	740	815

BITUMINOUS MATERIALS SCHEDULE

STATION	LENGTH FT.	WIDTH FT.	AREA SQ. YD.	BIT. MATL PR. CT. GAL.	AGGRE. (PR. CT.) TON	LEVEL BIND MACH M. TON	BINDER COURSE TON	SURFACE COURSE TON
206+00.00 - 207+00.00	100.00	20 to 24	245	42	0.5		37.6	13.8
207+00.00 - 207+18.00	18.00	24	48	5	0.1	1.4	11.0	3.4
207+18.00 - 207+64.00	46.00	24	123	12	0.3		19.4	8.9
207+64.00 - 208+00.00	36.00	24	96	10	0.2	2.7	20.6	7.0
208+00.00 - 209+00.00	100.00	20 to 24	245	40	0.5		44.6	14.0
Total				111	1.6	4.1	133.2	47.1



PROFILE

PLATE 1—PLAN PROFILE B. P.R. STANDARD
THE FREDERICK POST CO., Chicago

Rte. 47 Culvert Plans - 1967

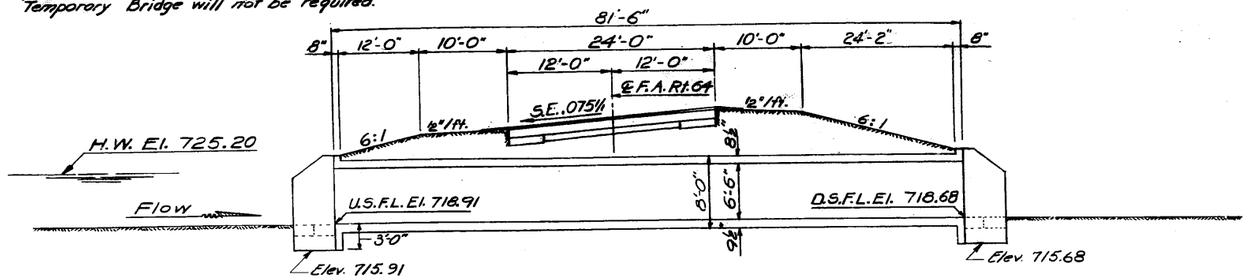
B.M.: Chiseled "+" on top wing wall in Southeast corner of the bridge over Blackberry Creek of C.H. Rte. 10, 17' Rt. of Sta 148+67 (C.H. Rte. 10) - Elev. = 728.21.

Existing Culvert is to be removed by contractor at the beginning of construction and replaced with a new structure. Handrail shall be salvaged by District Maintenance.
Temporary Bridge will not be required.

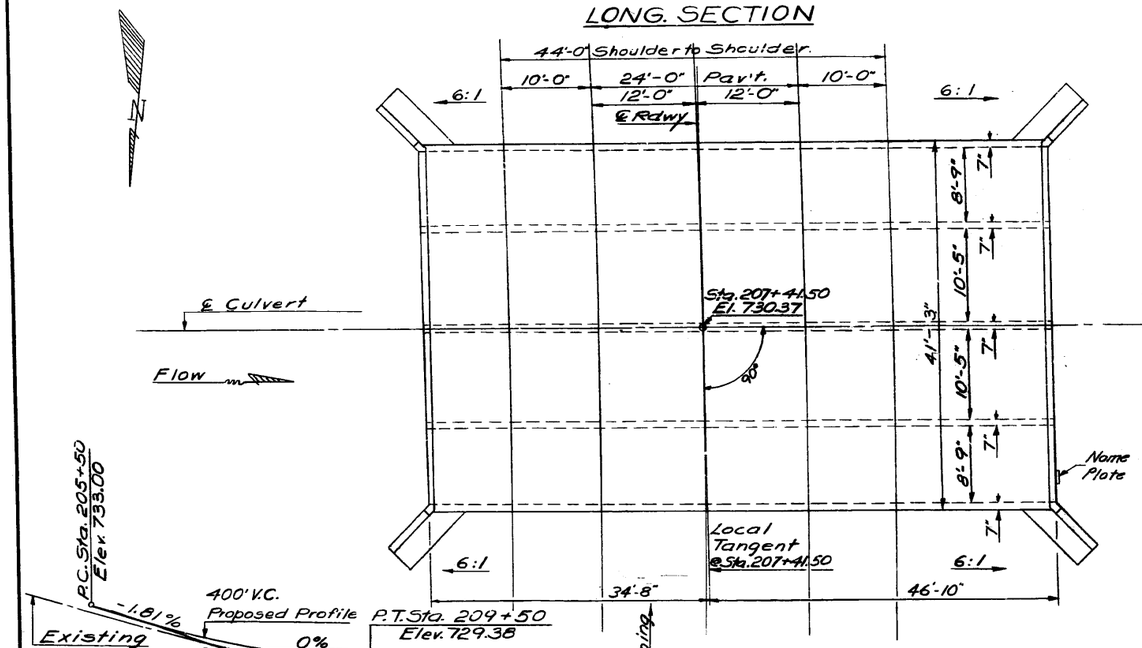
STATE OF ILLINOIS
DEPARTMENT OF PUBLIC WORKS & BUILDINGS
DIVISION OF HIGHWAYS

F.A.P. 64	107B-1	KANE	27	11
		ILLINOIS	FED. AID PROJECT	F-158(12)

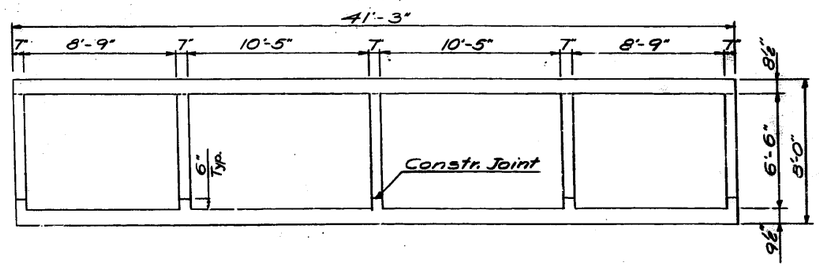
SHEET NO. 1
3 SHEETS



LONG. SECTION



PLAN



SECTION THRU BARREL

STATION 207+41.50
BUILT 19 BY
STATE OF ILLINOIS
F.A. RT. 64 SEC. 107B-I-1
LOADING HS 20

NAME PLATE
See Std 2113-1

GENERAL NOTES

Class X Concrete shall be used throughout.
Exposed edges shall be beveled ¾".
For backfilling and embankment see Std. Spec's.
All bars shall be lapped 20 diameters unless otherwise specified.
The top of the culvert, the backs of the sidewalls above the lower construction joint and backs of the wings above the tops of the footings shall be waterproofed in accordance with Art. 51.21 of the Std. Spec's.
Nonmetallic water seal used in the wingwall joints shall extend from the top of the footing to within 6" of the top of the headwall.
Any excavation needed to construct the bridge shall not be paid separately but will be included to Class "X" Concrete.

F.A. RTE. 64 CURVE DATA

Δ = 34°-24'
D = 2°-42.91'
T = 653.45'
L = 1,267.00
R = 2,110.95
E = 96.64
S = 0.075%, (Prop.)
P.C. = 197+19.80
P.I. = 203+73.25
P.C.C. = 209+86.80

TOTAL BILL OF MATERIAL

Item	Unit	Total
Class X Concrete	Cu. Yds.	267.0
Reinforcement Bars	Lbs.	54,840
Name Plates	Each	1
Removal of Existing Structures	Each	1

DESIGNED	Jim King	
CHECKED	Suresh T. Desai	I.K.
DRAWN	D. Derringer	
CHECKED		S.D.

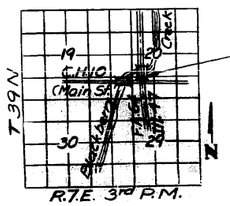
EXAMINED — July 11 1967
PASSED — H.E. Baumann
APPROVED — V.E. Stoffel

WATERWAY INFORMATION

Drainage Area	7,680 acres
Character: rolling, wooded,	cultivated
Required Opening	240 Sq. Ft. 50 Years frequency
Present Opening	240 Sq. Ft.
Proposed Opening	240 Sq. Ft.

Ordinary Water Elev. - 720.50

High Water Elev. - 725.20

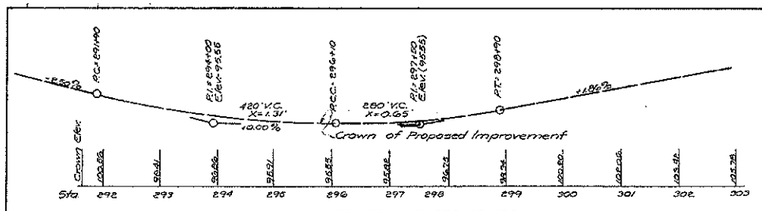


LOCATION SKETCH

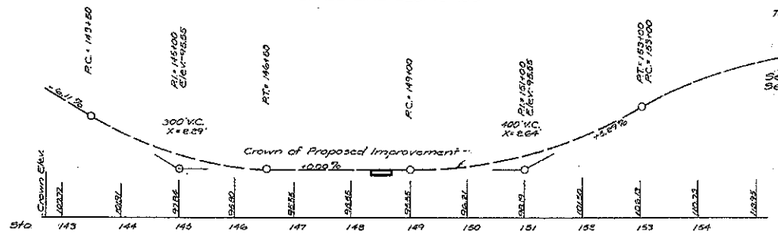
GENERAL PLAN & ELEVATION
PROJECT: F-158(12)
F.A. RT. 64 SECTION 107B-I-1
KANE COUNTY
STA. 207+41.50

Rte. 47 Culvert Plans - 1967

REINFORCED CONCRETE SLAB BRIDGE
2-SPANS-34 FT. OVERALL

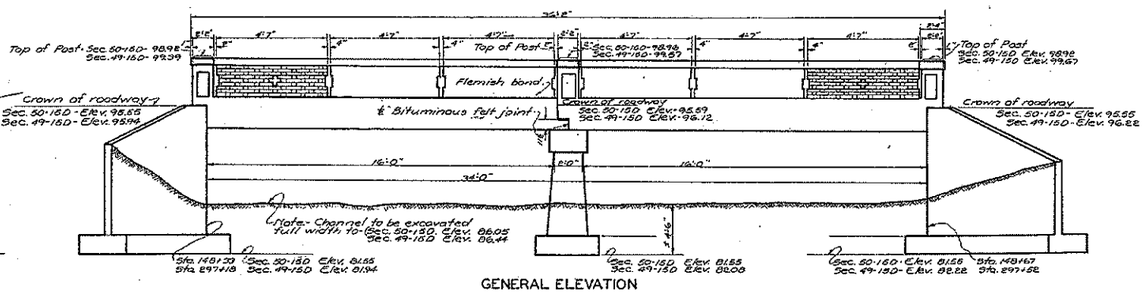


GRADE LINE SEC. 49-15D



GRADE LINE SEC. 50-15D

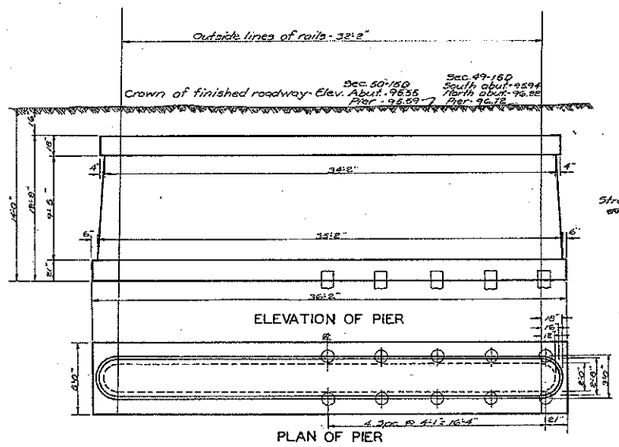
B.M.* 19- 3pk. E.S. willow free
Rf. Sta. 147+85 (Sec. 50-15D)
Elev. 91.64

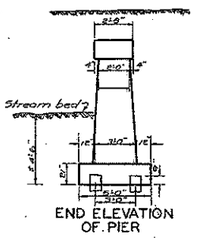


GENERAL ELEVATION

TOTAL BILL OF MATERIALS

Superstructure	
Concrete-Class A cu. yds.	40.8
Reinforcing steel- lbs.	8965
Class X Concrete - Cu. Yds.	5.1
Abutments	
Concrete-Class A cu. yds.	63.2
Reinforcing steel- lbs.	3340
Pier	
Concrete-Class-B- cu. yds.	40.3
Total	
Class X- Concrete cu. yds	5.1
Concrete-Class A cu. yds	104.0
Concrete-Class B cu. yds.	40.3
Total concrete cu. yds.	155.4
Reinforcing steel-lbs	12305
10 Ton Pile - lin ft.	270
Name Plate	1





⊕ 10 Ton Pile 10' Buff 8" Tip (Untr)
Est length 16'-0"
18 Reqd.- 270 lin. ft.

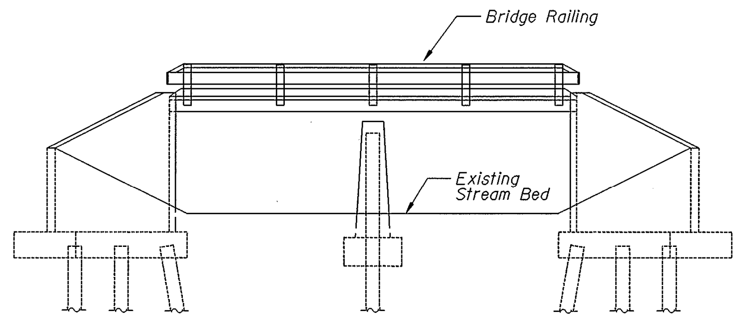
Note:- Class B concrete to be used in pier.
Proportions - 1-3:5
Class B concrete in Pier - 40.3

SEC. 49-15D – STA. 297 + 35
SEC. 50-15D – STA. 148 + 50

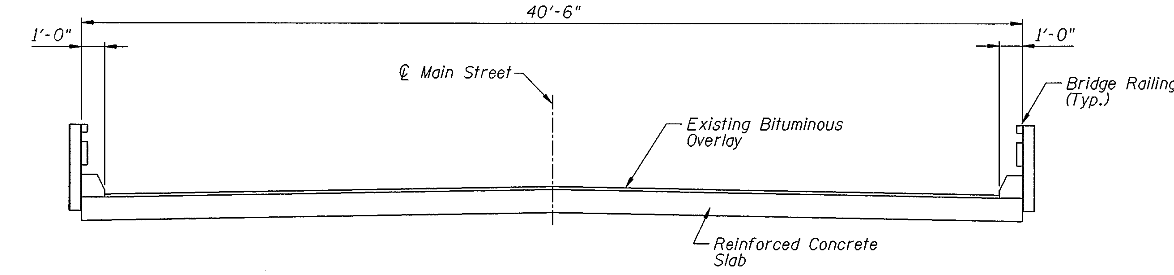
RTE. NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	03-00315-00-BR	KANE	23	20
STA.		TO STA.		

Scope of Work:

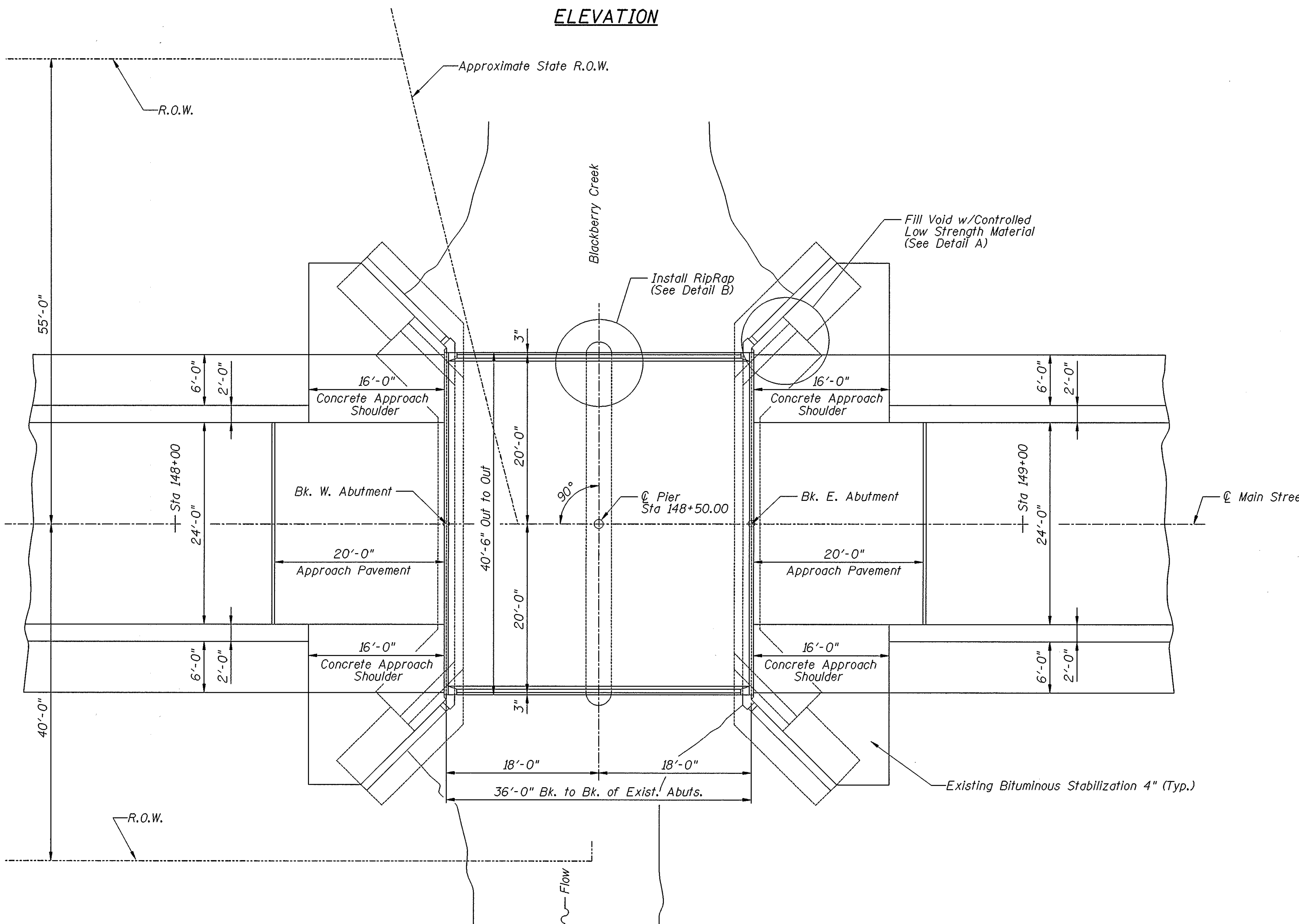
1. Fill Void Under East Approach Shoulder with Controlled Low Strength Material.
2. Clean and Paint Exposed Rebar on Underside of Deck.
3. Place RipRap Around Pier Nose as Shown in Detail B.



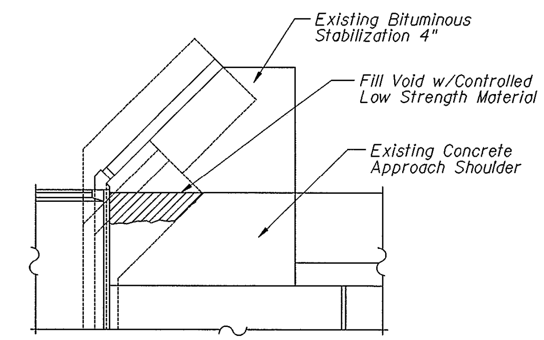
ELEVATION



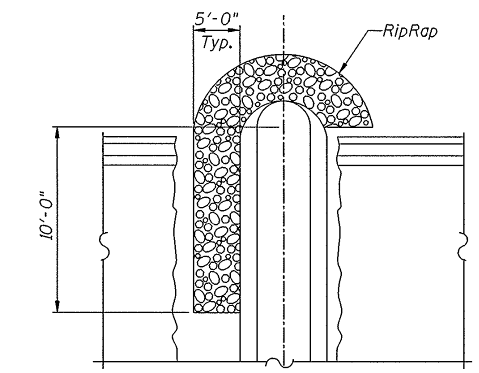
CROSS SECTION



PLAN



DETAIL A



DETAIL B

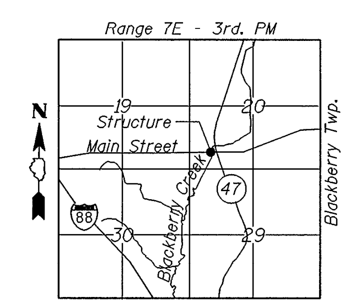
TOTAL BILL OF MATERIAL

	ITEM	UNIT	QUANTITY
*	CLEANING AND PAINTING EXPOSED REBAR	L.S.	1
*	STONE DUMPED RIPRAP, CLASS C4	TON	8
*	CONTROLLED LOW STRENGTH MATERIAL	L.S.	1
	CLASS D PATCHES, TYPE I	SQ. YD.	50

* -SEE SPECIAL PROVISIONS IN CONTRACT

Notes:

1. All work shall be performed within the ROW limits as shown.



LOCATION SKETCH

Main Street Bridge Plans
(PATRICK ENGINEERING)

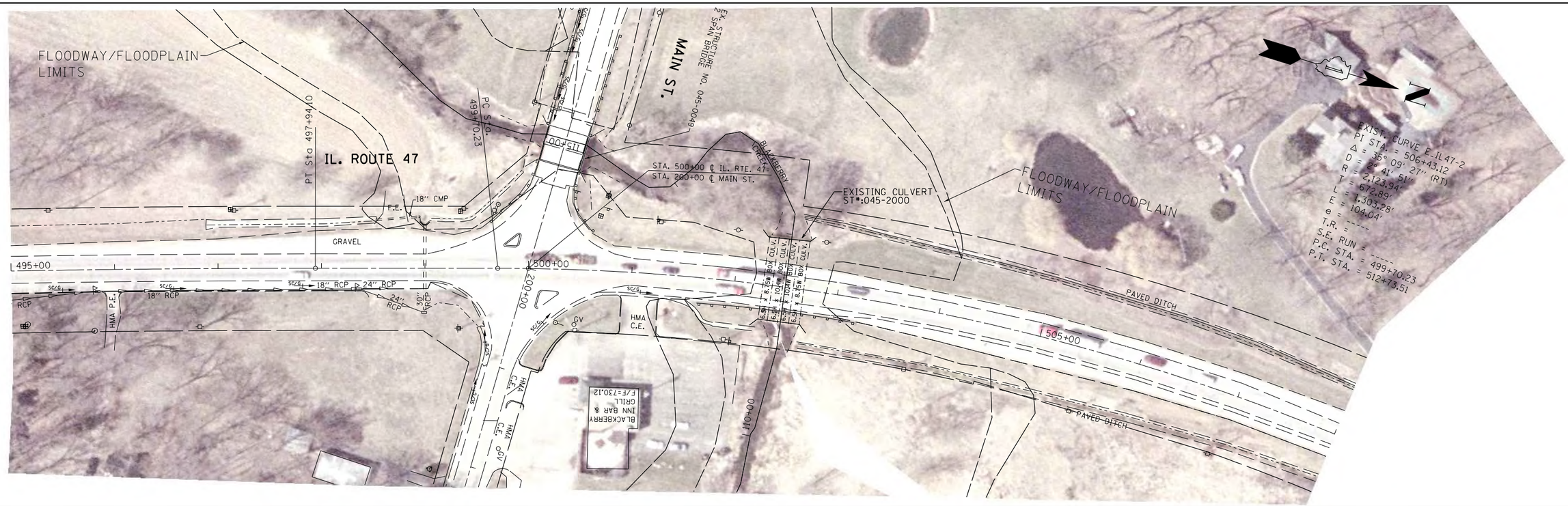
REVISIONS	
NAME	DATE

KANE COUNTY
DIVISION OF TRANSPORTATION
MAIN ST. (C.H. 10) OVER
BLACKBERRY CREEK
S/N: 045-0049
GENERAL PLAN AND ELEVATION

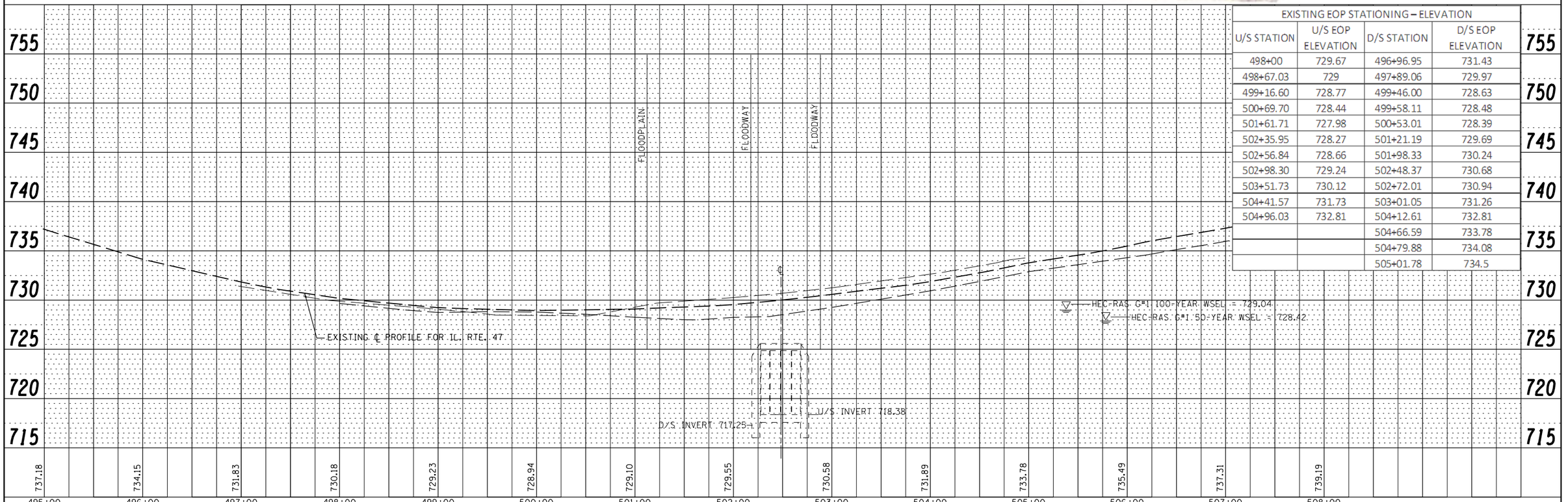
SCALE: NONE DRAWN BY: MB
DATE: 6/9/03 CHECKED BY: SB

PATRICK ENGINEERING INC.
LISLE, ILLINOIS

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



PROFILE — SURVEYED | PLOTTED | ALIGNMENT CHECKED | R.O.W. NOTED | STRUCTURE NOTATNS CHKD | NOTE BOOK | NO. | BY | DATE



EXISTING EOP STATIONING – ELEVATION

U/S STATION	U/S EOP ELEVATION	D/S STATION	D/S EOP ELEVATION
498+00	729.67	496+96.95	731.43
498+67.03	729	497+89.06	729.97
499+16.60	728.77	499+46.00	728.63
500+69.70	728.44	499+58.11	728.48
501+61.71	727.98	500+53.01	728.39
502+35.95	728.27	501+21.19	729.69
502+56.84	728.66	501+98.33	730.24
502+98.30	729.24	502+48.37	730.68
503+51.73	730.12	502+72.01	730.94
504+41.57	731.73	503+01.05	731.26
504+96.03	732.81	504+12.61	732.81
		504+66.59	733.78
		504+79.88	734.08
		505+01.78	734.5

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		DRAWN -	REVISED -
	PLOT SCALE = 100.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 7/28/2014	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

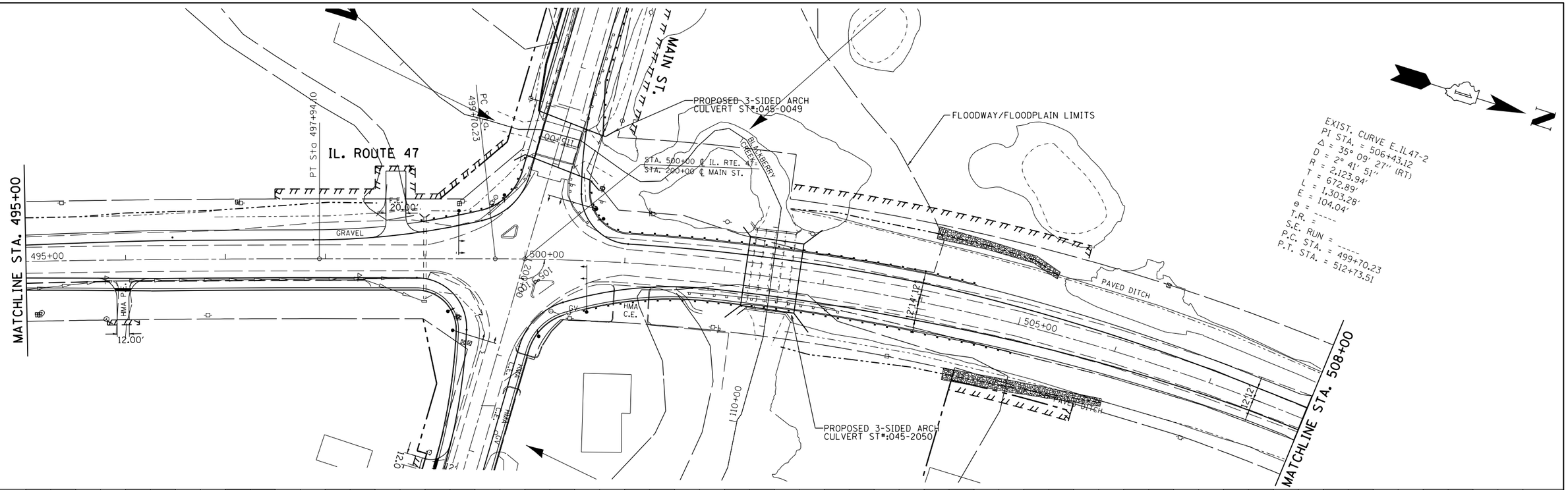
IL ROUTE 47 OVER BLACKBERRY CREEK
EXISITNG IL ROUTE 47 CENTERLINE PROFILE

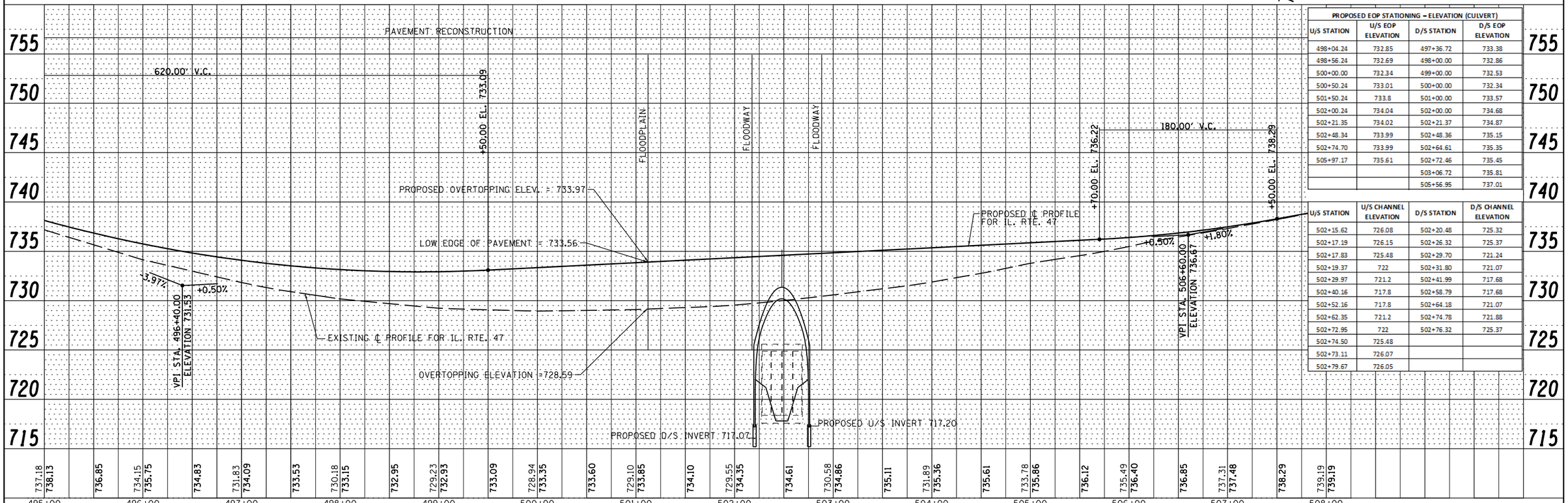
SCALE: | SHEET NO. OF SHEETS | STA. 495+00 TO STA. 508+00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326		KANE		
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		

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

PROFILE
SURVEYED
PLOTTED
GRADES CHECKED
B.M. NOTED
STRUCTURE NOTATNS CHKD
NOTE BOOK
NO.
BY
DATE





PROPOSED EOP STATIONING – ELEVATION (CULVERT)

U/S STATION	U/S EOP ELEVATION	D/S STATION	D/S EOP ELEVATION
498+04.24	732.85	497+36.72	733.38
498+56.24	732.69	498+00.00	732.86
500+00.00	732.34	499+00.00	732.53
500+50.24	733.01	500+00.00	732.34
501+50.24	733.8	501+00.00	733.57
502+00.24	734.04	502+00.00	734.68
502+21.35	734.02	502+21.37	734.87
502+48.34	733.99	502+48.36	735.15
502+74.70	733.99	502+64.61	735.35
505+97.17	735.61	502+72.46	735.45
		503+06.72	735.81
		505+56.95	737.01

U/S STATION	U/S CHANNEL ELEVATION	D/S STATION	D/S CHANNEL ELEVATION
502+15.62	726.08	502+20.48	725.32
502+17.19	726.15	502+26.32	725.37
502+17.83	725.48	502+29.70	721.24
502+19.37	722	502+31.80	721.07
502+29.97	721.2	502+41.99	717.68
502+40.16	717.8	502+58.79	717.68
502+52.16	717.8	502+64.18	721.07
502+62.35	721.2	502+74.78	721.88
502+72.95	722	502+76.32	725.37
502+74.50	725.48		
502+73.11	726.07		
502+79.67	726.05		

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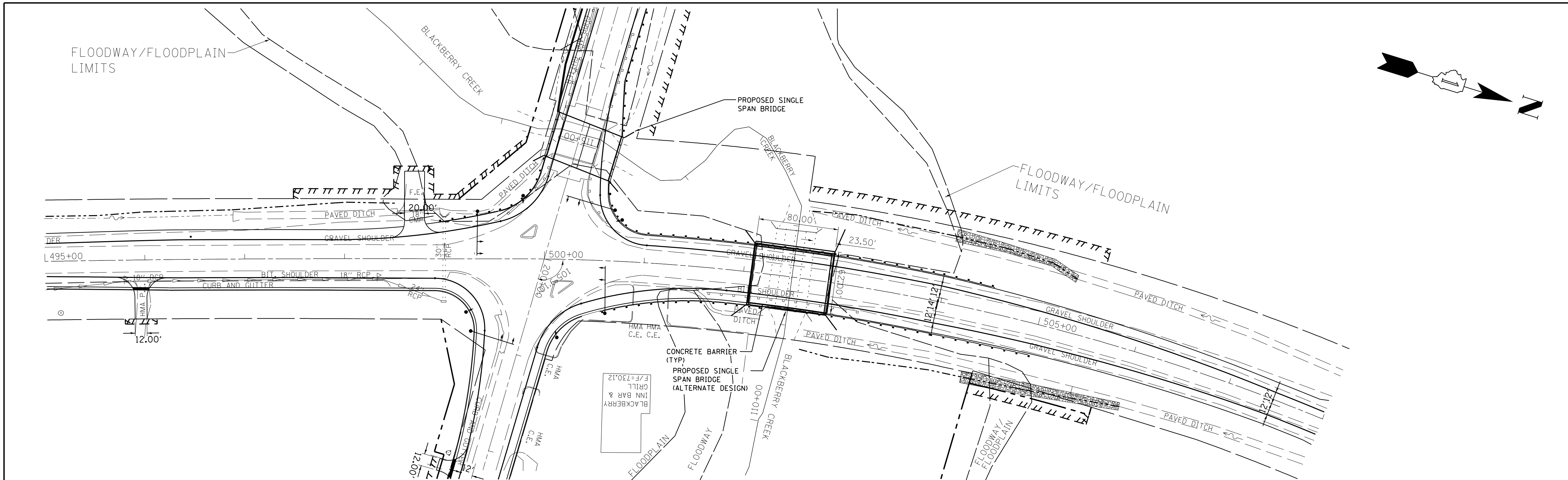
	PLOT DATE = 7/28/2014	DATE -	REVISED -

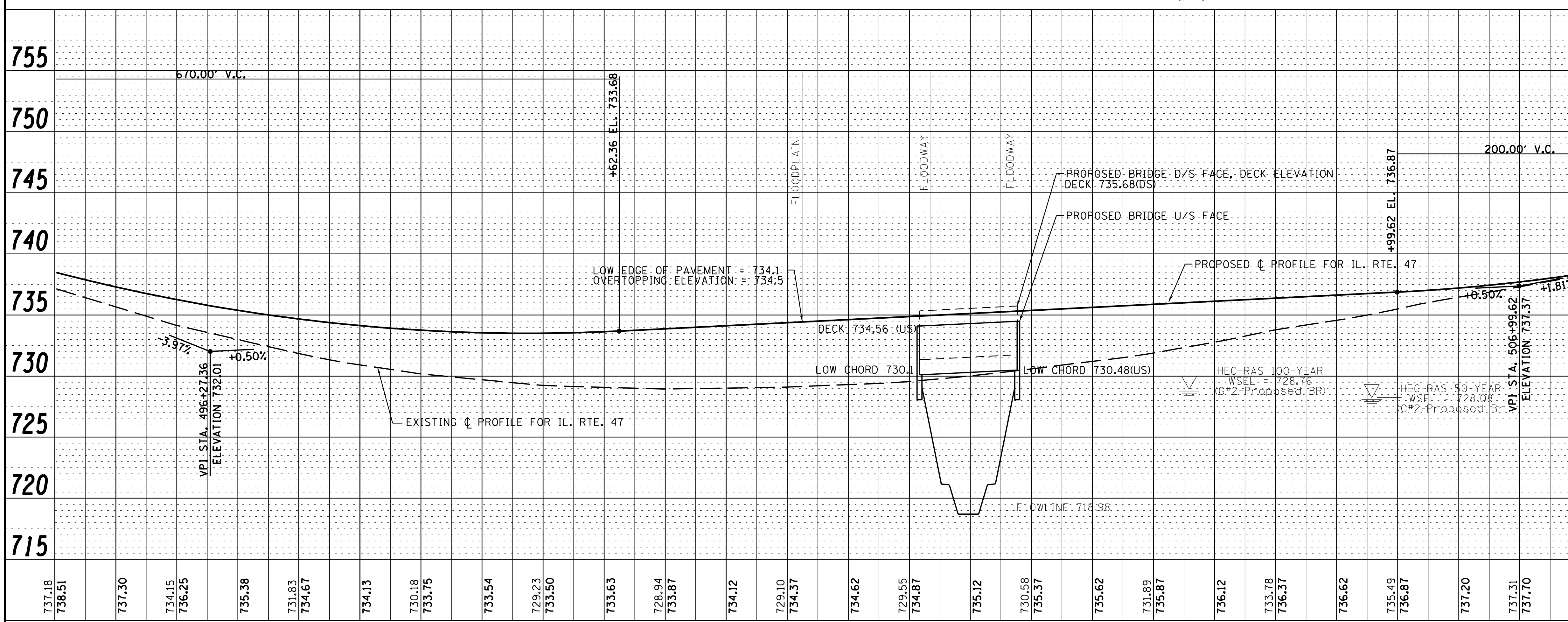
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

IL ROUTE 47 OVER BLACKBERRY CREEK
PROPOSED CULVERT PLAN AND PROFILE

SCALE: 1'' = 100' | SHEET NO. OF SHEETS | STA. 495+00 TO STA. 508+00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326		KANE		
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		





IL-47 OVER BLACKBERRY CREEK PROPOSED CONDITIONS					
PROPOSED BRIDGE DECK EOP STATIONING – ELEVATION					
U/S STATION	U/S EOP ELEVATION	U/S LOW CHORD ELEVATION	D/S STATION	D/S EOP ELEVATION	U/S LOW CHORD ELEVATION
498+00	733.47		496+96.95	734.43	
499+16.60	733.17		497+89.06	733.58	
500+69.70	733.72		499+46.00	733.11	
501+61.71	734.37		499+58.11	733.08	
502+10.37	734.56	730.1	500+53.01	733.63	
502+35.95	734.69	730.23	501+21.19	734.33	
502+48.37	734.75	730.33	501+98.33	735.17	
502+56.84	734.8	730.48	502+10.37	735.29	731.34
502+86.37	734.95		502+48.37	735.48	731.53
502+98.30	734.94		502+63.06	735.67	731.73
503+51.73	734.91		503+01.05	735.83	
504+41.57	735.17		504+12.61	736.89	
504+96.03	735.5		504+66.59	737.1	
505+95.27	736.09		504+79.88	737.14	
			505+01.78	737.2	
			505+59.75	737.67	

U/S STATION	CHANNEL ELEVATION	D/S STATION	D/S CHANNEL ELEVATION
502+15.62	726.08	502+25.25	725.32
502+25.16	726.29	502+22.99	723.88
502+26.17	723.97	502+26.16	721.17
502+28.50	723.45	502+29.7	721.24
502+32.04	719.62	502+26.16	721.17
502+35.15	719.06	502+34.12	719.82
502+41.96	717.98	502+48.72	718.92
502+44.20	718.37	502+53.44	718.27
502+45.21	718.36	502+58.79	719.84
502+46.38	718.16	502+68.21	720.44
502+62.38	718.48	502+68.86	722.54
502+63.37	718.88	502+84.66	724.32
502+66.39	719.49	502+90.17	724.95
502+67.83	726.09		
502+79.67	726.05		

PLAN: NOTE BOOK NO. / SURVEYED / PLOTTED / ALIGNMENT CHECKED / R.T. OF WAY CHECKED / CADD FILE NAME / BY / DATE

PROFILE: NOTE BOOK NO. / SURVEYED / PLOTTED / GRADES CHECKED / B.M. NOTED / STRUCTURE NOTATIONS CHECKED / BY / DATE

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	PLOT SCALE = 100.0000 ' / in.	CHECKED -	REVISED -	
	PLOT DATE = 7/28/2014	DATE -	REVISED -	

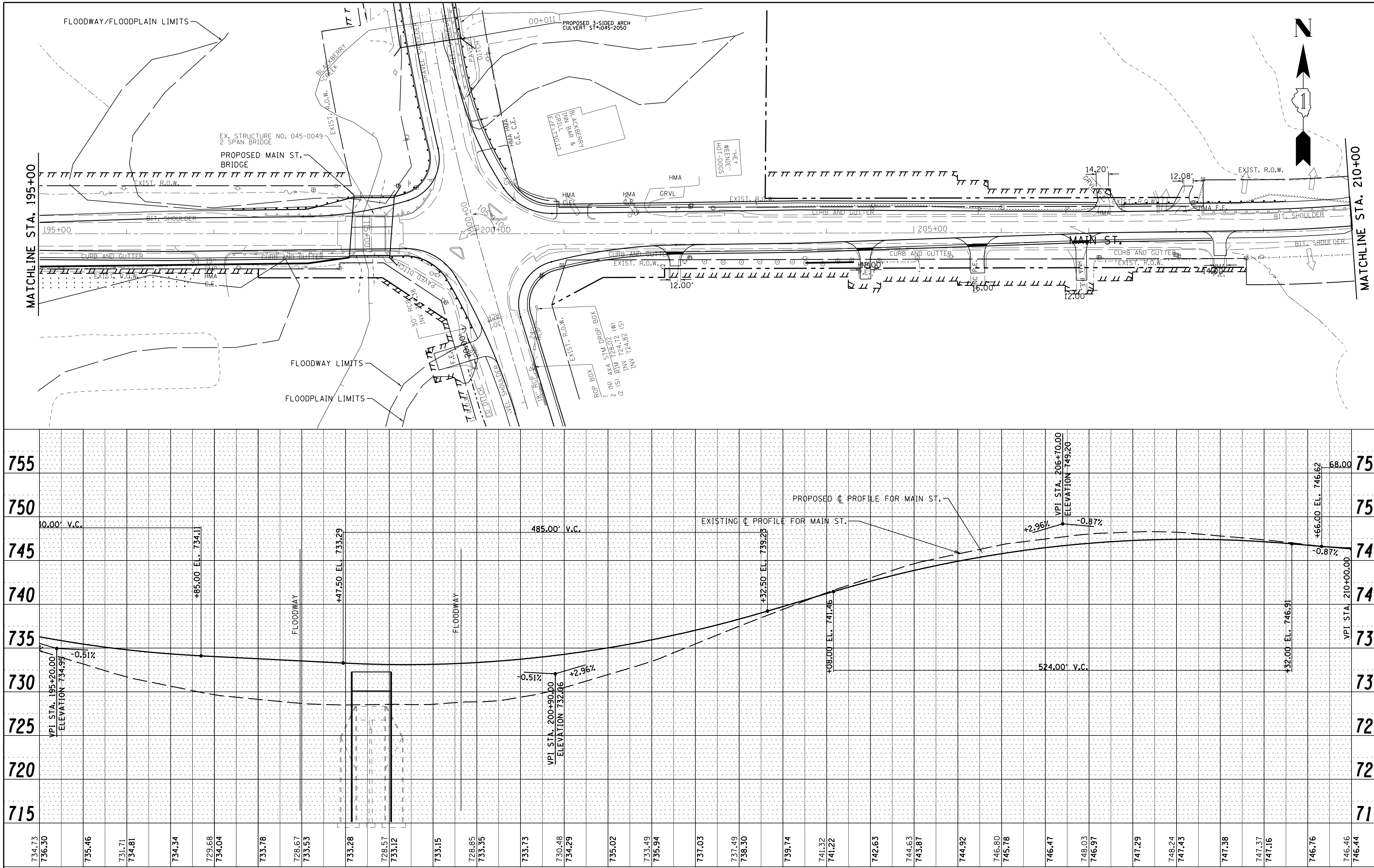
IL ROUTE 47 OVER BLACKBERRY CREEK
PROPOSED BRIDGE PLAN AND PROFILE

SCALE: 1"=50' | SHEET NO. OF SHEETS | STA. 495+00 TO STA. 508+00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326		KANE		

CONTRACT NO.

ILLINOIS FED. AID PROJECT



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	PLOT SCALE = 100.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 5/6/2014	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

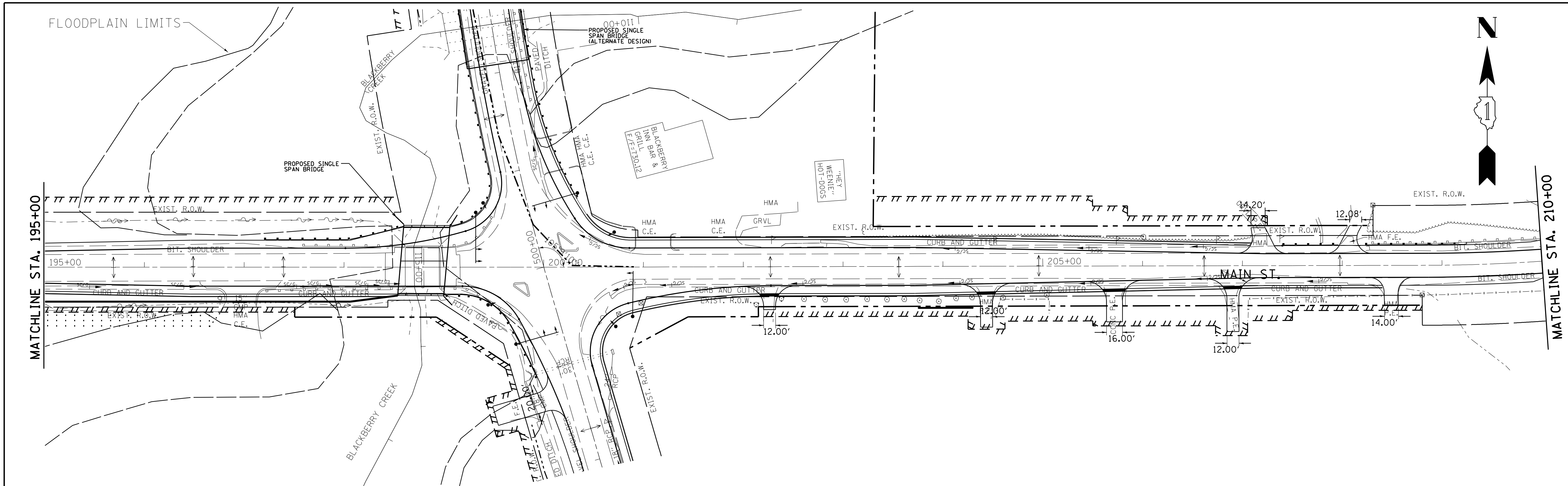
MAIN ST OVER BLACKBERRY CREEK
PROPOSED MAIN ST CENTERLINE PROFILE (IL RTE 47 ARCH PROFILE)

SCALE: SHEET NO. OF SHEETS STA. 195+00 TO STA. 210+00

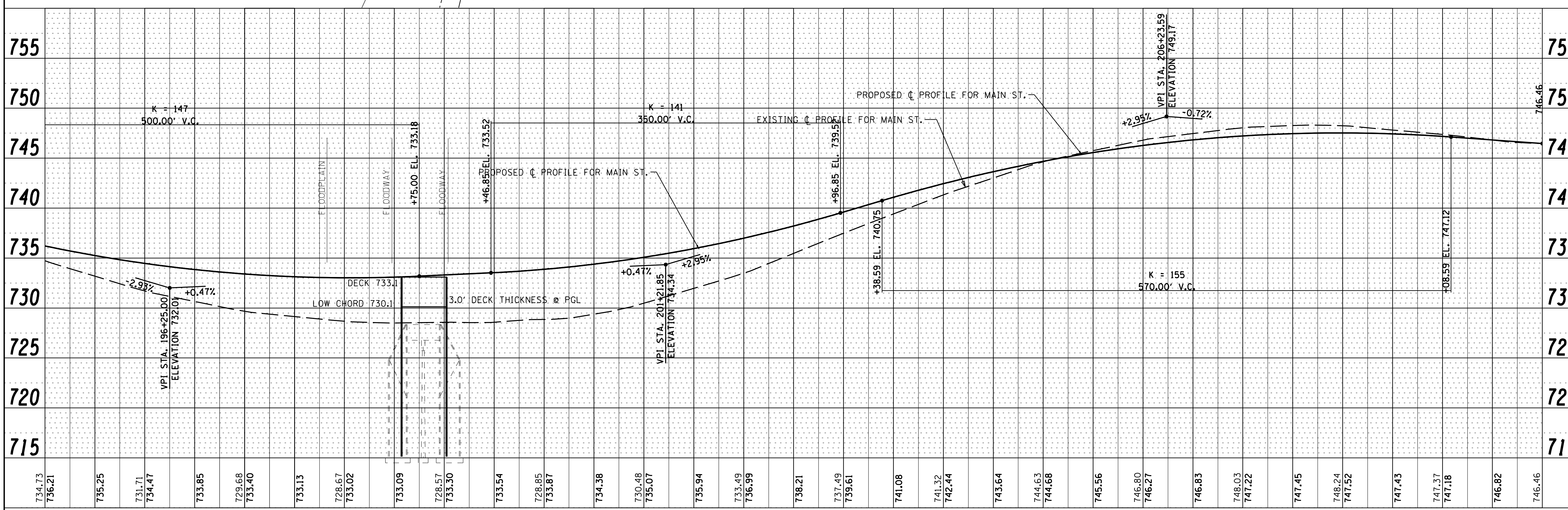
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326		KANE		

CONTRACT NO.

ILLINOIS FED. AID PROJECT



FLOODPLAIN LIMITS
PROPOSED SINGLE SPAN BRIDGE (ALTERNATE DESIGN)
PROPOSED SINGLE SPAN BRIDGE
BLACKBERRY CREEK
EXIST. R.O.W.
PAVED DITCH
BLACKBERRY INN BAR & GRILL F/F=730.12
"HEY WEENIE" HOT-DOGS
HMA C.E.
HMA
GRVL
CURB AND GUTTER
BIT. SHOULDER
MAIN ST.
195+00
200+00
205+00
110+00
500+00
12.00'
14.20'
12.08'
16.00'
14.00'
MATCHLINE STA. 195+00
MATCHLINE STA. 210+00
N



755
750
745
740
735
730
725
720
715
K = 147
500.00' V.C.
K = 141
350.00' V.C.
K = 155
570.00' V.C.
PROPOSED ℄ PROFILE FOR MAIN ST.
EXISTING ℄ PROFILE FOR MAIN ST.
FLOODPLAIN
FLOODWAY
+75.00 EL. 733.18
+46.85 EL. 733.52
+96.85 EL. 739.51
+38.59 EL. 740.75
+08.59 EL. 747.12
VPI STA. 196+25.00 ELEVATION 732.01
VPI STA. 201+21.85 ELEVATION 734.34
VPI STA. 206+23.59 ELEVATION 749.17
-2.93%
+0.47%
+2.95%
-0.72%
DECK 733.1
LOW CHORD 730.1
3.0' DECK THICKNESS @ PGL
746.46
734.73 736.21
735.25
731.71 734.47
733.85
729.68 733.40
733.13
728.67 733.02
733.09
728.57 733.30
733.54
728.85 733.87
734.38
730.48 735.07
735.94
733.49 736.99
738.21
737.49 739.61
741.08
741.32 742.44
743.64
744.63 744.68
745.56
746.80 746.27
746.83
748.03 747.22
747.45
748.24 747.52
747.43
747.37 747.18
746.82
746.46
195+00
196+00
197+00
198+00
199+00
200+00
201+00
202+00
203+00
204+00
205+00
206+00
207+00
208+00
209+00
210

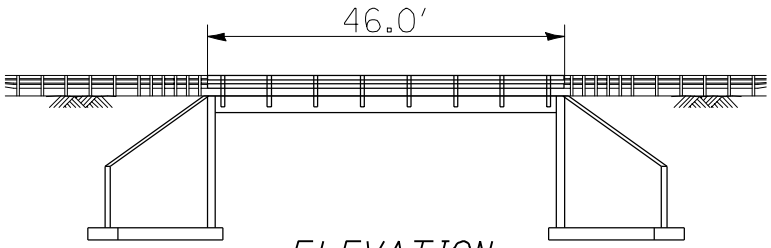
FILE NAME = P:\projects\09020\200\C\IL47\CADD\CADDsheets\D144909-sht-drain-struc.plnprf-bridge.dgn	USER NAME = stephen.schuh	DESIGNED -	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	MAIN ST OVER BLACKBERRRY CREEK
	PLOT SCALE = 100.0000 ' / in.	DRAWN -	REVISED -		MAIN ST CENTERLINE PROFILE (IL RTE 47 BRIDGE PROFILE)
	PLOT DATE = 5/6/2014	CHECKED -	REVISED -		SCALE: SHEET NO. OF SHEETS STA. 195+00 TO STA. 210+00
		DATE -	REVISED -		

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
326		KANE		
		CONTRACT NO.		
	ILLINOIS FED. AID PROJECT			

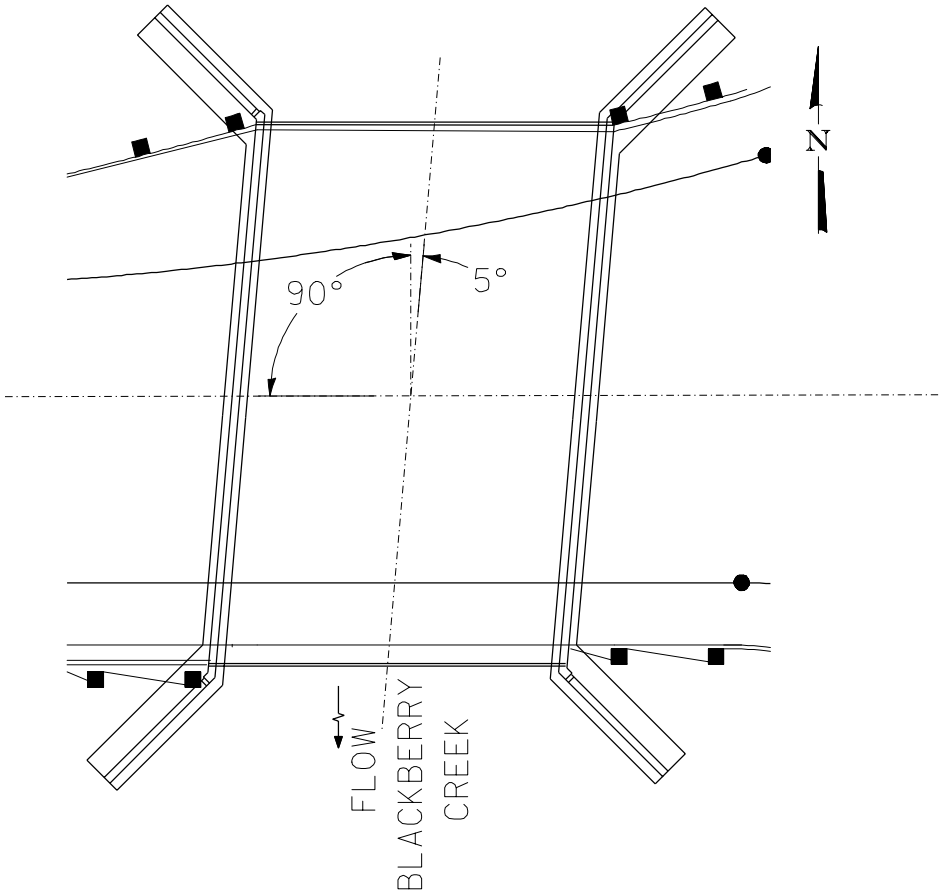
PLAN — NOTE BOOK NO. — SURVEYED / PLOTTED / ALIGNMENT CHECKED / R.O.W. CHECKED / CADD FILE NAME — BY — DATE

PROFILE — NOTE BOOK NO. — SURVEYED / PLOTTED / GRADES CHECKED / B.M. NOTED / STRUCTURE NOTATIONS CHKD — BY — DATE

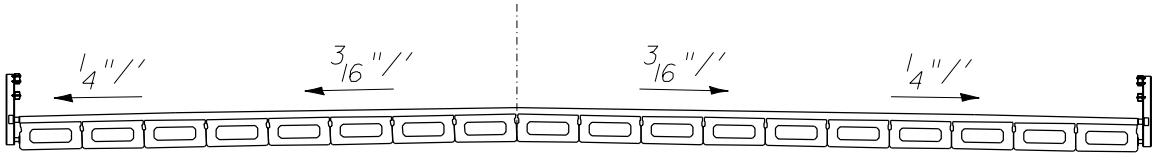
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION



ELEVATION



PROPOSED STRUCTURE PLAN



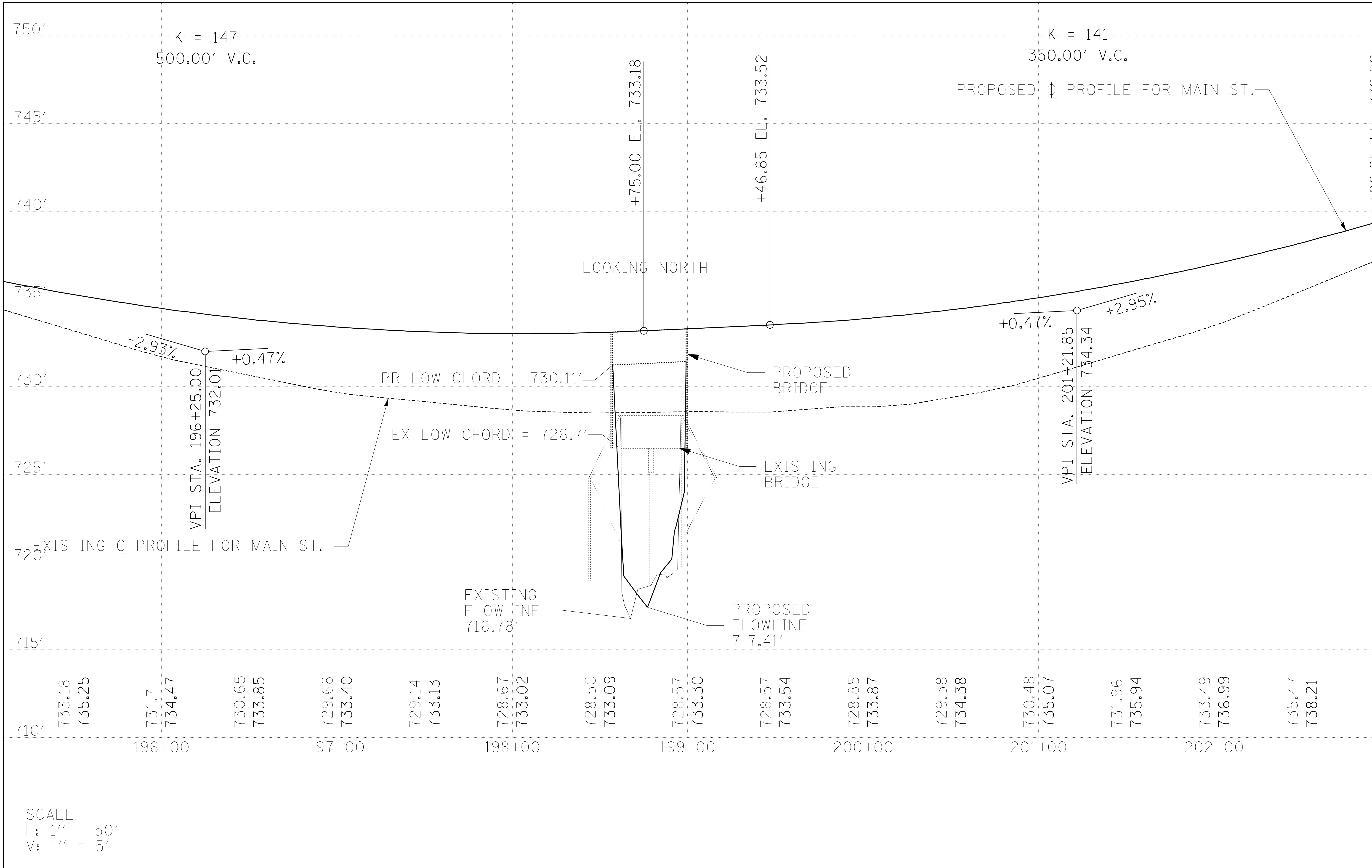
PROPOSED CROSS SECTION

NOTES:

1) THE NUMBER AND LOCATION OF PIERS, THE PROFILE GRADE, AND BRIDGE LENGTH ARE SUBJECT TO REFINEMENT IN THE TS&L PHASE.

2) SUPERSTRUCTURE TYPE, BEAM SPACING AND RAIL TYPE TO BE DETERMINED DURING TS$L PHASE.

TENG & ASSOCIATES, INC.
ENGINEERS/ARCHITECTS/PLANNERS
CHICAGO, ILLINOIS

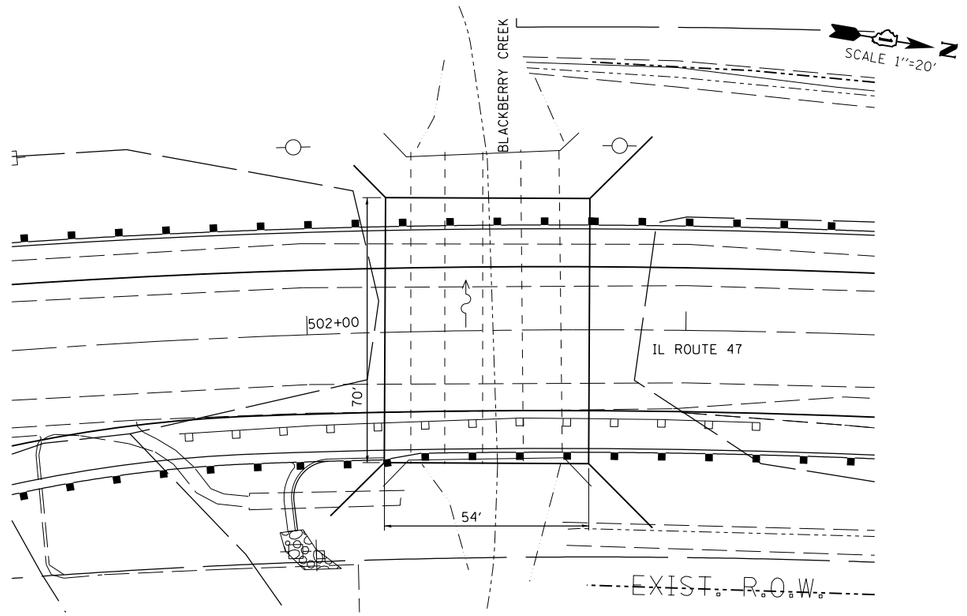


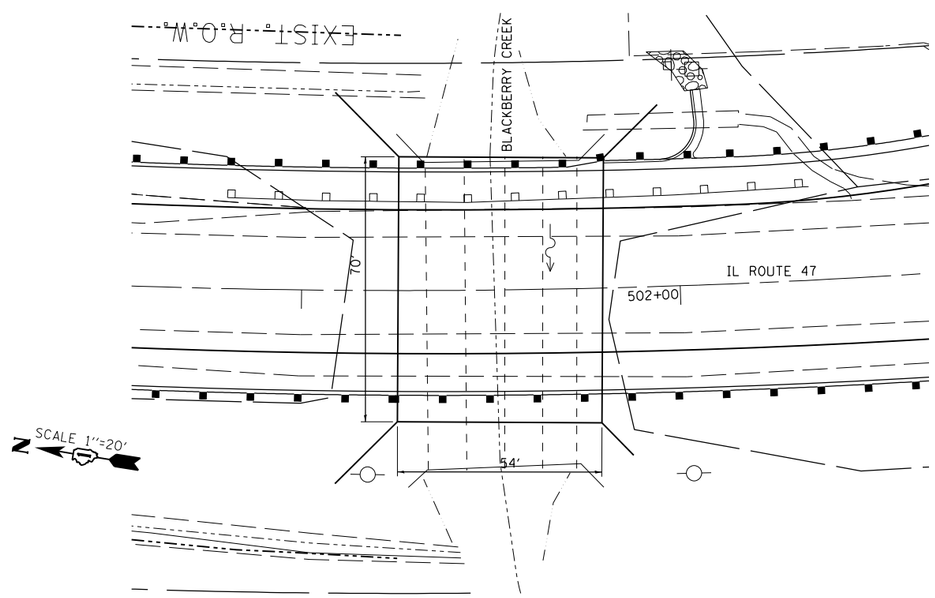
DRAWN - HDU CHECKED - TKL TENG — TENG & ASSOCIATES, INC. ENGINEERS/ARCHITECTS/PLANNERS CHICAGO, ILLINOIS	SCALE - SEE ABOVE DATE - 12/05/2012	**KANE COUNTY DIVISION OF TRANSPORTATION** MAIN STREET (CH 10) OVER BLACKBERRY CREEK SECTION: 08-00385-00-BR, PROJECT: BROS-0089(143), JOB: P-91-269-09	EXISTING UPSTREAM CROSS-SECTION SUPERIMPOSED ON PROPOSED UPSTREAM CROSS-SECTION	ATTACHMENT 6

PLAN

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

BY





PROFILE

	DATE
SURVEYED	
PLOTTED	
DESIGN CHECKED	
BM. NOTED	
STRUCTURE NOTATNS CHKD	
NOTE BOOK	
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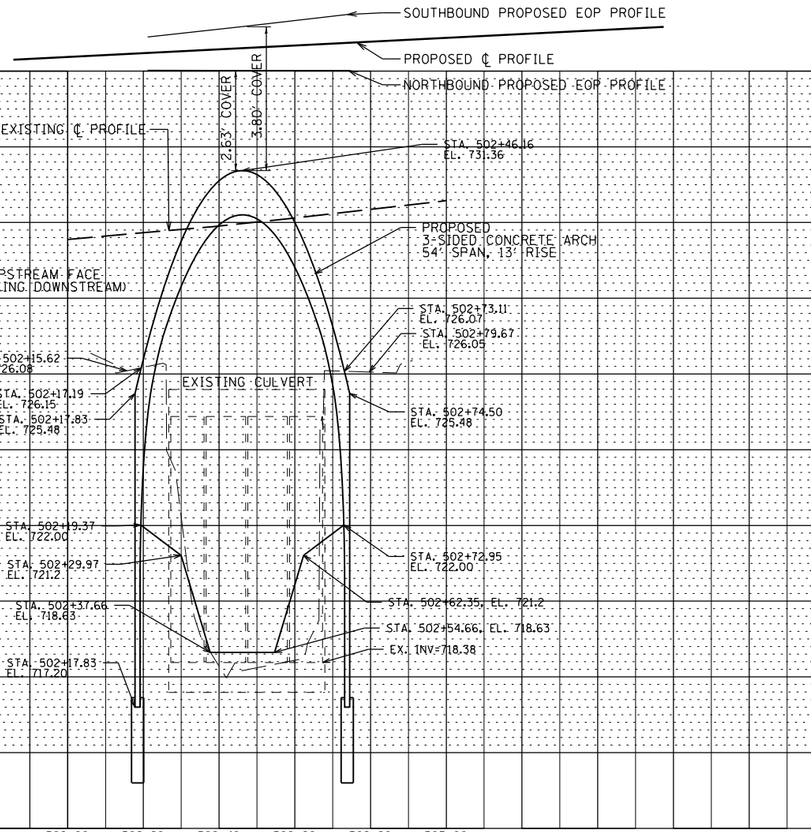
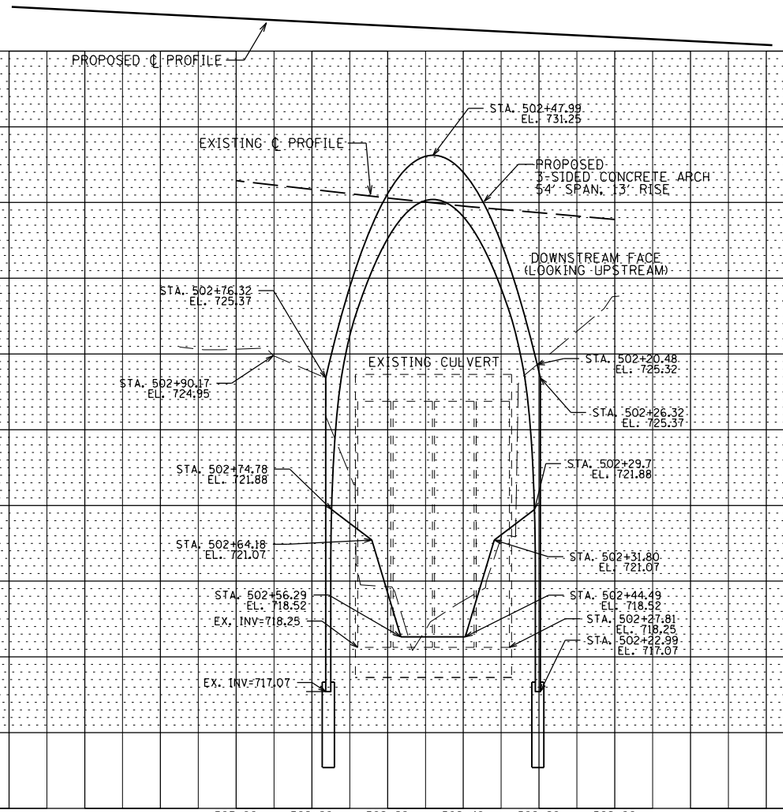
BY





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	PLOT SCALE = 40.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 8/29/2014	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

IL ROUTE 47 PROPOSED ARCH CULVERT OVER BLACKBERRY CREEK
EAST AND WEST FACE /UPSTREAM – DOWNSTREAM

SCALE: | SHEET NO. 1 OF 1 SHEETS | STA. 500+00 TO STA. 505+00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		KANE	1	1
		CONTRACT NO.		
	ILLINOIS FED. AID PROJECT			

PLAN

SURVEYED	BY
PLOTTED	
ALIGNMENT CHECKED	
RT. OF WAY CHECKED	
CADD FILE NAME	
NOTE BOOK	
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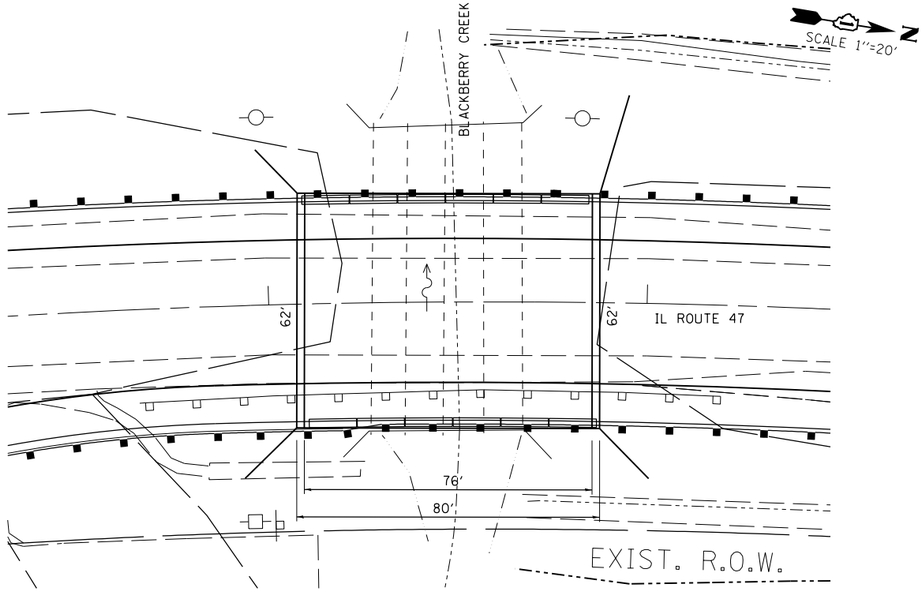

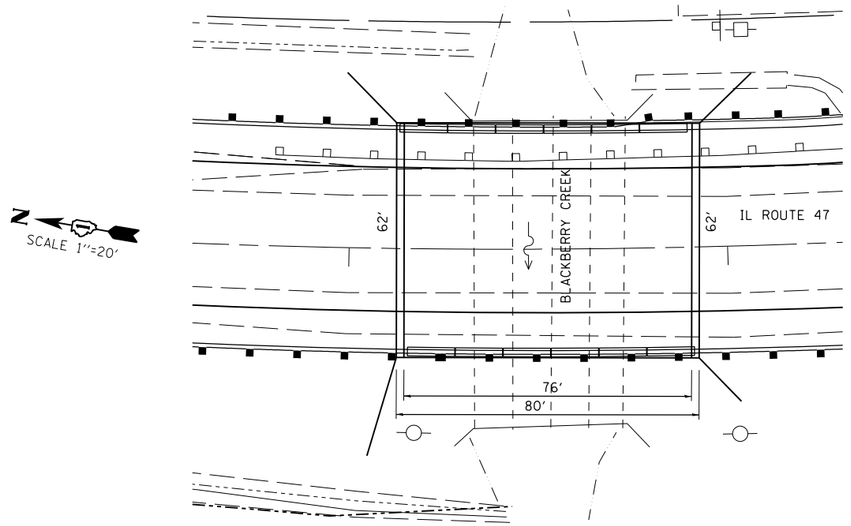

PROFILE

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BM. NOTED	
STRUCTURE NOTATNS CHKD	
NOTE BOOK	
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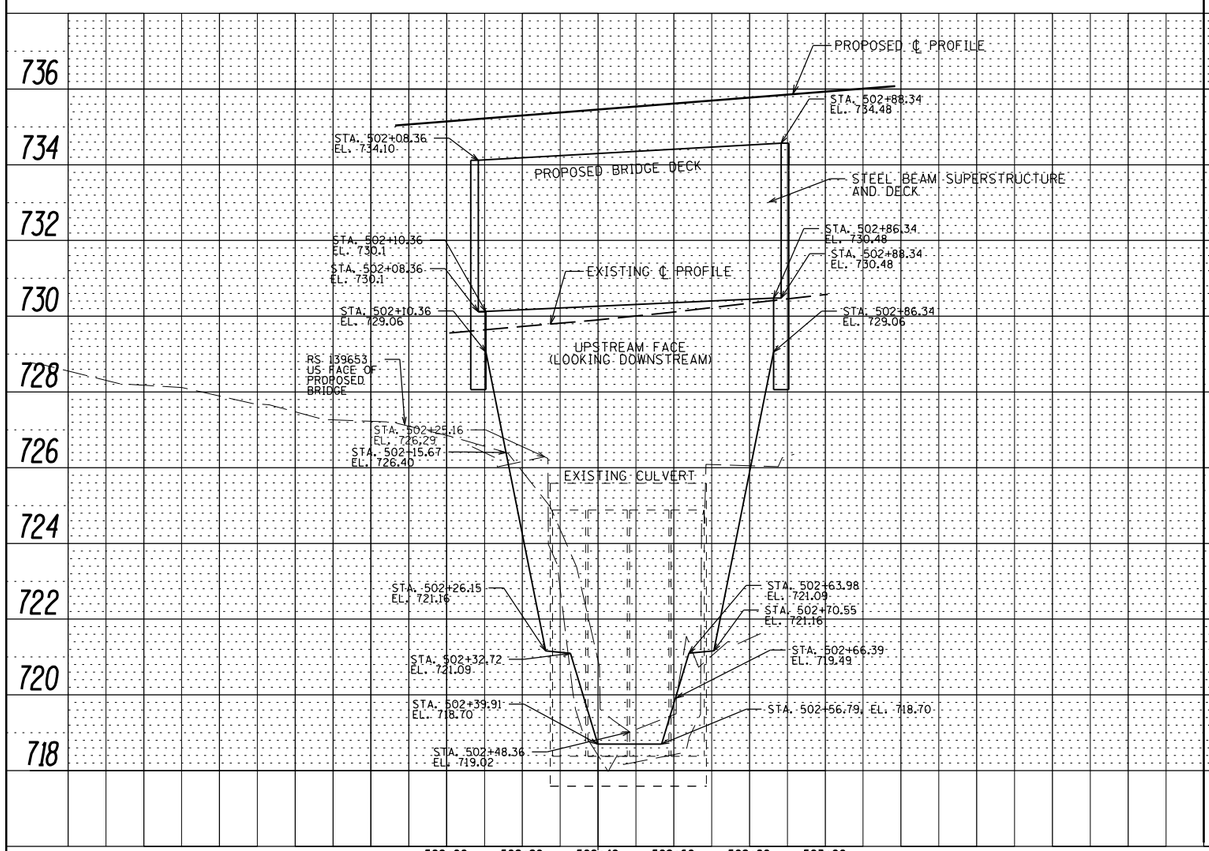

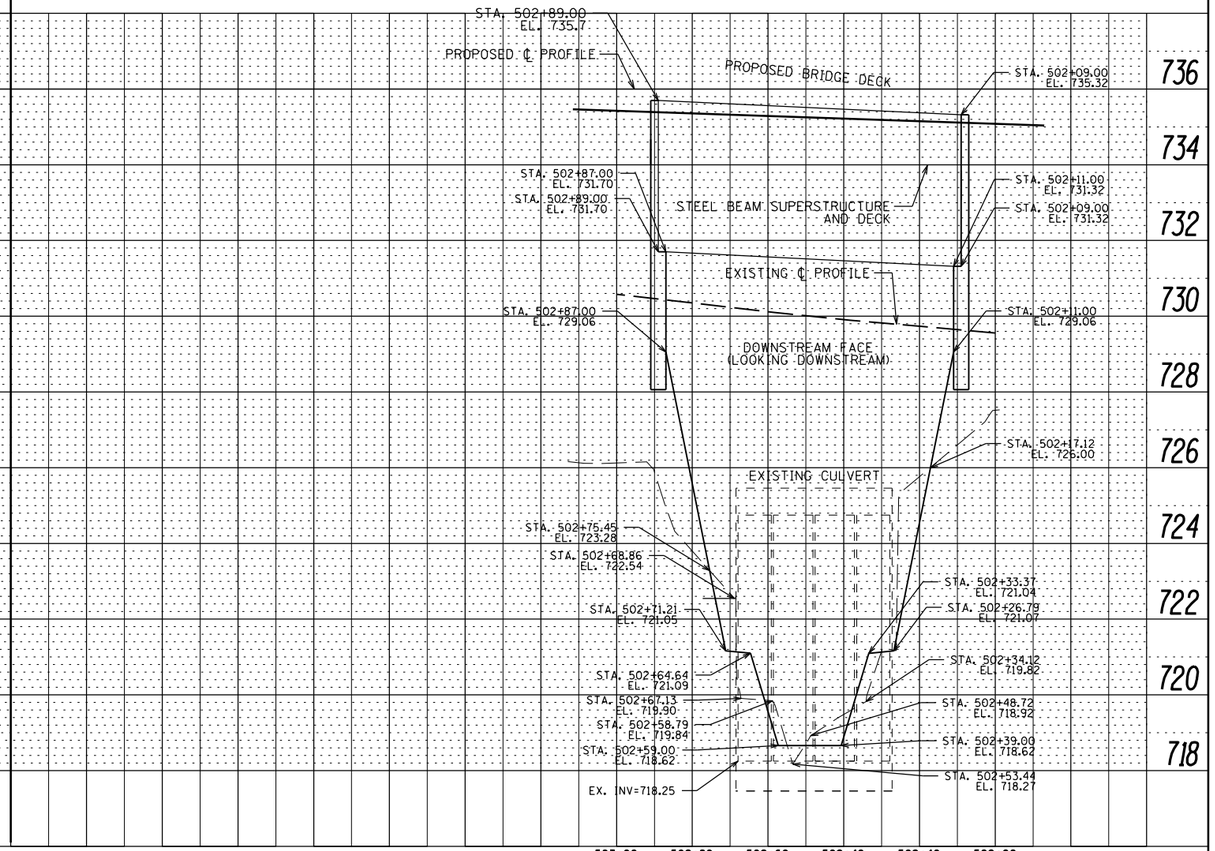

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	PLOT DATE = 5/15/2014	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

IL ROUTE 47 PROPOSED BRIDGE OVER BLACKBERRY CREEK
EAST AND WEST FACE /UPSTREAM – DOWNSTREAM

SCALE: | SHEET NO. 1 OF 1 SHEETS | STA. 500+00 TO STA. 505+00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		KANE	1	1
		CONTRACT NO.		
	ILLINOIS FED. AID PROJECT			

SEE VOLUME 2

Section 16 Scour Analysis Summary

Scour analysis indicates that for the 3-sided concrete arch culvert there will be significant abutment, contraction, and pressure scour for worst case scenarios, the 100 and 500-year events. The scour analysis for the bridge option at this time only includes calculations for abutment and contraction scour at this time. Scour analysis is not performed on the existing conditions as the structure exhibits no signs of scour in the field investigation. The below table records results from HEC-RAS output for abutment scour and manual HEC-18 Section 8.6.3 calculations contraction scour. Manual calculations for contraction scour were not done for the Bridge alternative.

Proposed 3-Sided Arch Conditions	Proposed Bridge Conditions
• 10-year storm event	• 10-year storm event
○ Contraction scour depth = 0.38 ft	○ Contraction scour depth = 0.00 ft
○ Left abutment scour depth = 3.71 ft	○ Left abutment scour depth = 0.10 ft
○ Right abutment scour depth = 7.94 ft	○ Right abutment scour depth = 6.36 ft
○ Total Scour = 8.32 ft (6.7*)	○ Total Scour = 6.36 ft
○ Potential scour elevation = 710.81 ft (712.23)	○ Potential scour elevation = 712.57 ft
• 50-year storm event	• 50-year storm event
○ Contraction scour depth = 0.96 ft	○ Contraction scour depth = 0.00 ft
○ Left abutment scour depth = 6.70 ft	○ Left abutment scour depth = 4.86 ft
○ Right abutment scour depth = 9.45 ft	○ Right abutment scour depth = 9.60 ft
○ Total Scour = 10.44 ft (11.3 ft*)	○ Total Scour = 9.60 ft
○ Potential scour elevation = 708.49 ft (707.63)	○ Potential scour elevation = 709.33 ft
• 100-year storm event	• 100-year storm event
○ Contraction scour depth = 1.24 ft	○ Contraction scour depth = 0.00 ft
○ Left abutment scour depth = 5.81 ft	○ Left abutment scour depth = 5.50 ft
○ Right abutment scour depth = 12.99 ft	○ Right abutment scour depth = 10.53 ft
○ Total Scour = 14.23 ft (15.0 ft*)	○ Total Scour = 10.53 ft
○ Potential scour elevation = 704.70 ft (703.93)	○ Potential scour elevation = 708.40 ft
• 500-year storm event	• 500-year storm event
○ Contraction scour depth = 0.00 ft	○ Contraction scour depth = 0.00 ft
○ Left Abutment scour depth = 8.14 ft	○ Left abutment scour depth = 8.51
○ Right Abutment scour depth = 15.54 ft	○ Right Abutment scour depth = 12.50 ft
○ Total Scour = 15.54 ft (20.5 ft*)	○ Total Scour = 12.50 ft
○ Potential scour elevation = 703.39 ft (698.43)	○ Potential scour elevation = 706.43 ft

(* - Total scour value from HEC-18 8.6.3 analysis, "Left" refers to south abutment, "Right" refers to north abutment.)

The potential scour is calculated from the channel lowpoint (718.93) located downstream of the structure (see Section 9 – Streambed Profile for the location of the lowpoint). Analysis indicates that the footing elevation of the 3-sided arch culvert will need to be set on a pedestal wall footing at an elevation lower than 703.93 feet, if using the more conservative value obtained with HEC-18 calculation for contraction scour. The abutment and contraction scour results should be investigated further in Phase 2 after soil boring information is available.

SCOUR EVALUATION

Re: Unincorporated Kane County (Elburn)
Section 107B-I-1
IL-47 over Blackberry Creek
(Main before D) Blackberry Creek

The proposed structure is an open spill-through abutment with a 3- sided arch culvert design that will replace the existing 4 barrel box culvert. The 3-sided arch culvert will have a 54 foot span, 13 foot rise and will be 70 feet long. The channel velocity through the proposed structure is calculated to be 2.5 fps for the 100-year event. Proposed countermeasures will be needed to protect the channel over banks at the expected velocity. HEC-RAS does not have a scour analysis for a culvert, therefore the (x,y) coordinates of the culvert shape were supplied by 3-sided arch culvert contractor and inserted to match up with the US and DS HEC-RAS stationing. The station and elevations of the culvert were used to define an US/DS low chord for a bridge deck that could be analyzed with HEC-RAS. HEC-18 analysis was used to calculate the contraction scour. The HEC-RAS plan name used for this scour analysis is Group#2-Proposed (GEC).p11 in the IL47 and Main Design Model.

Hydraulic Design Data 100-year

Contraction Scour

	Left	Channel	Right
Average Depth (ft):	2.36	7.65	
Approach Velocity (ft/s):		0.63	2.41
Br Average Depth (ft):		13.27	
BR Opening Flow (cfs):		1376	
BR Top WD (ft):		30.69	
Grain Size D50 (mm):	0.01	0.01	0.01
Approach Flow (cfs):	53.36	1322.64	
Approach Top WD (ft):	35.93	71.67	
K1 Coefficient:	0.69	0.69	0.69

Results

Scour Depth Ys (ft):	0.94
Critical Velocity (ft/s):	0.50
Equation:	Live

HEC-18 Results for Scour : 5.8 ft

Note: Grain Size of 0.005 mm was initally assumed based on the NRCS Soil Survey indicating that the soil type was Lena Muck. Lena Muck properties have no measurements for percentage of particles passing the 4 in sieve or the #200 sieve, indicating that the soil particles are silt. An approximate diameter of silt(organic) particles is assumed to be 0.005 mm. However, a diameter size of 0.01 mm was used as a diameter of 0.005mm exaggerated scour amounts.


88° 28' 8"
88° 28' 2"
41° 50' 32"
41° 50' 33"
41° 50' 27"
378040
378060
378080
378100
378120
378140
378160
4633320
4633300
4633280
4633260
4633240
4633220
4633200
4633180
4633160
210A
20
527C2
Blackberry Creek
Main Street Rd
Map Scale: 1:847 if printed on A size (8.5" x 11") sheet.
N
Meters
0 5 10 20 30
Feet
0 30 60 120 180

Map Unit Legend

Kane County, Illinois (IL089)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
210A	Lena muck, 0 to 2 percent slopes	2.5	71.2%
527C2	Kidami loam, 4 to 6 percent slopes, eroded	1.0	28.8%
Totals for Area of Interest		**3.5**	**100.0%**

Report—Engineering Properties

Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash.

Engineering Properties– Kane County, Illinois												
Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
210A—Lena muck, 0 to 2 percent slopes												
Lena	0-10	*Muck	PT	A-8	0	0	—	—	—	—	0-0	NP
	10-60	*Muck	PT	A-8	0	0	—	—	—	—	0-0	NP
219A—Millbrook silt loam, 0 to 2 percent slopes												
Millbrook	0-8	*Silt loam	ML, CL	A-7-6, A-6	0	0	100	100	95-100	85-100	31-45	11-18
	8-12	*Silt loam	CL	A-4, A-6	0	0	100	100	95-100	85-100	26-39	9-19
	12-26	*Silty clay loam, Silt loam	CL	A-6, A-7-6	0	0	100	100	95-100	85-100	35-47	17-25
	26-41	*Loam, Clay loam, sandy loam, sandy clay loam	CL, SC	A-6, A-7-6	0	0-3	95-100	85-100	70-95	40-85	27-42	12-22
	41-65	*Stratified loamy sand to clay loam	CL-ML, CL, SC, SC-SM	A-2-4, A-4, A-6, A-2-6	0-1	0-5	90-100	80-100	60-90	15-80	20-40	6-21

Engineering Properties– Kane County, Illinois												
Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
527C2—Kidami loam, 4 to 6 percent slopes, eroded												
Kidami	0-9	*Loam	CL-ML, ML, CL	A-4, A-6	0	0	95-100	90-100	80-95	60-80	22-38	6-16
	9-30	*Clay loam, Loam	CL	A-6, A-7-6	0	0-2	95-100	85-98	75-95	55-75	31-46	13-24
	30-40	*Loam	CL	A-6	0	0-2	90-100	80-98	70-90	55-70	26-38	11-19
	40-60	*Loam, Sandy loam	SC, CL	A-4, A-6	0	0-3	90-100	80-95	65-90	40-65	24-32	9-13

Data Source Information

Soil Survey Area: Kane County, Illinois
Survey Area Data: Version 5, Feb 12, 2010

ABUTMENT/CONTRACTION SCOUR CALCULATION

Project Route: IL 47 and Main St. By: SJS Date: Oct-14

Project Limits: Intersection Improvements Checked: DH Date: Oct-14

HEC-18: Section 8.6.3, based on NCHRB Project 24-20 - Clear Water Scour

Length of Embankment, L (ft) = 221 **(Right)** Floodplain Width, B_f (ft) = 247 L/B_f = 0.89

Length of Embankment, L (ft) = 90 **(Left)** Floodplain Width, B_f (ft) = 117 L/B_f = 0.77

L/Bf > 0.75, then use Eqn. 8.5

River Station	Profile	q_{2c}/q_1	α_A	y_c	y_{max}	y_0	y_s
139653	10-yr	2.144	1.17	10.32	12.078948	5.37	6.7089482
139653	50-yr	2.705	1.12	16.36	18.318427	6.97	11.348427
139653	100-yr	3.169	1.1	20.59	22.645475	7.66	14.985475
139653	500-yr	3.516	1.1	27.03	29.734675	9.2	20.534675

Total Scour, y_s		
10-Year	**6.7**	
50-Year	**11.3**	
100-Year	**15.0**	
500-Year	**20.5**	

					From Bridge output (q_{2c})				From RS139653 output (q_1)		
River Station	Profile	q_{2c}	q_1	y_c	Q U/S	E_w	A_{flow}	$H_{d,channel}$	$Q_{(CHANNEL)}$	T_w (Ch)	y_1
139653	10-yr	14.50	6.77	10.32	634	43.71	314.74	7.2	631.95	93.41	5.37
139653	50-yr	31.59	11.68	16.36	1120	35.46	376.89	10.63	1090.82	93.41	6.97
139653	100-yr	44.86	14.16	20.59	1376.00	30.67	398.73	13	1322.38	93.41	7.66
139653	500-yr	73.87	21.01	27.03	2096	28.37	425.61	15	1962.31	93.41	9.2

$$Y_{max} = \alpha_A * y_c \quad (8.3)$$

$$y_s = Y_{max} - y_0 \quad (8.4)$$

$$y_c = y_1 \left(\frac{q_{2c}}{q_1}\right)^{6/7} \quad (8.5)$$

Eqn. from HEC-18, Section 8.6.3

α_A From Figure 8.10 (HEC-18) found on graph using ratio q_{2c}/q_1

Y_{max} Maximum flow depth resulting from abutment scour

Y_c Flow depth including clear-water scour

y_s Abutment scour depth

y_0 Flow depth prior to scour

q_1 Upstream unit discharge, ft^2/s; = $Q_{(CHANNEL)} / T_w$

q_{2c} Unit discharge at U/S side of bridge output, ft^2/s, = (Q U/S) / E_w ; $E_w = A_{flow}/H_d$

y_1 Upstream flow depth

GRAVEL SHOULDER
505+00
GRAVEL SHOULDER
GRAVEL SHOULDER
9628
L=221.24'
PAVED DITCH
PAVED DITCH
139653
L=90.08'
B(f)=117.01'
B(f)=247.29'
HMA HMA
C.E. C.E.
110+00
139757
SCALE 1" = 50'
N

Plan: G#2-Proposed Blackberry Creek Main Before D RS: 139653 Profile: Q10

E.G. Elev (ft)	726.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.090	0.050	
W.S. Elev (ft)	726.50	Reach Len. (ft)	42.00	25.00	47.00
Crit W.S. (ft)	722.14	Flow Area (sq ft)	9.21	385.11	
E.G. Slope (ft/ft)	0.000344	Area (sq ft)	9.21	464.73	210.19
Q Total (cfs)	634.00	Flow (cfs)	2.05	631.95	
Top Width (ft)	277.42	Top Width (ft)	14.76	93.41	169.25
Vel Total (ft/s)	1.61	Avg. Vel. (ft/s)	0.22	1.64	
Max Chl Dpth (ft)	8.44	Hydr. Depth (ft)	0.62	5.37	
Conv. Total (cfs)	34202.5	Conv. (cfs)	110.7	34091.8	
Length Wtd. (ft)	25.03	Wetted Per. (ft)	14.85	74.91	
Min Ch El (ft)	718.06	Shear (lb/sq ft)	0.01	0.11	
Alpha	1.04	Stream Power (lb/ft s)	458.34	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	2.73	18.20	8.53
C & E Loss (ft)	0.00	Cum SA (acres)	3.18	6.79	8.32

Plan: G#2-Proposed Blackberry Creek Main Before D RS: 139653 Profile: Q50

E.G. Elev (ft)	728.17	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.090	0.050	
W.S. Elev (ft)	728.10	Reach Len. (ft)	42.00	25.00	47.00
Crit W.S. (ft)	722.88	Flow Area (sq ft)	60.43	499.85	
E.G. Slope (ft/ft)	0.000429	Area (sq ft)	95.99	614.28	513.21
Q Total (cfs)	1120.00	Flow (cfs)	29.18	1090.82	
Top Width (ft)	396.99	Top Width (ft)	96.26	93.41	207.32
Vel Total (ft/s)	2.00	Avg. Vel. (ft/s)	0.48	2.18	
Max Chl Dpth (ft)	10.04	Hydr. Depth (ft)	1.68	6.97	
Conv. Total (cfs)	54059.7	Conv. (cfs)	1408.6	52651.1	
Length Wtd. (ft)	25.22	Wetted Per. (ft)	36.03	74.91	
Min Ch El (ft)	718.06	Shear (lb/sq ft)	0.04	0.18	
Alpha	1.16	Stream Power (lb/ft s)	458.34	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	6.68	24.33	21.09
C & E Loss (ft)	0.00	Cum SA (acres)	5.11	7.12	12.76

Plan: G#2-Proposed Blackberry Creek Main Before D RS: 139653 Profile: Q100

E.G. Elev (ft)	728.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.090	0.050	
W.S. Elev (ft)	728.79	Reach Len. (ft)	42.00	25.00	47.00
Crit W.S. (ft)	723.21	Flow Area (sq ft)	85.23	549.33	
E.G. Slope (ft/ft)	0.000461	Area (sq ft)	177.39	678.76	661.13
Q Total (cfs)	1376.00	Flow (cfs)	53.62	1322.38	
Top Width (ft)	454.31	Top Width (ft)	139.65	93.41	221.25
Vel Total (ft/s)	2.17	Avg. Vel. (ft/s)	0.63	2.41	
Max Chl Dpth (ft)	10.73	Hydr. Depth (ft)	2.37	7.66	
Conv. Total (cfs)	64119.0	Conv. (cfs)	2498.6	61620.5	
Length Wtd. (ft)	25.33	Wetted Per. (ft)	36.03	74.91	
Min Ch El (ft)	718.06	Shear (lb/sq ft)	0.07	0.21	
Alpha	1.19	Stream Power (lb/ft s)	458.34	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	8.89	26.93	27.45
C & E Loss (ft)	0.00	Cum SA (acres)	5.83	7.19	13.96

Plan: G#2-Proposed Blackberry Creek Main Before D RS: 139653 Profile: Q500

E.G. Elev (ft)	730.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.090	0.050	
W.S. Elev (ft)	730.32	Reach Len. (ft)	42.00	25.00	47.00
Crit W.S. (ft)	724.02	Flow Area (sq ft)	140.24	659.07	
E.G. Slope (ft/ft)	0.000553	Area (sq ft)	515.38	821.79	1030.95
Q Total (cfs)	2097.00	Flow (cfs)	134.70	1962.31	
Top Width (ft)	628.51	Top Width (ft)	275.54	93.41	259.55
Vel Total (ft/s)	2.62	Avg. Vel. (ft/s)	0.96	2.98	
Max Chl Dpth (ft)	12.26	Hydr. Depth (ft)	3.90	9.20	
Conv. Total (cfs)	89204.7	Conv. (cfs)	5729.8	83474.9	
Length Wtd. (ft)	25.55	Wetted Per. (ft)	36.03	74.91	
Min Ch El (ft)	718.06	Shear (lb/sq ft)	0.13	0.30	
Alpha	1.21	Stream Power (lb/ft s)	458.34	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	14.88	32.85	41.87
C & E Loss (ft)	0.01	Cum SA (acres)	7.36	7.19	15.90

Plan: G#2-Proposed Blackberry Creek Main Before D RS: 139602 BR U Profile: Q10

E.G. Elev (ft)	726.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.		0.055	
W.S. Elev (ft)	726.46	Reach Len. (ft)	70.00	70.00	70.00
Crit W.S. (ft)	721.69	Flow Area (sq ft)		314.74	
E.G. Slope (ft/ft)	0.000685	Area (sq ft)		314.74	
Q Total (cfs)	634.00	Flow (cfs)		634.00	
Top Width (ft)	43.68	Top Width (ft)		43.68	
Vel Total (ft/s)	2.01	Avg. Vel. (ft/s)		2.01	
Max Chl Dpth (ft)	7.83	Hydr. Depth (ft)		7.20	
Conv. Total (cfs)	24225.7	Conv. (cfs)		24225.7	
Length Wtd. (ft)	70.00	Wetted Per. (ft)		65.45	
Min Ch El (ft)	718.63	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)	510.23	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	2.73	17.96	8.42
C & E Loss (ft)		Cum SA (acres)	3.17	6.74	8.22

Plan: G#2-Proposed Blackberry Creek Main Before D RS: 139602 BR U Profile: Q50

E.G. Elev (ft)	728.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.		0.055	
W.S. Elev (ft)	728.01	Reach Len. (ft)	70.00	70.00	70.00
Crit W.S. (ft)	722.54	Flow Area (sq ft)		376.86	
E.G. Slope (ft/ft)	0.001388	Area (sq ft)		376.86	
Q Total (cfs)	1120.00	Flow (cfs)		1120.00	
Top Width (ft)	35.46	Top Width (ft)		35.46	
Vel Total (ft/s)	2.97	Avg. Vel. (ft/s)		2.97	
Max Chl Dpth (ft)	9.38	Hydr. Depth (ft)		10.63	
Conv. Total (cfs)	30057.9	Conv. (cfs)		30057.9	
Length Wtd. (ft)	70.00	Wetted Per. (ft)		74.30	
Min Ch El (ft)	718.63	Shear (lb/sq ft)		0.44	
Alpha	1.00	Stream Power (lb/ft s)	510.23	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	6.60	24.00	20.77
C & E Loss (ft)		Cum SA (acres)	5.03	7.07	12.61

Plan: G#2-Proposed Blackberry Creek Main Before D RS: 139602 BR U Profile: Q100

E.G. Elev (ft)	728.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.		0.055	
W.S. Elev (ft)	728.67	Reach Len. (ft)	70.00	70.00	70.00
Crit W.S. (ft)	722.90	Flow Area (sq ft)		398.73	
E.G. Slope (ft/ft)	0.001893	Area (sq ft)		398.73	
Q Total (cfs)	1376.00	Flow (cfs)		1376.00	
Top Width (ft)	30.67	Top Width (ft)		30.67	
Vel Total (ft/s)	3.45	Avg. Vel. (ft/s)		3.45	
Max Chl Dpth (ft)	10.04	Hydr. Depth (ft)		13.00	
Conv. Total (cfs)	31624.1	Conv. (cfs)		31624.1	
Length Wtd. (ft)	70.00	Wetted Per. (ft)		79.27	
Min Ch El (ft)	718.63	Shear (lb/sq ft)		0.59	
Alpha	1.00	Stream Power (lb/ft s)	510.23	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	8.74	26.57	27.02
C & E Loss (ft)		Cum SA (acres)	5.66	7.14	13.79

Plan: G#2-Proposed Blackberry Creek Main Before D RS: 139602 BR U Profile: Q500

E.G. Elev (ft)	730.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.38	Wt. n-Val.		0.055	
W.S. Elev (ft)	729.99	Reach Len. (ft)	70.00	70.00	70.00
Crit W.S. (ft)	723.81	Flow Area (sq ft)		425.61	
E.G. Slope (ft/ft)	0.005112	Area (sq ft)		425.61	
Q Total (cfs)	2097.00	Flow (cfs)		2097.00	
Top Width (ft)	5.63	Top Width (ft)		5.63	
Vel Total (ft/s)	4.93	Avg. Vel. (ft/s)		4.93	
Max Chl Dpth (ft)	11.36	Hydr. Depth (ft)		75.63	
Conv. Total (cfs)	29330.6	Conv. (cfs)		29330.6	
Length Wtd. (ft)	70.00	Wetted Per. (ft)		104.47	
Min Ch El (ft)	718.63	Shear (lb/sq ft)		1.30	
Alpha	1.00	Stream Power (lb/ft s)	510.23	0.00	0.00
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	14.32	32.41	41.13
C & E Loss (ft)	0.00	Cum SA (acres)	7.03	7.14	15.68

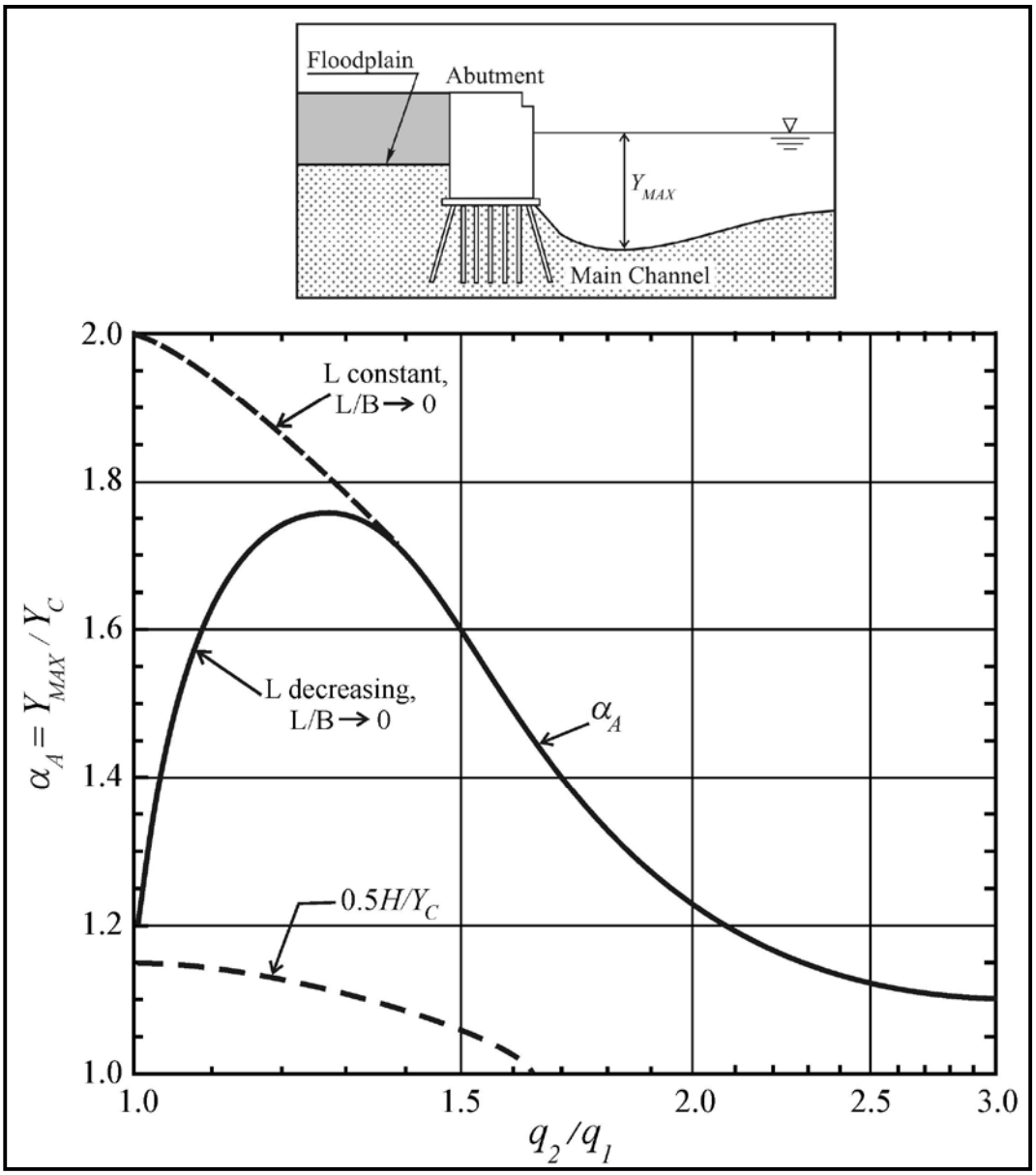
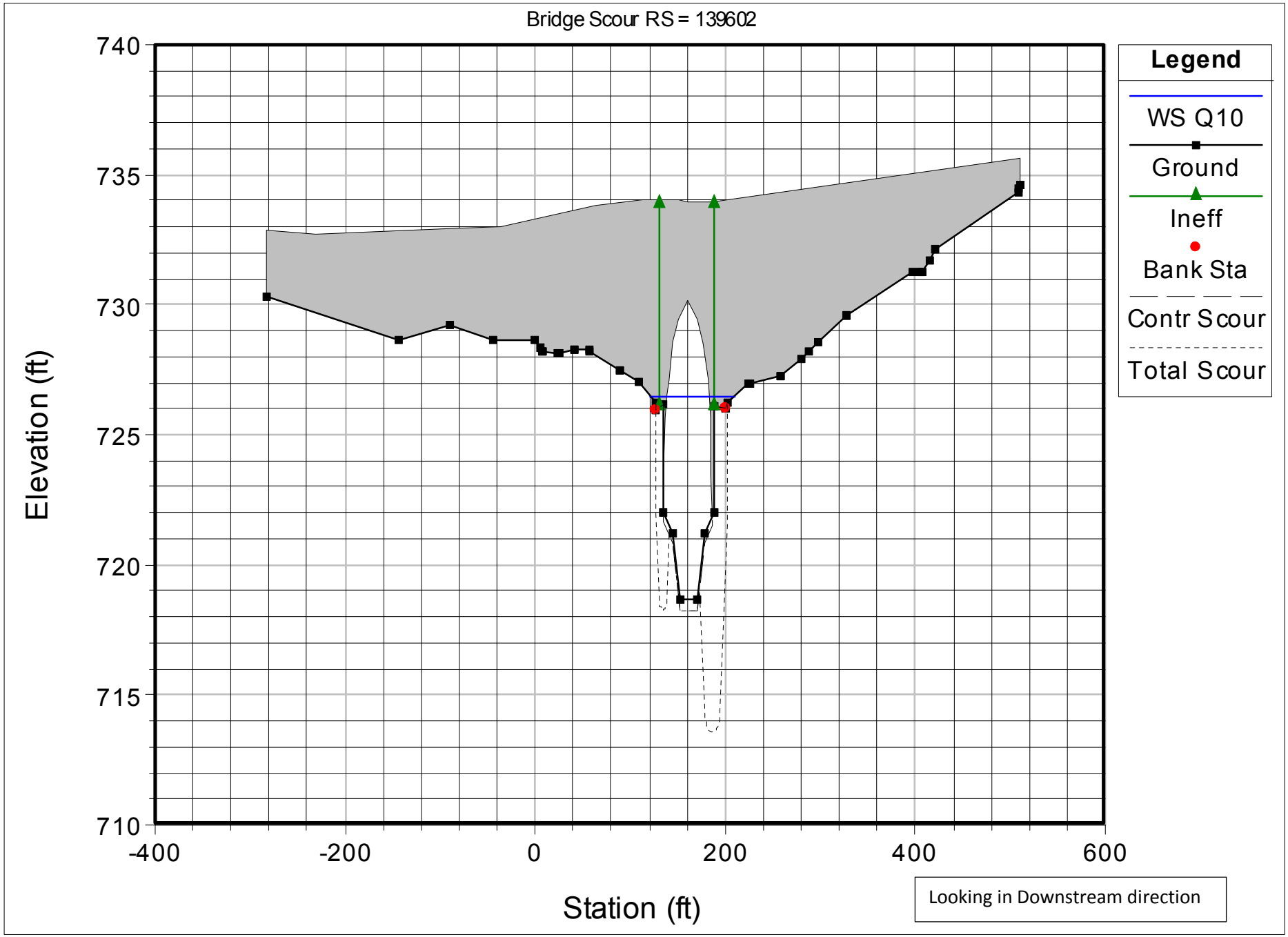


Figure 8.10. Scour amplification factor for wingwall abutments and live-bed conditions (NCHRP 2010b).

If the projected length of the embankment, L, is less than 75 percent of the width of the floodplain (B_f), scour condition (b) in Figure 8.7 occurs and the contraction scour calculation is performed using a clear-water scour calculation (see Chapter 6). The clear-water contraction scour equation also uses unit discharge (q), which can be estimated either by discharge divided by width or by the product of velocity and depth. Two clear-water contraction scour equations may be applied. The first equation is the standard equation based on grain size:

$$y_c = \left(\frac{q_{2f}}{K_u D_{50}^{1/3}} \right)^{6/7} \tag{8.6}$$

10-year Scour



Hydraulic Design - Bridge Scour River=Blackberry Creek Reach= Main Before D RS = 139602 BR
Contraction Scour

	Left	Channel	Right
Input Data			
Average Depth (ft):	0.62	5.37	
Approach Velocity (ft/s):		0.22	1.64
Br Average Depth (ft):		7.20	
BR Opening Flow (cfs):		634.00	
BR Top WD (ft):		43.68	
Grain Size D50 (mm):	0.01	0.01	0.01
Approach Flow (cfs):	2.05	631.95	
Approach Top WD (ft):	14.76	71.67	
K1 Coefficient:	0.690	0.690	0.690
Results			
Scour Depth Ys (ft):		0.38	(From HEC-18 Calculations, Contraction = 3.40 ft)
Critical Velocity (ft/s):		0.48	
Equation:		Live	

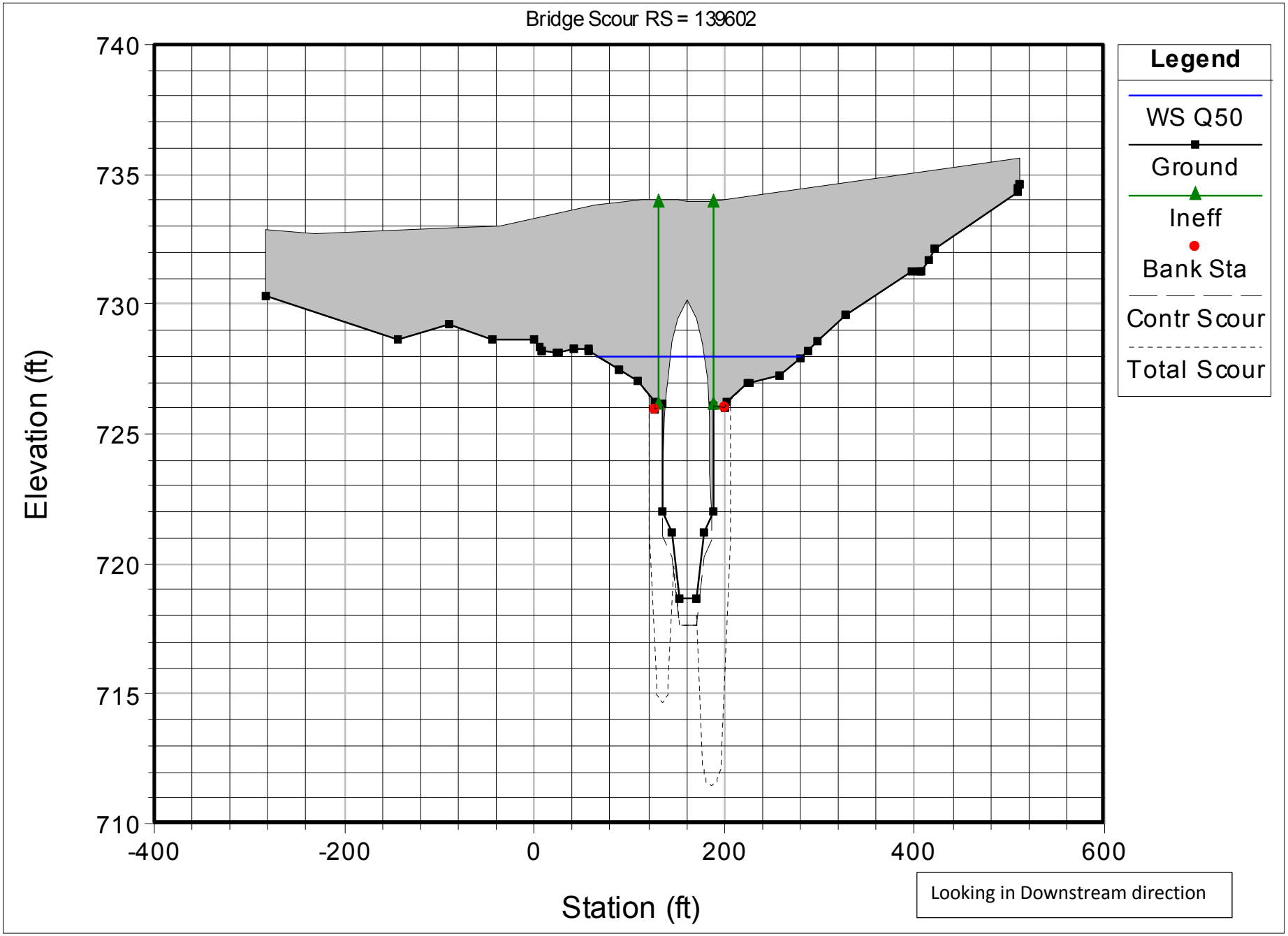
Abutment Scour

	Left	Right
Input Data		
Station at Toe (ft):	134.60	186.54
Toe Sta at appr (ft):	104.16	175.38
Abutment Length (ft):	20.68	11.10
Depth at Toe (ft):	4.09	4.60
K1 Shape Coef: 0.55 - Spill-through abutment		
Degree of Skew (degrees):	90.00	90.00
K2 Skew Coef:	1.00	1.00
Projected Length L' (ft):	11.02	11.10
Avg Depth Obstructed Ya (ft):	1.98	5.37
Flow Obstructed Qe (cfs):	54.27	97.88
Area Obstructed Ae (sq ft):	41.03	59.65
Results		
Scour Depth Ys (ft):	3.71	7.94
Qe/Ae = Ve:	1.32	1.64
Froude #:	0.17	0.12
Equation:	Froehlich	Froehlich

Combined Scour Depths

Left (South) abutment scour + contraction scour (ft):	4.09
Right (North) abutment scour + contraction scour (ft):	8.32
HEC-18 contraction scour +Right abutment scour (ft):	11.34

50-yr Scour


Bridge Scour RS = 139602
740
735
730
725
720
715
710
Elevation (ft)
-400
-200
0
200
400
600
Station (ft)
Legend
WS Q50
Ground
Ineff
Bank Sta
Contr Scour
Total Scour
Looking in Downstream direction

Hydraulic Design - Bridge Scour River=Blackberry Creek Reach= Main Before D RS = 139602 BR

Contraction Scour

	Left	Channel	Right
Input Data			
Average Depth (ft):	1.68	6.97	
Approach Velocity (ft/s):		0.48	2.18
Br Average Depth (ft):		10.63	
BR Opening Flow (cfs):		1120.00	
BR Top WD (ft):		35.46	
Grain Size D50 (mm):	0.01	0.01	0.01
Approach Flow (cfs):	29.18	1090.82	
Approach Top WD (ft):	35.93	71.67	
K1 Coefficient:	0.690	0.690	69.000
Results			
Scour Depth Ys (ft):		0.96	(From HEC-18 Calculations, Contraction = 5.10 ft)
Critical Velocity (ft/s):		0.50	
Equation:		Live	

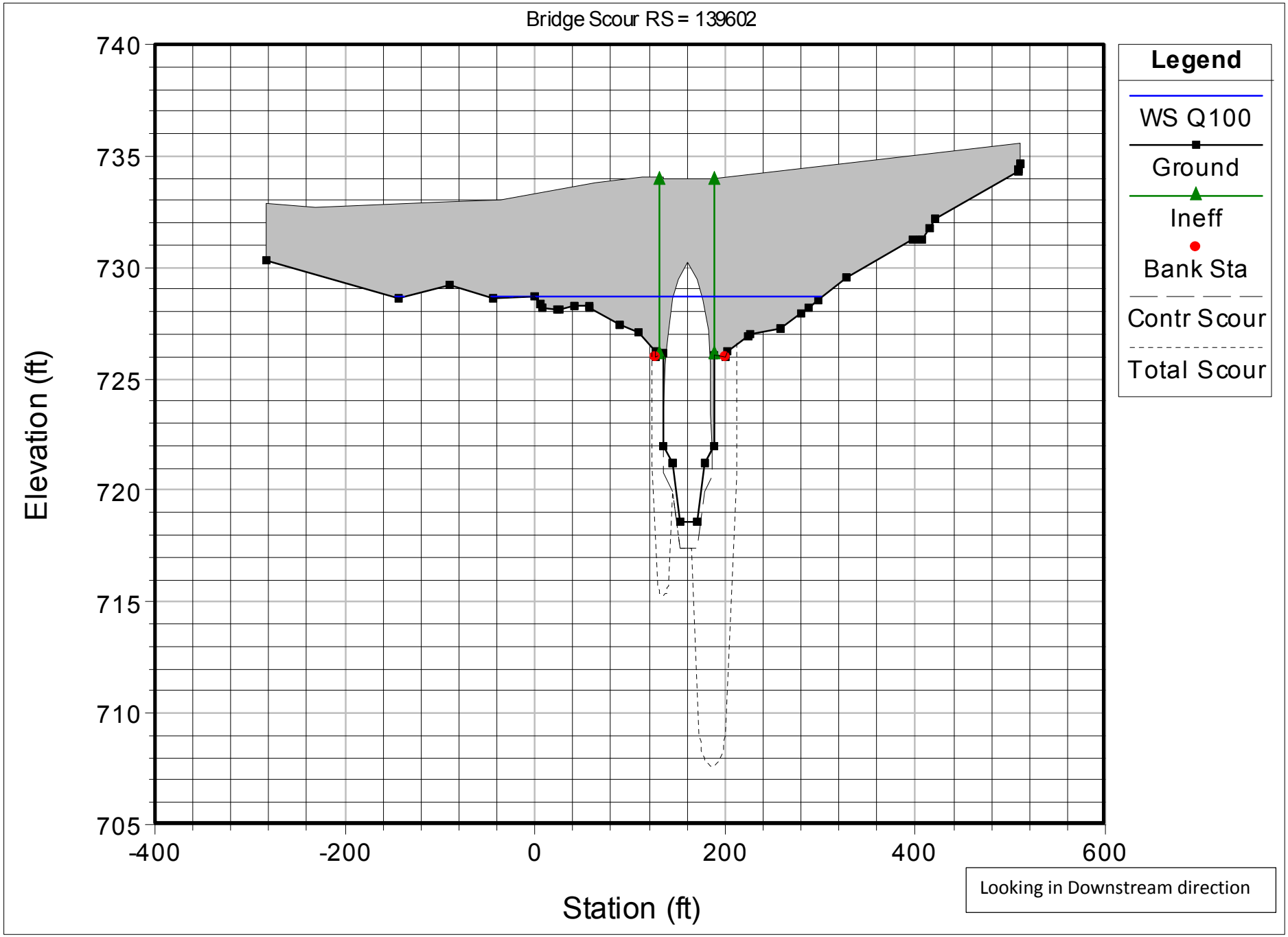
Abutment Scour

	Left	Right
Input Data		
Station at Toe (ft):	134.60	186.54
Toe Sta at appr (ft):	104.16	175.38
Abutment Length (ft):	41.85	11.10
Depth at Toe (ft):	5.67	6.17
K1 Shape Coef: 0.82 - Vert. with wing walls		
Degree of Skew (degrees):	90.00	90.00
K2 Skew Coef:	1.00	1.00
Projected Length L' (ft):	37.44	2.28
Avg Depth Obstructed Ya (ft):	2.43	6.97
Flow Obstructed Qe (cfs):	119.31	168.95
Area Obstructed Ae (sq ft):	101.73	77.42
Results		
Scour Depth Ys (ft):	6.70	9.45
Qe/Ae = Ve:	1.17	2.18
Froude #:	0.13	0.15
Equation:	Froehlich	Froehlich

Combined Scour Depths

Left (South)abutment scour + contraction scour (ft):	7.69
Right (North) abutment scour + contraction scour (ft):	10.44
HEC-18 contraction scour +Right abutment scour (ft):	14.55

100-yr Scour


Bridge Scour RS = 139602
740
735
730
725
720
715
710
705
Elevation (ft)
-400
-200
0
200
400
600
Station (ft)
Legend
WS Q100
Ground
Ineff
Bank Sta
Contr Scour
Total Scour
Looking in Downstream direction

Hydraulic Design - Bridge Scour River=Blackberry Creek Reach= Main Before D RS = 139602 BR

Contraction Scour

	Left	Channel	Right
Input Data			
Average Depth (ft):	2.37	7.66	
Approach Velocity (ft/s):		0.63	2.41
Br Average Depth (ft):		13.00	
BR Opening Flow (cfs):		1376.00	
BR Top WD (ft):		30.67	
Grain Size D50 (mm):	0.01	0.01	0.01
Approach Flow (cfs):	53.62	1322.38	
Approach Top WD (ft):	35.93	71.67	
K1 Coefficient:	0.690	0.690	0.690
Results			
Scour Depth Ys (ft):		1.24	(From HEC-18 Calculations, Contraction =5.8ft)
Critical Velocity (ft/s):		0.50	
Equation:		Live	

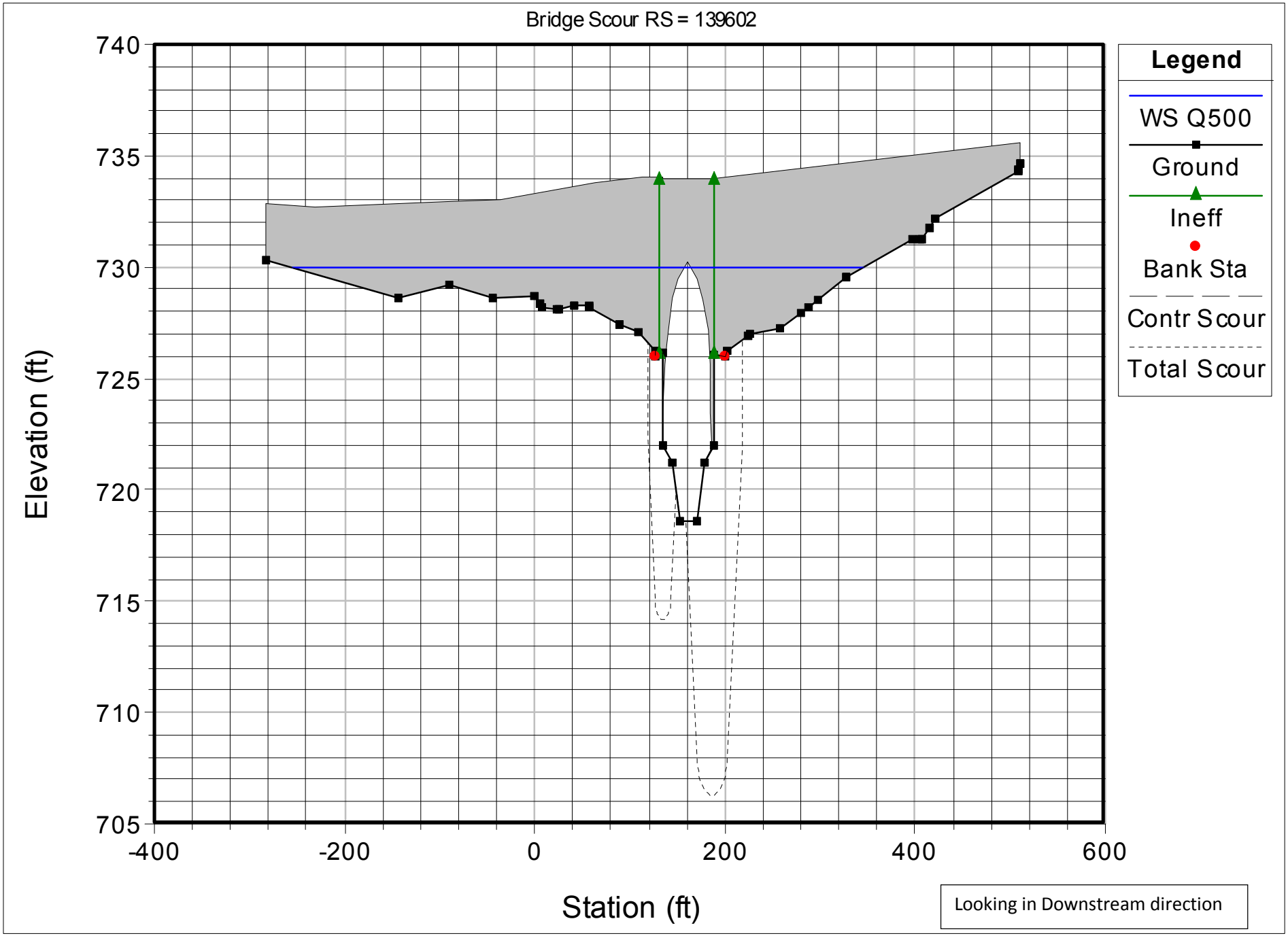
Abutment Scour

	Left	Right
Input Data		
Station at Toe (ft):	134.60	186.54
Toe Sta at appr (ft):	104.16	175.38
Abutment Length (ft):	41.85	11.10
Depth at Toe (ft):	6.34	6.84
K1 Shape Coef: 0.82 - Vert. with wing walls		
Degree of Skew (degrees):	90.00	90.00
K2 Skew Coef:	1.00	1.00
Projected Length L' (ft):	10.00	11.10
Avg Depth Obstructed Ya (ft):	3.12	7.66
Flow Obstructed Qe (cfs):	162.88	204.82
Area Obstructed Ae (sq ft):	130.62	85.08
Results		
Scour Depth Ys (ft):	5.81	12.99
Qe/Ae = Ve:	1.25	2.41
Froude #:	0.12	0.15
Equation:	Froehlich	Froehlich

Combined Scour Depths

Left (South) abutment scour + contraction scour (ft): 7.05
Right (North) abutment scour + contraction scour (ft): 14.23
HEC-18 contraction scour +Right abutment scour (ft): 18.79

500-yr Scour


Bridge Scour RS = 139602
740
735
730
725
720
715
710
705
Elevation (ft)
-400
-200
0
200
400
600
Station (ft)
Legend
WS Q500
Ground
Ineff
Bank Sta
Contr Scour
Total Scour
Looking in Downstream direction

Hydraulic Design - Bridge Scour River=Blackberry Creek Reach= Main Before D RS = 139602 BR

Contraction Scour

	Left	Channel	Right
Input Data			
Average Depth (ft):	3.90	9.20	
Approach Velocity (ft/s):		0.96	2.98
Br Average Depth (ft):		75.63	
BR Opening Flow (cfs):		2097.00	
BR Top WD (ft):		5.63	
Grain Size D50 (mm):	0.01	0.01	0.01
Approach Flow (cfs):	134.70	1962.31	
Approach Top WD (ft):	35.93	71.67	
K1 Coefficient:	0.690	0.690	0.690
Results			
Scour Depth Ys (ft):		0.00	(From HEC-18 Calculations, Contraction = 7.2 ft)
Critical Velocity (ft/s):		0.52	
Equation:		Live	

Abutment Scour

	Left	Right
Input Data		
Station at Toe (ft):	134.60	186.54
Toe Sta at appr (ft):	104.16	175.38
Abutment Length (ft):	41.85	11.10
Depth at Toe (ft):	7.82	8.32
K1 Shape Coef: 0.82 - Vert. with wing walls		
Degree of Skew (degrees):	90.00	90.00
K2 Skew Coef:	1.00	1.00
Projected Length L' (ft):	11.00	11.10
Avg Depth Obstructed Ya (ft):	4.65	9.20
Flow Obstructed Qe (cfs):	296.83	303.93
Area Obstructed Ae (sq ft):	194.70	102.08
Results		
Scour Depth Ys (ft):	8.17	15.57
Qe/Ae = Ve:	1.52	2.98
Froude #:	0.12	0.17
Equation:	Froehlich	Froehlich

Combined Scour Depths

Left (South) abutment scour + contraction scour (ft):	8.17
Right (North) abutment scour + contraction scour (ft):	15.57
HEC-18 contraction scour +Right abutment scour (ft):	22.77

SCOUR EVALUATION

Re: Unincorporated Kane County (Elburn)
Section 107B-I-1
IL-47 over Blackberry Creek
(Main before D) Blackberry Creek

The proposed alternate structure is an open spill-through abutment with rolled steel beam superstructure design that will replace the existing 4 barrel box culvert. The bridge span will be 76 feet and will have a deck width of 62 feet. The channel velocity through the proposed structure is calculated to be 2.8 fps for the 100-year event. Proposed countermeasures will be needed to protect the open abutment at the expected velocity.

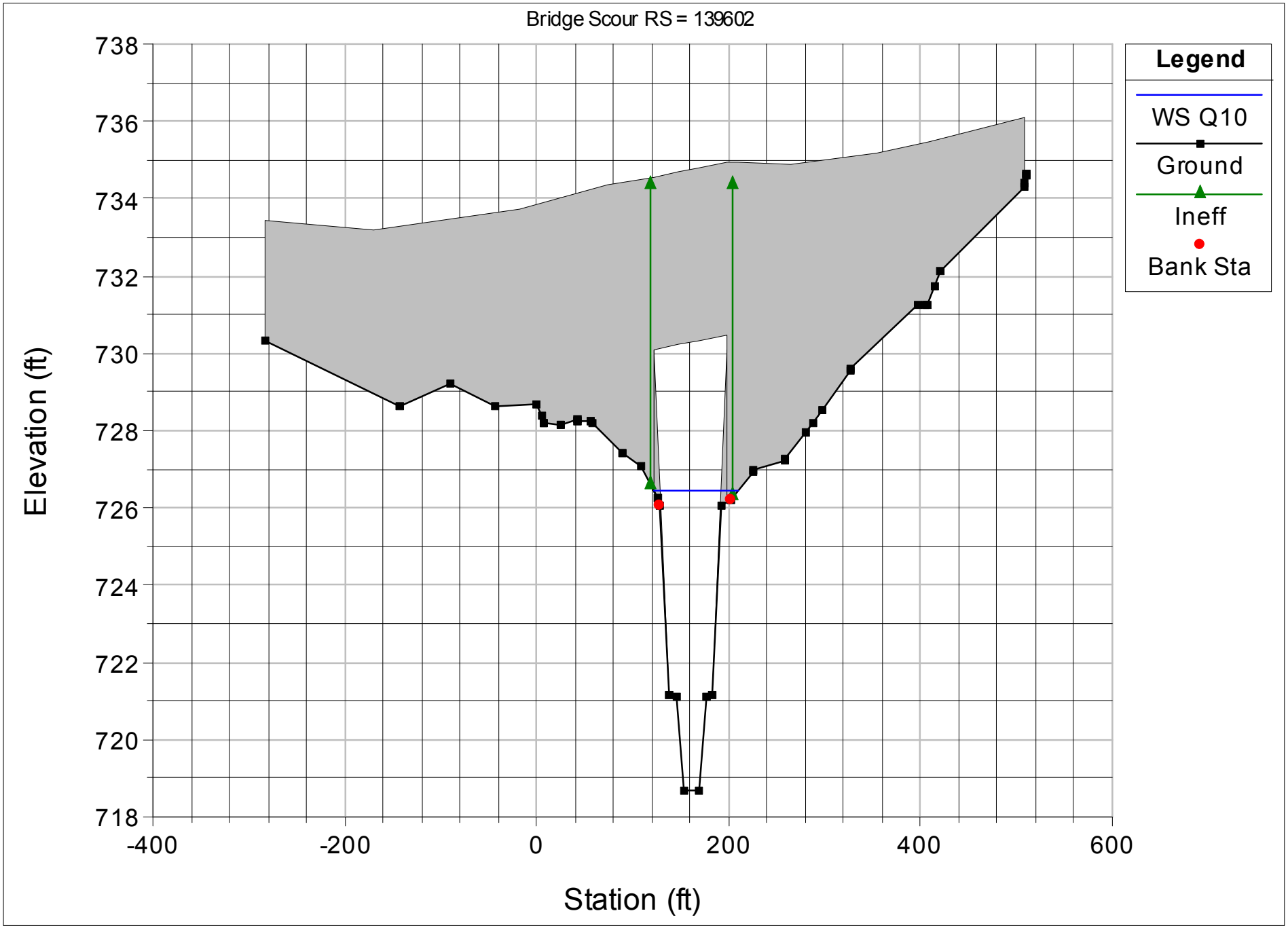
Hydraulic Design Data

Contraction Scour

	Left	Channel	Right
Input Data			
Average Depth (ft):	0.63	5.08	
Approach Velocity (ft/s):	0.20	1.44	
Br Average Depth (ft):		5.39	
BR Opening Flow (cfs):		634	
BR Top WD (ft):		63.08	
Grain Size D50 (mm):	0.01	0.01	0.01
Approach Flow (cfs):	1.81	632.19	
Approach Top WD (ft):	14.04	86.66	
Results			
Contraction Scour not computed.			

Note: Grain Size of 0.002 mm was assumed based on the NRCS Soil Survey indicating that the soil type was Lena Muck. Lena Muck properties have no measurements for percentage of particles passing the 4 in sieve or the #200 sieve, indicating that the soil particles are silt. An approximate diameter of silt(organic) particles is assumed to be 0.002 mm. However, a diameter of 0.01 mm was used as the results seemed unreasonable with a diameter of 0.002 mm.

10-Year Scour



Hydraulic Design Data

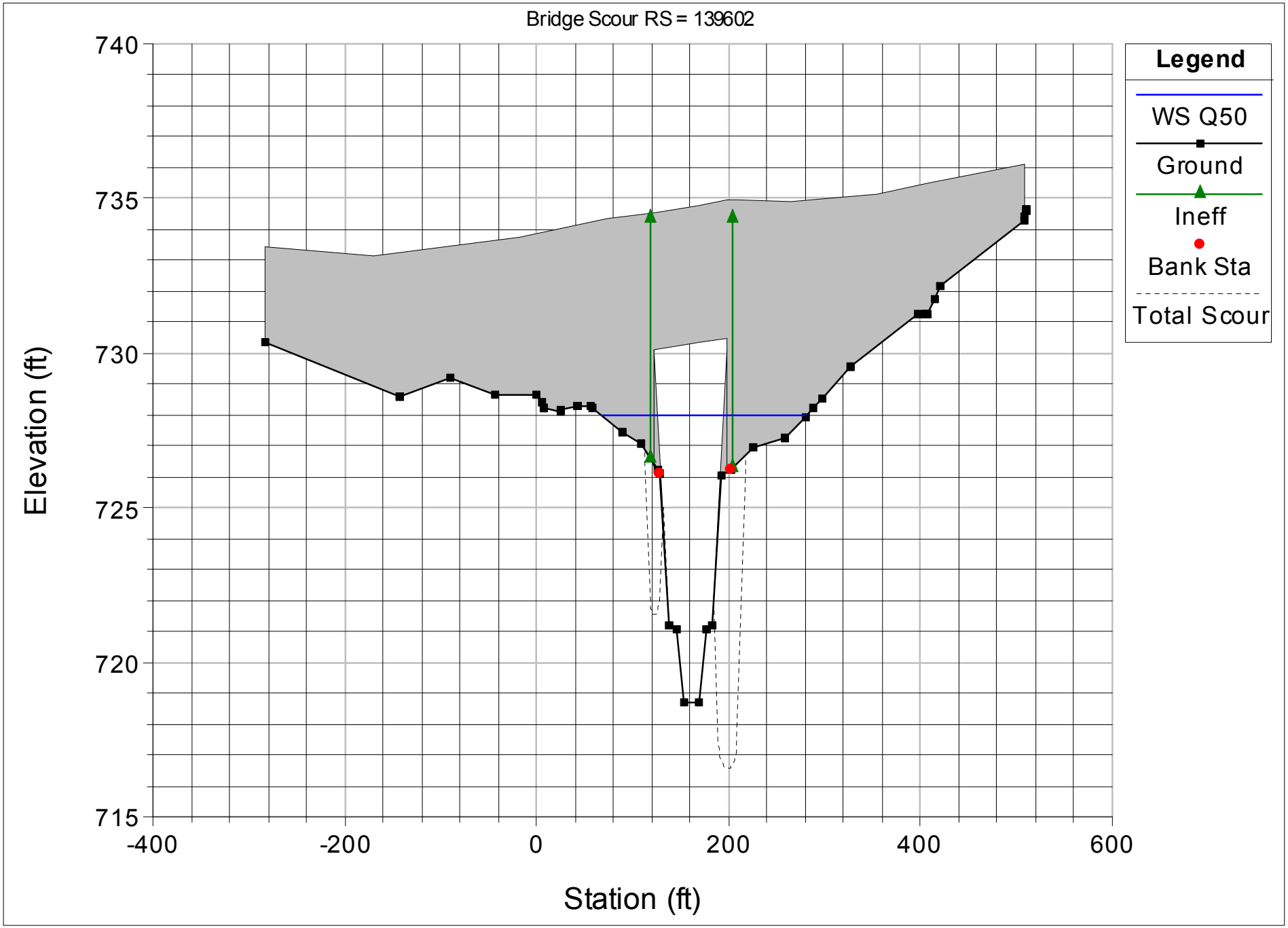
Abutment Scour

	Left	Right
Input Data		
Station at Toe (ft):	123.00	199.13
Toe Sta at appr (ft):	90.30	186.92
Abutment Length (ft):	14.04	2.72
Depth at Toe (ft):	0.06	0.28
K1 Shape Coef: 0.55 - Spill-through abutment		
Degree of Skew (degrees):	90.00	90.00
K2 Skew Coef:	1.00	1.00
Projected Length L' (ft):	14.04	2.72
Avg Depth Obstructed Ya (ft):	0.63	5.08
Flow Obstructed Qe (cfs):	1.81	19.84
Area Obstructed Ae (sq ft):	8.91	13.83
Results		
Scour Depth Ys (ft):	0.10	6.36
Qe/Ae = Ve:	0.00	1.43
Froude #:	0.07	0.11
Equation:	HIRE	Froehlich

Left abutment scour + contraction scour (ft): 0.10

Right abutment scour + contraction scour (ft): 6.36

50-Year Scour



Hydraulic Design Data

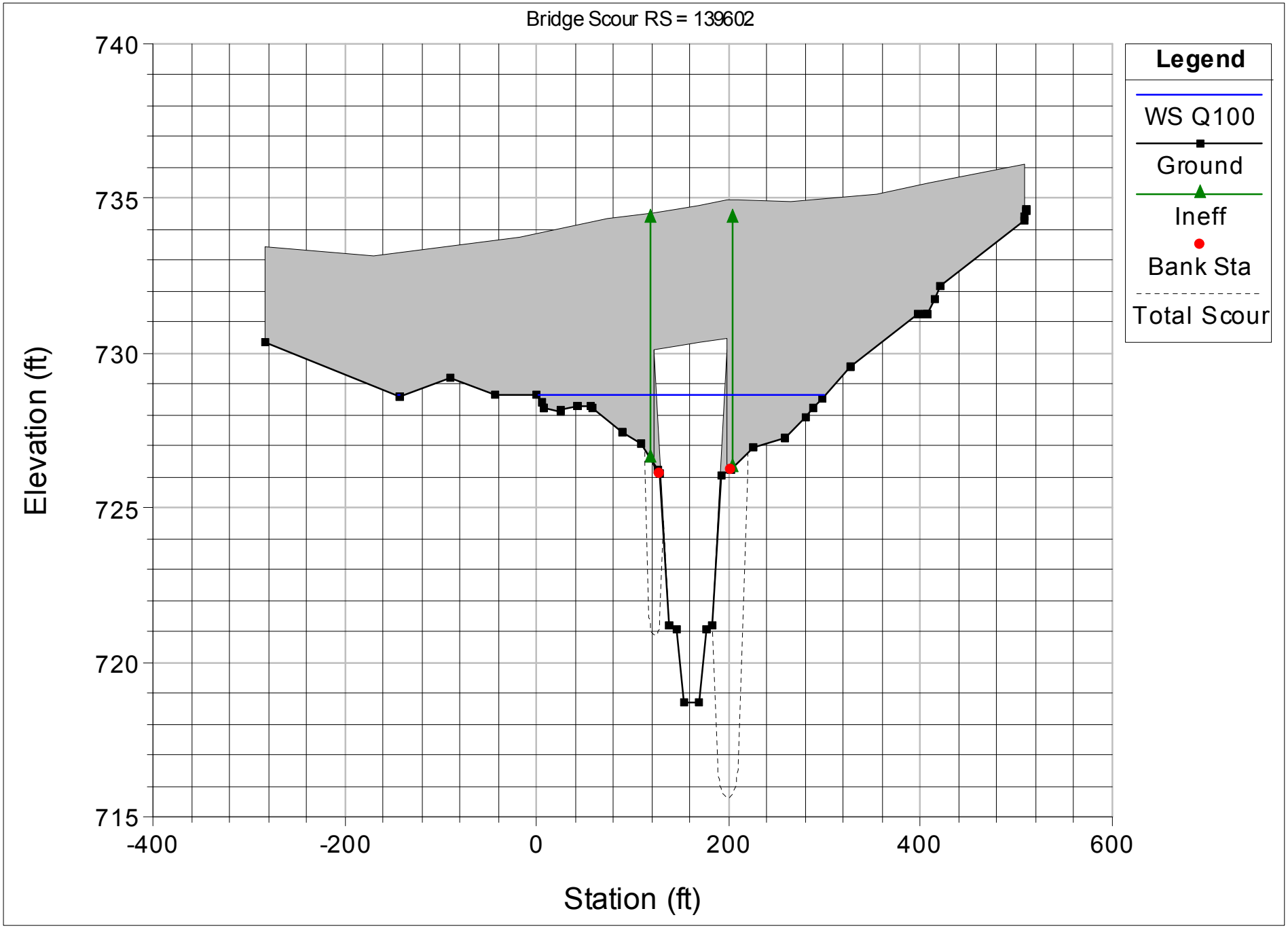
Abutment Scour

	Left	Right
Input Data		
Station at Toe (ft):	123.00	199.13
Toe Sta at appr (ft):	90.30	186.92
Abutment Length (ft):	49.94	2.72
Depth at Toe (ft):	1.61	1.83
K1 Shape Coef: 1.00 - Vertical abutment		
Degree of Skew (degrees):	90.00	90.00
K2 Skew Coef:	1.00	1.00
Projected Length L' (ft):	49.94	2.72
Avg Depth Obstructed Ya (ft):	1.41	6.65
Flow Obstructed Qe (cfs):	27.12	34.31
Area Obstructed Ae (sq ft):	70.65	18.10
Results		
Scour Depth Ys (ft):	4.86	9.60
Qe/Ae = Ve:	0.00	1.90
Froude #:	0.07	0.13
Equation:	HIRE	Froehlich

Left abutment scour + contraction scour (ft): 4.86

Right abutment scour + contraction scour (ft): 9.60

100-Year Scour

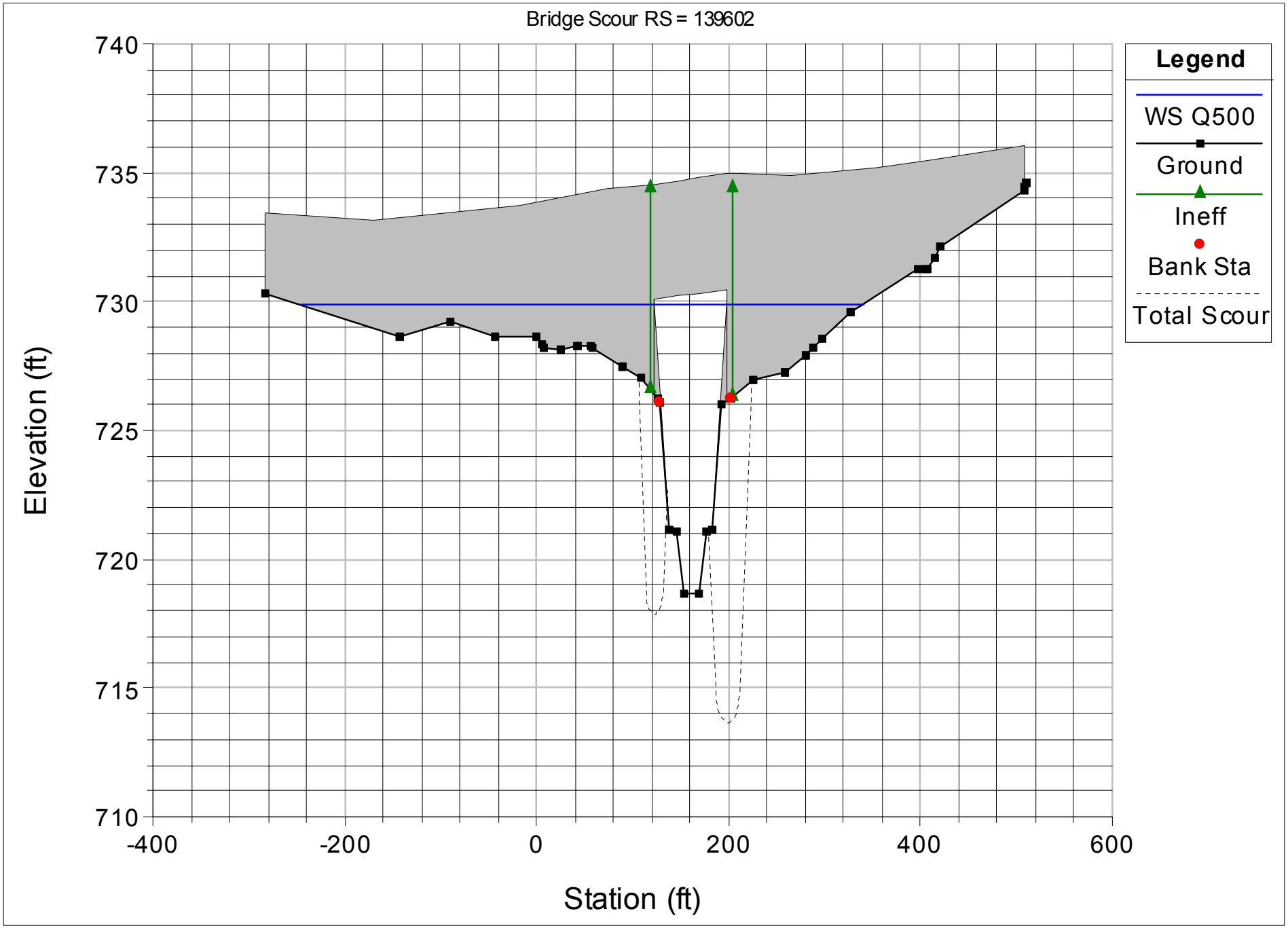


Hydraulic Design Data

Abutment Scour

	Left	Right	
Input Data			
Station at Toe (ft):	123.00	199.13	
Toe Sta at appr (ft):	90.30	186.92	
Abutment Length (ft):	49.94	2.72	
Depth at Toe (ft):	2.27	2.49	
K1 Shape Coef: 1.00 - Vertical abutment			
Degree of Skew (degrees):	90.00	90.00	
K2 Skew Coef:	1.00	1.00	
Projected Length L' (ft):	49.94	2.72	
Avg Depth Obstructed Ya (ft):	2.08	7.32	
Flow Obstructed Qe (cfs):	53.29	41.52	
Area Obstructed Ae (sq ft):	103.97	19.92	
Results			
Scour Depth Ys (ft):	5.50	10.53	
Qe/Ae = Ve:	0.51	2.08	
Froude #:	0.06	0.14	
Equation:	Froehlich		Froehlich

500-Year Scour



Hydraulic Design Data

Abutment Scour

	Left	Right	
Input Data			
Station at Toe (ft):	123.00	199.13	
Toe Sta at appr (ft):	90.30	186.92	
Abutment Length (ft):	49.94	2.72	
Depth at Toe (ft):	3.55	3.76	
K1 Shape Coef: 1.00 - Vertical abutment			
Degree of Skew (degrees):	90.00	90.00	
K2 Skew Coef:	1.00	1.00	
Projected Length L' (ft):	49.94	2.72	
Avg Depth Obstructed Ya (ft):	3.40	8.64	
Flow Obstructed Qe (cfs):	135.68	61.57	
Area Obstructed Ae (sq ft):	169.61	23.49	
Results			
Scour Depth Ys (ft):	8.51	12.50	
Qe/Ae = Ve:	0.80	2.62	
Froude #:	0.08	0.16	
Equation:	Froehlich		Froehlich

17. RIP-RAP SIZING

The Rip-Rap size will be determined during Phase II design.

Illinois Department of Transportation

Permit Summary for Floodway Construction in Northeast Illinois

Applicant Agency:	Illinois Department of Transportation	County:	Kane
Route:	IL Route 47 @ Main St.	Stream:	Blackberry Creek
Section:	107B-I-1	SN:	045-2000 (existing), 045-2050 (proposed)

General Description (bridge length, bridge width, number of spans, abutment type, proposed scope of work within floodway, etc.):
Existing Facility: 4 barrel culvert 82 feet long, 40 feet wide, 45 degree Headwall, 2-6.5'x8.75' sections, 2-6.5'x10.42' sections
Proposed Improvement: Replacement of existing 4 barrel culvert with a 3-sided arch culvert with a 54' span and 13' rise. Culvert length is 70' from headwall to headwall.

1. Is the proposed work classified as repairs such as deck replacement, pavement resurfacing, or the armoring or filling of a scour hole? ☐ Yes ☒ No

2. Does the proposed work only consist of modifications to the existing structure which will occur above the regulatory 100-year flood profile? ☐ Yes ☒ No

Note: If the answer to question 1 or 2 is yes, no permit is required and questions 3 through 12 may be omitted.

3. Does the proposed work below the regulatory 100-year flood profile consist of widening of the existing structure by 12 feet or less? ☐ Yes ☒ No

Note: If yes, Regional Permit No. 2 applies and questions 4 through 9 may be omitted.

4. Is the proposed improvement, including the approach roadway, more restrictive to normal and flood flows than the existing structure? ☐ Yes ☒ No

5. Is a Channel Modification proposed? ☐ Yes ☒ No

6. Are there any buildings or structures located upstream in the 100-year floodplain within the influence of the structure backwater? ☒ Yes ☐ No

   6a. If no, does the backwater of the proposed improvement exceed the backwater of the existing structure by more than 0.1 foot? ☐ Yes ☐ No

   6b. If yes, does the proposed backwater exceed the natural high water elevation by more than 0.1 foot? ☒ Yes ☐ No

7. Are transitions required for this project? ☐ Yes ☒ No

8. Is the flood profile at the project site impacted by backwater from a downstream receiving stream? ☐ Yes ☒ No

   If yes, list frequency of starting elevation for analysis:

9. Is backwater from a downstream structure affecting the flood profile at the project site? ☒ Yes ☐ No

9a. Was the existing downstream structure used in the analysis for determining flood profile at the project site? (Attach documentation) ☒ Yes ☐ No

9b. Is the downstream structure scheduled for improvement in the next 5 years? ☒ Yes ☐ No

9c. Was the proposed downstream improvement used in the analysis? ☒ Yes ☐ No

10. Is a floodway map change required due to the proposed project? ☐ Yes ☒ No

11. Will fill or material be placed in the floodway due to the proposed work? ☒ Yes ☐ No

11a. If yes, is compensatory storage provided at the project location? (Attach a copy of completed Attachment A) ☒ Yes ☐ No

11b. If the answer to 11a is no, is compensatory storage provided at another location? If yes, give location and attach a copy of completed Attachment A. ☐ Yes ☐ No

11c. Has compensatory storage relief been granted? (Attach Documentation) ☐ Yes ☒ No

12. Coordination based on Memorandum of Agreement has occurred with Agency(ies) (Attach documentation):. ☐ Yes ☒ No

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All engineering analysis has been performed by me or under my direct supervision.

Signature: [signature] IL/P.E. #: 062.054930

Date: 11/24/14 P.E. Expiration Date: 11/30/15

FOR DEPARTMENTAL USE ONLY

Is a permit required for this project? ☐ Yes ☐ No

If yes, specify type of permit: ☐ Floodway, ☐ Regional 1, ☐ Regional 2

Permit Summary
(Attachment A - Compensatory Storage)

Part of Permit Summary for Floodway Construction in Northeast Illinois:

☒ Phase I (Preliminary) ☐ Phase II (Final)

Applicant Agency:	Illinois Department of Transportation	County:	Kane
Route:	IL Route 47 @ Main St.	Stream:	Blackberry Creek - Main Stem
Section:	107B-I-1	SN:	045-2050

Provide the following information for Item 11:

a. Flood Water Elevations (Natural): 100-year 728.62 ft. 10-year 726.61 ft.
Normal 720.76 ft.

b. Determine the amount of fill or material being placed in the floodway:

1. Between the 100-year and 10-year flood elevation 759 cu. yds.
2. Between the 10-year and normal water elevation 0 cu. yds (FW Cut > FW fill) .

c. Determine the volume being provided to compensate for above item b:
(i.e. from structures removal, excavation, etc.)

1. Between the 100-year and 10-year flood elevation 2120 (max) cu. yds.
2. Between the 10-year and normal water elevation 1172 (max) cu. yds.

d. Mark on the exhibits the location and amount of compensatory storage to be excavated. Also show the location of floodway and floodplain boundaries. (Include a set of plans and cross sections)

Attach copy of calculations and Exhibit(s) reflecting the above finding.

All engineering analysis has been performed by me or under my direct supervision.

Signature:	[signature]	IL/P.E. #:	062.054930
Date:	11/24/14	P.E. Expiration Date:	11/30/15

FLOODPLAIN FILL CALCULATIONS (IL-47 3-sided arch Option)

Project Route: IL 47 and Main Street
Project Limits: Intersection Improvements
County: Kane
State Job No.: P-91-449-09

By: SJS Date: Nov-14

Checked: DH Date: Nov-14

IL ROUTE 47 FLOODPLAIN CUT/FILL DUE TO 3-SIDED ARCH PROFILE INCREASE (STATION 498+69.19 TO STATION 506+00)

Normal-10 YR Floodplain/Floodway Range (720.76-726.61)						10-100 YR Floodplain/Floodway Range (726.61-728.62)					
STA	FP CUT Area (ft^2)	FP FILL Area (ft^2)	Dist (ft)	FP CUT Vol (ft^3)	FP FILL Vol (ft^3)	STA	FP CUT Area (ft^2)	FP FILL Area (ft^2)	Dist (ft)	FP CUT Vol (ft^3)	FP FILL Vol (ft^3)
497+00	0	0				497+00	0	1.6			
			100	485.0	90.0				100	0.0	940.0
498+00	9.7	1.8				498+00	0.0	17.2			
			69.2	335.6	162.6				69.2	0.0	2065.3
498+69.19	0.0	2.9				498+69.19	0.0	42.5			
			135.6	27.1	5576.6				135.6	0.0	8803.8
500+04.81	0.4	79.4				500+04.81	0.0	87.4			
			45.2	9.0	1792.9				45.2	0.0	1973.7
500+50	0.0	0.0				500+50	0.0	0.0			
			18.8	0.0	0.0				18.8	0.0	360.6
500+68.83	0.0	0.0				500+68.83	0.0	38.3			
			31.2	0.0	0.0				31.2	0.0	1034.3
501+00	0.0	0.0				501+00	0.0	28.0			
			50.0	0.0	0.0				50.0	0.0	1590.0
501+50	0.0	0.0				501+50	0.0	35.6			
			50.0	0.0	725.0				50.0	0.0	2420.0
502+00	0.0	29.0				502+00	0.0	61.2			
			22.3	0.0	323.4				22.3	0.0	829.6
502+22.26	0.0	0.0				502+22.26	0.0	13.2			
See Culvert Calc			50.0	2102.5	455.0				24.9	0.0	270.2
502+72.00	84.1	18.2				502+72.00	0.0	8.5			
			27.0	1946.7	814.1				27.0	0.0	741.2
503+00	41.3	76.6				503+00	0.0	54.2			
			24.0	1216.8	1424.4				24.0	0.0	1207.2
503+24	40.4	27.4				503+24	0.0	39.4			
			26.0	1306.5	903.5				26.0	0.0	1115.4
503+50	60.1	42.1				503+50	0.0	46.4			
			50.0	6410.0	1860.0				50.0	1312.5	2832.5
504+00	196.3	32.3				504+00	52.5	66.9			
			50.0	6175.0	860.0				50.0	1800.0	2032.5
504+50	50.7	2.1				504+50	19.5	14.4			
			50.0	1662.5	87.5				50.0	692.5	715.0
505+00	15.8	1.4				505+00	8.2	14.2			
			100.0	790.0	70.0				100.0	410.0	710.0
506+00	0.0	0.0				506+00	0.0				
			FP	**3309.2**	**7779.6**	**cu-ft**			FP	**1102.5**	**16602.7** **cu-ft**
FP=Floodplain, FW=Floodway			FW	**19157.5**	**7365.3**				FW	**3112.5**	**13038.5**

FLOODPLAIN FILL CALCULATIONS (IL-47 3-Sided Arch Option) Continued

MAIN STREET FLOODWAY CUT/FILL DUE TO ROUTE 47 PROFILE INCREASE (STATION 194+00 TO STATION 200+00)

Normal-10 YR Floodway Range (720.26-726.29)						10-100 YR Floodway Range (726.29-728.37)					
STA	FW CUT Area (ft^2)	FW FILL Area (ft^2)	Dist (ft)	FW CUT Vol (ft^3)	FW FILL Vol (ft^3)	STA	FW CUT Area (ft^2)	FW FILL Area (ft^2)	Dist (ft)	FW CUT Vol (ft^3)	FW FILL Vol (ft^3)
194+79.86	0.0	0.0				194+79.86	0.0	0.0			
			20.1	0.0	0.0				20.1	26.1	75.4
195+00	0.0	0.0				195+00	2.6	7.5			
			100.0	0.0	1410.0				100.0	130.0	2460.0
196+00	0.0	28.2				196+00	0.0	41.7			
			100.0	0.0	4205.0				100.0	65.0	4465.0
197+00	0.0	55.9				197+00	1.3	47.6			
			100.0	270.0	5460.0				100.0	65.0	5465.0
198+00	5.4	53.3				198+00	0.0	61.7			
(55' is to W. side of Mn St bridge) ->			55.0	148.5	1465.8				78.9	0.0	5277.1
198+78.94	0.0	0.0				198+78.94	0.0	72.0			
			100.0	0.0	0.0				100.0	0.0	3600.0
199+00	0.0	0.0				199+00	0.0	0.0			
			100.0	0.0	0.0				100.0	0.0	0.0
200+00	0.0	0.0				200+00	0.0	0.0			
		Total:	FW	**418.5**	**12540.8**	**cu-ft**		**Total:**	FW	**286.1**	**21342.5** **cu-ft**

FP=Floodplain, FW=Floodway

		Normal-10 YR TOTALS				10-100 YR TOTALS				
		FP CUT	**FP FILL**	**FW CUT**	**FW FILL**	**FP CUT**	**FP FILL**	**FW CUT**	**FW FILL**	
IL-47	Road Profile	3309	7780	19158	7365	1103	16603	3113	13038	
	3-Sided Arch*			8960				5103		
Main St	Road Profile			419	12541			286	21343	
	Bridge*			5373				5375		
	SUBTOTAL	**3309**	**7780**	**33909**	**19906**	**1103**	**16603**	**13877**	**34381**	**CU-FT**
CUMULATIVE FILL		**4470**		**-14003**		**15500**		**20504**		**CU-FT**
		166		**-519**		**574**		**759**		**CU-YD**
		(FP Fill - FP Cut)		(FW Fill - FW Cut)		(FP Fill - FP Cut)		(FW Fill - FW Cut)		

* See Microstation Sketches for 3-Sided Arch and Bridge Floodway volume cuts

REQUIRED COMPENSATORY STORAGE CALCULATIONS FOR FLOODWAY FILL

NORMAL-10YR COMPENSATORY STORAGE REQUIRED = CUMULATIVE FW FILL = -14003 cu-ft = -519 cu-yd
10-100YR COMPENSATORY STORAGE REQUIRED = CUMULATIVE FW FILL = 20504 cu-ft = 759 cu-yd

FLOODPLAIN FILL CALCULATIONS (IL-47 Arch Option)

Project Route: IL 47 and Main Street
Project Limits: Intersection Improvements
County: Kane
State Job No.: P-91-449-09

By: SJS Date: Nov-14
Checked: DH Date: Nov-14

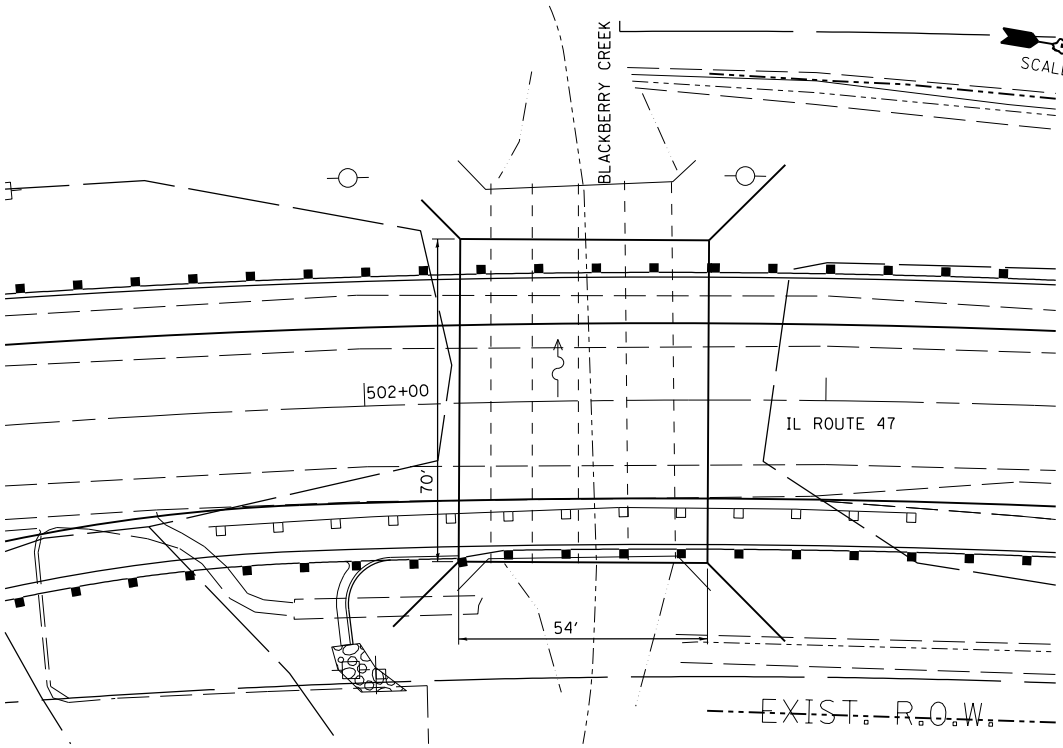
PROVIDED FLOODPLAIN/FLOODWAY COMPENSATORY STORAGE NORTH OF PROPOSED IL-47 STRUCTURE

Normal-10 YR Floodway Range (720.76-726.61)						10-100 YR Floodway Range (726.61-728.62)						
RS	FP CUT Area (ft^2)	FW CUT Area (ft^2)	Dist (ft)	FP CUT Vol (ft^3)	FW CUT Vol (ft^3)	STA	FP CUT Area (ft^2)	FW CUT Area (ft^2)	Dist (ft)	FP CUT Vol (ft^3)	FW CUT Vol (ft^3)	
139988	0.0	0.0				139988	0.0					
			100.0	5450.0	2200.0				100.0	12450.0	300.0	
139888	109.0	44.0				139888	249.0	6.0				
			102.0	11067.0	3774.0				102.0	25704.0	357.0	
139786	108.0	30.0				139786	255.0	1.0				
			101.0	6312.5	2828.0				101.0	18281.0	151.5	
139685	17.0	26.0				139685	107.0	2.0				
TOTAL STORAGE				**22829.5**	**8802.0**	CU-FT				**56435.0**	**808.5**	CU-FT

TOTAL FLOODPLAIN/FLOODWAY STORAGE PROVIDED

	FLOODPLAIN STORAGE UPSTREAM OF IL-47 BRIDGE (cu-ft)/(cu-yd)		FLOODWAY STORAGE UPSTREAM OF IL-47 BRIDGE (cu-ft)/(cu-yd)		TOTAL STORAGE PROVIDED = FP + FW STORAGE (cu-ft /cu-yd)		TOTAL STORAGE REQUIRED (cu-ft/cu-yd)	
Normal-10 YR	22829.5	845.5	8802.0	326	**31632**	**1172**	**-14003**	**-519**
10-100 YR	56435.0	2090.2	808.5	30	**57244**	**2120**	**20504**	**759**

NOTES:
RS= River Station
The bulk of the proposed storage area is proposed to be situated at the Blackberry Inn property. This property will need to be purchased. The property acquisition is based on the assumption that storage is needed at a ratio of 1:1 times that of the floodplain fill volume (Usual rate for Kane County is 1:1.5, but the 1:1 ratio was agreed to by IDOT



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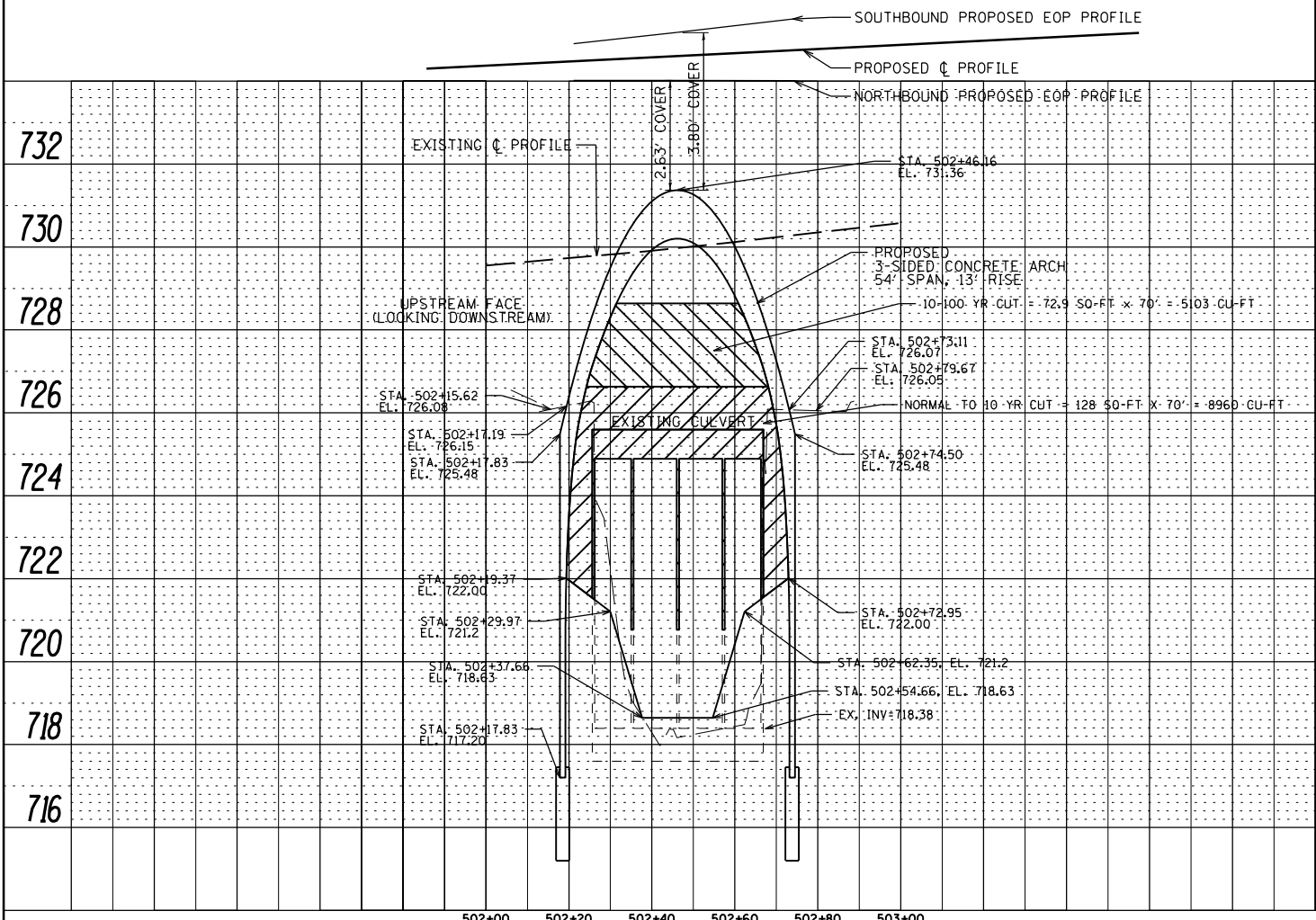

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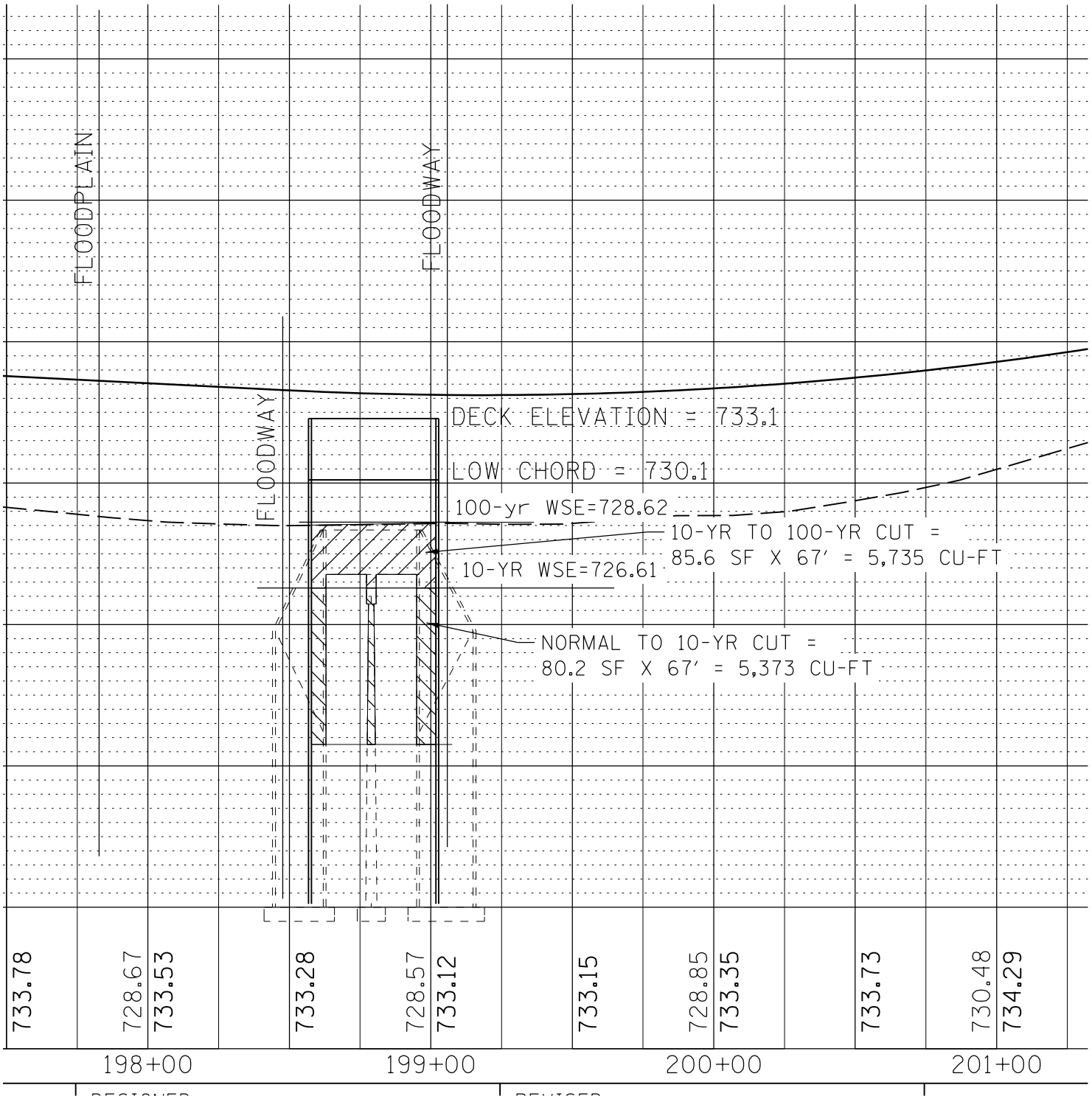
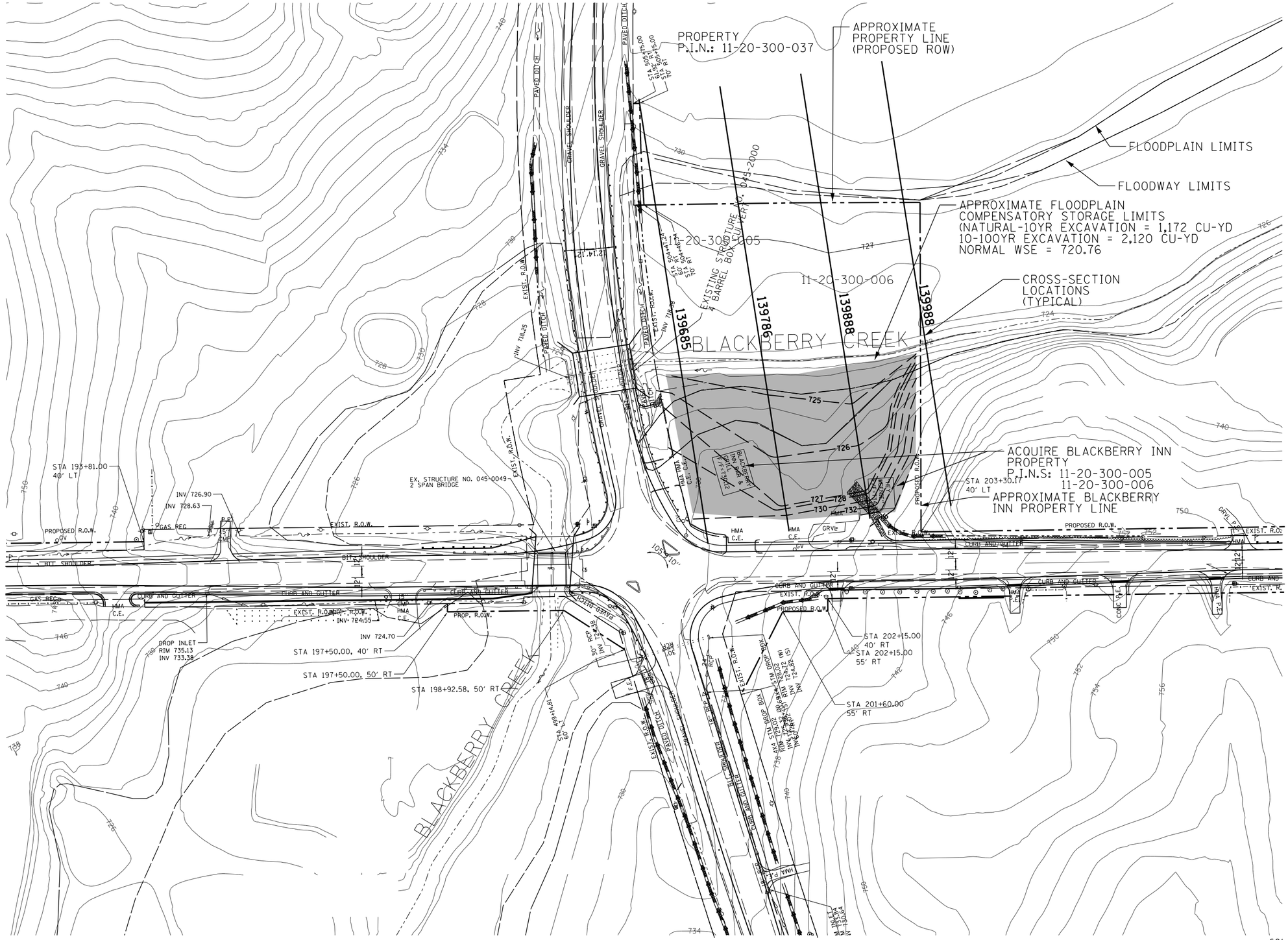

FLOODPLAIN
FLOODWAY
FLOODWAY
DECK ELEVATION = 733.1
LOW CHORD = 730.1
100-yr WSE=728.62
10-YR WSE=726.61
10-YR TO 100-YR CUT =
85.6 SF X 67' = 5,735 CU-FT
NORMAL TO 10-YR CUT =
80.2 SF X 67' = 5,373 CU-FT
733.78
728.67
733.53
733.28
728.57
733.12
733.15
728.85
733.35
733.73
730.48
734.29
198+00
199+00
200+00
201+00



LEGEND

CROSS-SECTION	———
RIVER STATION	139988
PROPOSED CONTOUR	— — —

GRAPHIC SCALE

60′ 0 60′ 120′ 240′

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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

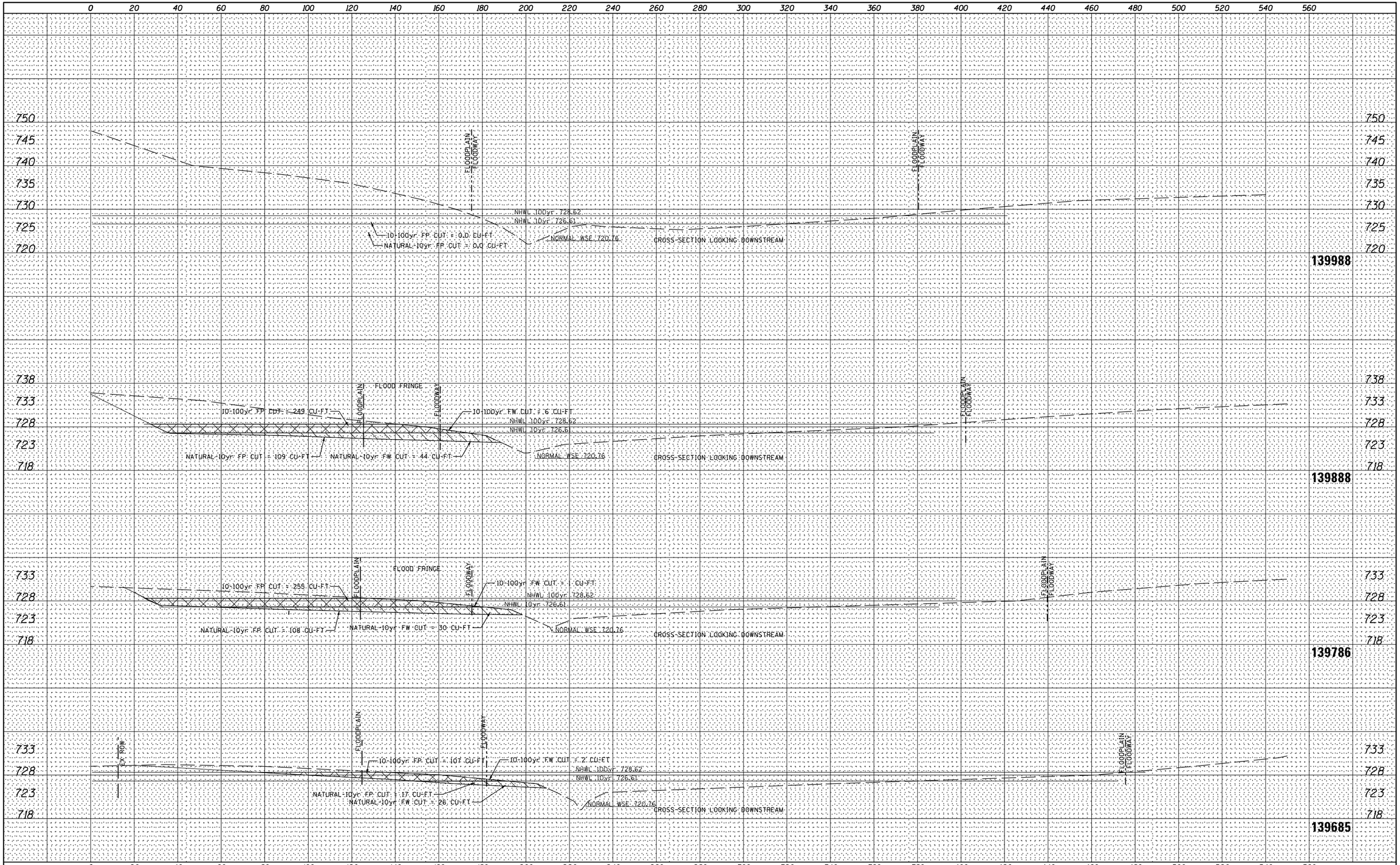
IL ROUTE 47 – MAIN ST
PROPOSED FLOODPLAIN COMPENSATORY STORAGE LOCATIONS

SCALE: 1"=60' | SHEET 1 OF 1 SHEETS | STA. | TO STA.

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		KANE	1	1
		CONTRACT NO.		
	ILLINOIS FED. AID PROJECT			

FINAL SURVEY		BY	DATE
NOTE BOOK	SURVEYED		
NO.	PLOTTED		
	TEMPLATE		
	AREAS		
	AREAS CHECKED		

ORIGINAL SURVEY		BY	DATE
NOTE BOOK	SURVEYED		
NO.	PLOTTED		
	TEMPLATE		
	AREAS		
	AREAS CHECKED		



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	PLOT DATE = 11/3/2014	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

IL ROUTE 47 – MAIN ST
PROPOSED FLOODPLAIN COMPENSATORY STORAGE

SCALE: 1"=40' | SHEET 1 OF 3 SHEETS | STA. 139685 | TO STA. 139988

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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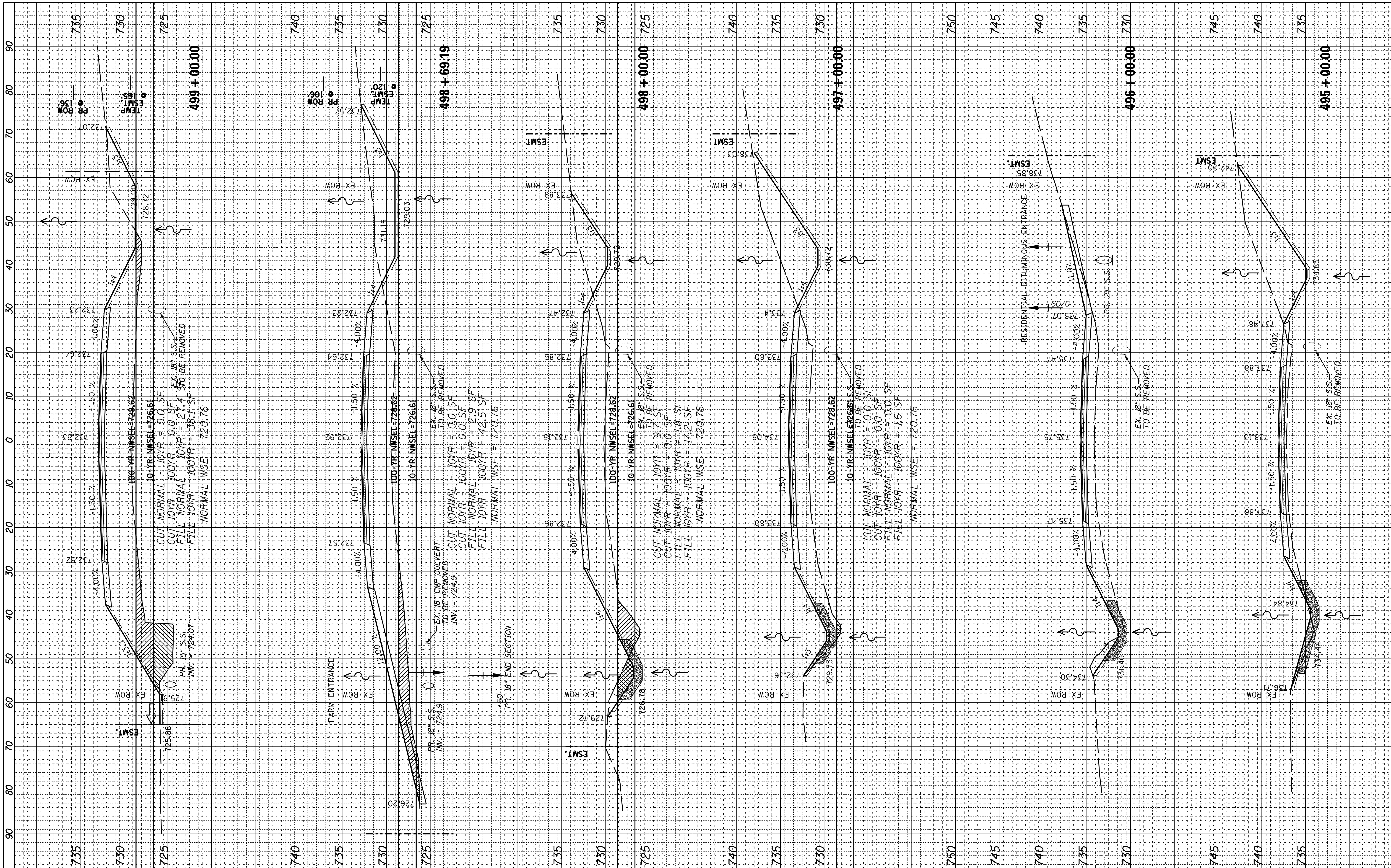
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		



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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

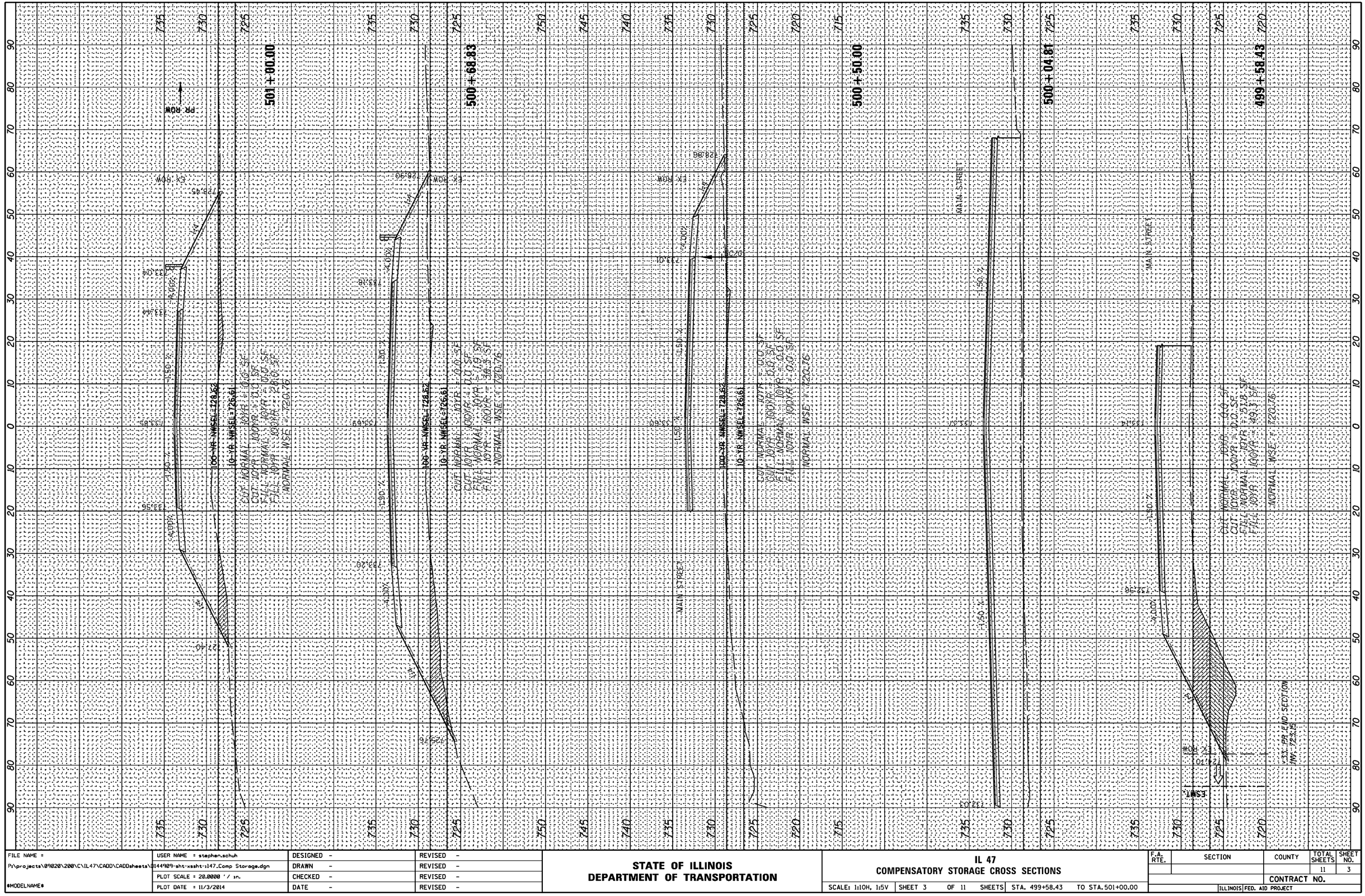
IL 47
COMPENSATORY STORAGE CROSS SECTIONS

SCALE: 1:10H, 1:5V | SHEET 2 OF 11 SHEETS | STA. 495+00.00 TO STA. 499+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		KANE	11	2
		CONTRACT NO.		
		ILLINOIS FED. AID PROJECT		

FINAL SURVEY
NOTE BOOK
NO.
SURVEYED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
BY
DATE

ORIGINAL SURVEY
NOTE BOOK
NO.
SURVEYED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
BY
DATE



CUT NORMAL - 10YR = 0.0 SF
CUT 10YR - 100YR = 0.0 SF
FILL NORMAL - 10YR = 0.0 SF
FILL 10YR - 100YR = 28.0 SF
NORMAL WSE = 720.76

CUT NORMAL - 10YR = 0.0 SF
CUT 10YR - 100YR = 0.0 SF
FILL NORMAL - 10YR = 1.9 SF
FILL 10YR - 100YR = 38.3 SF
NORMAL WSE = 720.76

CUT NORMAL - 10YR = 0.0 SF
CUT 10YR - 100YR = 0.0 SF
FILL NORMAL - 10YR = 0.0 SF
FILL 10YR - 100YR = 0.0 SF
NORMAL WSE = 720.76

CUT NORMAL - 10YR = 0.0 SF
CUT 10YR - 100YR = 0.0 SF
FILL NORMAL - 10YR = 51.8 SF
FILL 10YR - 100YR = 49.3 SF
NORMAL WSE = 720.76

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$MODELNAME$	PLOT DATE = 11/3/2014	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

IL 47
COMPENSATORY STORAGE CROSS SECTIONS

SCALE: 1:10H, 1:5V | SHEET 3 OF 11 SHEETS | STA. 499+58.43 TO STA. 501+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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		CONTRACT NO.		
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FINAL SURVEY		BY	DATE
NOTE BOOK	SURVEYED		
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	AREAS CHECKED		

ORIGINAL SURVEY		BY	DATE
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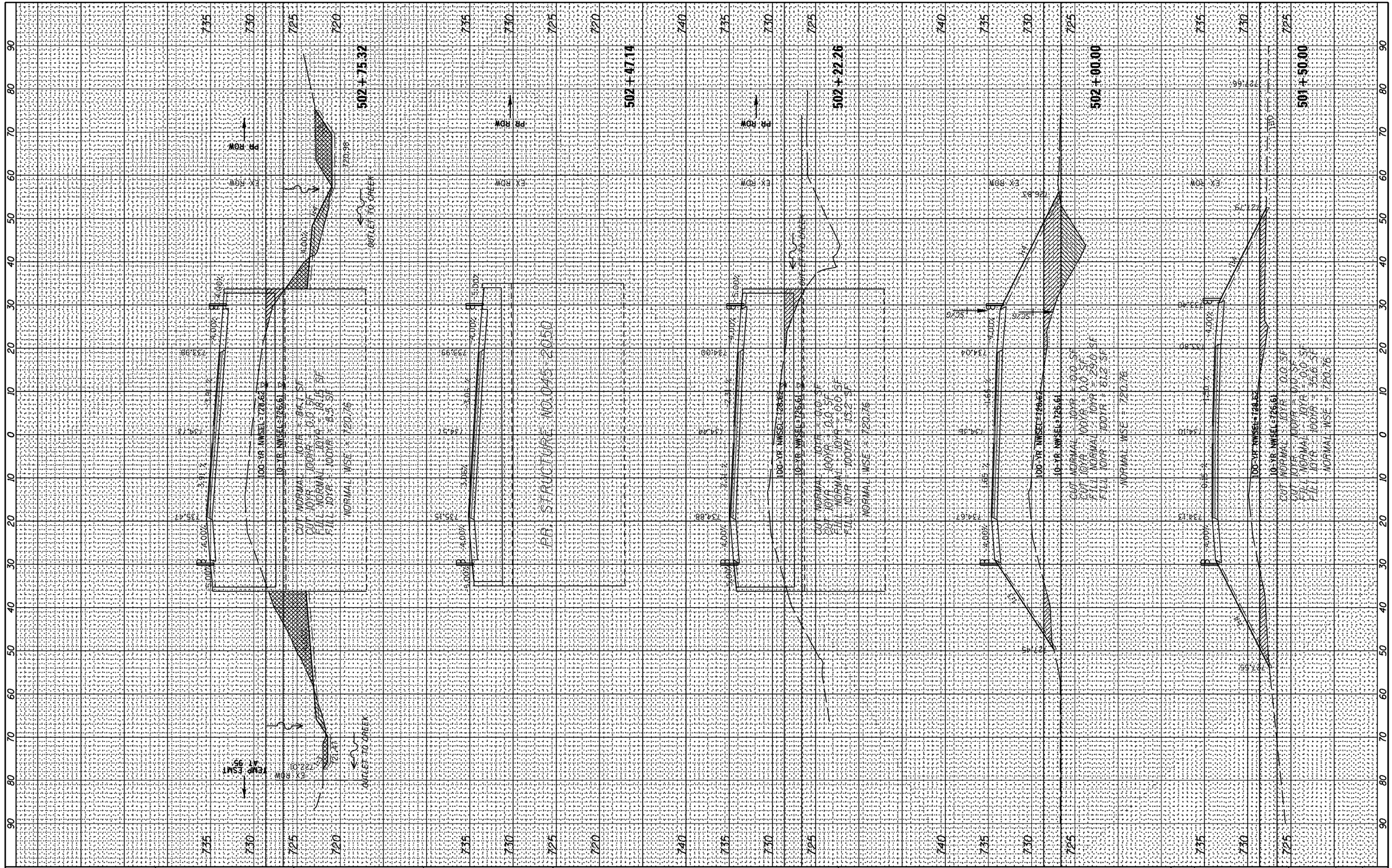
	AREAS		
	AREAS CHECKED		



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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

IL 47
COMPENSATORY STORAGE CROSS SECTIONS

SCALE: 1:10H, 1:5 | SHEET 4 OF 11 SHEETS | STA. 501+50.00 TO STA. 502+88.33

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			11	4
		CONTRACT NO.		
	ILLINOIS FED. AID PROJECT			

FINAL SURVEY		BY	DATE
NOTE BOOK	SURVEYED		
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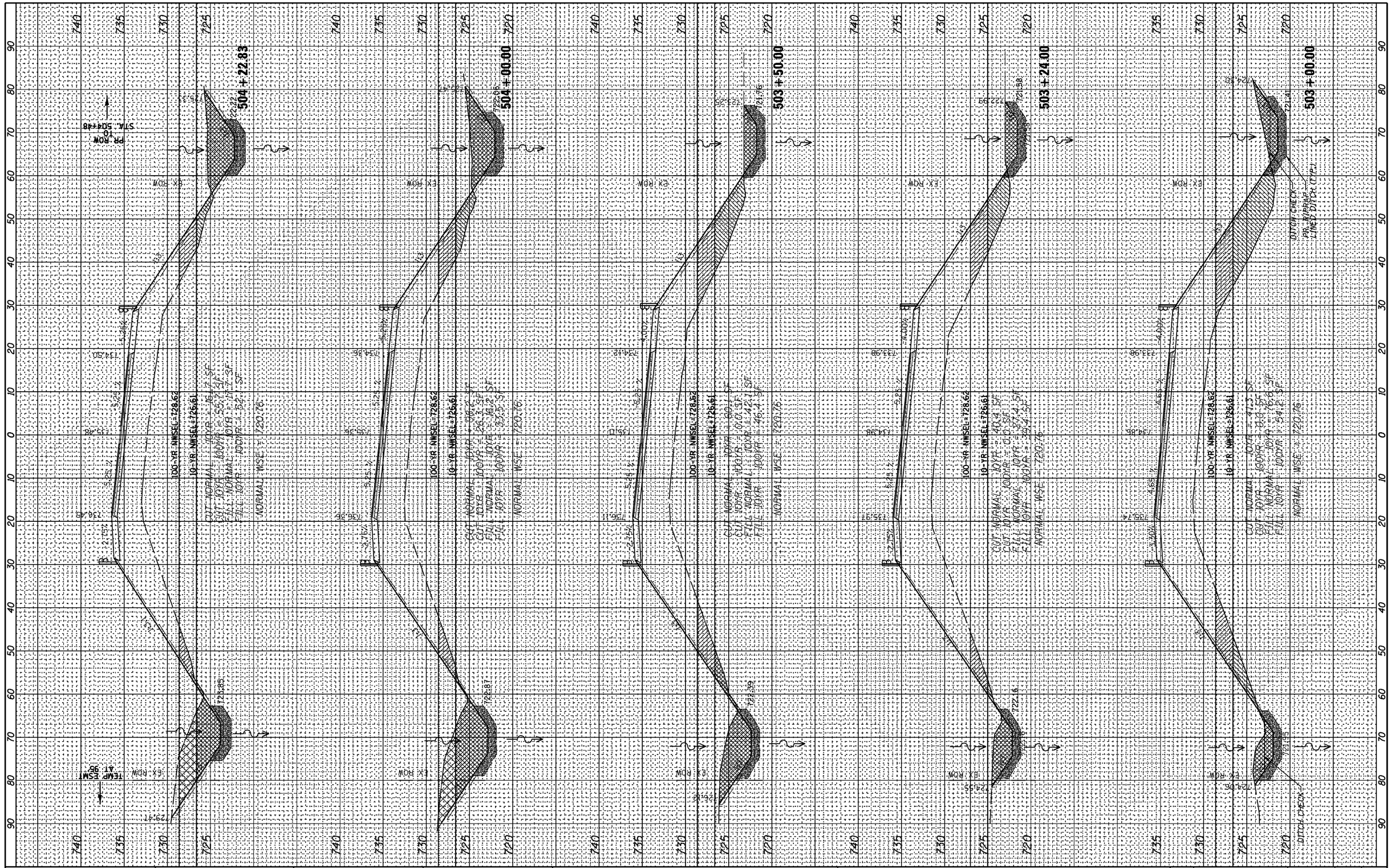
	TEMPLATE		
	AREAS		
	AREAS CHECKED		

ORIGINAL SURVEY		BY	DATE
NOTE BOOK	SURVEYED		
NO.	PLOTTED		
	TEMPLATE		
	AREAS		
	AREAS CHECKED		



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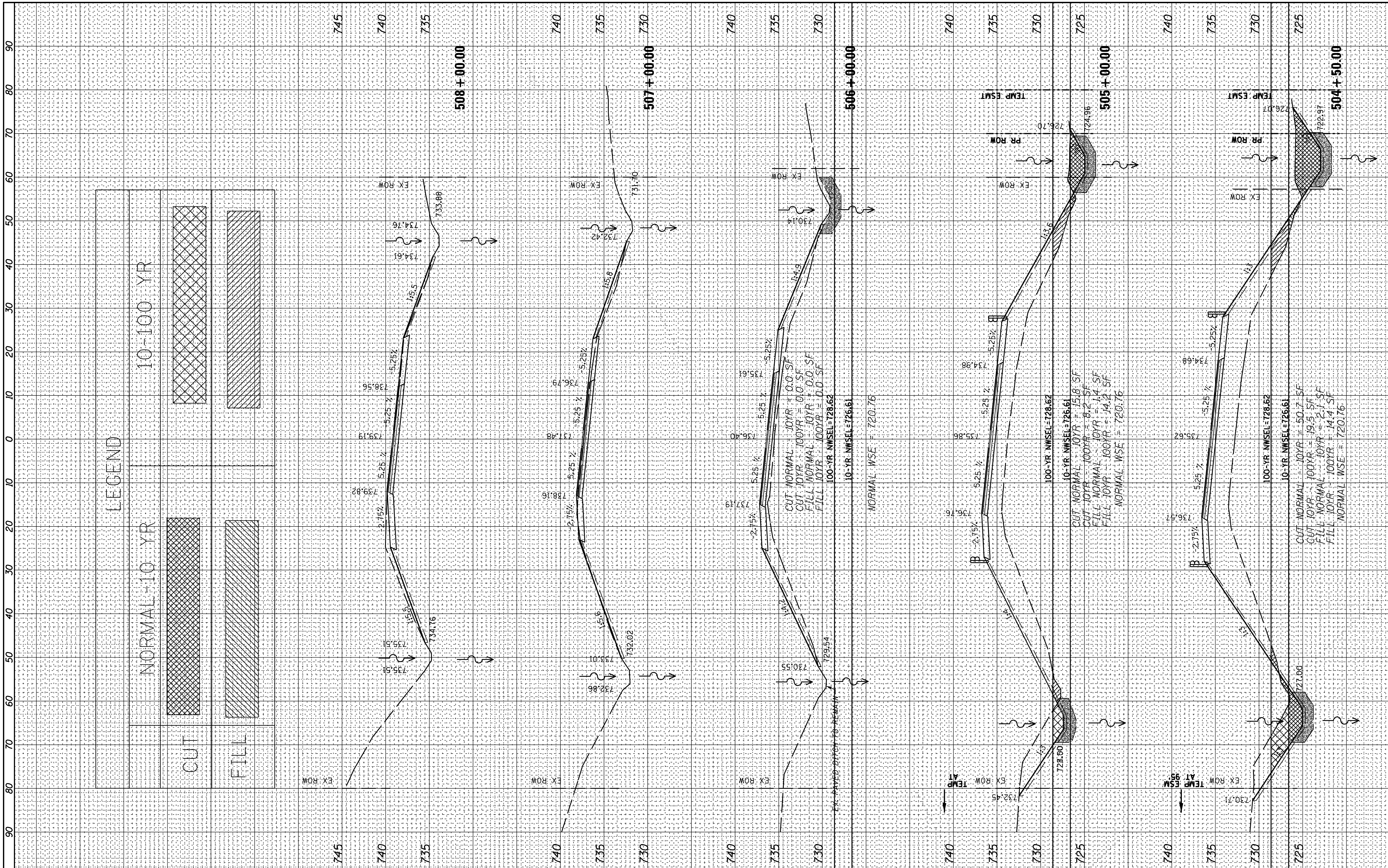
		DRAWN -	REVISED -
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
$MODELNAME$	PLOT DATE = 11/3/2014	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

IL 47
COMPENSATORY STORAGE CROSS SECTIONS

SCALE: 1:10H, 1:5V | SHEET 5 OF 11 SHEETS | STA. 503+00.00 TO STA. 504+22.83

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			11	5
		CONTRACT NO.		
	ILLINOIS FED. AID PROJECT			



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	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
$MODELNAME$	PLOT DATE = 11/3/2014	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

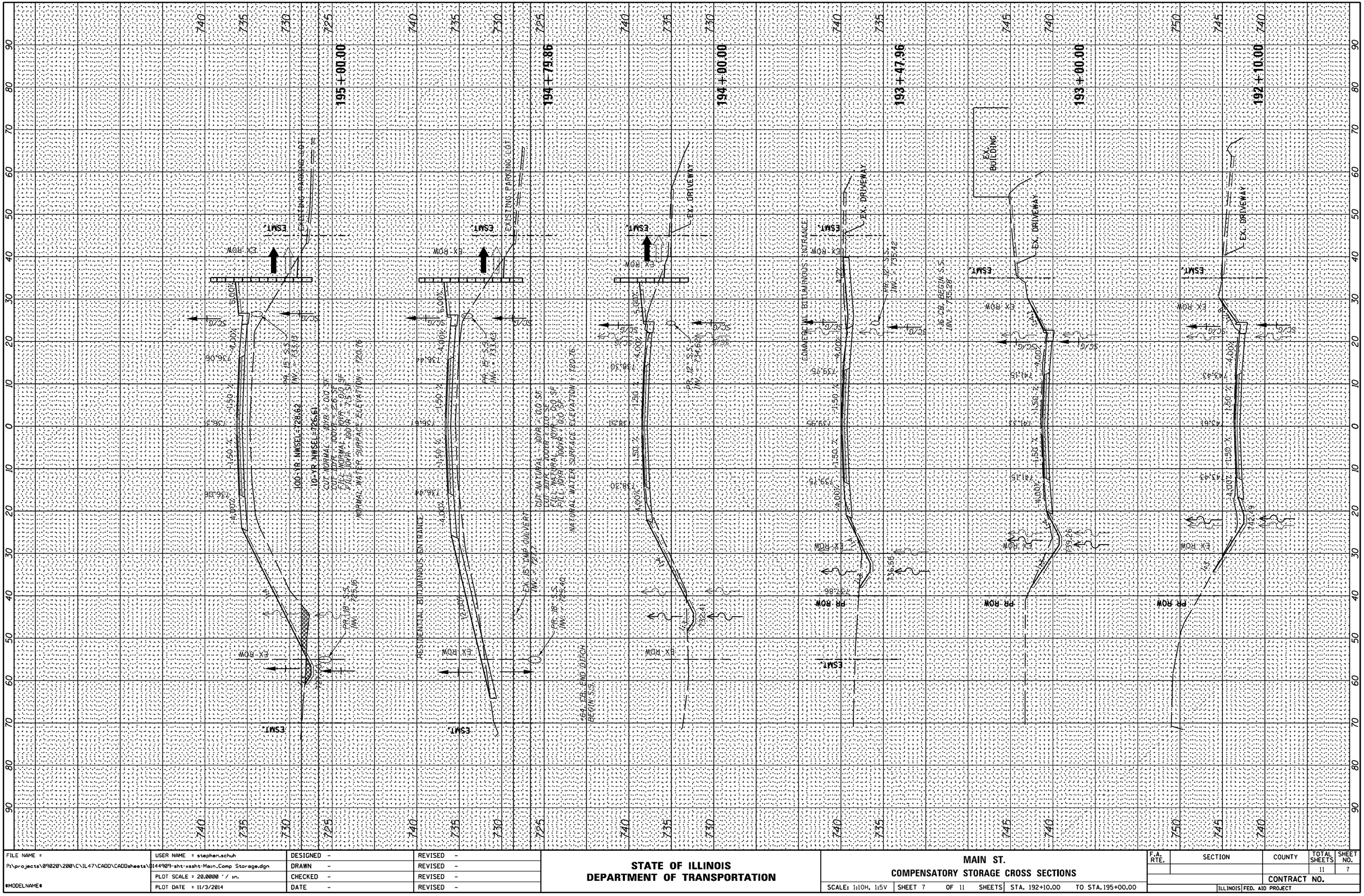
IL 47
COMPENSATORY STORAGE CROSS SECTIONS

SCALE: 1:10H, 1:5V | SHEET 6 OF 11 SHEETS | STA. 504+50.00 TO STA. 508+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			11	6
		CONTRACT NO.		
	ILLINOIS	FED. AID PROJECT		

FINAL SURVEY		BY	DATE
NOTE BOOK	SURVEYED		
NO.	PLOTTED		
	TEMPLATE		
	AREAS		
	AREAS CHECKED		

ORIGINAL SURVEY		BY	DATE
NOTE BOOK	SURVEYED		
NO.	PLOTTED		
	TEMPLATE		
	AREAS		
	AREAS CHECKED		



FILE NAME =	USER NAME = stephen.schuh	DESIGNED -	REVISED -
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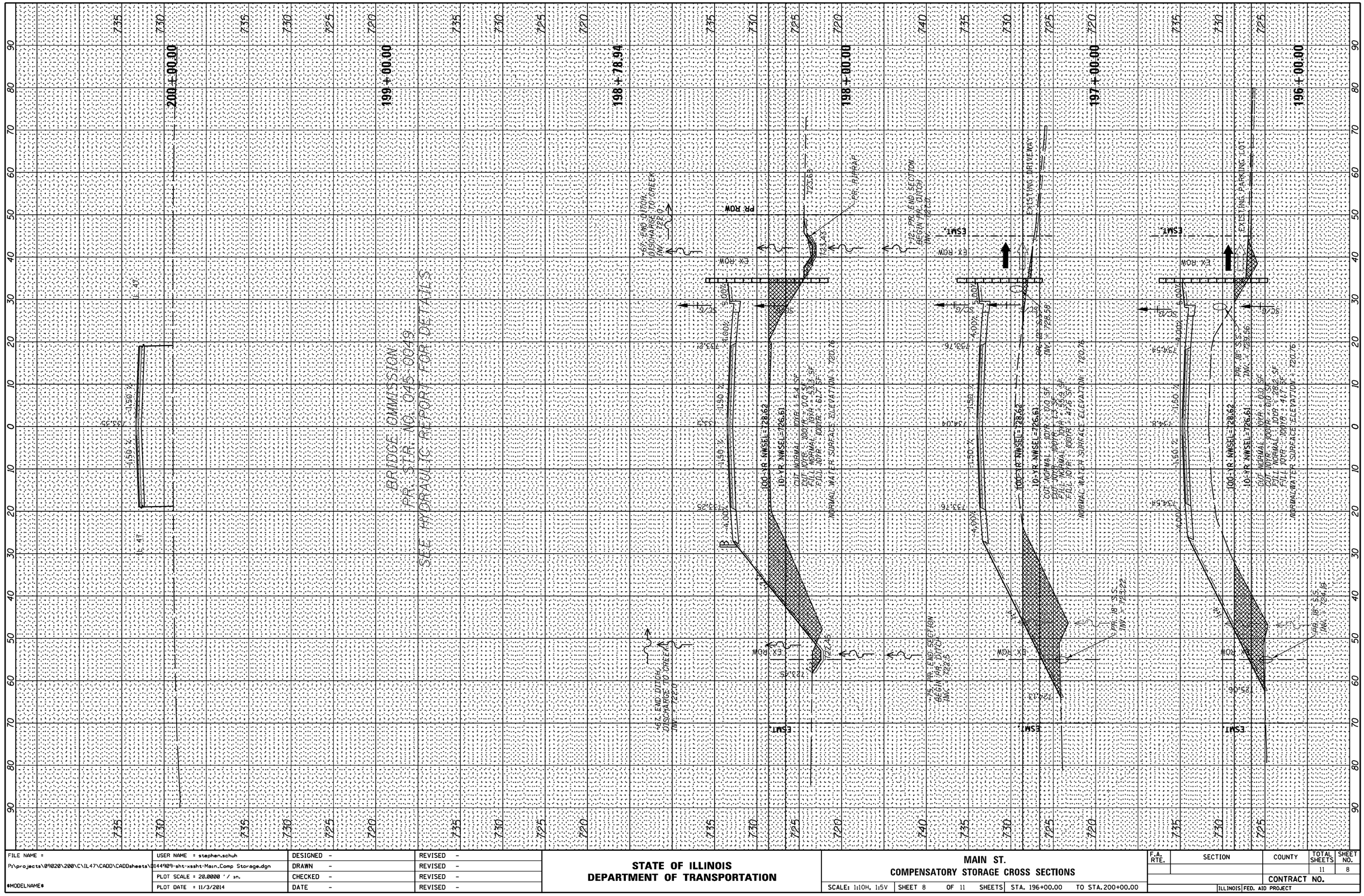
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
$MODELNAME$	PLOT DATE = 11/3/2014	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

MAIN ST.
COMPENSATORY STORAGE CROSS SECTIONS

SCALE: 1:10H, 1:5V | SHEET 7 OF 11 SHEETS | STA. 192+10.00 TO STA. 195+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			11	7
		CONTRACT NO.		
	ILLINOIS FED. AID PROJECT			



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	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
$MODELNAME$	PLOT DATE = 11/3/2014	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

MAIN ST.
COMPENSATORY STORAGE CROSS SECTIONS

SCALE: 1:10H, 1:5V | SHEET 8 OF 11 SHEETS | STA. 196+00.00 TO STA. 200+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			11	8

CONTRACT NO.

ILLINOIS | FED. AID PROJECT

20. SURVEY NOTES

The survey was completed in March of 2010 and the survey is too large to include in this printout. Please see Section 23, Compact Disc for the field notes and point files.

21. ESTIMATED WATER SURFACE ELEVATION

The estimated water surface elevation was obtained during the cross-section survey in March 2010. There is no gauge data available for this location.

Illinois Department of Transportation

Informal Transmittal

To:	P Harmet / J Baczek / S Schilke / R Wojcik / T walloch
Bureau:	Programming
Attn:	S Wilson / A Dilacova Maint.

From:	R Tollefson
Bureau:	Maint
Subject:	IL 47 at MainStreet
	P-91-449-09

Date:	5/26/2010

Please check appropriate box below:

- ☐ Take Necessary Action
- ☐ For Your Comments
- ☒ Per Your Request
- ☐ For Your Approval
- ☒ For Your Information
- ☐ See Me About the Attached
- ☐ Draft (Letter)(Memo) For My signature
- ☐ Reply
- ☐ Return
- ☐ Route
- ☐ File

Message

This area has had flooding on numerous occasions. All lanes will be covered on Rt47 just North Of Main St and at the intersection. The creek at this area passes under Rt47 makes a dog leg turn to the south then passes under Main St. The creek has large deposits of silt /gravel on the east side of Rt47, between Rt47 and Main St., and on the south side of Main St. It's possible that the dog leg that is between Rt47 and Main St. is a very large deposit but I'm not sure of that.

R Tollefson
Signature

Copies to

Response

Section 22
Correspondence -
Drainage Issue Memo and Report

Signature

ILLINOIS DEPARTMENT OF TRANSPORTATION
DISTRICT ONE
OPERATIONS AND COMMUNICATIONS CENTER
INCIDENT REPORT

5

TIME/DATE RECEIVED– 0610 hrs - Friday 6-24-94

INFORMANT– Kane Co.

SUBJECT– Flooding

LOCATION– RT 47 & Main

LOAD/WEIGHT/TYPE(FOR TRUCKS)

PUBLIC/MEDIA EMERGENCY INFORMATION DISTRIBUTION

FOR EACH ENTER TIME OR N/A

CONGESTION LIMITS DUE TO INCIDENT

CRT

HAR **CMS**

DOT-INFO EXT#

SPRINGFIELD NOTIFIED (WHO/TIME)

FAX TO SPFLD.(TIME)

DETAILS AND NOTIFICATIONS

0610 hrs - Control notified RC 532.
0729 hrs - Control was advised by RC 532 that the above location is passable and has been signed.

VEHICLE INFO:

EMC #

DRIVER/OWNER NAME:

PLATE # **STATE:**

ADDRESS:

CITY: **STATE:**

ACCIDENT RPT. #

COMMERCIAL RPT(METAL COIL):

#

VERIFIED: RC 533 1008hrs 6-24-94

COPIES SENT TO:

AKEMANN, FONDA, MCDERMOTT, SABOURIN, WANG

COMMUNICATIONS SPECIALIST(S)

AIJ

INCIDENT REPORT #

94 – 2606

TAKAHASHI 3/92 UPDATED 4/94

5

3-20-2010
RNL/RH
32° ↑ SNOW

NOTE: RESIDENCE
WATER CRESTED ROADWAY
(2) TIMES IN 34 YEARS.
43 W 659 MAIN ST

TALK TO RESIDENCE HE SAID
IN THE 34 YEARS HE LIVED @
ABOVE ADDRESS THE CREEK
CRESTED THE ROADWAY @
I-47 & MAIN ST (2) TIMES
NOT REMEMBER DATES:

Section 22
Correspondence-
Surveyor's Note of
Flooding Issues

Stephen Schuh

From: Ross, Peter
Sent: Wednesday, November 02, 2011 2:35 PM
To: stephen.schuh@gec-group.com
Cc: Wine, Chris; Liliensiek, Thomas
Subject: EM_TENG_PFR_Main Street over Blackberry Creek Elevations_11022011
Attachments: image001.png; CA_TENG_TCG_Main Street over Blackberry Creek Elevations_11022011.pdf

Stephen:

The attached drawing shows low chord elevations, deck corners and the face of the Main Street structure. At this point, the elevations represent the minimums based on our hydraulic model and use of 21" deck beams + 5" wearing surface. Note that a deck beam bridge would be rectangular in shape due to the use of deck beams.

The minimum centerline profile elevations are for your use in developing the final Main Street profile. We understand that there may be other factors in developing the profile, such as constraints along Main Street away from the bridge and the intersection elevation relative to the upstream structure. So long as the final profile is kept at or above these minimums, the Main Street structure will meet is design intent. Please pass along the final profile when it is available. We will use it in completing our PNP for the BCR and PBDHR for the Main Street structure.

Let me know of any questions or concerns that you may have.

Regards,
Pete

TENG
An exp Company

Peter Ross, P.E.
Project Manager | Civil Engineer
Teng & Associates, Inc.
t: +1.312.616.7523 f: +1.312.616.6069
205 North Michigan Avenue, Suite 3600
Chicago, Illinois 60601
USA

Section 22
Correspondence - TENG email with Proposed Main St. Bridge Elevations

Illinois Department of Transportation
201 West Center Court
Schaumburg, IL 60196-1096

Informal Transmittal

FROM: TO:

To:	Abdul Dahhan
Bureau:	Materials
Attn:	Ed Frank

From:	Pete Harmet/John Baczek/Steve Schilke
Bureau:	Programming/Project Studies/ CSU
From:	Terry Walloch
Subject:	IL 47 AT MAIN ST (S/O ELBURN)
	P-91-449-09

Date:	May 10, 2011

Please check appropriate box below:

- ☒ Take Necessary Action
- ☒ For Your Comments
- ☐ Per Your Request
- ☒ For Your Approval
- ☐ For Your Information
- ☐ See Me About the Attached
- ☐ Draft (Letter)(Memo) For My signature
- ☐ Reply
- ☐ Return
- ☐ Route
- ☐ File

Message

We are exploring replacing the culvert on IL 47 just north of Main Street (see attached map) with a bridge. We are requesting any existing soil data that is available near this culvert.

Thank you,

DEPT. OF TRANSPORTATION
MAY 11 2011
DISTRICT 1-MATERIALS

Section 22
Correspondence - IDOT Soil Boring Log for Main St Bridge, 1974

Copies to file

Response

We have no borings at the culvert. Attached are two copies each of borings for the bridge on Main St. over Blackberry Ck, just west of IL 47. Not the best borings, only one boring extends to 31½ ft.

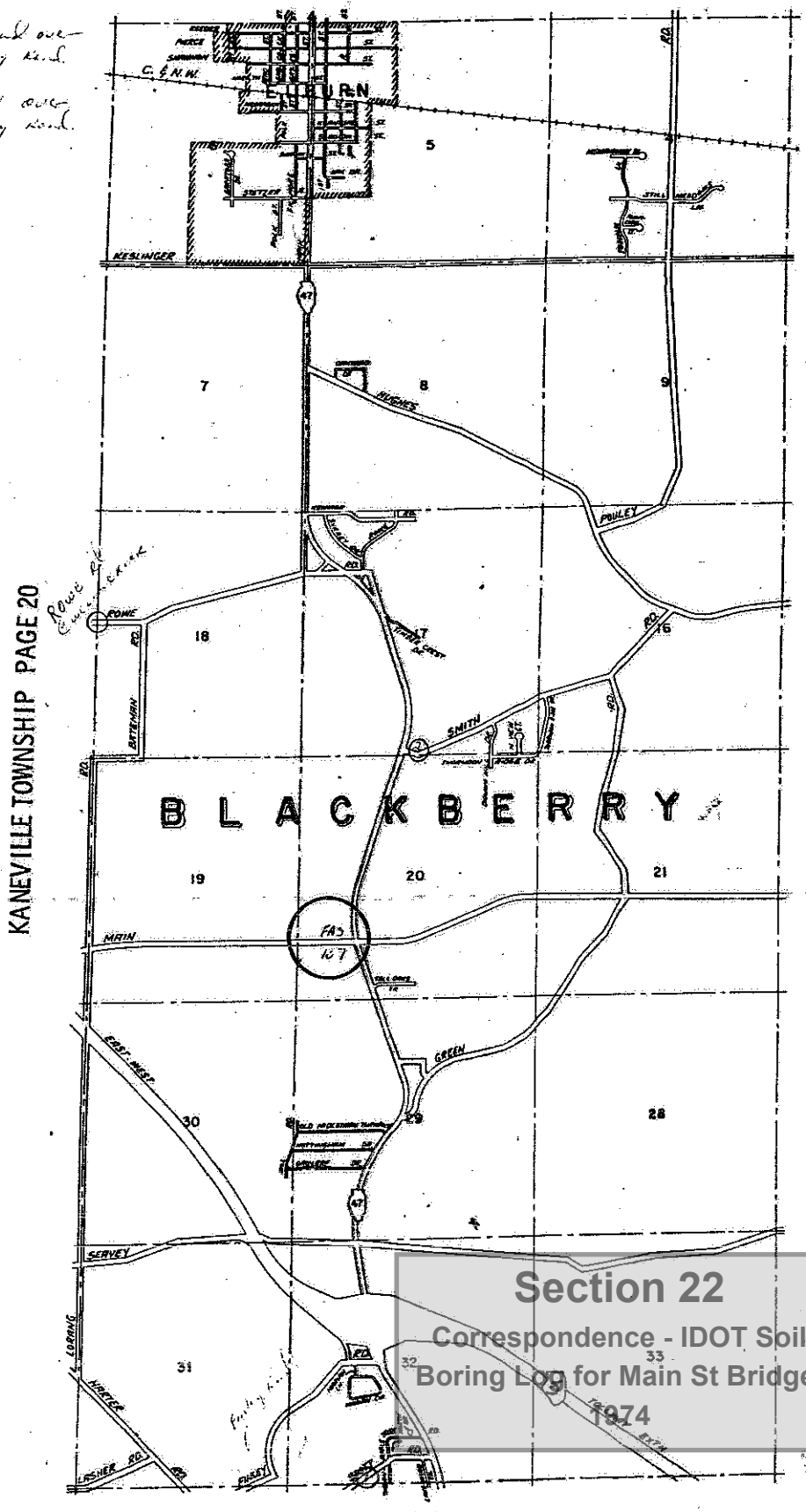
Ed Frank 5/13/2011
Signature

transmem - Revised 2/19/98

W. ½ T.39N. R.7E. AREA II

CAMPTON TOWNSHIP PAGE 15

1. SCOTT road over Blackberry Creek
2. Smith Rd over Blackberry Creek



KANEVILLE TOWNSHIP PAGE 20

BLACKBERRY TOWNSHIP PAGE 22

SUGAR GROVE TOWNSHIP PAGE 27

BLACKBERRY

October 11, 1974

Bridge & Traffic Structure
FAS Route 107
Section 50 BR
Kane County
FAS Route 107 over Blackberry Creek

Mr. W. E. Baumann
Engineer of Design
Administration Building - Room 331
2300 South Dirksen Parkway
Springfield, Illinois 62764

Dear Mr. Baumann,

I am submitting herewith three foundation borings for the above captioned section. This structure is located in the northwest one-quarter of the southwest one-quarter of Section 20, Township 39 North, Range 7 East, Kane County.

The benchmark used is an "X" on the northwest wingwall of the existing bridge, Main Street over Blackberry Creek. The elevation is 728.16.

The existing structure is to be widened approximately 3 feet on each side. The existing west approach shows no signs of distress, even though the roadway has been constructed over fill and/or alluvial soils. Since the footing elevation will be below the stream-bed elevation of 718±, no stability problems are anticipated.

Very truly yours,

Sigmund Ziejewski
District Engineer

by: M. J. Tauchen
M. J. Tauchen
District Quality Control Engineer

DHK/bgt

cc: Project Group III, G. Burseth
File

FORM NO. S. D. 107 REV. 8-65 Sh. 1 of 1 Sh.

BRIDGE FOUNDATION BORING LOG

PROJECT

ROUTE FAS 107

SEC. 50 BR

COUNTY Kane

BRIDGE Main Street over Blackberry Creek

STA. 148 + 50

Date July 24, 1974

Bored By J. R. WASHBURN

Checked By D. H. KRAMER

Boring No. B-1

Station 148 + 30 ℄ FAS 107

Offset 13' Lt. ℄ Survey

Surface Water El. ——

Groundwater El. at Completion ——

After 24 Hours 722.53

Elevation	N	Qu t/s.f.	w (%)
Ground Surface 727.72			
0			
STIFF BROWN CLAY LOAM FILL			21
722.72			
-5			
MEDIUM STIFF BLACK ALLUVIAL CLAY (Pushed)			
717.72			
-10			
LOOSE BLACK SAND LOAM	7		28
715.72			
MEDIUM-GRAY SANDY GRAVEL	25		
-15			
711.22	24		
Auger string broke. Had to abandon hole.			
-20			
-25			
-30			
-35			
-40			
-45			

– Standard Penetration Test – ows per foot to drive 2" D. Split Spoon Sampler 12" with 0# 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

BRIDGE FOUNDATION BORING LOG

PROJECT

ROUTE FAS 107

SEC. 50 BR

COUNTY Kane

BRIDGE Main Street over Blackberry Creek

STA. 148 + 50

Date August 26, 1974

Bored By J. R. WASHBURN

Checked By D. H. KRAMER

Boring No. B-2
Station 148 + 27.5 ℄ FAS 107
Offset 47' Rt. ℄ of Survey

Surface Water El. —

Groundwater El. at Completion —

After 24 Hours 721.46

Ground Surface 723.96	Elevation	N	Qu t/s.f.	w (%)
FILL-CREEK -- dredgings & alluvial wash, SAND & CLAY	0			
	-5			
717.96				
MEDIUM-DENSE SAND				97
		18		
	-10			
		21		
709.96		10		
DENSE BROWN SANDY GRAVEL	-15			
707.46		26		
VERY STIFF BROWN SILTY CLAY (TILL)				
		38	B 3.72	11
704.46	-20			
MEDIUM-DENSE BROWN SANDY GRAVEL				
		24		
701.96				

	Elevation	N	Qu t/s.f.	w (%)
VERY DENSE BROWN SANDY GRAVEL				
		69		
	-25			
		110		
		158		
	-30			
692.46		86		
Bottom of Boring				
	-35			
	-40			
	-45			

– Standard Penetration Test –
ows per foot to drive 2"
D. Split Spoon Sampler 12" with
0# 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

FORM NO. 9. D. 137 REV. 8-60

BRIDGE FOUNDATION BORING LOG

PROJECT

ROUTE FAS 107

SEC. 50 BR

COUNTY Kane

BRIDGE Main Street over Blackberry Creek

STA. 148 + 50

Date August 29, 1974

Bored By J. R. WASHBURN

Checked By D. KRAMER

Boring No. B-3
Station 148 +90 ℄ FAS 107
Offset 26.5 Lt. ℄ Survey

Surface Water El.

Groundwater El. at Completion

After ____ Hours

Elevation	N	Qu t/s.f.	w (%)
Ground Surface 727.30			
0			
BLACK CLAY TOPSOIL 726.80			
BROWN SANDY GRAVEL FILL 725.80			
STIFF BROWN CLAY FILL		1.50	19
-5			
722.30			
BLACK SILTY CLAY LOAM TOPSOIL Pushed		.75	51
720.30			
MEDIUM-DENSE GRAY SANDY GRAVEL	24		
717.80			
-10			
DENSE GRAY SANDY GRAVEL	33		
714.80			
Bottom of Boring (Flowing Sand)			
-15			
-20			
-25			
-30			
-35			
-40			
-45			

– Standard Penetration Test –
ows per foot to drive 2"
D. Split Spoon Sampler 12" with
0# 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

Illinois Department of Transportation

Memorandum

To:	Diane M. O'Keefe, District 1	Attn: Christopher J. Holt
From:	D. Carl Puzey	By: Jayme F. Schiff
Subject:	BRIDGE CONDITION REPORT APPROVAL	
Date:	February 22, 2012	

Highway Bridge Program
Kane County
Section 08-00385-00-BR

SN 045-0049

F.A.S. 107 (Main Street) over Blackberry Creek

The Bridge Condition Report for the above-designated bridge replacement project is hereby approved. This approval is based on concurrence from the FHWA, in their January 18, 2012 correspondence, for the use of Highway Bridge Program funding for complete replacement of the structure.

Please note approval of the project is contingent on approval by others of the proposed geometry, obtaining environmental signoffs, and any required historic structure coordination and other approvals required by statutes or the policies of the Department.

One copy of the approved report is being returned and we will retain one copy for our files. If you have any questions, contact Jim Klein at 217/782-5928 or Matt Humke at 217/782-5929.

MDH/kkt0450049-20120222

Illinois Department of Transportation

Memorandum

To:	John A. Fortmann, District 1	Attn: Peter E. Harmet
From:	D. Carl Puzey	By: David Greifzu
Subject:	Bridges and Structures	
Date:	May 3, 2013	David L. Greifzu (cmc)

F.A.P. Route 326
Kane County

P-91-449-09
S.N. 045-2000

Illinois Route 47 over Blackberry Creek

We received the Bridge Condition Report (BCR) for the subject structure, which was submitted with your memorandum dated March 8, 2013. The report recommends a total replacement of the existing four cell box culvert due to the significant roadway improvements and the inadequate waterway opening of the existing culvert.

After reviewing the report and the existing plans, we have the following comments:

1. We have no objection with your recommendation to replace the existing structure.

2. We concur that stage construction appears feasible. The actual details will be subject to further investigation during the development of TS&L plans.

3. We have no objection with the proposed structure width, in order to accommodate 2-12 foot lanes, 2-10 foot shoulders and a 14 foot median. Please verify if the 10 foot shoulder includes only 8 foot of the paved shoulder would be carried across a bridge-type structure.

4. The structure type and length is subject to refinement during the development of TS&L plans. We recommend a larger multi-barrel box culvert and a multiple-span three sided precast bridge be investigated during the TS&L plan development stage. These buried structures offer better long term maintenance costs for the department. In addition, from a safety point of view, there is less icing problems with a buried structure versus a bridge. We will review the estimated cost of construction for both buried structure types and the bridge. The total cost for all of the structure options will need to be compiled. This should include the cost to raise the roadway to varying degrees for each option.

5. Please contact your District Geotechnical Engineer as boring data will be required at this structure. The Foundations and Geotechnical Unit can be contacted if assistance is needed regarding substructure exploration requirements or if any existing boring or foundation data is required.

The Bridge Condition Report is approved subject, to these comments.

Please note that a TS&L plan, a structure report, a refined hydraulic report and a structure geotechnical report will be required.

Please contact Marcus Christensen at (217) 785-2916 with questions pertaining to this project.

TAC/MKC/kkt0452000-20130503

Section 22

Correspondence - IDOT Approval of IL 47 BCR