Hydraulic and Hydrological Study
for
I-75 Reversible Lanes (Bridge #16 & #17)
over
Hope Creek & Rottenwood Creek

Project Number: NH000-0073-03(242)
P.I. No. 714130

<u>Community & FEMA Coordination Required</u>
City of Marietta & Cobb County, Georgia
Community No.: 130226 & 130052

November 2009

Prepared by

PBSJ

1600 RiverEdge Pkwy, Suite 600
Atlanta, GA 30328

for
Georgia Transportation Partners
Atlanta, Georgia

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GEORGIA REGISTERED No. 030078 PROFESSIONAL ENGINEER CYNTHIA M. MATYAS

11/30/09

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Section 1:
Hydraulic and Hydrological Report

relate to project stations

How much will the creek be realigned? Where will it be located? How will this reduce impacts? Show on roadway plan more clear

Project Location and Description

The crossing of the I-75 Reversible Lanes over Hope Creek and Rottenwood Creek is located in the city of Marietta, Cobb County, Georgia. The proposed new alignment consists of two bridges (Bridge #16 and #17) which cross Hope Creek longitudinally and transversely crosses Rottenwood Creek at the Hope Creek confluence. The proposed alignment is located on the west side of I-75, approximately 20 feet or less west of the existing I-75 edge of shoulder and is within a designated regulatory floodway. As part of this project, Hope Creek will be re-aligned from River Station 2650 through 4080 to reduce impacts by the piers at Bridge #17. The proposed alignment crossing occurs in an area that is heavily vegetated with large specimen trees and dense underbrush. While there is no development within the immediate floodplain, there is commercial and multi-residential units located along the western floodplain edge approximately 100 ft west of the proposed bridge alignments. The eastern floodplain edge is defined by I-75. Roadway embankment fill contained within MSE walls will connect Bridge #16 and #17. This roadway section is within the floodplain.

Proposed Condition

The proposed bridge #16 structure is to be a 1120'-0" long by 39'-3" wide, out-to-out, PSC beam bridge with concrete hammerhead piers and MSE wall abutments. All bents are positioned at 90 degrees to the roadway centerline and with the exception of Span #1 are perpendicular to the channel and direction of flow. Span #1 at Bridge #16 spans the I-75 culvert inlet of Rottenwood Creek and the Hope Creek confluence. All spans are 140'-0" long. The proposed bridge will be 36'-0" wide gutter to gutter and consists of two 12'-0" travel lanes with a 2'-0" inside shoulder and 10'-0" outside shoulder. The minimum low chord elevation is 950.07 feet and the minimum roadway elevation is 957.24 feet. The proposed bridge #16 is the minimum length required to reduce impacts to the designated regulatory floodway and associated floodplain.

Span 2?

The proposed bridge #17 structure is to be a 5080'-0" long by 39'-3" wide, out-to-out, PSC beam bridge with concrete hammerhead piers and MSE wall abutments. All bents are positioned at 90 degrees to the roadway centerline and with the exception of Span #19 are perpendicular to the channel and direction of flow. Span #19 at Bridge #17 spans the I-75 culvert outlet of Hope Creek. All spans are 140'-0" long. The proposed bridge will be 36'-0" wide gutter to gutter and consists

of two 12'-0" travel lanes with a 2'-0" inside shoulder and 10'-0" outside shoulder. The minimum low chord elevation is 960.00 feet and the minimum roadway elevation is 967.18 feet. The proposed bridge #17 is the minimum length required to reduce impacts to the designated regulatory floodway and associated floodplain.

Proposed Alternatives

No alternate structures were considered for this site.

Method of Analysis for Proposed Bridge

Requirements and guidelines contained in the Georgia Department of Transportation's (GDOT) Drainage Design Manual, Chapters 2 & 14, were used in the preparation of this report. Cross-sectional information was derived from the Federal Emergency Management Agency (FEMA) data (HEC-2), supplemented with a field survey provided by PBS&J. Modeling and hydraulic analysis was performed with the HEC-RAS (Version 3.1.3, May 2005) program using the energy and momentum bridge modeling methods for the proposed bridges. Within the FEMA models the downstream boundary conditions were set as the normal depth using the hydraulic slope derived from USGS Quadrangle Topographical maps. For the corrected effective model and proposed models the downstream boundary conditions were set as the normal depth using the hydraulic slope derived from field survey data.

what about Rottenwood Ck. D.A.?

The drainage basin within the limits of the two proposed bridge crossings is approximately 832 acres (1.30 sq. mi.) and was measured from the USGS Quadrangle Topographical maps for Marietta and Sandy Springs, Georgia, in combination with FEMA data. The drainage area for this project site is located in Region 1. Discharges for the 10, 50, 100, and 500-year storms are detailed in the FEMA Summary of Discharges data which can be found in Section 4.

Manning "n" values were specified as 0.025 – 0.045 in the channel and 0.080 – 0.120 in the overbank areas and are based on the site assessment which agrees with FEMA data. In the proposed model the values at the left overbank were adjusted to properly model the changed condition after the bridges are introduced in the floodplain sections.

There is no design year ADT available for this site. However, per GDOT guidelines for an

interstate this ~~site~~ bridge has been designed to accommodate the 50-year storm and provide a minimum of 2 foot of freeboard. Also, the ~~site~~ bridge must provide a minimum of 1 foot of freeboard above the 100-yr storm.

FEMA Participation

This site is located in the City of Marietta, Cobb County, Georgia. Since this community participates in the National Flood Insurance Program (NFIP) administered by the Federal Emergency Management Agency (FEMA), all NFIP regulations apply. In particular, the NFIP regulation 60.3(d)(3), states that the community shall:

> *"Prohibit encroachments, including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analysis performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge..."*

Hope Creek and Rottenwood Creek have been previously studied by FEMA, and at the proposed crossing is designated as a Zone AE flood area. This site is also within a designated floodway. Due to the location of the proposed alignment of Bridge #16 and #17 it is necessary to encroach on the regulatory floodway, however the encroachment occurs within the project right-of-way. Consequently, the proposed bridges create an increase in the base flood elevations and floodway elevations. However they still meet GDOT hydraulic design criteria. In accordance with FEMA guidelines, community coordination ~~with~~ and FEMA ~~is~~ are required coordination for this site to revise the effective base flood elevations, floodway widths, and floodway elevations. This will also address the re-alignment of Hope Creek in the vicinity of Bridge #17. If the community agrees with the proposed changes to the floodway then a "Conditional Letter of Map Revision" (CLOMR) must be submitted to FEMA.

Model Development & Design Approach

The alignment of Bridge #16 and #17 crosses Hope Creek longitudinally. In order to model this scenario one-dimensionally each bent and span section that comes in contact with the creek was entered as a bridge crossing. Flow is subcritical and the proposed bridges do not constrict the ??

These calculations are to be done using GDOT discharges, survey, N values, etc. Floodplain & floodway elevations & encroachments are s

?? not applicable; therefore the energy and momentum methods were applied in the bridge analysis. For the purpose of calculating floodstage elevations, floodway elevations, velocities, scour, etc., three computer models were developed to simulate the 10-, 50-, 100-, 500-year storm events and 100-yr floodway using FEMA discharge data. The computer model simulations and corresponding electronic file names are summarized in the following Table 1. Each model is described in more detail below. Model data and comparison of all models to the published FIS data is in tabular format and can be found in Sections 6 & 7.

Table 1	**Model Runs and Corresponding File Names**	
Computer Model	**Simulation**	**Plan Name**
Duplicate Effective Model (HEC-RAS)	Multi-profile	ex fp
	Floodway	ex fw
Corrected Effective Model (HEC-RAS)	Multi-profile	Corrected Effective-ChanRealign 5Qs
	Floodway	Corrected Effective-ChanRealign
Proposed Model (HEC-RAS)	Multi-profile	Proposed Structure-ChanRealign 5Qs
	Floodway	Proposed Structure-ChanRealign

Duplicate Effective Model - The Duplicate Effective Model was created using the published FIS data from the 2008 FEMA study for the entire Hope Creek reach. The FEMA sections are named in reference to the distance of the corresponding section upstream of the confluence of Hope Creek with Rottenwood Creek. The HEC-RAS files provided by the County contained the multi-profile and floodway input information. In the duplicate effective multi-profile and floodway models, the downstream boundary condition was set as the normal depth using the hydraulic slope. The output data summary from the Duplicate Effective Model is provided in Section 6.

Corrected Effective (Existing Condition) Model - The Duplicate Effective HEC-RAS Model was updated and corrected to establish the Corrected Effective or Existing Condition Model. Adjustments were made to eliminate unnecessary cross sectional data. The cross sections in the Duplicate Effective Model were over 1000 ft long. therefore, geometry points beyond the floodplain boundaries (particulary on the east side of I-75) were removed. Also, the existing cross sections

were extremely high, in some places over 20 feet above the 500-yr water surface elevation. therefore, geometry points above this elevation were removed. Using field survey data obtained for this project, the model includes new cross-sectional data. Cross sectional data at River Sta. 2650 through 4080 was corrected to incorporate the proposed re-alignment of Hope Creek. The downstream boundary conditions were set as the normal depth using the hydraulic slope derived from field survey data. Profile data for the Corrected Effective Model is provided in Section 6.

Proposed Model - The Corrected Effective Model was altered to include the proposed bridge structures along with adjustments to the Manning "n" values at the bounding cross sections. Also, within the vicinity of Bridge #16 and #17 the Manning "n" values in the left overbank areas were reduced to 0.09 to reflect the cleared condition at these sections resulting from the bridge construction. Cross sectional data at River Sta. 1027.831 through 2354.325 was corrected to include the proposed roadway embankment being added between Bridge #16 and #17. Profile data for the Proposed Model is provided in Section 6.

Hydraulic Assessment for Proposed Structure

The 10-, 50-, 100- and 500-year events were modeled for the natural and proposed conditions using the HEC-RAS computer program. The proposed conditions model was run with the proposed bridge sections entered for Bridge #16 and #17 where bent locations actually crossed the creek. Not all bent locations at Bridge #16 cross or interact with Hope Creek, therefore only bents #6, #7 and #8 appear in the model. The area of opening, velocities, and floodstage elevations for the existing condition and proposed structure were calculated using the HEC-RAS modeling. This hydraulic data is detailed in Tables 2 & 3.

The proposed bridges ~~has~~ have been sized to provide 10 feet of setback from the abutment walls to edge of bank (where applicable) and provide 2 ft and 1 ft of freeboard at the 50-year and 100-year storm, respectively.

The mean velocities (or velocities thru the structure) at Bridge #16 for the 50 and 100-year storms are 5.20 ft/s and 5.39 ft/s, respectively. The 50 and 100-year storms create 0.40 feet and 0.37 ft, respectively, of backwater for the proposed bridge. Models indicate that Bridge #16 clears the 50,

100, and 500-year storms with no flow over the roadway.

The mean velocities (or velocities thru the structure) at Bridge #17 for the 50 and 100-year storms are 2.31 ft/s and 2.35 ft/s, respectively. The 50 and 100-year storms create 0.05 feet and 0.06 ft, respectively, of backwater for the proposed bridge. Models indicate that Bridge #17 clears the 50, 100, and 500-year storms with no flow over the roadway.

Maximum channel scour depths within the limits of Bridge #16 and #17 vary for the 100-year storm and 500-year storm. The maximum calculated total scour depth at Bridge #16 occurs at bents #6 and is 16.84 ft for the 100-year storm and 17.72 ft for the 500-year storm. The maximum calculated total scour depth at Bridge #17 occurs at bents #2 and #6 and is 17.30 ft and 17.67 ft for the 100-year storm and 18.86 ft and 18.64 ft for the 500-year storm, respectively. (See the Predicted Scour Report in Section 8.)

A risk assessment was performed for this site and no risk was determined since the proposed bridges have no significant encroachments.

The required maps, calculations, computer runs, roadway and bridge sheets are included in the following sections.

TABLE 2: HYDRAULIC DATA AT BRIDGE #16

50-Year Storm

	Proposed Bridge
Floodstage Elevation	957.42
Discharge Thru Bridge (cfs)	1590.00
Flow Area (sf)	305.68
Velocity Thru Bridge (fps)	5.20
Channel Velocity (fps)	4.97
Backwater (ft)	0.40
Approach W/O Bridge	957.40
Approach W/Bridge	957.80
Natural Channel Velocity	5.25

Mean velocity (avg. velocity) should not be higher than channel velocity

100-Year Storm

	Proposed Bridge
Floodstage Elevation	958.04
Discharge Thru Bridge (cfs)	1790.00
Flow Area (sf)	332.37
Velocity Thru Bridge (fps)	5.39
Channel Velocity (fps)	5.17
Backwater (ft)	0.37
Approach W/O Bridge	958.04
Approach W/Bridge	958.41
Natural Channel Velocity	5.43

500-Year Storm

	Proposed Bridge
Floodstage Elevation	959.44
Discharge Thru Bridge (cfs)	2300.00
Flow Area (sf)	396.40
Velocity Thru Bridge (fps)	5.80
Channel Velocity (fps)	5.66
Backwater (ft)	0.30
Approach W/O Bridge	959.49
Approach W/Bridge	959.79
Natural Channel Velocity	5.86
2-Year Floodstage	953.84
10-Year Floodstage	955.70

Note: Approach elevations taken at River Sta. 4925.68
Natural channel velocities taken at River Sta. 4925.68

Note: For comparative purposes, data derived from cross section upstream of Bent #19

TABLE 3: HYDRAULIC DATA AT BRIDGE #17

50-Year Storm

	Proposed Bridge
Floodstage Elevation	937.21
Discharge Thru Bridge (cfs)	2450.00
Flow Area (sf)	1060.78
Velocity Thru Bridge (fps)	2.31
Channel Velocity (fps)	4.74
Backwater (ft)	0.05
Approach W/O Bridge	937.20
Approach W/Bridge	937.25
Natural Channel Velocity	4.78

100-Year Storm

	Proposed Bridge
Floodstage Elevation	937.70
Discharge Thru Bridge (cfs)	2800.00
Flow Area (sf)	1190.23
Velocity Thru Bridge (fps)	2.35
Channel Velocity (fps)	4.97
Backwater (ft)	0.06
Approach W/O Bridge	937.68
Approach W/Bridge	937.74
Natural Channel Velocity	5.03

500-Year Storm

	Proposed Bridge
Floodstage Elevation	938.90
Discharge Thru Bridge (cfs)	3650.00
Flow Area (sf)	1521.68
Velocity Thru Bridge (fps)	2.40
Channel Velocity (fps)	5.32
Backwater (ft)	0.09
Approach W/O Bridge	938.85
Approach W/Bridge	938.94
Natural Channel Velocity	5.40
2-Year Floodstage	934.76
10-Year Floodstage	935.98

Note: Approach elevations taken at River Sta. 878.1
Natural channel velocities taken at River Sta. 878.1

Note: For comparative purposes, data derived from cross section upstream of Bent #8

Section 2:
Hydraulic Site Inspection

I-75 REVERSIBLE LANES (Bridge #16 & #17)
OVER HOPE CREEK & ROTTENWOOD CREEK

MARIETTA, GEORGIA
COBB COUNTY

HYDRAULIC SITE INSPECTION

On September 1, 2009, a hydraulic site inspection was performed at the location of the proposed I-75 Reversible Lanes bridge crossings over Hope Creek and Rottenwood Creek. The following site conditions were noted:

The proposed crossing occurs in an area that is heavily vegetated with large specimen trees and dense underbrush. While there is no development within the immediate floodplain, there ~~is~~ are commercial and multi-residential units located along the western floodplain edge approximately 100 ft from the centerline of the channel. The eastern floodplain is bordered by I-75 which is located approximately 20 ft from the centerline of the channel with some locations even closer.

The channel through the proposed alignment averages 40 feet in width with high well-defined banks that are lined with vegetation and overhanging trees. Banks are stable but the stream appears to be cutting at various locations along the alignment.

The bottom of the channel is composed of medium grained sandy-clay. At the time of the site inspection, the water in the channel was approximately 10 – 12 inches deep and moving slowly. With the exception of where Hope Creek confluences with Rottenwood Creek, for the majority of the project the direction of flow occurs perpendicular to the proposed alignment.

parallel ?

Outlet of I-75 RCBC at Hope Creek

East Overbank

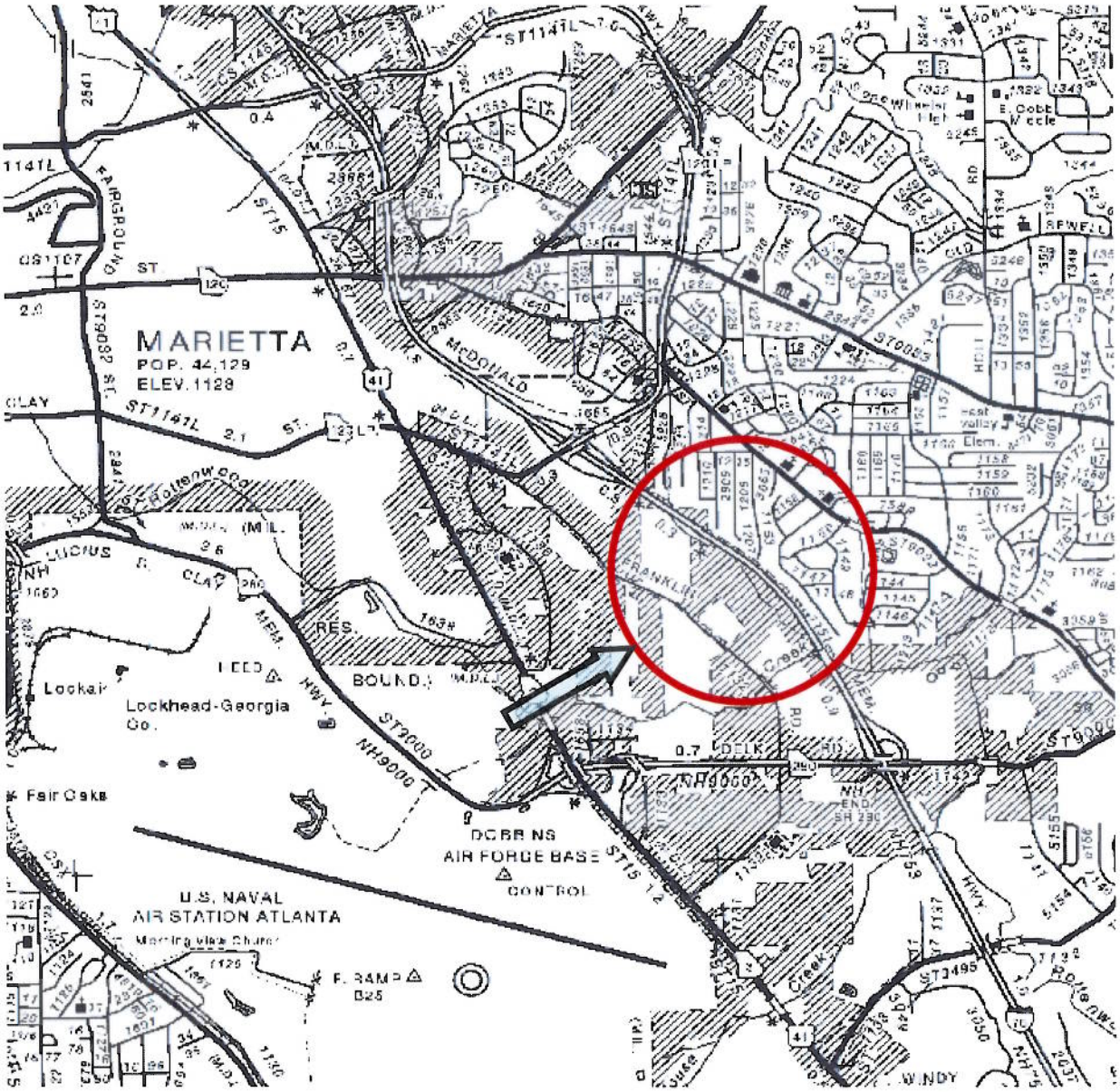
Typical Channel Section

West Overbank

Hope Creek Confluence with Rottenwood Creek

Inlet of I-75 RCBC at Rottenwood Creek

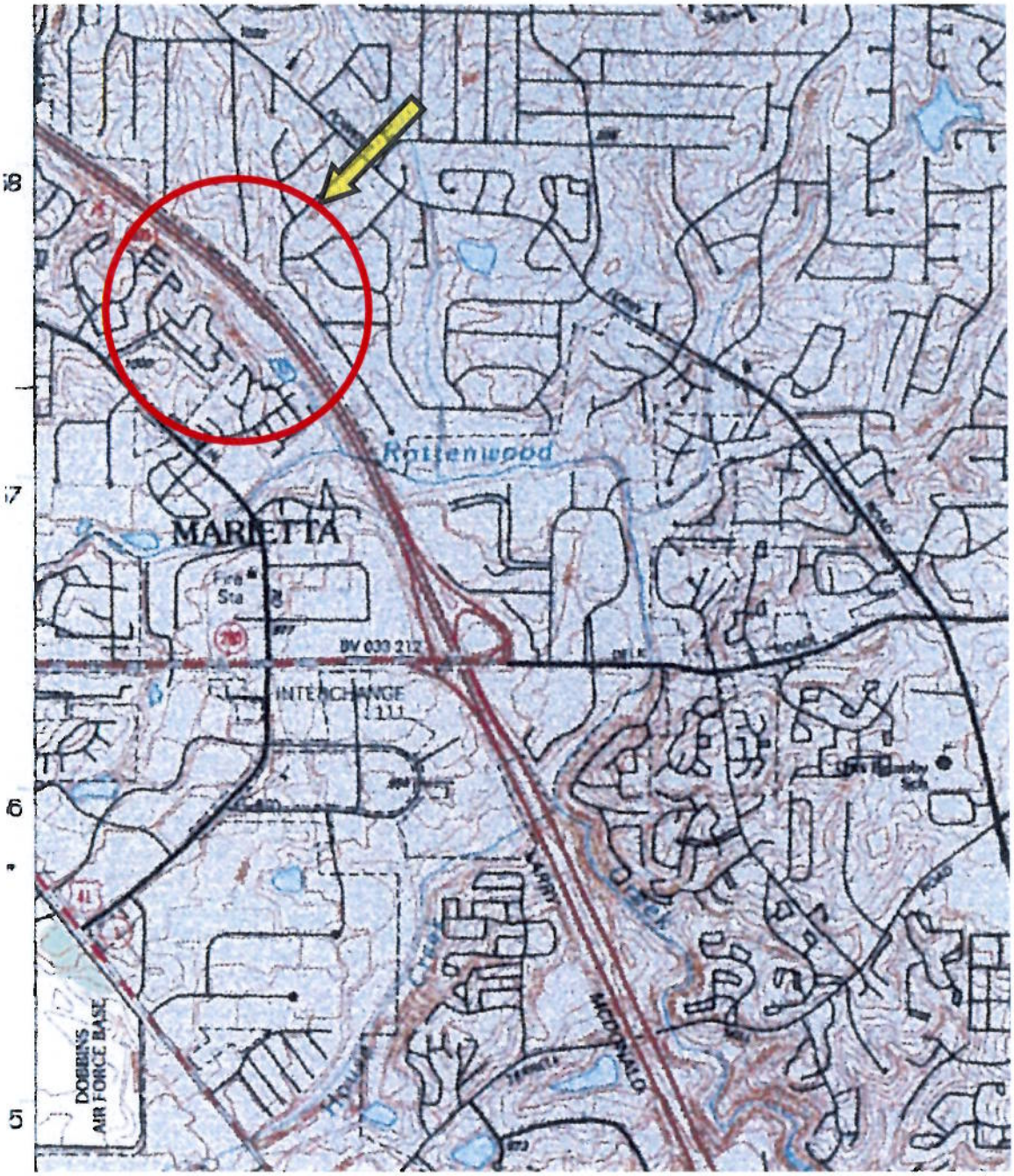
Section 3:
Site Location, USGS Quadrangle & Flood Insurance Maps



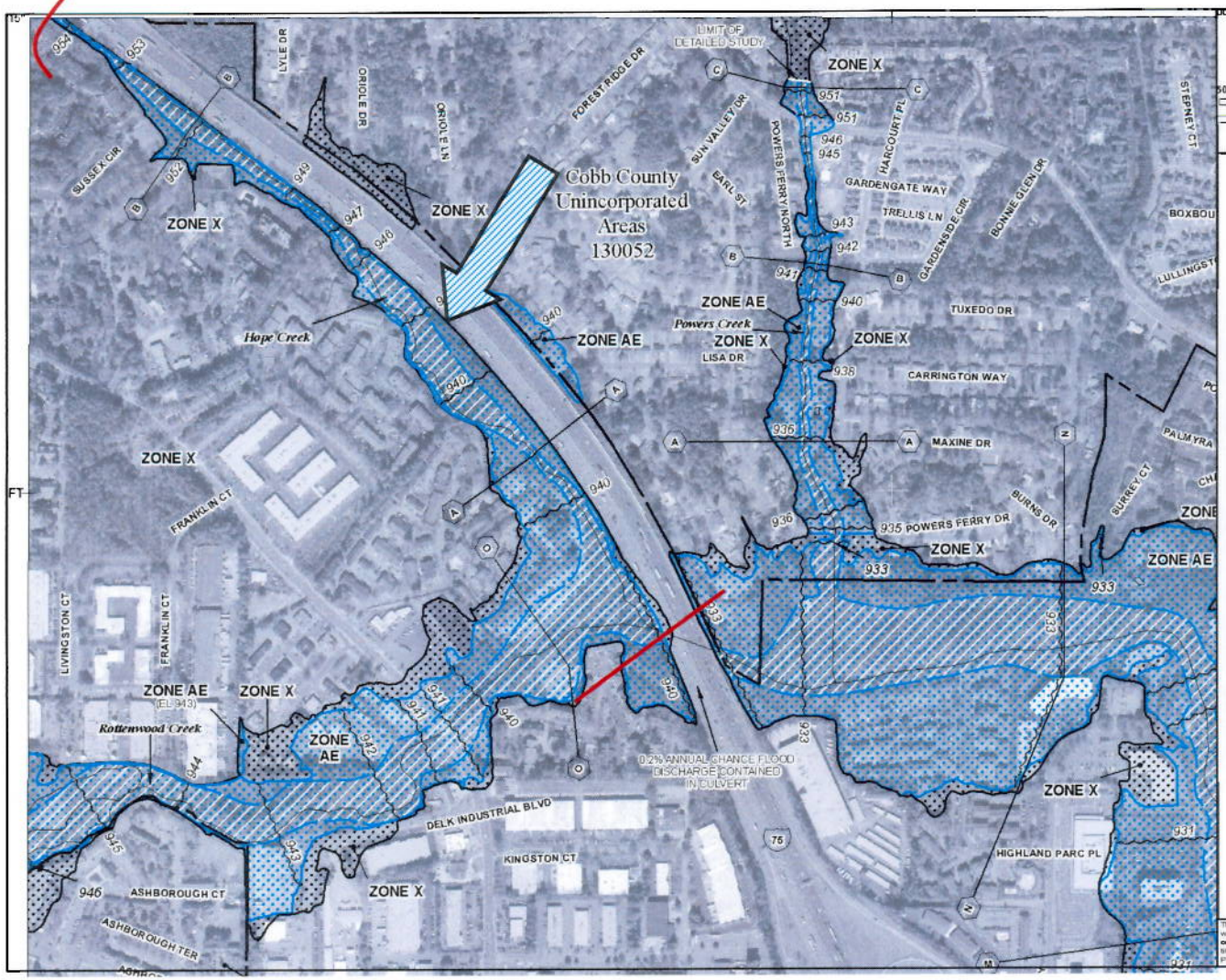
Location Map

Project: NH000-0073-03(242), Cobb County **PI No.:** 714130

Description: I-75 Reversible Lanes over Hope Creek & Rottenwood Creek, approx. 5 miles East of Marietta



USGS Topo Map – Sandy Springs Quadrangle



MAP SCALE 1" = 500'

0 500 1000 FEET

METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0136G

FIRM

FLOOD INSURANCE RATE MAP

COBB COUNTY, GEORGIA AND INCORPORATED AREAS

PANEL 136 OF 252

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS

COMMUNITY	NUMBER	PANEL	SUFFIX
COBB COUNTY	130052	0136	G
MARIETTA, CITY OF	130168	0136	G

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 13067C0136G

MAP REVISED DECEMBER 16, 2008

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Section 4:
Discharge Data

FIS/FEMA DISCHARGE DATA

The 2008 FEMA Flood Insurance Study for Cobb County, provides discharge values at this site of 1650 cfs for the 10-year storm (Q_{10}), 2450 cfs for the 50-year storm (Q_{50}), 2800 cfs for the 100-year storm (Q_{100}), and 3650 cfs for the 500-year storm (Q_{500}). See published data on next page.

TABLE 2 - 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 Existing	1-Percent-Annual-Chance Future	0.2-Percent-Annual-Chance
GORDON BRANCH						
At confluence with Gordon Creek	0.30	382	546	623	*	806
At South Gordon Road	0.10	208	298	342	*	446
GORDON CREEK						
At county boundary	2.40	1,375	1,962	2,220	*	2,852
At South Dillon Road Southwest	1.60	1,133	1,612	1,824	*	2,341
At South Gordon Road Southwest	1.00	890	1,256	1,421	*	1,815
At Kenneth Lane Southwest	0.40	481	683	776	*	998
GOTHARDS CREEK						
At confluence with Sweetwater Creek	23.00	2,839	4,485	5,153	*	7,011
At Brownsville-Lithia Springs Road Southwest	21.70	2,738	4,327	4,975	*	6,773
HARMONY GROVE CREEK						
At confluence with Willeo Creek	1.40	879	1,288	1,473	*	1,932
At Post Oak Tritt Road Northeast	1.20	809	1,178	1,347	*	1,761
At Johnson Ferry Road Northeast	0.30	448	636	723	*	930
HOPE CREEK						
At confluence with Rottenwood Creek	1.30	1,650	2,450	2,800	2,930	3,650
At Interstate 75	0.84	1,100	1,590	1,790	1,920	2,300
Approximately 1,290 feet Upstream of South Marietta Parkway Southeast State Highway 120	0.55	860	1,240	1,400	1,490	1,790
LAUREL CREEK						
At confluence with Nickajack Creek	3.68	1,500	2,660	3,090	3,200	3,980
At East West Connector	3.50	1,550	3,150	3,810	3,930	5,310

*Data not available

Section 5:
Flood Insurance Study Information

FLOODING SOURCE		FLOODWAY			BASE 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
Hope Creek								
A	1,084[1]	47	336	8.3	939.9	937.4[3]	938.1	0.7
B	3,785[1]	108	656	3.5	952.3	952.3	952.7	0.4
C	6,278[1]	52	203	8.8	972.6	972.6	972.6	0.0
D	8,000[1]	99	168	8.3	1,004.0	1,004.0	1,004.7	0.7
Laurel Creek								
A	527[2]	398	3,985	0.8	807.4	806.4[4]	806.4	0.0
B	2,549[2]	233	775	4.9	810.2	810.2	810.2	0.0
C	3,993[2]	49	322	11.8	822.4	822.4	822.6	0.2
D	6,060[2]	43	269	13.0	851.1	851.1	851.1	0.0
E	7,543[2]	533	2,157	2.0	873.1	873.1	873.1	0.0
F	9,873[2]	230	1,210	2.5	875.6	875.6	875.9	0.3
G	12,254[2]	65	515	5.8	887.1	887.1	887.2	0.1
H	14,609[2]	109	651	4.2	901.6	901.8	901.8	0.2
I	15,588[2]	33	181	13.4	912.7	912.7	912.7	0.0
J	16,876[2]	71	294	7.1	930.3	930.3	930.6	0.3
K	18,055[2]	85	215	3.4	941.1	941.1	941.9	0.8
L	19,175[2]	73	322	1.4	961.2	961.2	961.2	0.0
M	19,840[2]	54	238	1.9	979.6	979.6	979.9	0.3

[1]Feet above confluence with Rottenwood Creek
[2]Feet above confluence with Nickajack Creek
[3]Elevation computed without consideration of backwater effects from Rottenwood Creek
[4]Elevation computed without consideration of backwater effects from Nickajack Creek

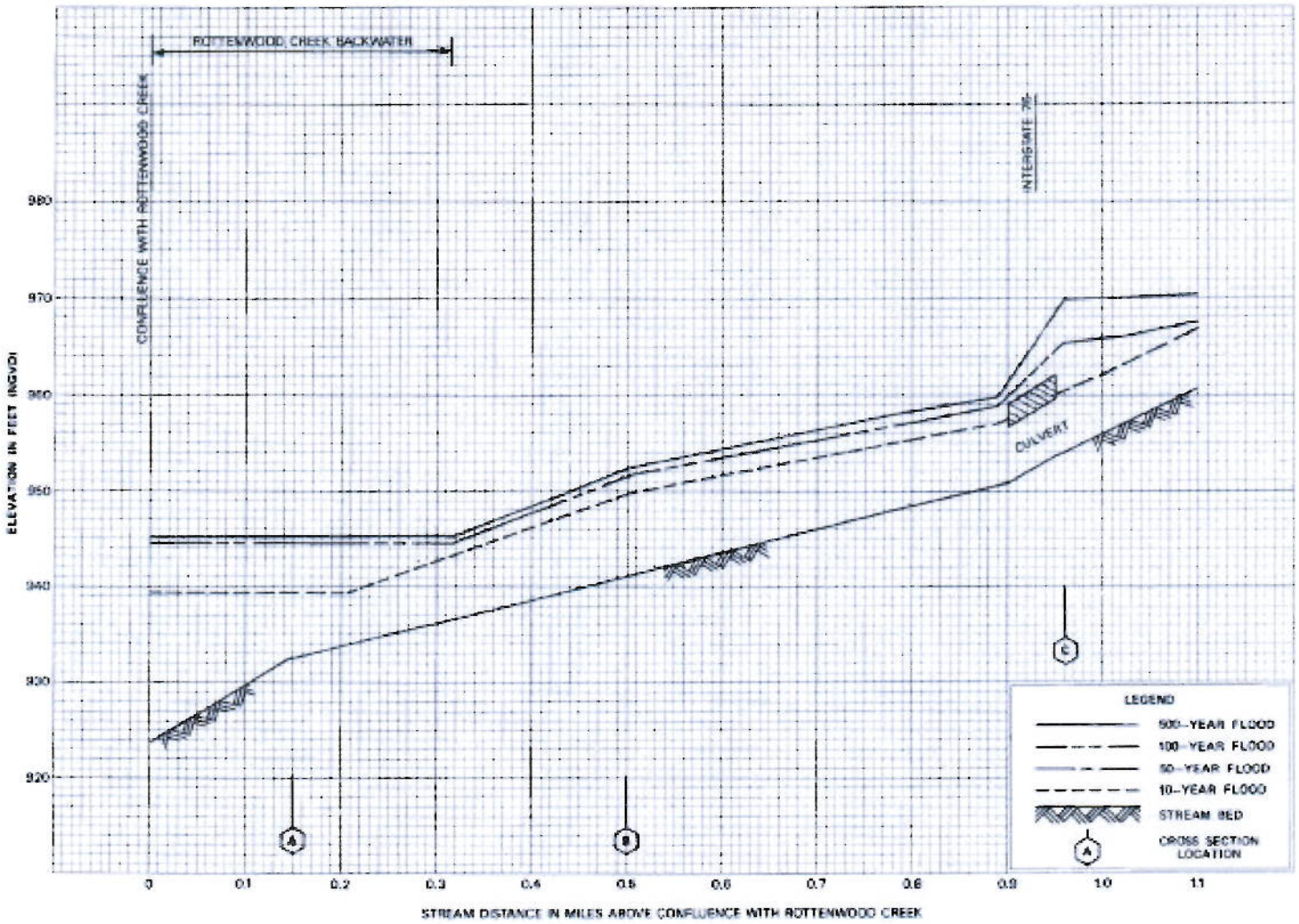
TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

COBB COUNTY, GA
AND INCORPORATED AREAS

FLOODWAY DATA

HOPE CREEK – LAUREL CREEK



FLOOD PROFILES

HOPE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COBB COUNTY, GA
AND INCORPORATED AREAS

Section 6:
Hydraulic Model Data

PUBLISHED FIS/DUPLICATE EFFECTIVE MODEL (HEC-RAS) DATA

Table 4							
FEMA Cross Section	River Station No.	10-Year WSEL	50-Year WSEL	100-Year WSEL	500-Year WSEL	Floodway WSEL	Floodway Top Width
D	8000	1003.2	1003.77	1003.98	1004.45	1004.7	38.84
	7548	996.92	997.52	997.74	998.23	997.93	38.84
	7061	986.73	987.56	987.87	990.86	987.87	42.82
	6930	985.12	987.31	988.15	991.07	988.15	52.42
	6496	972.95	973.49	973.73	974.26	974.71	27.86
C	6278	971.33	972.22	972.59	973.4	972.59	51.99
	5629	963.66	964.71	967.39	967.91	967.66	25.76
	5428	963.47	964.7	967.53	968.09	967.66	25.76
	4969	956.11	957.82	958.45	959.89	958.42	23.97
	4718	952.56	953.67	954.03	954.89	955.03	23.97
	4209	950.96	952.31	952.82	953.93	953.36	63.24
B	3784	950.28	951.75	952.33	953.59	952.67	108.24
	3147	947.27	948.62	949.13	950.25	949.36	45.11
	2870	945.59	946.8	947.24	948.08	947.39	38.31
	2262	941.31	941.9	942.14	942.77	942.92	126.12
	1650	938.37	939.56	940	940.88	940.79	198.41
A	1084	935.98	937.02	937.39	938.36	938.12	47.03
	553	933.22	934.51	934.93	935.21	935.39	47.03
	151	930.04	931.32	931.71	932.7	932.01	47.03

CORRECTED EFFECTIVE MODEL (HEC-RAS) DATA

Table 5							
FEMA Cross Section	River Station No.	10-Year WSEL	50-Year WSEL	100-Year WSEL	500-Year WSEL	Floodway WSEL	Floodway Top Width
D	8000	1003.23	1003.77	1003.98	1004.45	1004.7	38.84
	7548	996.9	997.27	997.74	998.23	997.93	38.84
	7061	986.75	987.56	987.87	990.86	987.87	42.82
	6930	985.12	987.31	988.15	991.07	988.15	52.42
	6496	972.95	973.49	973.73	974.26	974.71	27.86
C	6278	971.33	972.22	972.6	973.4	972.59	51.99
	5629	963.66	964.73	967.35	969.35	967.64	25.76
	5428	963.47	964.52	967.5	969.92	967.64	25.76
	4969	956.15	957.68	958.24	959.53	958.4	23.97
	4925.68	955.64	957.4	958.04	959.49	958.12	41.86
	4907.87	955.63	957.39	958.03	959.48	958.1	39.81
	4783.02	955.45	957.21	957.85	959.3	957.92	42.12
	4764.39	955.36	957.12	957.75	959.2	957.83	41.85
	4718	954.68	956.31	956.9	958.23	956.99	34.39
	4643.05	953.84	955.3	955.81	956.99	955.7	29.55
	4625.32	953.5	954.75	955.16	956.02	955.21	30.99
	4503.71	952.85	954.06	954.42	955.16	954.54	40.5
	4485.05	952.82	954.04	954.41	955.17	954.53	41.94
	4361.84	952.11	953.37	953.79	954.64	953.89	51.45
	4343.3	952	953.19	953.58	954.38	953.77	52.88
	4222.47	951.45	952.6	953.02	953.92	953.26	62.2
	4204.47	951.44	952.63	953.06	953.97	953.27	63.72
*	4080.46	950.88	952.1	952.56	953.5	952.77	51.1
*	4062.73	950.81	952.04	952.5	953.44	952.71	51.28
*	3940.9	950.08	951.41	951.89	952.99	952.09	50.82
*	3922.63	950.11	951.45	951.94	953.04	952.12	51.88
*	3799.87	949.78	951.23	951.78	952.95	951.79	49.96
B	3784	---	---	---	---	---	---
*	3781.1	946.75	951.2	951.75	952.93	951.75	49.96
*	3659.62	949.41	950.87	951.41	952.64	951.37	49.96

*	3641.43	949.34	950.8	951.36	952.58	951.3	49.96
*	3518.86	948.86	950.29	950.84	951.99	950.9	52.58
*	3500.63	948.82	950.26	950.81	951.96	950.87	52.64
*	3378.49	948.42	949.94	950.52	951.74	950.47	50.9
*	3360.44	948.36	949.88	950.46	951.68	950.41	50.9
*	3238.3	947.84	949.4	950.01	951.27	950.01	55.38
*	3220.24	947.8	949.37	949.98	951.25	949.97	55.71
*	3147	946.98	948.35	948.87	950.01	948.87	52.51
*	3097.38	946	947.27	947.76	948.89	947.82	49.03
*	3079.08	945.59	946.84	947.3	948.26	947.62	49.01
*	2955.93	944.93	946.16	946.6	947.53	947.16	54.29
*	2937.88	944.85	946.07	946.5	947.41	947.1	54.83
*	2870	944.63	945.87	946.32	947.22	946.9	51.13
*	2813.98	944.45	945.66	946.09	946.94	946.74	51.13
*	2795.94	944.35	945.54	945.97	946.84	946.65	51.13
*	2668.4	943.99	945.13	945.55	946.46	946.37	70.15
*	2650.68	944.05	945.24	945.68	946.62	946.45	70.15
	2537.86	943.02	943.92	944.18	945.08	944.31	86.28
	2520.83	941.42	943.01	943.69	944.51	943.94	88.74
	2390.93	941.66	943.23	943.62	944.05	943.68	107.5
	2354.33	940.11	941.25	941.94	942.91	943	112.79
	2262	940.28	941.59	942.01	942.9	943.43	126.12
	2081.92	939.81	940.98	941.42	942.29	943.05	147.39
	1650	938.97	940.36	940.85	941.76	942.69	198.41
	1492.06	938.52	939.98	940.48	941.36	942.35	159.56
A	1084	936.22	937.34	937.74	938.99	939.55	47.03
	1027.83	935.88	937.14	937.63	938.81	939.44	47.03
	949.76	935.74	936.99	937.49	938.67	939.38	47.03
	878.1	935.95	937.2	937.68	938.85	939.7	47.03
	859.34	935.9	937.13	937.62	938.79	939.55	47.03
	735.53	935.53	936.82	937.3	938.5	938.74	47.03
	716.39	935.48	936.58	936.97	938.15	938.44	47.03
	595.36	934.71	936.02	936.5	937.67	937.24	47.03
	577.59	934.29	935.77	936.27	937.4	936.88	47.03
	553	933.94	935.38	935.93	936.9	936.9	47.03

	459.59	933.36	934.44	934.62	935.34	936.56	47.03
	441.54	933.47	934.66	934.93	935.83	936.48	47.03
	324.87	932.13	932.76	933.29	933.96	933.87	47.03
	307.28	931.95	933.18	933.51	934.28	933.23	47.03
	200.79	929.98	931.31	931.82	932.67	931.62	47.83
	185.03	929.84	930.68	931.18	932.4	931.1	50.24
	28.22	928.47	929.6	930.02	930.89	930.02	124.65
	12.14	928.71	929.78	930.18	931.03	930.18	131

*** = channel realignment**

PROPOSED MODEL (HEC-RAS) DATA

Table 6							
FEMA Cross Section	River Station No.	10-Year WSEL	50-Year WSEL	100-Year WSEL	500-Year WSEL	Floodway WSEL	Floodway Top Width
D	8000	1003.23	1003.77	1003.99	1004.45	1004.7	38.84
	7548	996.9	997.52	997.73	998.23	997.93	38.84
	7061	986.75	987.53	987.89	990.86	987.87	42.82
	6930	985.12	987.31	988.15	991.07	988.15	52.42
	6496	972.95	973.49	973.73	974.26	974.71	27.86
C	6278	971.33	972.22	972.6	973.4	972.59	51.99
	5629	963.66	964.73	967.71	969.41	968.09	25.76
	5428	963.47	964.93	967.84	969.97	968.09	25.76
	4969	956.47	957.99	958.55	959.79	958.8	23.97
	4925.68	956.12	957.8	958.41	959.79	958.59	41.96
	4907.87	955.73	957.46	958.09	959.5	958.27	39.81
	4783.02	955.56	957.28	957.91	959.32	958.1	42.35
	4764.39	955.47	957.19	957.81	959.22	958.01	42.1
	4718	954.83	956.41	956.98	958.27	957.21	34.58
	4643.05	954.12	955.57	956.1	957.26	956.16	29.74
	4625.32	953.85	955.17	955.62	956.62	955.83	31.24
	4503.71	953.38	954.69	955.15	956.16	955.45	40.5
	4485.05	953.03	954.28	954.68	955.55	955.05	41.94
	4361.84	952.45	953.58	954.25	955.26	954.65	51.45
	4343.3	952.34	953.6	954.04	954.99	954.42	52.88
	4222.47	951.92	953.26	953.74	954.78	954.12	62.2
	4204.47	951.65	952.87	953.31	954.32	953.72	63.72
*	4080.46	951.2	952.45	952.92	953.98	953.36	52.28
*	4062.73	951.06	952.33	952.79	953.83	953.2	52.26
*	3940.9	950.55	951.87	952.38	953.54	952.78	52.2
*	3922.63	950.24	951.6	952.11	953.28	952.46	52.5
*	3799.87	949.96	951.42	951.98	953.23	952.18	49.96
B	3784	---	---	---	---	---	---
*	3781.1	949.87	951.37	951.93	953.18	952	49.96
*	3659.62	949.56	951.64	951.64	952.93	951.67	49.96
*	3641.43	949.5	951	951.58	952.88	951.59	49.96

*	3518.86	949.08	950.55	951.12	952.35	951.25	52.64
*	3500.63	948.92	950.38	950.94	952.13	951.08	52.64
*	3378.49	948.55	950.09	950.68	951.93	950.72	50.9
*	3360.44	948.46	950.02	950.61	951.86	950.61	50.9
*	3238.3	947.99	949.59	950.2	951.5	950.26	55.76
*	3220.24	947.83	949.42	950.03	951.31	950.08	55.76
*	3147	947.05	948.44	948.99	950.15	949.09	53.4
*	3097.38	946.34	947.69	948.23	949.43	948.49	51.69
*	3079.08	945.81	947.2	947.7	948.8	948.11	50.97
*	2955.93	945.37	946.79	947.33	948.51	947.83	56.48
*	2937.88	945.17	946.56	947.08	948.19	947.61	56.43
*	2870	945.01	946.46	946.98	948.1	947.45	51.13
*	2813.98	944.87	946.31	946.82	947.91	947.33	51.13
*	2795.94	944.76	946.13	946.6	947.61	947.19	51.13
*	2668.4	944.5	945.88	946.37	947.42	946.99	70.15
*	2650.68	944.04	945.36	945.83	946.83	946.37	70.15
	2537.86	943.01	944.38	944.88	945.92	944.5	86.28
	2520.83	941.42	943.01	943.69	944.51	944.01	88.74
	2390.93	941.66	943.23	943.62	944.58	943.63	107.5
**	2354.33	940.11	941.25	941.99	943.06	942.9	112.79
**	2262	940.55	941.95	942.38	943.37	943.33	126.12
**	2081.92	940.08	941.46	941.87	942.88	942.96	147.39
**	1650	939.36	940.99	941.41	942.47	942.63	198.41
**	1492.06	938.99	940.69	941.08	942.13	942.33	159.56
A	1084	936.1	937.12	938.27	938.83	939.53	47.03
**	1027.83	935.65	936.82	937.24	938.61	939.42	47.03
	949.76	935.8	937.06	937.56	938.77	939.39	47.03
	878.1	936.01	937.25	937.74	938.94	939.69	47.03
	859.34	935.96	937.19	937.68	938.89	939.55	47.03
	735.53	935.61	936.89	937.39	938.61	938.76	47.03
	716.39	935.54	936.63	937.02	938.23	938.47	47.03
	595.36	934.88	936.13	936.59	937.8	937.38	47.03
	577.59	934.29	935.77	936.27	937.4	936.93	47.03
	553	933.94	935.38	935.93	936.9	936.94	47.03

	459.59	933.36	934.44	934.62	935.34	936.56	47.03
	441.54	933.47	934.66	934.93	935.83	936.48	47.03
	324.87	932.13	932.76	933.29	933.96	933.87	47.03
	307.28	931.95	933.18	933.52	934.28	933.23	47.03
	200.79	929.98	931.31	931.81	932.67	931.62	47.83
	185.03	929.84	930.68	931.18	932.4	931.1	50.24
	28.22	928.47	929.6	930.02	930.89	930.02	124.65
	12.14	928.71	929.78	930.18	931.03	930.18	131

*** = channel realignment**
**** = roadway fill & wall**

Section 7:
Hydraulic Model Comparison Tables

Data Comparison for all Models

Summary profiles for each storm event are shown in Tables 7-10. Floodway data is detailed in Tables 11-12. Data for all models are compared to the published FIS data.

10-YEAR STORM COMPARISON DATA

Table 7 - WS Elevations from Models				
FEMA Cross Section	River Station No.	Duplicate Effective	Corrected Effective	Proposed
D	8000	1003.2	1003.23	1003.23
	7548	996.92	996.9	996.9
	7061	986.73	986.75	986.75
	6930	985.12	985.12	985.12
	6496	972.95	972.95	972.95
C	6278	971.33	971.33	971.33
	5629	963.66	963.66	963.66
	5428	963.47	963.47	963.47
	4969	956.11	956.15	956.47
	4925.68	---	955.64	956.12
	4907.87	---	955.63	955.73
	4783.02	---	955.45	955.56
	4764.39	---	955.36	955.47
	4718	952.56	954.68	954.83
	4643.05	---	953.84	954.12
	4625.32	---	953.5	953.85
	4503.71	---	952.85	953.38
	4485.05	---	952.82	953.03
	4361.84	---	952.11	952.45
	4343.3	---	952	952.34
	4222.47	---	951.45	951.92
	4204.47	950.96	951.44	951.65
*	4080.46	---	950.88	951.2
*	4062.73	---	950.81	951.06
*	3940.9	---	950.08	950.55
*	3922.63	---	950.11	950.24
*	3799.87	---	949.78	949.96
B	3784	950.28	---	---
*	3781.1	---	946.75	949.87
*	3659.62	---	949.41	949.56

*	3641.43	---	949.34	949.5
*	3518.86	---	948.86	949.08
*	3500.63	---	948.82	948.92
*	3378.49	---	948.42	948.55
*	3360.44	---	948.36	948.46
*	3238.3	---	947.84	947.99
*	3220.24	---	947.8	947.83
*	3147	947.27	946.98	947.05
*	3097.38	---	946	946.34
*	3079.08	---	945.59	945.81
*	2955.93	---	944.93	945.37
*	2937.88	---	944.85	945.17
*	2870	945.59	944.63	945.01
*	2813.98	---	944.45	944.87
*	2795.94	---	944.35	944.76
*	2668.4	---	943.99	944.5
*	2650.68	---	944.05	944.04
	2537.86	---	943.02	943.01
	2520.83	---	941.42	941.42
	2390.93	---	941.66	941.66
	2354.33	---	940.11	940.11
	2262	941.31	940.28	940.55
	2081.92	---	939.81	940.08
	1650	938.37	938.97	939.36
	1492.06	---	938.52	938.99
A	1084	935.98	936.22	936.1
	1027.83	---	935.88	935.65
	949.76	---	935.74	935.8
	878.1	---	935.95	936.01
	859.34	---	935.9	935.96
	735.53	---	935.53	935.61
	716.39	---	935.48	935.54
	595.36	---	934.71	934.88
	577.59	---	934.29	934.29
	553	933.22	933.94	933.94

	459.59	---	933.36	933.36
	441.54	---	933.47	933.47
	324.87	---	932.13	932.13
	307.28	---	931.95	931.95
	200.79	---	929.98	929.98
	185.03	---	929.84	929.84
	28.22	---	928.47	928.47
	12.14	---	928.71	928.71

50-YEAR STORM COMPARISON DATA

Table 8 - WS Elevations from Models				
FEMA Cross Section	**River Station No.**	**Duplicate Effective**	**Corrected Effective**	**Proposed**
D	8000	1003.77	1003.77	1003.77
	7548	997.52	997.27	997.52
	7061	987.56	987.56	987.53
	6930	987.31	987.31	987.31
	6496	973.49	973.49	973.49
C	6278	972.22	972.22	972.22
	5629	964.71	964.73	964.73
	5428	964.7	964.52	964.93
	4969	957.82	957.68	957.99
	4925.68	---	957.4	957.8
	4907.87	---	957.39	957.46
	4783.02	---	957.21	957.28
	4764.39	---	957.12	957.19
	4718	953.67	956.31	956.41
	4643.05	---	955.3	955.57
	4625.32	---	954.75	955.17
	4503.71	---	954.06	954.69
	4485.05	---	954.04	954.28
	4361.84	---	953.37	953.58
	4343.3	---	953.19	953.6
	4222.47	---	952.6	953.26
	4204.47	952.31	952.63	952.87
*	4080.46	---	952.1	952.45
*	4062.73	---	952.04	952.33
*	3940.9	---	951.41	951.87
*	3922.63	---	951.45	951.6
*	3799.87	---	951.23	951.42
B	3784	951.75	---	---
*	3781.1	---	951.2	951.37
*	3659.62	---	950.87	951.64

*	3641.43	---	950.8	951
*	3518.86	---	950.29	950.55
*	3500.63	---	950.26	950.38
*	3378.49	---	949.94	950.09
*	3360.44	---	949.88	950.02
*	3238.3	---	949.4	949.59
*	3220.24	---	949.37	949.42
*	3147	948.62	948.35	948.44
*	3097.38	---	947.27	947.69
*	3079.08	---	946.84	947.2
*	2955.93	---	946.16	946.79
*	2937.88	---	946.07	946.56
*	2870	946.8	945.87	946.46
*	2813.98	---	945.66	946.31
*	2795.94	---	945.54	946.13
*	2668.4	---	945.13	945.88
*	2650.68	---	945.24	945.36
	2537.86	---	943.92	944.38
	2520.83	---	943.01	943.01
	2390.93	---	943.23	943.23
	2354.33	---	941.25	941.25
	2262	941.9	941.59	941.95
	2081.92	---	940.98	941.46
	1650	939.56	940.36	940.99
	1492.06	---	939.98	940.69
A	1084	937.02	937.34	937.12
	1027.83	---	937.14	936.82
	949.76	---	936.99	937.06
	878.1	---	937.2	937.25
	859.34	---	937.13	937.19
	735.53	---	936.82	936.89
	716.39	---	936.58	936.63
	595.36	---	936.02	936.13
	577.59	---	935.77	935.77
	553	934.51	935.38	935.38

	459.59	---	934.44	934.44
	441.54	---	934.66	934.66
	324.87	---	932.76	932.76
	307.28	---	933.18	933.18
	200.79	---	931.31	931.31
	185.03	---	930.68	930.68
	28.22	---	929.6	929.6
	12.14	---	929.78	929.78

100-YEAR STORM COMPARISON DATA

Table 9 - Base Flood WS Elevations from Models				
FEMA Cross Section	River Station No.	Duplicate Effective	Corrected Effective	Proposed
D	8000	1003.98	1003.98	1003.99
	7548	997.74	997.74	997.73
	7061	987.87	987.87	987.89
	6930	988.15	988.15	988.15
	6496	973.73	973.73	973.73
C	6278	972.59	972.6	972.6
	5629	967.39	967.35	967.71
	5428	967.53	967.5	967.84
	4969	958.45	958.24	958.55
	4925.68	---	958.04	958.41
	4907.87	---	958.03	958.09
	4783.02	---	957.85	957.91
	4764.39	---	957.75	957.81
	4718	954.03	956.9	956.98
	4643.05	---	955.81	956.1
	4625.32	---	955.16	955.62
	4503.71	---	954.42	955.15
	4485.05	---	954.41	954.68
	4361.84	---	953.79	954.25
	4343.3	---	953.58	954.04
	4222.47	---	953.02	953.74
	4204.47	952.82	953.06	953.31
*	4080.46	---	952.56	952.92
*	4062.73	---	952.5	952.79
*	3940.9	---	951.89	952.38
*	3922.63	---	951.94	952.11
*	3799.87	---	951.78	951.98
B	3784	952.33	---	---
*	3781.1	---	951.75	951.93
*	3659.62	---	951.41	951.64

*	3641.43	---	951.36	951.58
*	3518.86	---	950.84	951.12
*	3500.63	---	950.81	950.94
*	3378.49	---	950.52	950.68
*	3360.44	---	950.46	950.61
*	3238.3	---	950.01	950.2
*	3220.24	---	949.98	950.03
*	3147	949.13	948.87	948.99
*	3097.38	---	947.76	948.23
*	3079.08	---	947.3	947.7
*	2955.93	---	946.6	947.33
*	2937.88	---	946.5	947.08
*	2870	947.24	946.32	946.98
*	2813.98	---	946.09	946.82
*	2795.94	---	945.97	946.6
*	2668.4	---	945.55	946.37
*	2650.68	---	945.68	945.83
	2537.86	---	944.18	944.88
	2520.83	---	943.69	943.69
	2390.93	---	943.62	943.62
	2354.33	---	941.94	941.99
	2262	942.14	942.01	942.38
	2081.92	---	941.42	941.87
	1650	940	940.85	941.41
	1492.06	---	940.48	941.08
A	1084	937.39	937.74	938.27
	1027.83	---	937.63	937.24
	949.76	---	937.49	937.56
	878.1	---	937.68	937.74
	859.34	---	937.62	937.68
	735.53	---	937.3	937.39
	716.39	---	936.97	937.02
	595.36	---	936.5	936.59
	577.59	---	936.27	936.27
	553	934.93	935.93	935.93

	459.59	---	934.62	934.62
	441.54	---	934.93	934.93
	324.87	---	933.29	933.29
	307.28	---	933.51	933.52
	200.79	---	931.82	931.81
	185.03	---	931.18	931.18
	28.22	---	930.02	930.02
	12.14	---	930.18	930.18

500-YEAR STORM COMPARISON DATA

Table 10 - WS Elevations from Models				
FEMA Cross Section	River Station No.	Duplicate Effective	Corrected Effective	Proposed
D	8000	1004.45	1004.45	1004.45
	7548	998.23	998.23	998.23
	7061	990.86	990.86	990.86
	6930	991.07	991.07	991.07
	6496	974.26	974.26	974.26
C	6278	973.4	973.4	973.4
	5629	967.91	969.35	969.41
	5428	968.09	969.92	969.97
	4969	959.89	959.53	959.79
	4925.68	---	959.49	959.79
	4907.87	---	959.48	959.5
	4783.02	---	959.3	959.32
	4764.39	---	959.2	959.22
	4718	954.89	958.23	958.27
	4643.05	---	956.99	957.26
	4625.32	---	956.02	956.62
	4503.71	---	955.16	956.16
	4485.05	---	955.17	955.55
	4361.84	---	954.64	955.26
	4343.3	---	954.38	954.99
	4222.47	---	953.92	954.78
	4204.47	953.93	953.97	954.32
*	4080.46	---	953.5	953.98
*	4062.73	---	953.44	953.83
*	3940.9	---	952.99	953.54
*	3922.63	---	953.04	953.28
*	3799.87	---	952.95	953.23
B	3784	953.59	---	---
*	3781.1	---	952.93	953.18
*	3659.62	---	952.64	952.93

*	3641.43	---	952.58	952.88
*	3518.86	---	951.99	952.35
*	3500.63	---	951.96	952.13
*	3378.49	---	951.74	951.93
*	3360.44	---	951.68	951.86
*	3238.3	---	951.27	951.5
*	3220.24	---	951.25	951.31
*	3147	949.36	950.01	950.15
*	3097.38	---	948.89	949.43
*	3079.08	---	948.26	948.8
*	2955.93	---	947.53	948.51
*	2937.88	---	947.41	948.19
*	2870	948.08	947.22	948.1
*	2813.98	---	946.94	947.91
*	2795.94	---	946.84	947.61
*	2668.4	---	946.46	947.42
*	2650.68	---	946.62	946.83
	2537.86	---	945.08	945.92
	2520.83	---	944.51	944.51
	2390.93	---	944.05	944.58
	2354.33	---	942.91	943.06
	2262	942.77	942.9	943.37
	2081.92	---	942.29	942.88
	1650	940.88	941.76	942.47
	1492.06	---	941.36	942.13
A	1084	938.36	938.99	938.83
	1027.83	---	938.81	938.61
	949.76	---	938.67	938.77
	878.1	---	938.85	938.94
	859.34	---	938.79	938.89
	735.53	---	938.5	938.61
	716.39	---	938.15	938.23
	595.36	---	937.67	937.8
	577.59	---	937.4	937.4
	553	935.21	936.9	936.9

	459.59	---	935.34	935.34
	441.54	---	935.83	935.83
	324.87	---	933.96	933.96
	307.28	---	934.28	934.28
	200.79	---	932.67	932.67
	185.03	---	932.4	932.4
	28.22	---	930.89	930.89
	12.14	---	931.03	931.03

FLOODWAY ELEVATION COMPARISON DATA

Table 11 - Floodway Elevations from Models				
FEMA Cross Section	River Station No.	Duplicate Effective	Corrected Effective	Proposed
D	8000	1004.7	1004.7	1004.7
	7548	997.93	997.93	997.93
	7061	987.87	987.87	987.87
	6930	988.15	988.15	988.15
	6496	974.71	974.71	974.71
C	6278	972.59	972.59	972.59
	5629	967.66	967.64	968.09
	5428	967.66	967.64	968.09
	4969	958.42	958.4	958.8
	4925.68	---	958.12	958.59
	4907.87	---	958.1	958.27
	4783.02	---	957.92	958.1
	4764.39	---	957.83	958.01
	4718	955.03	956.99	957.21
	4643.05	---	955.7	956.16
	4625.32	---	955.21	955.83
	4503.71	---	954.54	955.45
	4485.05	---	954.53	955.05
	4361.84	---	953.89	954.65
	4343.3	---	953.77	954.42
	4222.47	---	953.26	954.12
	4204.47	953.36	953.27	953.72
*	4080.46	---	952.77	953.36
*	4062.73	---	952.71	953.2
*	3940.9	---	952.09	952.78
*	3922.63	---	952.12	952.46
*	3799.87	---	951.79	952.18
B	3784	952.67	---	---
*	3781.1	---	951.75	952
*	3659.62	---	951.37	951.67

*	3641.43	---	951.3	951.59
*	3518.86	---	950.9	951.25
*	3500.63	---	950.87	951.08
*	3378.49	---	950.47	950.72
*	3360.44	---	950.41	950.61
*	3238.3	---	950.01	950.26
*	3220.24	---	949.97	950.08
*	3147	950.25	948.87	949.09
*	3097.38	---	947.82	948.49
*	3079.08	---	947.62	948.11
*	2955.93	---	947.16	947.83
*	2937.88	---	947.1	947.61
*	2870	947.39	946.9	947.45
*	2813.98	---	946.74	947.33
*	2795.94	---	946.65	947.19
*	2668.4	---	946.37	946.99
*	2650.68	---	946.45	946.37
	2537.86	---	944.31	944.5
	2520.83	---	943.94	944.01
	2390.93	---	943.68	943.63
	2354.33	---	943	942.9
	2262	942.92	943.43	943.33
	2081.92	---	943.05	942.96
	1650	940.79	942.69	942.63
	1492.06	---	942.35	942.33
A	1084	938.12	939.55	939.53
	1027.83	---	939.44	939.42
	949.76	---	939.38	939.39
	878.1	---	939.7	939.69
	859.34	---	939.55	939.55
	735.53	---	938.74	938.76
	716.39	---	938.44	938.47
	595.36	---	937.24	937.38
	577.59	---	936.88	936.93
	553	935.39	936.9	936.94

	459.59	---	936.56	936.56
	441.54	---	936.48	936.48
	324.87	---	933.87	933.87
	307.28	---	933.23	933.23
	200.79	---	931.62	931.62
	185.03	---	931.1	931.1
	28.22	---	930.02	930.02
	12.14	---	930.18	930.18

FLOODWAY TOP WIDTH COMPARISON DATA

Table 12 - Floodway Top Widths				
FEMA Cross Section	River Station No.	Duplicate Effective	Corrected Effective	Proposed
D	8000	38.84	38.84	38.84
	7548	38.84	38.84	38.84
	7061	42.82	42.82	42.82
	6930	52.42	52.42	52.42
	6496	27.86	27.86	27.86
C	6278	51.99	51.99	51.99
	5629	25.76	25.76	25.76
	5428	25.76	25.76	25.76
	4969	23.97	23.97	23.97
	4925.68	---	41.86	41.96
	4907.87	---	39.81	39.81
	4783.02	---	42.12	42.35
	4764.39	---	41.85	42.1
	4718	23.97	34.39	34.58
	4643.05	---	29.55	29.74
	4625.32	---	30.99	31.24
	4503.71	---	40.5	40.5
	4485.05	---	41.94	41.94
	4361.84	---	51.45	51.45
	4343.3	---	52.88	52.88
	4222.47	---	62.2	62.2
	4204.47	63.24	63.72	63.72
*	4080.46	---	51.1	52.28
*	4062.73	---	51.28	52.26
*	3940.9	---	50.82	52.2
*	3922.63	---	51.88	52.5
*	3799.87	---	49.96	49.96
B	3784	108.24	---	---
*	3781.1	---	49.96	49.96
*	3659.62	---	49.96	49.96

*	3641.43	---	49.96	49.96
*	3518.86	---	52.58	52.64
*	3500.63	---	52.64	52.64
*	3378.49	---	50.9	50.9
*	3360.44	---	50.9	50.9
*	3238.3	---	55.38	55.76
*	3220.24	---	55.71	55.76
*	3147	45.11	52.51	53.4
*	3097.38	---	49.03	51.69
*	3079.08	---	49.01	50.97
*	2955.93	---	54.29	56.48
*	2937.88	---	54.83	56.43
*	2870	38.31	51.13	51.13
*	2813.98	---	51.13	51.13
*	2795.94	---	51.13	51.13
*	2668.4	---	70.15	70.15
*	2650.68	---	70.15	70.15
	2537.86	---	86.28	86.28
	2520.83	---	88.74	88.74
	2390.93	---	107.5	107.5
	2354.33	---	112.79	112.79
	2262	126.12	126.12	126.12
	2081.92	---	147.39	147.39
	1650	198.41	198.41	198.41
	1492.06	---	159.56	159.56
A	1084	47.03	47.03	47.03
	1027.83	---	47.03	47.03
	949.76	---	47.03	47.03
	878.1	---	47.03	47.03
	859.34	---	47.03	47.03
	735.53	---	47.03	47.03
	716.39	---	47.03	47.03
	595.36	---	47.03	47.03
	577.59	---	47.03	47.03
	553	47.03	47.03	47.03

	459.59	---	47.03	47.03
	441.54	---	47.03	47.03
	324.87	---	47.03	47.03
	307.28	---	47.03	47.03
	200.79	---	47.83	47.83
	185.03	---	50.24	50.24
	28.22	---	124.65	124.65
	12.14	---	131	131

Section 8: Predicted Scour Report, Calculations & Tables

PREDICTED SCOUR REPORT

Theoretical scour depths for the proposed bridge at this site were calculated by using the methods shown in the FHWA publication, HEC-18, "Evaluating Scour at Bridges" and the HEC-RAS computer program. General contraction scour and local pier scour were calculated for the 100 and 500-year storms, as called for in this publication. While geotechnical soil borings were not conducted for this site, an assessment of the soil type was made in the field during the site inspection. The soil type at this site was judged to be medium sand. Therefore, the D_{50} and D_{90} soil particle sizes are estimated to be 0.00123 ft (0.375 mm) and 0.00154 ft (0.475 mm), respectively. Tables and calculations showing predicted scour depths are included in the following pages.

Results

Maximum channel scour depths within the limits of Bridge #16 and #17 vary for the 100-year storm and 500-year storm. The maximum calculated total scour depth at Bridge #16 occurs at bents #6 and is 16.84 ft for the 100-year storm and 17.72 ft for the 500-year storm. The maximum calculated total scour depth at Bridge #17 occurs at bents #2 and #6 and is 17.30 ft and 17.67 ft for the 100-year storm and 18.86 ft and 18.64 ft for the 500-year storm, respectively.

Summary & Conclusion

Foundations depths for the proposed bents should exceed the scour depths noted. The exception will be if rock is encountered before such depths. At Bridge #16, preliminary borings indicate depths to partially weathered rock (PWR) varied between 19 and 49 feet; with bed rock indicated by auger refusal (AR) encountered approximately between 21 and 59 ft. At Bridge #17, preliminary borings indicate depths to partially weathered rock (PWR) varied between 18 ft and 79 ft; AR depths varied between 17 ft to about 80 ft (Boring B-146, Bent 8, 428+37 where, no PWR was present, bed rock indicated by AR is immediately 17 ft below soil overburden). Theoretical scour depths at the abutments are not included, however rip rap placed at the vertical wall abutments protects against scouring.

THEORETICAL SCOUR DEPTHS (ft)

Scour depths at each bent are noted below:

Bridge #16

	100 Year Storm			500 Year Storm		
	General	Local	Total	General	Local	Total
Bent 6	0.30	16.54	16.84	0.52	17.20	17.72
Bent 7	0.00	14.56	14.56	0.00	15.06	15.06
Bent 8	0.00	12.75	12.75	0.00	13.30	13.30

Bridge #17

	100 Year Storm			500 Year Storm		
	General	Local	Total	General	Local	Total
Bent 2	0.56	16.74	17.30	1.35	17.51	18.86
Bent 3	0.00	14.69	14.69	0.00	15.54	15.54
Bent 4	0.09	15.14	15.23	0.39	16.13	16.52
Bent 5	0.00	15.99	15.99	0.00	16.81	16.81
Bent 6	0.66	17.01	17.67	0.85	17.79	18.64
Bent 7	0.42	14.41	14.83	0.55	14.90	15.45
Bent 8	0.00	14.05	14.05	0.00	14.54	14.54
Bent 9	0.72	14.35	15.08	1.48	14.92	16.41
Bent 10	0.27	13.69	13.96	0.44	13.88	14.32
Bent 11	0.00	13.48	13.48	0.00	13.65	13.65
Bent 12	0.00	14.60	14.60	0.00	14.93	14.93
Bent 13	0.07	14.74	14.81	0.01	15.32	15.33
Bent 14	0.00	15.04	15.04	0.00	15.70	15.70
Bent 15	0.00	15.85	15.85	0.55	16.62	17.18
Bent 16	0.00	16.80	16.80	0.00	17.84	17.84
Bent 17	0.00	17.44	17.44	0.00	18.45	18.45
Bent 18	0.00	13.04	13.04	0.00	13.85	13.85
Bent 19	0.00	12.88	12.88	0.00	13.61	13.61

BR 18, BNT 6
100 yr

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	4.41	9.41	2.67
	Approach Velocity (ft/s):	1.86	8.01	1.35
	Br Average Depth (ft):	3.81	8.95	2.81
	BR Opening Flow (cfs):	335.93	1857.86	606.21
	BR Top WD (ft):	43.06	23.12	125.25
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	417.72	1874.33	507.96
	Approach Top WD (ft):	50.89	24.89	140.92
	K1 Coefficient:	0.690	0.690	0.690
Results				
	Scour Depth Ys (ft):	0.30	0.88	0.24
	Critical Velocity (ft/s):	1.54	1.75	1.42
	Equation:	Live	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	10.84
	Velocity Upstream (ft/s):	10.12
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	16.54
	Froude #:	0.54
	Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Left Bank:	16.84

BR 10, BNT 6
500 YR

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	5.44	10.61	2.80
	Approach Velocity (ft/s):	2.07	8.42	1.36
	Br Average Depth (ft):	4.73	10.07	2.54
	BR Opening Flow (cfs):	501.81	2279.92	868.27
	BR Top WD (ft):	45.14	23.12	210.10
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	593.28	2223.11	833.62
	Approach Top WD (ft):	52.77	24.89	219.42
	K1 Coefficient:	0.690	0.690	0.690
Results				
	Scour Depth Ys (ft):	0.52	1.34	0.12
	Critical Velocity (ft/s):	1.60	1.79	1.43
	Equation:	Live	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	12.05
	Velocity Upstream (ft/s):	10.72
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	17.20
	Froude #:	0.54
	Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Left Bank:	17.72

BR 16, BNT 7
100 yr

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	4.64	9.11	3.18
	Approach Velocity (ft/s):	1.18	5.37	0.94
	Br Average Depth (ft):	4.86	9.68	3.78
	BR Opening Flow (cfs):	303.70	1745.61	750.69
	BR Top WD (ft):	40.98	27.42	147.96
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	183.93	1988.92	627.15
	Approach Top WD (ft):	33.55	40.68	209.55
	K1 Coefficient:	0.690	0.690	0.640
Results				
	Scour Depth Ys (ft):	0.00	1.01	0.00
	Critical Velocity (ft/s):	1.56	1.74	1.46
	Equation:	Clear	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	10.98
	Velocity Upstream (ft/s):	7.50
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	14.56
	Froude #:	0.40
	Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Left Bank:	14.56

BR 16, BNT 7
500 YR

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	5.47	10.32	4.02
	Approach Velocity (ft/s):	1.29	5.70	1.08
	Br Average Depth (ft):	5.84	10.90	5.00
	BR Opening Flow (cfs):	410.95	2073.38	1165.66
	BR Top WD (ft):	42.86	27.42	147.96
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	254.20	2391.87	1003.93
	Approach Top WD (ft):	36.11	40.68	232.04
	K1 Coefficient:	0.690	0.690	0.690
Results				
	Scour Depth Ys (ft):	0.00	1.09	0.00
	Critical Velocity (ft/s):	1.60	1.78	1.52
	Equation:	Clear	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	12.20
	Velocity Upstream (ft/s):	7.84
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	15.06
	Froude #:	0.40
	Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Left Bank:	15.06

Br 16, Bnt 8
100 yr

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	4.05	8.81	1.98
	Approach Velocity (ft/s):	1.75	7.95	1.10
	Br Average Depth (ft):	5.27	9.70	3.25
	BR Opening Flow (cfs):	162.01	2094.18	543.81
	BR Top WD (ft):	27.26	42.76	191.91
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	508.87	1998.90	292.23
	Approach Top WD (ft):	71.84	28.52	134.01
	K1 Coefficient:	0.690	0.690	0.690
Results				
	Scour Depth Ys (ft):	0.00	0.00	0.00
	Critical Velocity (ft/s):	1.52	1.73	1.35
	Equation:	Live	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	11.00
	Velocity Upstream (ft/s):	5.50
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	12.75
	Froude #:	0.29
	Equation:	CSU equation

BR 1k, BNT 8
500 yr

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	5.09	10.02	2.19
	Approach Velocity (ft/s):	1.94	8.28	1.12
	Br Average Depth (ft):	5.97	10.90	4.45
	BR Opening Flow (cfs):	216.37	2523.36	910.27
	BR Top WD (ft):	29.78	42.76	191.91
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	737.49	2366.93	545.58
	Approach Top WD (ft):	74.54	28.52	221.85
	K1 Coefficient:	0.690	0.690	0.690
Results				
	Scour Depth Ys (ft):	0.00	0.00	0.00
	Critical Velocity (ft/s):	1.58	1.77	1.37
	Equation:	Live	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	12.20
	Velocity Upstream (ft/s):	5.87
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	13.30
	Froude #:	0.30
	Equation:	CSU equation

BR 17, BNT 2
100 yr

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	3.90	7.28	1.22
	Approach Velocity (ft/s):	1.35	6.52	0.68
	Br Average Depth (ft):	1.92	6.38	
	BR Opening Flow (cfs):	267.88	2532.12	
	BR Top WD (ft):	70.35	32.74	
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	132.71	2615.42	51.86
	Approach Top WD (ft):	25.23	55.09	62.39
	K1 Coefficient:	0.690	0.690	0.640
Results				
	Scour Depth Ys (ft):	0.56	3.76	
	Critical Velocity (ft/s):	1.51	1.68	
	Equation:	Clear	Live	

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	9.34
	Velocity Upstream (ft/s):	10.90
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	16.74
	Froude #:	0.63
	Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Left Bank:	17.30

BR 17, BNT 2
500 YR

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	4.54	8.28	2.16
	Approach Velocity (ft/s):	1.53	7.27	1.02
	Br Average Depth (ft):	2.85	7.35	0.81
	BR Opening Flow (cfs):	509.55	3108.13	32.32
	BR Top WD (ft):	72.43	32.87	35.10
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	191.07	3316.49	142.44
	Approach Top WD (ft):	27.46	55.09	64.51
	K1 Coefficient:	0.690	0.690	0.690
Results				
	Scour Depth Ys (ft):	1.35	3.83	0.00
	Critical Velocity (ft/s):	1.55	1.71	1.37
	Equation:	Clear	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	10.37
	Velocity Upstream (ft/s):	11.71
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	17.51
	Froude #:	0.64
	Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Left Bank:	18.86

BR 17, BNT 3
100 YR

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	2.11	7.09	1.20
	Approach Velocity (ft/s):	1.48	7.57	0.80
	Br Average Depth (ft):	1.15	7.39	1.75
	BR Opening Flow (cfs):	6.14	2695.52	98.34
	BR Top WD (ft):	8.80	53.78	62.43
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	41.19	2742.88	15.93
	Approach Top WD (ft):	13.14	51.13	16.55
	K1 Coefficient:	0.690	0.690	0.640
Results				
	Scour Depth Ys (ft):	0.00	0.00	0.00
	Critical Velocity (ft/s):	1.36	1.67	1.24
	Equation:	Live	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	10.03
	Velocity Upstream (ft/s):	7.86
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	14.69
	Froude #:	0.44
	Equation:	CSU equation

BR 17, BNT 3
500 YR

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	2.82	8.09	2.20
	Approach Velocity (ft/s):	1.85	8.53	1.25
	Br Average Depth (ft):	1.76	8.42	2.70
	BR Opening Flow (cfs):	17.34	3418.51	214.15
	BR Top WD (ft):	11.35	53.78	64.66
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	77.02	3527.68	45.30
	Approach Top WD (ft):	14.77	51.13	16.55
	K1 Coefficient:	0.690	0.690	0.690
Results				
	Scour Depth Ys (ft):	0.00	0.00	0.00
	Critical Velocity (ft/s):	1.43	1.71	1.37
	Equation:	Live	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	11.08
	Velocity Upstream (ft/s):	8.69
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	15.54
	Froude #:	0.46
	Equation:	CSU equation

BR 17, BNT 4
100 yr

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	2.27	6.96	0.71
	Approach Velocity (ft/s):	1.64	7.62	0.53
	Br Average Depth (ft):	1.96	7.42	0.76
	BR Opening Flow (cfs):	23.41	2774.49	2.11
	BR Top WD (ft):	9.13	47.13	4.49
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	87.52	2711.49	0.98
	Approach Top WD (ft):	23.47	51.13	2.63
	K1 Coefficient:	0.690	0.690	0.640
Results				
	Scour Depth Ys (ft):	0.00	0.09	0.00
	Critical Velocity (ft/s):	1.38	1.67	1.14
	Equation:	Live	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	9.60
	Velocity Upstream (ft/s):	8.56
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	15.14
	Froude #:	0.49
	Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Channel:	15.23

Br 17, Bnt 4
500 yr

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	3.16	8.08	1.26
	Approach Velocity (ft/s):	2.04	8.43	0.78
	Br Average Depth (ft):	2.56	8.40	1.17
	BR Opening Flow (cfs):	44.83	3596.87	8.30
	BR Top WD (ft):	10.84	47.13	8.05
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	164.20	3481.16	4.64
	Approach Top WD (ft):	25.53	51.13	4.70
	K1 Coefficient:	0.690	0.690	0.690
Results				
	Scour Depth Ys (ft):	0.00	0.39	0.00
	Critical Velocity (ft/s):	1.46	1.71	1.25
	Equation:	Live	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	10.69
	Velocity Upstream (ft/s):	9.58
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	16.13
	Froude #:	0.52
	Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Channel:	16.52

BR 17, BNT 5
100 YR

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):		5.16	
	Approach Velocity (ft/s):		10.99	
	Br Average Depth (ft):	0.86	6.23	
	BR Opening Flow (cfs):	11.25	2788.75	
	BR Top WD (ft):	12.14	51.27	
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):		2800.00	
	Approach Top WD (ft):		49.36	
	K1 Coefficient:		0.690	
Results				
	Scour Depth Ys (ft):		0.00	
	Critical Velocity (ft/s):		1.58	
	Equation:		Live	

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	8.74
	Velocity Upstream (ft/s):	10.00
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	15.99
	Froude #:	0.60
	Equation:	CSU equation

BR 17, BNT 5
500 YR

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	0.72	5.79	
	Approach Velocity (ft/s):	1.32	11.69	
	Br Average Depth (ft):	1.19	7.01	
	BR Opening Flow (cfs):	37.07	3612.93	
	BR Top WD (ft):	22.79	53.38	
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	10.83	3639.17	
	Approach Top WD (ft):	11.38	53.76	
	K1 Coefficient:	0.690	0.690	
Results				
	Scour Depth Ys (ft):	0.09	0.00	
	Critical Velocity (ft/s):	1.14	1.62	
	Equation:	Live	Live	

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	9.92
	Velocity Upstream (ft/s):	10.80
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	16.81
	Froude #:	0.60
	Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Channel:	16.81

BR 17, BNT 6
100YR

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	0.62	5.72	
	Approach Velocity (ft/s):	0.95	9.21	
	Br Average Depth (ft):		5.38	
	BR Opening Flow (cfs):		2800.00	
	BR Top WD (ft):		49.07	
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	6.38	2793.62	
	Approach Top WD (ft):	10.84	52.99	
	K1 Coefficient:	0.640	0.690	
Results				
	Scour Depth Ys (ft):		0.66	
	Critical Velocity (ft/s):		1.61	
	Equation:		Live	

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	7.67
	Velocity Upstream (ft/s):	12.03
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	17.01
	Froude #:	0.77
	Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Channel:	17.67

BR 17, BNT 6
500YR

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	1.18	6.58	0.29
	Approach Velocity (ft/s):	1.43	9.86	0.25
	Br Average Depth (ft):	0.81	6.17	
	BR Opening Flow (cfs):	13.16	3636.84	
	BR Top WD (ft):	11.86	51.13	
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	33.54	3616.44	0.02
	Approach Top WD (ft):	19.82	55.76	0.28
	K1 Coefficient:	0.690	0.690	0.640
Results				
	Scour Depth Ys (ft):	0.00	0.85	
	Critical Velocity (ft/s):	1.24	1.65	
	Equation:	Live	Live	

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	8.87
	Velocity Upstream (ft/s):	12.76
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	17.79
	Froude #:	0.75
	Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Channel:	18.64

BR 17, BNT 7
100YR

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	1.09	6.89	2.53
	Approach Velocity (ft/s):	0.84	6.31	1.11
	Br Average Depth (ft):	1.18	6.61	0.11
	BR Opening Flow (cfs):	16.08	2293.88	0.04
	BR Top WD (ft):	13.98	51.76	2.65
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	17.36	2211.60	81.04
	Approach Top WD (ft):	19.15	50.90	28.76
	K1 Coefficient:	0.640	0.690	0.690
Results				
	Scour Depth Ys (ft):	0.00	0.42	0.00
	Critical Velocity (ft/s):	1.22	1.66	1.41
	Equation:	Clear	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	9.14
	Velocity Upstream (ft/s):	7.75
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	14.41
	Froude #:	0.45
	Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Channel:	14.83

BR 17, BNT 7
500 YR

Contraction Scour

Input Data	Left	Channel	Right
Average Depth (ft):	1.64	8.13	3.54
Approach Velocity (ft/s):	1.03	6.59	1.29
Br Average Depth (ft):	1.54	7.85	0.81
BR Opening Flow (cfs):	49.28	2873.47	7.25
BR Top WD (ft):	29.21	51.76	16.03
Grain Size D50 (mm):	0.38	0.38	0.38
Approach Flow (cfs):	59.57	2728.09	142.34
Approach Top WD (ft):	35.24	50.90	31.08
K1 Coefficient:	0.640	0.690	0.690
Results			
Scour Depth Ys (ft):	0.00	0.55	0.00
Critical Velocity (ft/s):	1.31	1.71	1.49
Equation:	Clear	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data	
Pier Shape:	Square nose
Pier Width (ft):	8.00
Grain Size D50 (mm):	0.38000
Depth Upstream (ft):	10.44
Velocity Upstream (ft/s):	8.03
K1 Nose Shape:	1.10
Pier Angle:	0.00
Pier Length (ft):	6.00
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	0.47000
K4 Armouring Coef:	1.00
Results	
Scour Depth Ys (ft):	14.90
Froude #:	0.44
Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Channel: 15.45

BR 17, BNT 8
100 YR

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	1.00	6.65	1.22
	Approach Velocity (ft/s):	0.84	6.53	0.73
	Br Average Depth (ft):	1.27	7.35	2.61
	BR Opening Flow (cfs):	17.48	2198.04	94.48
	BR Top WD (ft):	15.11	46.90	31.99
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	15.93	2285.47	8.60
	Approach Top WD (ft):	19.01	52.64	9.70
	K1 Coefficient:	0.640	0.690	0.640
Results				
	Scour Depth Ys (ft):	0.00	0.00	0.00
	Critical Velocity (ft/s):	1.20	1.65	1.25
	Equation:	Clear	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	9.30
	Velocity Upstream (ft/s):	7.27
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	14.05
	Froude #:	0.42
	Equation:	CSU equation

BR 17, BNT 8
100 YR

Contraction Scour

Input Data	Left	Channel	Right
Average Depth (ft):	1.51	7.84	1.90
Approach Velocity (ft/s):	1.05	6.91	0.92
Br Average Depth (ft):	1.62	8.58	3.62
BR Opening Flow (cfs):	51.73	2709.93	168.35
BR Top WD (ft):	31.51	46.90	34.38
Grain Size D50 (mm):	0.38	0.38	0.38
Approach Flow (cfs):	54.46	2851.92	23.62
Approach Top WD (ft):	34.50	52.64	13.53
K1 Coefficient:	0.640	0.690	0.690
Results			
Scour Depth Ys (ft):	0.00	0.00	0.00
Critical Velocity (ft/s):	1.29	1.70	1.34
Equation:	Clear	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data	
Pier Shape:	Square nose
Pier Width (ft):	8.00
Grain Size D50 (mm):	0.38000
Depth Upstream (ft):	10.55
Velocity Upstream (ft/s):	7.56
K1 Nose Shape:	1.10
Pier Angle:	0.00
Pier Length (ft):	6.00
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	0.47000
K4 Armouring Coef:	1.00
Results	
Scour Depth Ys (ft):	14.54
Froude #:	0.41
Equation:	CSU equation

BR 17, BNT 9
100 YR

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	1.10	7.10	1.74
	Approach Velocity (ft/s):	0.78	5.97	0.85
	Br Average Depth (ft):	1.15	7.02	0.91
	BR Opening Flow (cfs):	15.77	2291.15	3.08
	BR Top WD (ft):	14.86	48.64	5.73
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	19.32	2116.44	174.24
	Approach Top WD (ft):	22.47	49.96	118.19
	K1 Coefficient:	0.640	0.690	0.640
Results				
	Scour Depth Ys (ft):	0.00	0.72	0.00
	Critical Velocity (ft/s):	1.22	1.67	1.32
	Equation:	Clear	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	9.19
	Velocity Upstream (ft/s):	7.66
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	14.35
	Froude #:	0.45
	Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Channel:	15.08

BR 17, BNT 9
500 yr

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	1.75	8.39	2.83
	Approach Velocity (ft/s):	0.94	5.92	1.00
	Br Average Depth (ft):	1.31	8.20	1.50
	BR Opening Flow (cfs):	46.08	2872.38	11.54
	BR Top WD (ft):	36.14	48.64	9.47
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	67.76	2483.19	379.05
	Approach Top WD (ft):	41.06	49.96	134.03
	K1 Coefficient:	0.640	0.690	0.690
Results				
	Scour Depth Ys (ft):	0.00	1.48	0.00
	Critical Velocity (ft/s):	1.32	1.72	1.43
	Equation:	Clear	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	10.42
	Velocity Upstream (ft/s):	8.07
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	14.92
	Froude #:	0.44
	Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Channel:	16.41

BR 17, BNT 10
100 YR

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	1.23	7.24	1.99
	Approach Velocity (ft/s):	0.79	5.64	0.83
	Br Average Depth (ft):	1.27	7.62	1.80
	BR Opening Flow (cfs):	19.58	2107.01	183.42
	BR Top WD (ft):	18.52	45.96	123.26
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	22.01	2039.47	248.52
	Approach Top WD (ft):	22.76	49.96	150.58
	K1 Coefficient:	0.640	0.690	0.640
Results				
	Scour Depth Ys (ft):	0.00	0.27	0.00
	Critical Velocity (ft/s):	1.25	1.68	1.35
	Equation:	Clear	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	9.49
	Velocity Upstream (ft/s):	6.79
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	13.69
	Froude #:	0.39
	Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Channel:	13.96

BR 17, BNT 10
500 YR

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	1.85	8.49	3.24
	Approach Velocity (ft/s):	0.91	5.57	1.02
	Br Average Depth (ft):	1.84	8.90	2.83
	BR Opening Flow (cfs):	60.15	2469.94	399.92
	BR Top WD (ft):	33.86	45.96	137.55
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	69.28	2362.98	497.74
	Approach Top WD (ft):	41.05	49.96	150.58
	K1 Coefficient:	0.640	0.690	0.690
Results				
	Scour Depth Ys (ft):	0.00	0.44	0.00
	Critical Velocity (ft/s):	1.34	1.72	1.47
	Equation:	Clear	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	10.78
	Velocity Upstream (ft/s):	6.74
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	13.88
	Froude #:	0.36
	Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Channel:	14.32

BR 17, BNT 11
100 YR

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	0.89	6.22	1.60
	Approach Velocity (ft/s):	0.84	6.78	0.95
	Br Average Depth (ft):	1.26	7.61	2.24
	BR Opening Flow (cfs):	18.49	2012.28	279.22
	BR Top WD (ft):	18.50	45.96	136.46
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	9.28	2184.39	116.33
	Approach Top WD (ft):	12.33	51.87	76.40
	K1 Coefficient:	0.640	0.690	0.690
Results				
	Scour Depth Ys (ft):	0.00	0.00	0.00
	Critical Velocity (ft/s):	1.18	1.63	1.30
	Equation:	Clear	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	9.43
	Velocity Upstream (ft/s):	6.57
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	13.48
	Froude #:	0.38
	Equation:	CSU equation

BR 17, BNT 11
500 YR

Contraction Scour

Input Data	Left	Channel	Right
Average Depth (ft):	0.79	7.31	2.65
Approach Velocity (ft/s):	0.72	6.90	1.21
Br Average Depth (ft):	1.75	8.81	3.44
BR Opening Flow (cfs):	53.65	2345.71	530.64
BR Top WD (ft):	33.97	45.96	136.46
Grain Size D50 (mm):	0.38	0.38	0.38
Approach Flow (cfs):	23.23	2646.65	260.12
Approach Top WD (ft):	41.23	52.50	81.00
K1 Coefficient:	0.640	0.690	0.690
Results			
Scour Depth Ys (ft):	0.00	0.00	0.00
Critical Velocity (ft/s):	1.16	1.68	1.42
Equation:	Clear	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data	
Pier Shape:	Square nose
Pier Width (ft):	8.00
Grain Size D50 (mm):	0.38000
Depth Upstream (ft):	10.68
Velocity Upstream (ft/s):	6.50
K1 Nose Shape:	1.10
Pier Angle:	0.00
Pier Length (ft):	6.00
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	0.47000
K4 Armouring Coef:	1.00
Results	
Scour Depth Ys (ft):	13.65
Froude #:	0.35
Equation:	CSU equation

BR 17, BNT 12
100 YR

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	0.72	6.03	1.94
	Approach Velocity (ft/s):	0.79	7.17	1.15
	Br Average Depth (ft):	0.69	6.32	1.56
	BR Opening Flow (cfs):	5.89	2186.25	117.86
	BR Top WD (ft):	11.24	48.50	76.27
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	6.44	2223.64	79.92
	Approach Top WD (ft):	11.37	51.44	35.83
	K1 Coefficient:	0.640	0.690	0.690
Results				
	Scour Depth Ys (ft):	0.00	0.00	0.00
	Critical Velocity (ft/s):	1.14	1.63	1.35
	Equation:	Clear	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	8.45
	Velocity Upstream (ft/s):	8.19
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	14.60
	Froude #:	0.50
	Equation:	CSU equation

BR 17, BNT 12
500YR

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	1.24	6.93	2.47
	Approach Velocity (ft/s):	1.09	7.57	1.30
	Br Average Depth (ft):	1.50	7.46	2.63
	BR Opening Flow (cfs):	26.67	2634.33	269.00
	BR Top WD (ft):	15.71	48.50	79.31
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	26.51	2758.27	145.22
	Approach Top WD (ft):	19.56	52.56	45.18
	K1 Coefficient:	0.690	0.690	0.690
Results				
	Scour Depth Ys (ft):	0.00	0.00	0.00
	Critical Velocity (ft/s):	1.25	1.66	1.40
	Equation:	Clear	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	9.61
	Velocity Upstream (ft/s):	8.28
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	14.93
	Froude #:	0.47
	Equation:	CSU equation

BR 17, BNT 13
100 YR

Contraction Scour

Input Data	Left	Channel	Right
Average Depth (ft):	0.90	7.18	1.70
Approach Velocity (ft/s):	0.81	7.65	1.18
Br Average Depth (ft):	0.67	6.28	2.05
BR Opening Flow (cfs):	5.63	2224.99	79.38
BR Top WD (ft):	11.11	48.56	32.43
Grain Size D50 (mm):	0.38	0.38	0.38
Approach Flow (cfs):	1.79	2194.18	114.03
Approach Top WD (ft):	2.45	39.90	56.78
K1 Coefficient:	0.640	0.690	0.690
Results			
Scour Depth Ys (ft):	0.00	0.07	0.00
Critical Velocity (ft/s):	1.18	1.67	1.32
Equation:	Clear	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data	
Pier Shape:	Square nose
Pier Width (ft):	8.00
Grain Size D50 (mm):	0.38000
Depth Upstream (ft):	8.42
Velocity Upstream (ft/s):	8.38
K1 Nose Shape:	1.10
Pier Angle:	0.00
Pier Length (ft):	6.00
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	0.47000
K4 Armouring Coef:	1.00
Results	
Scour Depth Ys (ft):	14.74
Froude #:	0.51
Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Channel: 14.81

BR 17, BNT 13
500 YR

Contraction Scour

Input Data	Left	Channel	Right
Average Depth (ft):	1.80	8.19	2.65
Approach Velocity (ft/s):	1.10	8.21	1.56
Br Average Depth (ft):	1.38	7.31	2.91
BR Opening Flow (cfs):	24.84	2757.08	148.09
BR Top WD (ft):	15.42	48.56	34.88
Grain Size D50 (mm):	0.38	0.38	0.38
Approach Flow (cfs):	5.24	2683.63	241.13
Approach Top WD (ft):	2.65	39.90	58.47
K1 Coefficient:	0.690	0.690	0.690
Results			
Scour Depth Ys (ft):	0.00	0.01	0.00
Critical Velocity (ft/s):	1.33	1.71	1.42
Equation:	Clear	Live	Live

Pier Scour

All piers have the same scour depth

Input Data	
Pier Shape:	Square nose
Pier Width (ft):	8.00
Grain Size D50 (mm):	0.38000
Depth Upstream (ft):	9.48
Velocity Upstream (ft/s):	8.83
K1 Nose Shape:	1.10
Pier Angle:	0.00
Pier Length (ft):	6.00
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	0.47000
K4 Armouring Coef:	1.00
Results	
Scour Depth Ys (ft):	15.32
Froude #:	0.51
Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Channel: 15.33

BR 17, BNT 14
100 yr

Contraction Scour

Input Data	Left	Channel	Right
Average Depth (ft):	0.30	6.93	1.18
Approach Velocity (ft/s):	0.52	8.84	1.22
Br Average Depth (ft):	0.70	7.11	1.53
BR Opening Flow (cfs):	1.10	2223.50	85.40
BR Top WD (ft):	2.15	40.25	49.95
Grain Size D50 (mm):	0.38	0.38	0.38
Approach Flow (cfs):	0.27	2260.27	49.46
Approach Top WD (ft):	1.77	36.89	34.41
K1 Coefficient:	0.640	0.690	0.690
Results			
Scour Depth Ys (ft):	0.00	0.00	0.00
Critical Velocity (ft/s):	0.99	1.66	1.24
Equation:	Clear	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data	
Pier Shape:	Square nose
Pier Width (ft):	8.00
Grain Size D50 (mm):	0.38000
Depth Upstream (ft):	8.85
Velocity Upstream (ft/s):	8.64
K1 Nose Shape:	1.10
Pier Angle:	0.00
Pier Length (ft):	6.00
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	0.47000
K4 Armouring Coef:	1.00
Results	
Scour Depth Ys (ft):	15.04
Froude #:	0.51
Equation:	CSU equation

BR 17, BNT 14
500 YR

Contraction Scour

Input Data	Left	Channel	Right
Average Depth (ft):	1.04	7.89	2.06
Approach Velocity (ft/s):	1.09	9.61	1.76
Br Average Depth (ft):	1.59	8.12	2.47
BR Opening Flow (cfs):	4.09	2732.22	193.68
BR Top WD (ft):	2.38	40.25	51.76
Grain Size D50 (mm):	0.38	0.38	0.38
Approach Flow (cfs):	3.32	2795.69	130.99
Approach Top WD (ft):	2.93	36.89	36.14
K1 Coefficient:	0.690	0.690	0.690
Results			
Scour Depth Ys (ft):	0.00	0.00	0.00
Critical Velocity (ft/s):	1.21	1.70	1.36
Equation:	Clear	Live	Live

Pier Scour

All piers have the same scour depth

Input Data	
Pier Shape:	Square nose
Pier Width (ft):	8.00
Grain Size D50 (mm):	0.38000
Depth Upstream (ft):	9.89
Velocity Upstream (ft/s):	9.23
K1 Nose Shape:	1.10
Pier Angle:	0.00
Pier Length (ft):	6.00
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	0.47000
K4 Armouring Coef:	1.00
Results	
Scour Depth Ys (ft):	15.70
Froude #:	0.52
Equation:	CSU equation

BR 17, BNT 15
100 YR

Contraction Scour

		Left	Channel	Right
Input Data				
	Average Depth (ft):	1.81	7.99	0.58
	Approach Velocity (ft/s):	1.78	9.74	0.78
	Br Average Depth (ft):	0.36	6.93	1.41
	BR Opening Flow (cfs):	0.45	2257.41	52.14
	BR Top WD (ft):	2.11	36.28	28.02
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	29.73	2274.60	5.66
	Approach Top WD (ft):	9.26	29.23	12.55
	K1 Coefficient:	0.690	0.690	0.640
Results				
	Scour Depth Ys (ft):	0.00	0.00	0.00
	Critical Velocity (ft/s):	1.33	1.70	1.10
	Equation:	Live	Live	Clear

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	8.65
	Velocity Upstream (ft/s):	9.83
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	15.85
	Froude #:	0.59
	Equation:	CSU equation

BR 17, BNT 15
500 YR

Contraction Scour

Input Data

	Left	Channel	Right
Average Depth (ft):	2.08	8.86	1.35
Approach Velocity (ft/s):	2.07	11.00	1.44
Br Average Depth (ft):	1.29	8.04	2.39
BR Opening Flow (cfs):	4.64	2800.60	124.76
BR Top WD (ft):	3.01	36.28	30.04
Grain Size D50 (mm):	0.38	0.38	0.38
Approach Flow (cfs):	53.89	2849.07	27.05
Approach Top WD (ft):	12.55	29.23	13.92
K1 Coefficient:	0.690	0.690	0.690

Results

Scour Depth Ys (ft):	0.00	0.00	0.55
Critical Velocity (ft/s):	1.36	1.73	1.27
Equation:	Live	Live	Live

Pier Scour

All piers have the same scour depth

Input Data

Pier Shape:	Square nose
Pier Width (ft):	8.00
Grain Size D50 (mm):	0.38000
Depth Upstream (ft):	9.66
Velocity Upstream (ft/s):	10.61
K1 Nose Shape:	1.10
Pier Angle:	0.00
Pier Length (ft):	6.00
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	0.47000
K4 Armouring Coef:	1.00

Results

Scour Depth Ys (ft):	16.62
Froude #:	0.60
Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Right Bank: 17.18

BR 17, BNT 16
100 YR

Contraction Scour

Input Data	Left	Channel	Right
Average Depth (ft):	2.67	8.32	
Approach Velocity (ft/s):	2.72	11.19	
Br Average Depth (ft):	2.04	8.06	0.85
BR Opening Flow (cfs):	38.72	2268.65	2.64
BR Top WD (ft):	9.98	28.71	3.26
Grain Size D50 (mm):	0.38	0.38	0.38
Approach Flow (cfs):	98.77	2211.23	
Approach Top WD (ft):	13.60	23.74	
K1 Coefficient:	0.690	0.690	
Results			
Scour Depth Ys (ft):	0.00	0.00	
Critical Velocity (ft/s):	1.42	1.72	
Equation:	Live	Live	

Pier Scour

All piers have the same scour depth

Input Data	
Pier Shape:	Square nose
Pier Width (ft):	8.00
Grain Size D50 (mm):	0.38000
Depth Upstream (ft):	9.41
Velocity Upstream (ft/s):	10.97
K1 Nose Shape:	1.10
Pier Angle:	0.00
Pier Length (ft):	6.00
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	0.47000
K4 Armouring Coef:	1.00
Results	
Scour Depth Ys (ft):	16.80
Froude #:	0.63
Equation:	CSU equation

BR 17, BNT 16
500 YR

Contraction Scour

Input Data	Left	Channel	Right
Average Depth (ft):	3.12	9.17	
Approach Velocity (ft/s):	3.20	12.49	
Br Average Depth (ft):	2.27	8.90	1.33
BR Opening Flow (cfs):	65.25	2857.83	6.92
BR Top WD (ft):	13.11	28.71	4.54
Grain Size D50 (mm):	0.38	0.38	0.38
Approach Flow (cfs):	164.00	2766.00	
Approach Top WD (ft):	16.40	24.16	
K1 Coefficient:	0.690	0.690	
Results			
Scour Depth Ys (ft):	0.00	0.00	
Critical Velocity (ft/s):	1.46	1.74	
Equation:	Live	Live	

Pier Scour

All piers have the same scour depth

Input Data	
Pier Shape:	Square nose
Pier Width (ft):	8.00
Grain Size D50 (mm):	0.38000
Depth Upstream (ft):	10.42
Velocity Upstream (ft/s):	12.21
K1 Nose Shape:	1.10
Pier Angle:	0.00
Pier Length (ft):	6.00
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	0.47000
K4 Armouring Coef:	1.00
Results	
Scour Depth Ys (ft):	17.84
Froude #:	0.67
Equation:	CSU equation

BR 17, BNT 17
100 yr

Contraction Scour

Input Data	Left	Channel	Right
Average Depth (ft):	1.08	7.95	
Approach Velocity (ft/s):	1.08	8.43	
Br Average Depth (ft):	2.81	8.25	
BR Opening Flow (cfs):	96.96	2213.04	
BR Top WD (ft):	13.80	26.07	
Grain Size D50 (mm):	0.38	0.38	
Approach Flow (cfs):	5.70	2304.30	
Approach Top WD (ft):	4.90	34.39	
K1 Coefficient:	0.690	0.690	
Results			
Scour Depth Ys (ft):	1.39	1.05	
Critical Velocity (ft/s):	1.22	1.70	
Equation:	Clear	Live	

Pier Scour

All piers have the same scour depth

Input Data	
Pier Shape:	Square nose
Pier Width (ft):	8.00
Grain Size D50 (mm):	0.38000
Depth Upstream (ft):	9.92
Velocity Upstream (ft/s):	11.77
K1 Nose Shape:	1.10
Pier Angle:	0.00
Pier Length (ft):	6.00
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	0.47000
K4 Armouring Coef:	1.00
Results	
Scour Depth Ys (ft):	17.44
Froude #:	0.66
Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Right Bank:	17.44

BR 17, BNT 1
500YR

Contraction Scour

Input Data	Left	Channel	Right
Average Depth (ft):	1.76	8.98	
Approach Velocity (ft/s):	1.50	9.14	
Br Average Depth (ft):	3.29	9.25	
BR Opening Flow (cfs):	162.06	2767.95	
BR Top WD (ft):	17.19	26.56	
Grain Size D50 (mm):	0.38	0.38	
Approach Flow (cfs):	20.21	2909.79	
Approach Top WD (ft):	7.64	35.46	
K1 Coefficient:	0.690	0.690	
Results			
Scour Depth Ys (ft):	2.70	1.25	
Critical Velocity (ft/s):	1.32	1.74	
Equation:	Live	Live	

Pier Scour

All piers have the same scour depth

Input Data	
Pier Shape:	Square nose
Pier Width (ft):	8.00
Grain Size D50 (mm):	0.38000
Depth Upstream (ft):	11.09
Velocity Upstream (ft/s):	12.95
K1 Nose Shape:	1.10
Pier Angle:	0.00
Pier Length (ft):	6.00
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	0.47000
K4 Armouring Coef:	1.00
Results	
Scour Depth Ys (ft):	18.45
Froude #:	0.69
Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Right Bank: 18.45

BR 17, BNT 18
100 YR

Contraction Scour

Input Data	Left	Channel	Right
Average Depth (ft):	1.39	8.53	0.07
Approach Velocity (ft/s):	0.75	5.25	0.10
Br Average Depth (ft):		8.33	
BR Opening Flow (cfs):		1790.00	
BR Top WD (ft):		42.15	
Grain Size D50 (mm):	0.38	0.38	0.38
Approach Flow (cfs):	6.24	1783.76	0.01
Approach Top WD (ft):	5.99	39.81	1.33
K1 Coefficient:	0.640	0.690	0.590

Results

Scour Depth Ys (ft):	0.00
Critical Velocity (ft/s):	1.72
Equation:	Live

Pier Scour

All piers have the same scour depth

Input Data

Pier Shape:	Square nose
Pier Width (ft):	8.00
Grain Size D50 (mm):	0.38000
Depth Upstream (ft):	10.33
Velocity Upstream (ft/s):	5.91
K1 Nose Shape:	1.10
Pier Angle:	0.00
Pier Length (ft):	6.00
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	0.47000
K4 Armouring Coef:	1.00

Results

Scour Depth Ys (ft):	13.04
Froude #:	0.32
Equation:	CSU equation

BR 17, BNT 18
500 YR

Contraction Scour

Input Data

	Left	Channel	Right
Average Depth (ft):	2.30	9.94	0.77
Approach Velocity (ft/s):	1.01	5.75	0.48
Br Average Depth (ft):		9.35	
BR Opening Flow (cfs):		2300.00	
BR Top WD (ft):		44.01	
Grain Size D50 (mm):	0.38	0.38	0.38
Approach Flow (cfs):	18.98	2275.37	5.65
Approach Top WD (ft):	8.16	39.81	15.09
K1 Coefficient:	0.640	0.690	0.640

Results

Scour Depth Ys (ft):		0.01
Critical Velocity (ft/s):		1.77
Equation:		Live

Pier Scour

All piers have the same scour depth

Input Data

Pier Shape:	Square nose
Pier Width (ft):	8.00
Grain Size D50 (mm):	0.38000
Depth Upstream (ft):	11.74
Velocity Upstream (ft/s):	6.52
K1 Nose Shape:	1.10
Pier Angle:	0.00
Pier Length (ft):	6.00
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	0.47000
K4 Armouring Coef:	1.00

Results

Scour Depth Ys (ft):	13.85
Froude #:	0.34
Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Right Bank:	13.85

BR 17, BNT 19
100 YR

Contraction Scour

Input Data		Left	Channel	Right
	Average Depth (ft):	2.11	7.24	0.92
	Approach Velocity (ft/s):	2.34	10.30	1.03
	Br Average Depth (ft):	1.49	8.35	
	BR Opening Flow (cfs):	7.91	1782.10	
	BR Top WD (ft):	6.35	39.51	
	Grain Size D50 (mm):	0.38	0.38	0.38
	Approach Flow (cfs):	1.74	1787.64	0.63
	Approach Top WD (ft):	0.35	23.97	0.66
	K1 Coefficient:	0.690	0.690	0.690
Results				
	Scour Depth Ys (ft):	0.00	0.00	
	Critical Velocity (ft/s):	1.36	1.68	
	Equation:	Live	Live	

Pier Scour

All piers have the same scour depth

Input Data		
	Pier Shape:	Square nose
	Pier Width (ft):	8.00
	Grain Size D50 (mm):	0.38000
	Depth Upstream (ft):	9.45
	Velocity Upstream (ft/s):	5.90
	K1 Nose Shape:	1.10
	Pier Angle:	0.00
	Pier Length (ft):	6.00
	K2 Angle Coef:	1.00
	K3 Bed Cond Coef:	1.10
	Grain Size D90 (mm):	0.47000
	K4 Armouring Coef:	1.00
Results		
	Scour Depth Ys (ft):	12.88
	Froude #:	0.34
	Equation:	CSU equation

BR 17, BNT 19
500 YR

Contraction Scour

Input Data	Left	Channel	Right
Average Depth (ft):	3.36	8.49	2.16
Approach Velocity (ft/s):	3.14	11.28	1.79
Br Average Depth (ft):	2.46	9.70	0.07
BR Opening Flow (cfs):	22.30	2277.69	0.01
BR Top WD (ft):	7.98	39.51	1.13
Grain Size D50 (mm):	0.38	0.38	0.38
Approach Flow (cfs):	3.70	2293.74	2.56
Approach Top WD (ft):	0.35	23.97	0.66
K1 Coefficient:	0.690	0.690	0.690
Results			
Scour Depth Ys (ft):	0.00	0.00	0.00
Critical Velocity (ft/s):	1.48	1.72	1.37
Equation:	Live	Live	Live

Pier Scour

All piers have the same scour depth

Input Data	
Pier Shape:	Square nose
Pier Width (ft):	8.00
Grain Size D50 (mm):	0.38000
Depth Upstream (ft):	10.84
Velocity Upstream (ft/s):	6.43
K1 Nose Shape:	1.10
Pier Angle:	0.00
Pier Length (ft):	6.00
K2 Angle Coef:	1.00
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	0.47000
K4 Armouring Coef:	1.00
Results	
Scour Depth Ys (ft):	13.61
Froude #:	0.34
Equation:	CSU equation

Section 9:
Clearance Calculations

CLEARANCE CALCULATIONS

As per GDOT policy for a roadway designated as an Interstate, the proposed bridge superstructure will clear the design year (50-year) floodstage by a minimum of 2 feet and the 100-year floodstage by a minimum of 1 foot. The following tables list the bridge clearance results for Bridge #16 and #17, which exceed the minimum requirements. WSEL noted in tables below coorelates to location of low chord elevation on the bridge; River Sta.459.59 at Bridge #16 and River Sta. 2354.33 at Bridge #17.

Clearance to the Low Chord of Bridge #16, Downstream Face

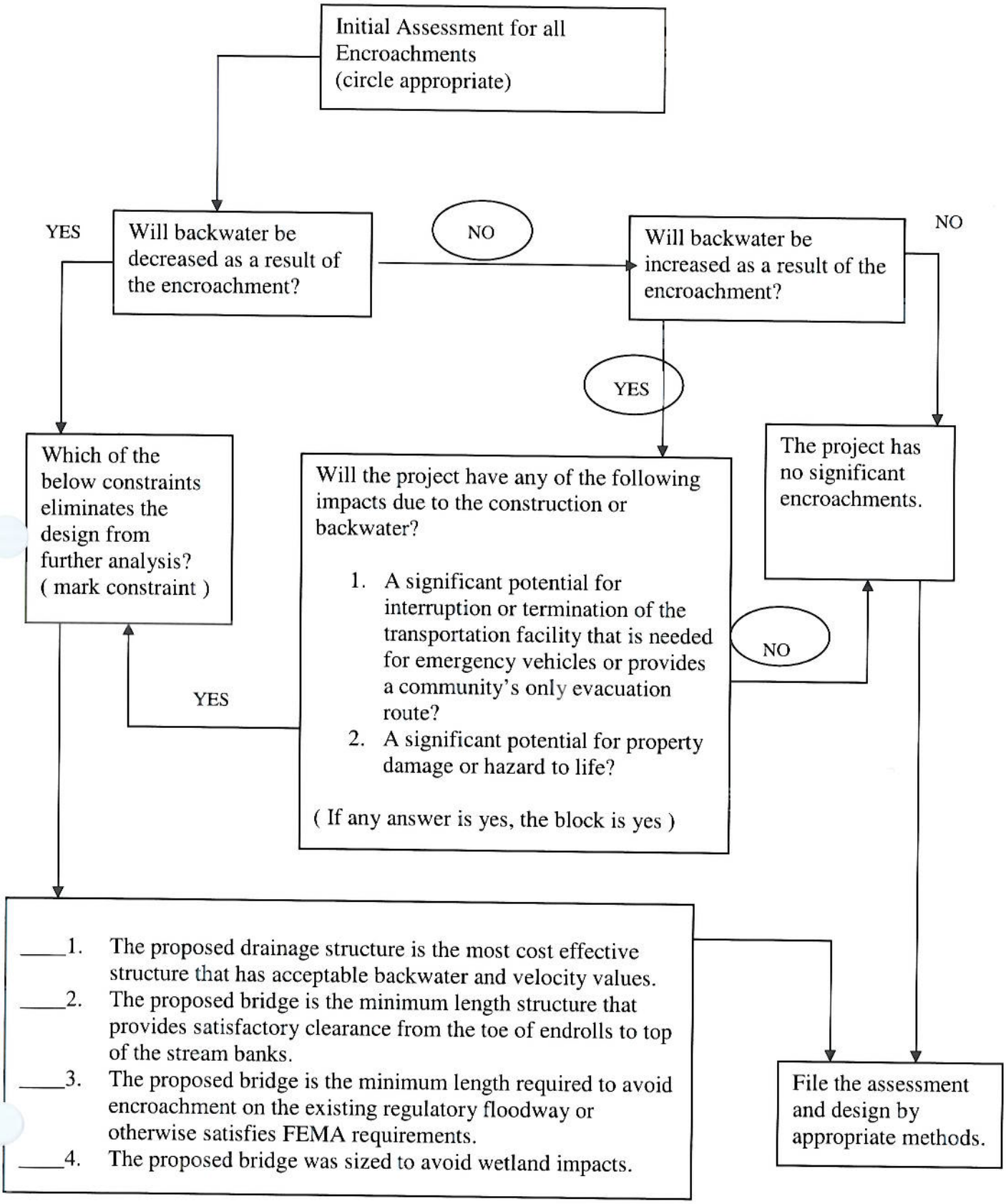
Design Event (yr)	Flow (cfs)	W.S. Elev (ft)	Low Chord of Bridge (ft)	Freeboard (ft)
10	1650	933.36	950.07	16.71
50	2450	934.44	950.07	15.63
100	2800	934.62	950.07	15.45
500	3650	935.34	950.07	14.73

Clearance to the Low Chord of Bridge #17, Downstream Face

Design Event (yr)	Flow (cfs)	W.S. Elev (ft)	Low Chord of Bridge (ft)	Freeboard (ft)
10	1650	940.11	960	19.89
50	2450	941.25	960	18.75
100	2800	941.99	960	18.01
500	3650	943.06	960	16.94

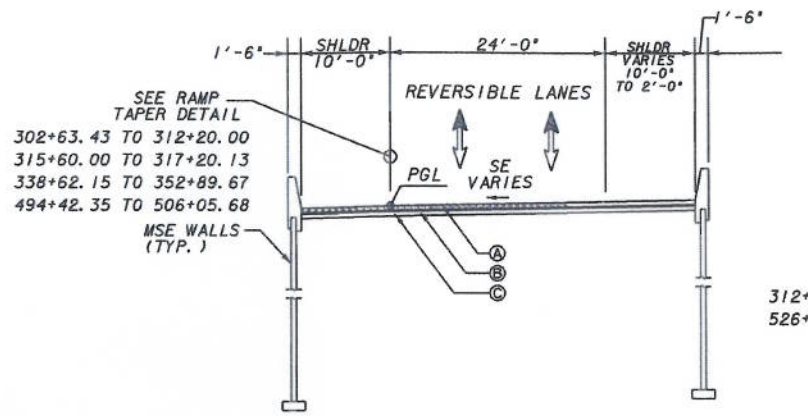
Section 10: Risk Assessment Sheet

Risk Assessment



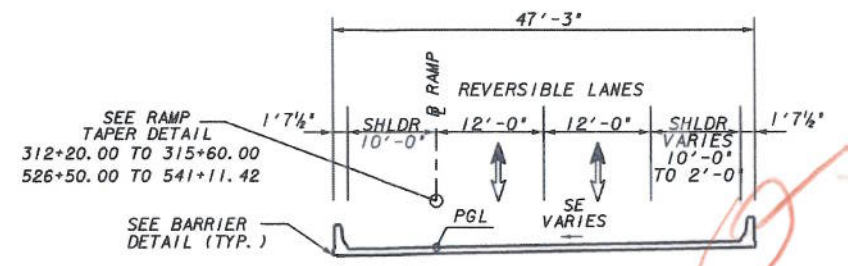
Section 11: Roadway Plan Sheets

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH-000-0073-03(242)		



TS-12
SUPERELEVATED WALL SECTION
I-75 REVERSIBLE (MANAGED LANES)

STA. 300+60.00 TO 302+63.43
STA. 317+20.13 TO 325+85.00
STA. 328+65.00 TO 338+62.15
STA. 383+10.00 TO 394+10.00
STA. 406+70.00 TO 418+55.00
STA. 469+35.00 TO 478+20.00
STA. 482+40.00 TO 489+05.00
STA. 490+80.00 TO 494+42.35
STA. 506+05.68 TO 513+20.00
STA. 551+80.00 TO 555+80.00
STA. 557+20.00 TO 565+20.00
STA. 570+50.00 TO 612+35.00
STA. 612+87.00 TO 624+50.00
STA. 675+30.00 TO 684+30.00
STA. 714+57.00 TO 721+46.91



USE constant slope on bridge

TS-13
SUPERELEVATED BRIDGE SECTION
I-75 REVERSIBLE (MANAGED LANES)

STA. 280+81.69 TO 300+60.00 (BRIDGE #13)
STA. 325+85.00 TO 328+65.00 (BRIDGE #14)
STA. 352+89.69 TO 383+10.00 (BRIDGE #15)
STA. 394+10.00 TO 406+70.00 (BRIDGE #16)
STA. 418+55.00 TO 469+35.00 (BRIDGE #17)
STA. 478+20.00 TO 482+40.00 (BRIDGE #18A)
STA. 489+05.00 TO 490+80.00 (BRIDGE #18)
STA. 513+20.00 TO 526+50.00 (BRIDGE #19)
STA. 541+11.42 TO 551+80.00 (BRIDGE #19)
STA. 555+80.00 TO 557+20.00 (BRIDGE #19B)
STA. 565+20.00 TO 570+50.00 (BRIDGE #19C)
STA. 612+35.00 TO 612++87.00 (BRIDGE #24A)
STA. 624+50.00 TO 675+30.00 (BRIDGE #25)
STA. 684+30.00 TO 714+57.00 (BRIDGE #26 & 29)

PAVEMENT MATERIAL SCHEDULE
(A) CONTINUOUSLY REINFORCED CONCRETE, 12 INCH
(B) RECYCLED ASPH. CONC. 19 MM SUPERPAVE, 330 LBS./SY
(C) GRADED AGGREGATE BASE, 12 INCH
(D) CONCRETE MEDIAN BARRIER TP. S-2
(E) C.I.P. TRAFFIC BARRIER TP. V
(F) CONCRETE SIDE BARRIER TP. 7-W

Note 1: IMPORTANT NOTICE:
This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. I-01.

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KATHRYN HALLMARK	9/23/09	DRAWN BY
		CHECKED BY
		SUPERVISOR
		APPROVED

TRACKING

NO	DATE	DESCRIPTION	DRIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	CEC			
B	9/25/09	50% SUBMITTAL	KAH			
C	11/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	CEC			

GTP GEORGIA TRANSPORTATION PARTNERS

NORTHWEST I-75/I-575 CORRIDOR

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PBSJ

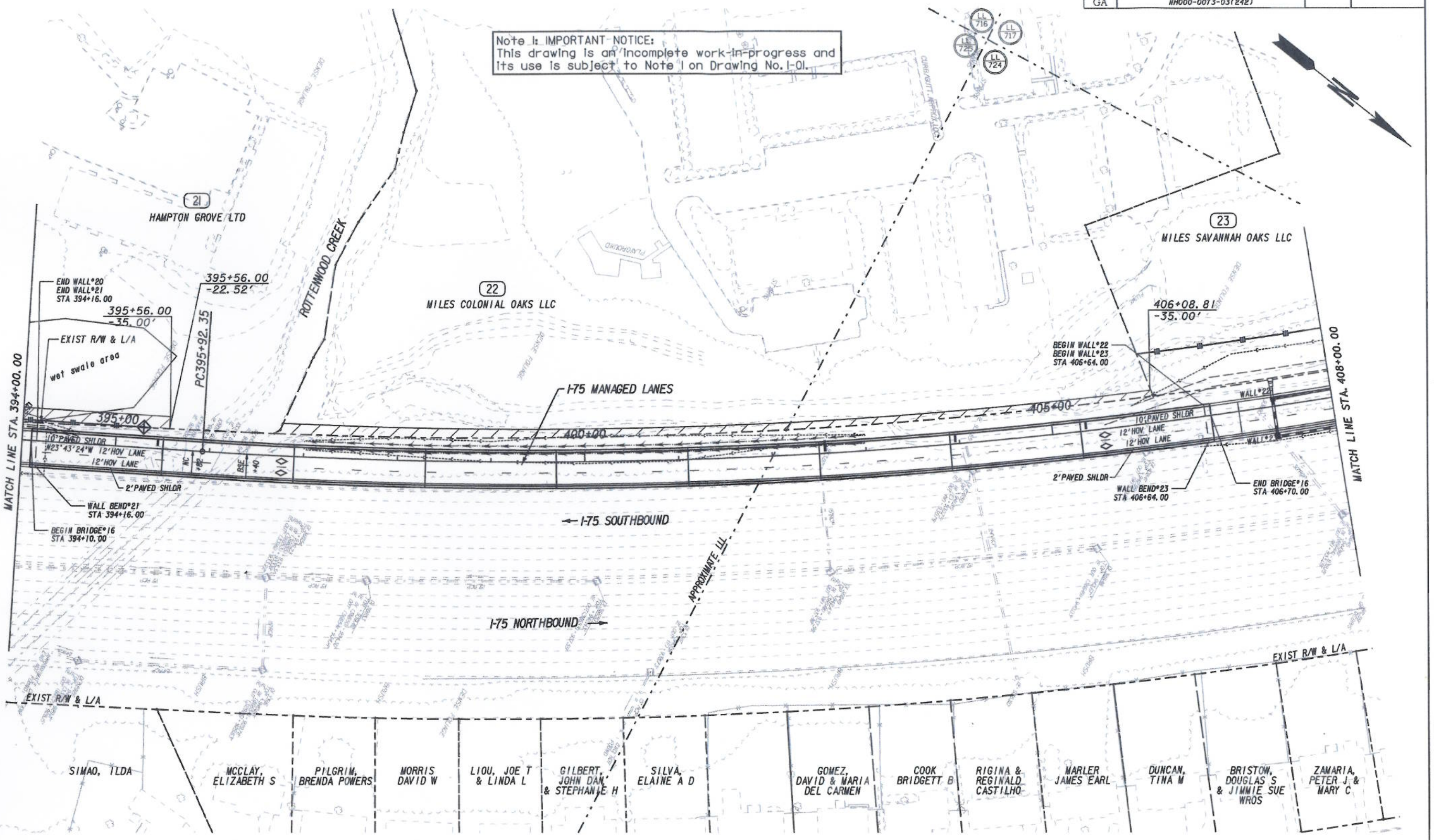
I-75 / I-575 NORTHWEST CORRIDOR

TYPICAL SECTIONS
I-75 REVERSIBLE MANAGED LANES

DRAWING No. 5-5

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	HH000-0073-03(242)		

Note 1: IMPORTANT NOTICE:
This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. I-01.



CLARA CASH 9/23/09
DRAWN BY
CHECKED BY
SUPERVISOR
APPROVED

TRACKING

NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	CEC			
B	9/25/09	50% SUBMITTAL	CEC			
C	11/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	CEC			

GTP GEORGIA TRANSPORTATION PARTNERS

SCALE IN FEET
0 50 100 200

NORTHWEST I-75/I-575 CORRIDOR

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PBSJ

I-75 / I-575 NORTHWEST CORRIDOR

CONSTRUCTION PLAN

I-75 REVERSIBLE

DRAWING No. 13-16

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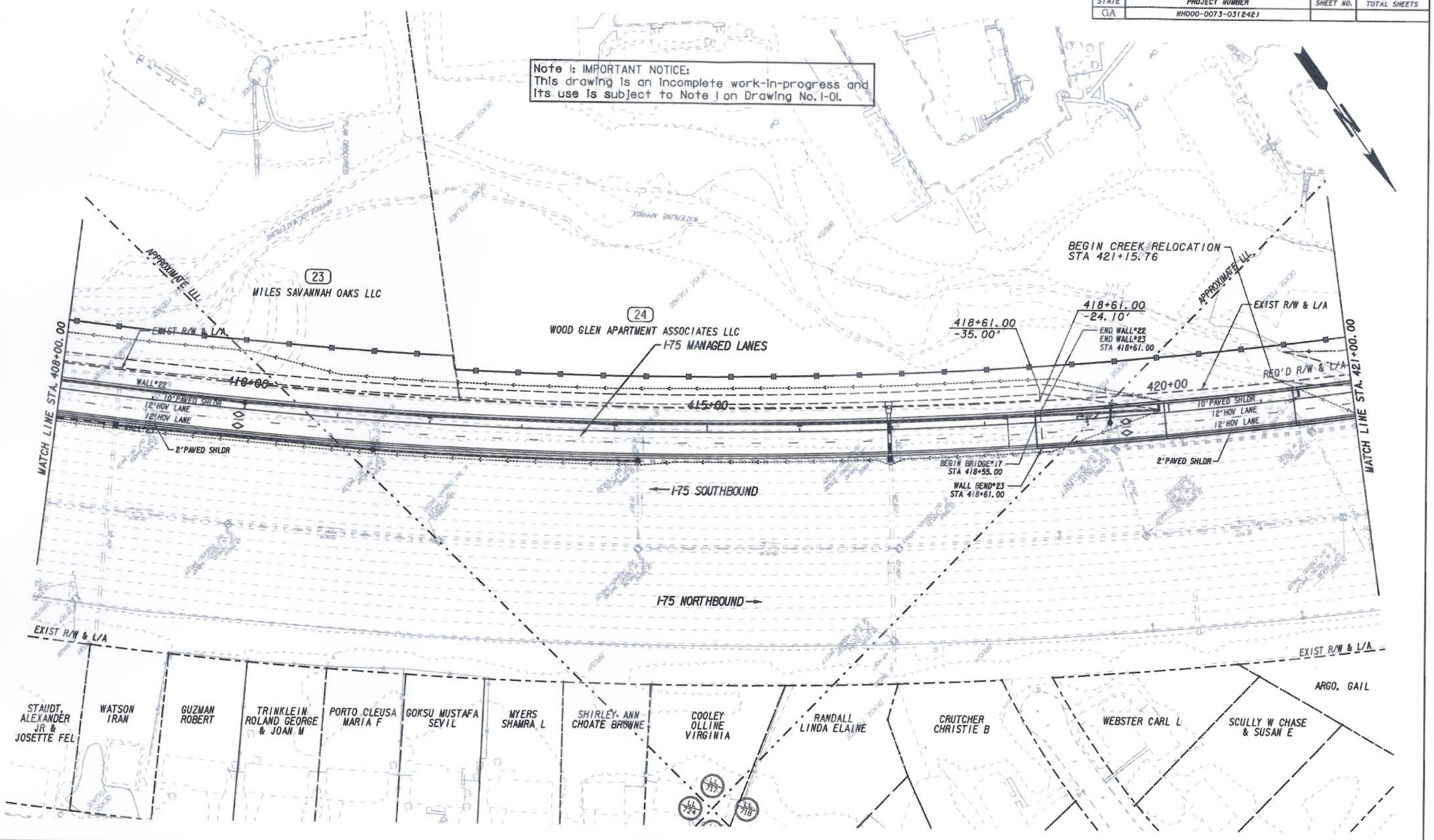
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		

Note 1: IMPORTANT NOTICE:
This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. 1-01.



CLARA CASH	9/23/09	DRAWN BY
		CHECKED BY
		SUPERVISOR
		APPROVED

TRACKING

NO	DATE	DESCRIPTION	DRIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	CEC			
B	9/25/09	50% SUBMITTAL	CEC			
C	11/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	CEC			

GTP GEORGIA TRANSPORTATION PARTNERS

SCALE IN FEET
0 50 100 200

NORTHWEST I-75/I-575 CORRIDOR

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PBSJ

I-75 / I-575 NORTHWEST CORRIDOR

CONSTRUCTION PLAN

I-75 REVERSIBLE

DRAWING No. 13-17

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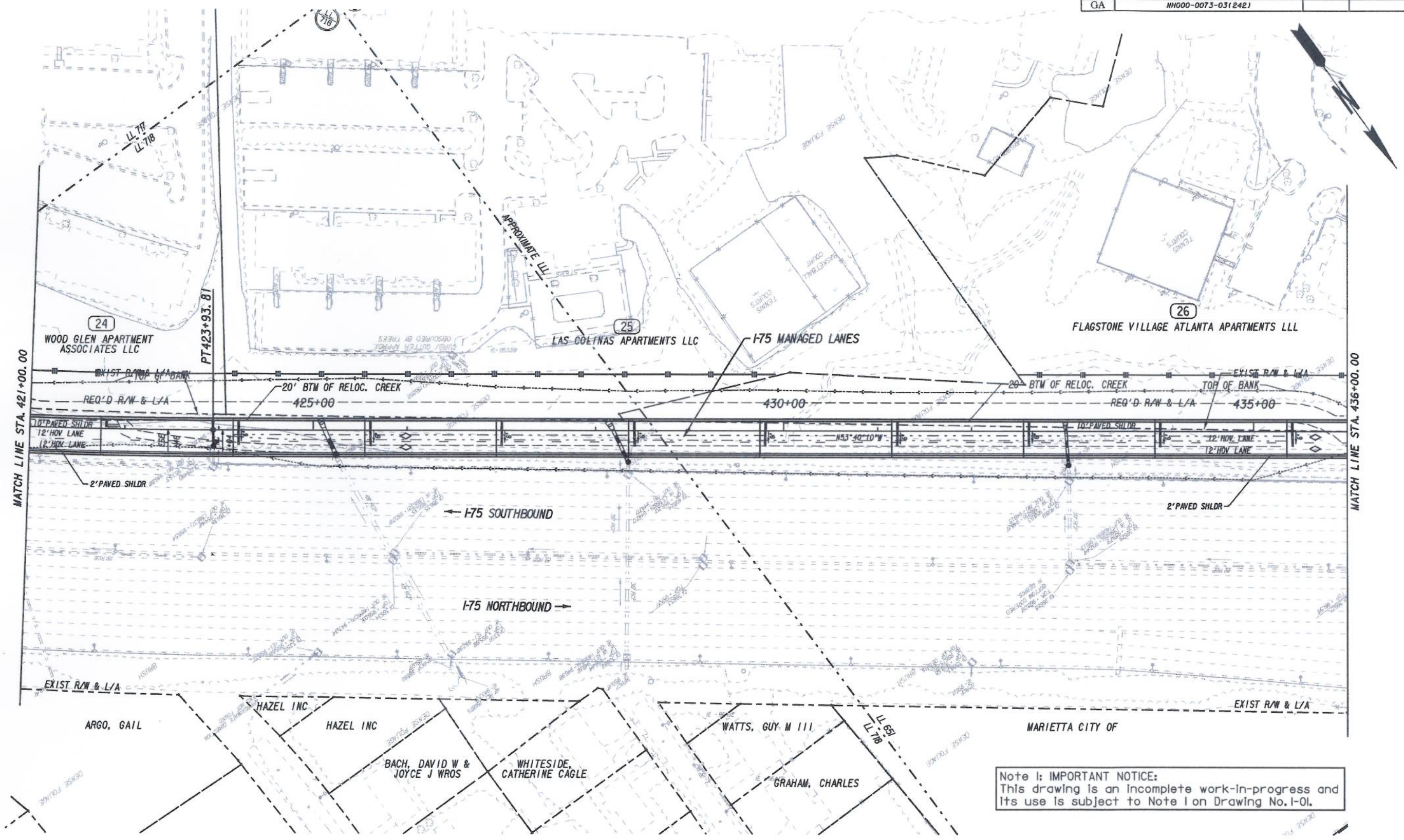
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		



Note 1: IMPORTANT NOTICE:
This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. 1-01.

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CLARA CASH	9/23/09	DRAWN BY
		CHECKED BY
		SUPERVISOR
		APPROVED

TRACKING

NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	CEC			
B	9/25/09	50% SUBMITTAL	CEC			
C	11/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	CEC			

GTP GEORGIA TRANSPORTATION PARTNERS

SCALE IN FEET
0 50 100 200

NORTHWEST I-75/I-575 CORRIDOR

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PBSJ

I-75 / I-575 NORTHWEST CORRIDOR

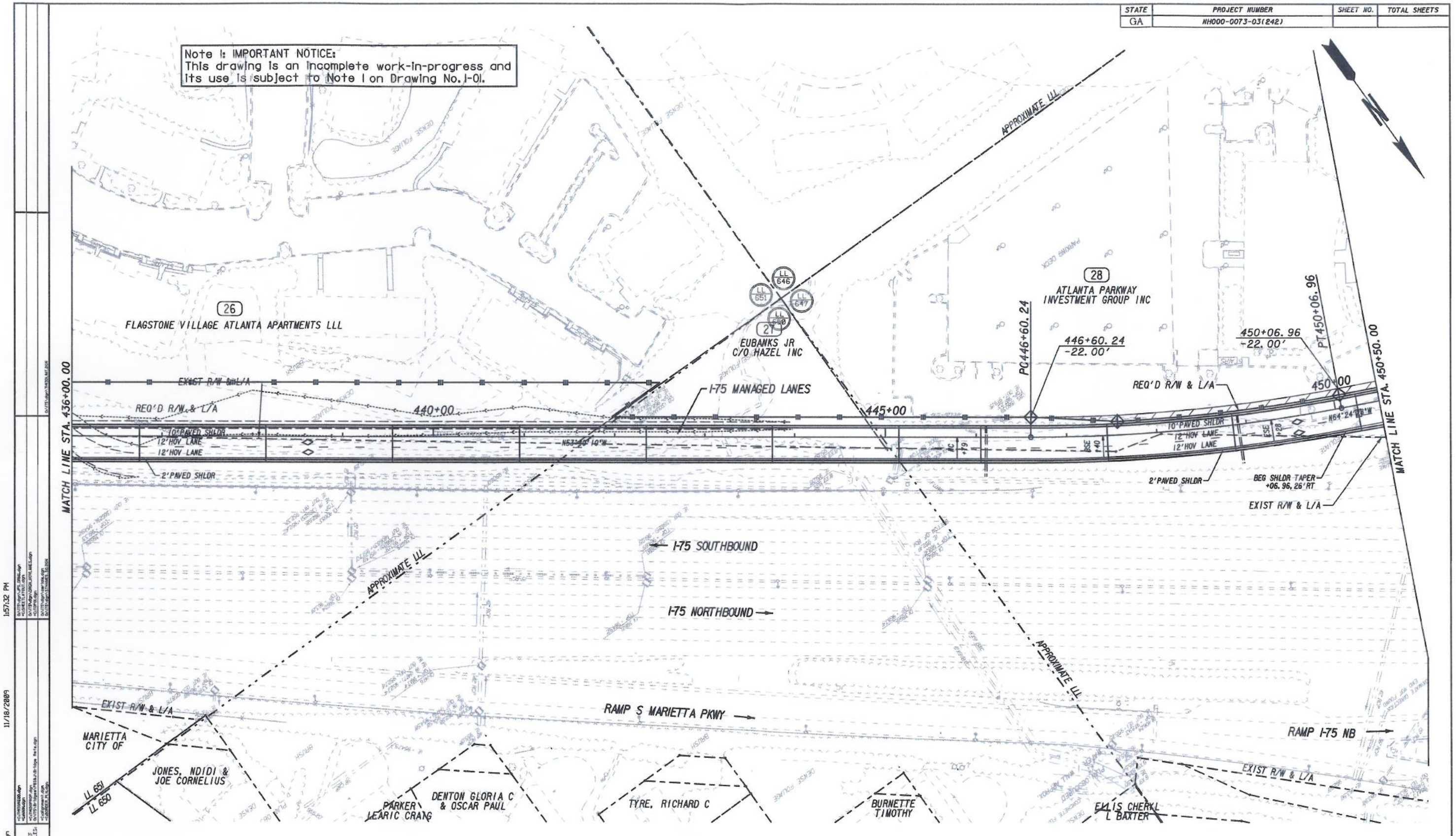
CONSTRUCTION PLAN

I-75 REVERSIBLE

DRAWING No. 13-18

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		

Note 1: IMPORTANT NOTICE:
This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. I-01.



CLARA CASH	9/23/09	DRAWN BY
		CHECKED BY
		SUPERVISOR
		APPROVED

TRACKING

NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	CEC			
B	9/25/09	50% SUBMITTAL	CEC			
C	11/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	CEC			

GTP GEORGIA TRANSPORTATION PARTNERS

SCALE IN FEET
0 50 100 200

NORTHWEST I-75/I-575 CORRIDOR

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PBS&J

I-75 / I-575 NORTHWEST CORRIDOR

CONSTRUCTION PLAN

I-75 REVERSIBLE

DRAWING No. 13-19

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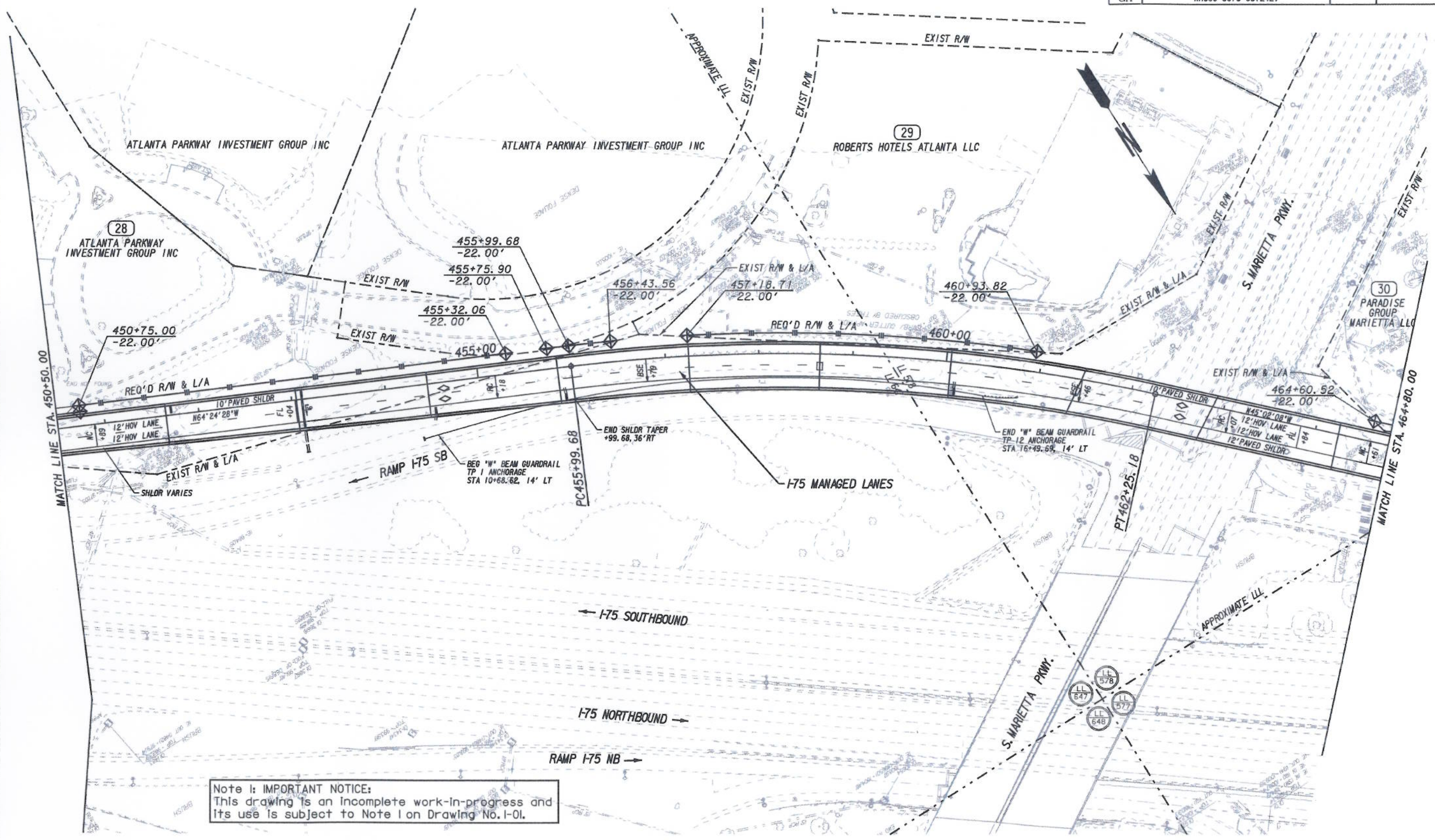
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		



Note 1: IMPORTANT NOTICE:
This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. 1-01.

CLARA CASH	9/23/09	DRAWN BY
		CHECKED BY
		SUPERVISOR
		APPROVED

TRACKING

NO	DATE	DESCRIPTION	DRIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	CEC			
B	9/25/09	50% SUBMITTAL	CEC			
C	11/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	CEC			

GTP GEORGIA TRANSPORTATION PARTNERS

SCALE IN FEET
0 50 100 200

NORTHWEST I-75/I-575 CORRIDOR

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PBSJ

I-75 / I-575 NORTHWEST CORRIDOR

CONSTRUCTION PLAN

I-75 REVERSIBLE

DRAWING No. 13-20

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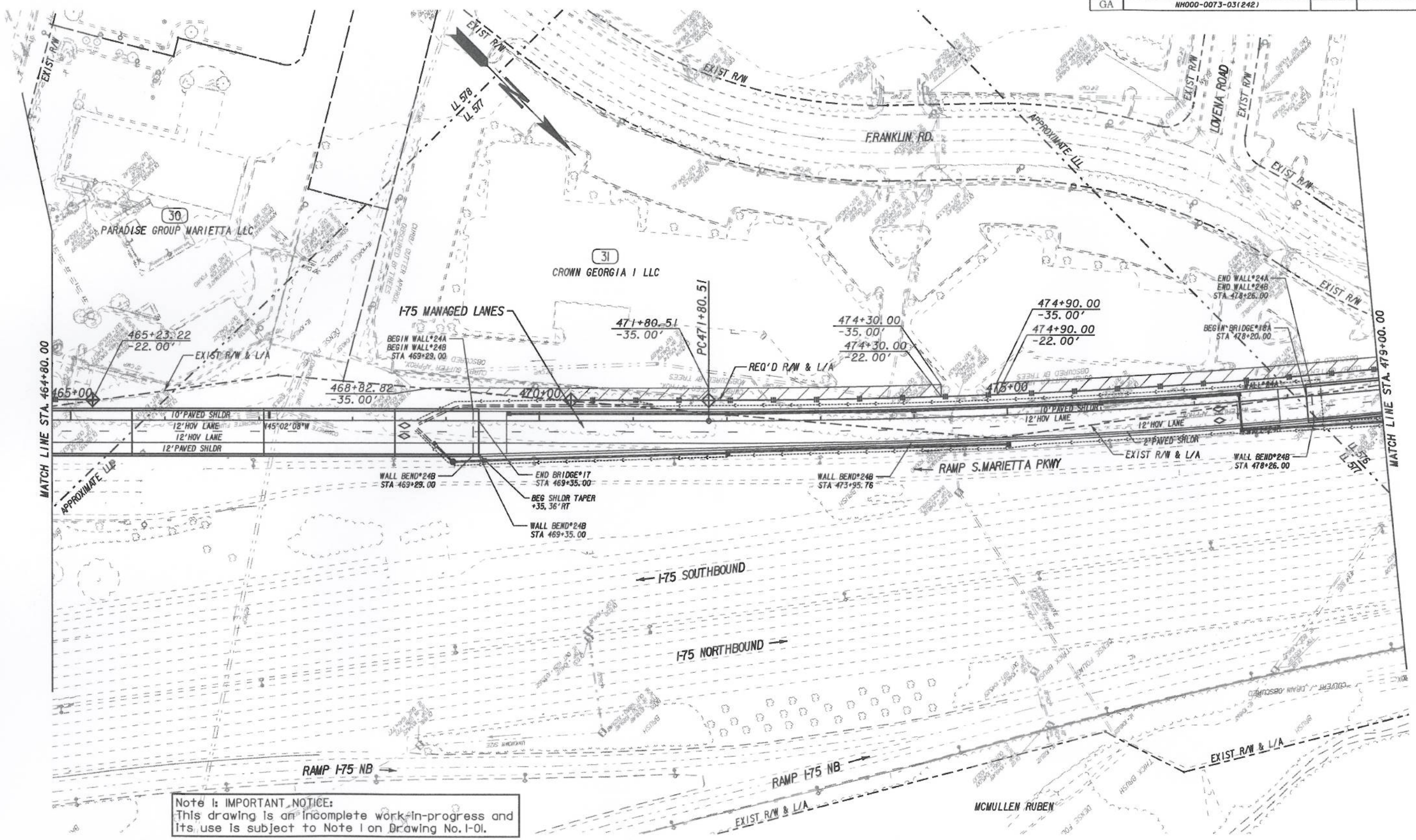
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		



Note 1: IMPORTANT NOTICE:
This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. I-01.

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CLARA CASH	9/23/09	DRAWN BY
		CHECKED BY
		SUPERVISOR
		APPROVED

TRACKING

NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	CEC			
B	9/25/09	50% SUBMITTAL	CEC			
C	11/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	CEC			

GTP GEORGIA TRANSPORTATION PARTNERS

SCALE IN FEET
0 50 100 200

NORTHWEST I-75/I-575 CORRIDOR

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PBSJ

I-75 / I-575 NORTHWEST CORRIDOR

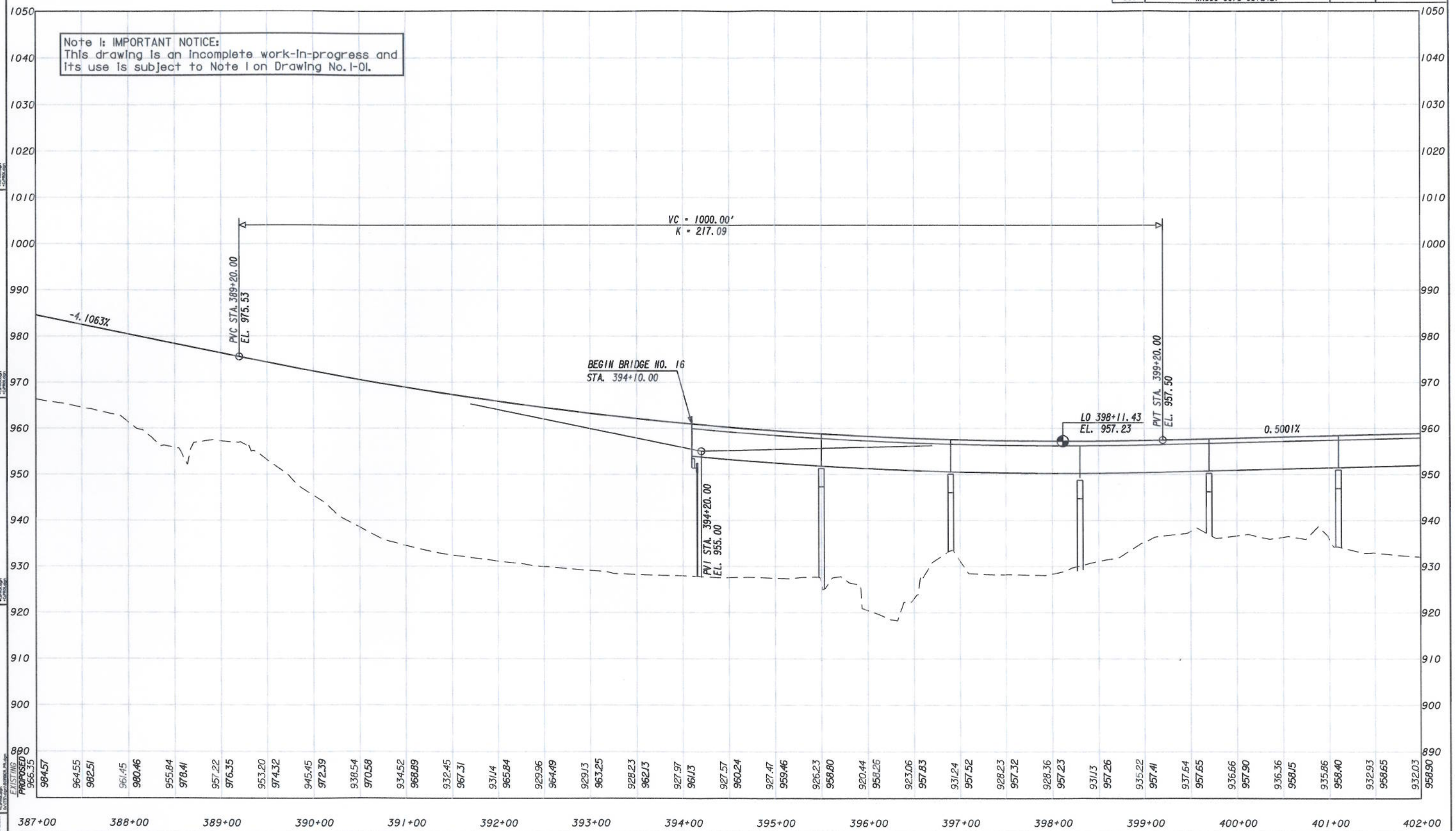
CONSTRUCTION PLAN

I-75 REVERSIBLE

DRAWING No. 13-21

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		

Note 1: IMPORTANT NOTICE:
This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. 1-01.



CLARA CASH	9/23/09	
DRAWN BY	DATE	
CHECKED BY	DATE	
SUPERVISOR	DATE	
APPROVED	DATE	

REVISIONS

NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	CEC			
B	9/25/09	50% SUBMITTAL	CEC			
C	11/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	CEC			

GTP GEORGIA TRANSPORTATION PARTNERS

SCALE: 1" = 50' HORIZ.
1" = 10' VERT.

NORTHWEST I-75/I-575 CORRIDOR

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PBS&J

I-75 / I-575 NORTHWEST CORRIDOR

MAINLINE PROFILE

I-75 REVERSIBLE

DRAWING No. 15-14

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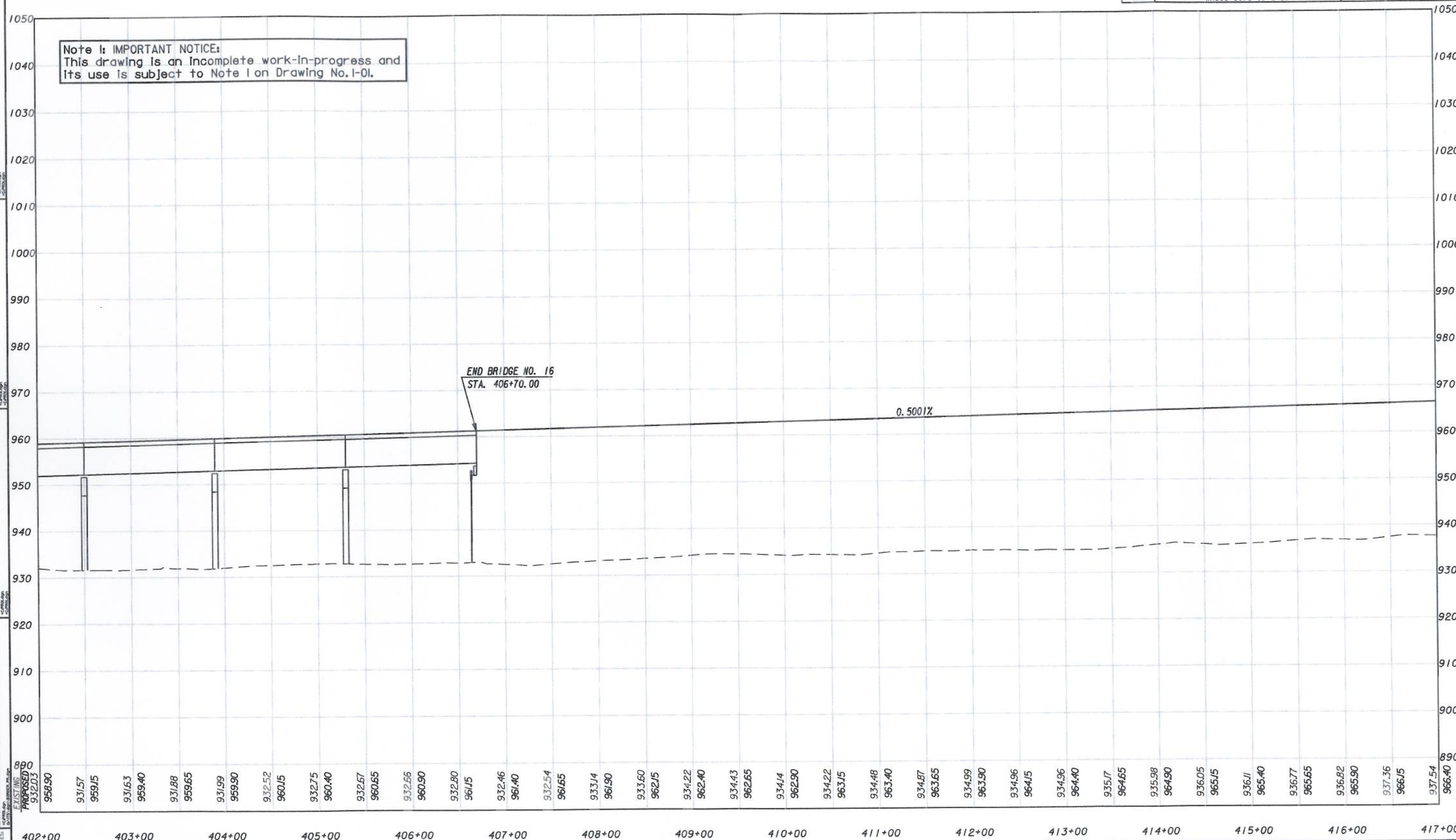
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		

Note 1: IMPORTANT NOTICE:
This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. 1-01.



CLARA CASH	9/23/09	
DRAWN BY	DATE	
CHECKED BY	DATE	
SUPERVISOR	DATE	
APPROVED	DATE	

REVISIONS

NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	CEC			
B	9/25/09	50% SUBMITTAL	CEC			
C	8/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	CEC			

GTP GEORGIA TRANSPORTATION PARTNERS

SCALE: 1" = 50' HORIZ. 1" = 10' VERT.

NORTHWEST I-75/I-575 CORRIDOR

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PBSJ

I-75 / I-575 NORTHWEST CORRIDOR

MAINLINE PROFILE

I-75 REVERSIBLE

DRAWING No. 15-15

11/18/2009 2:10:21 PM

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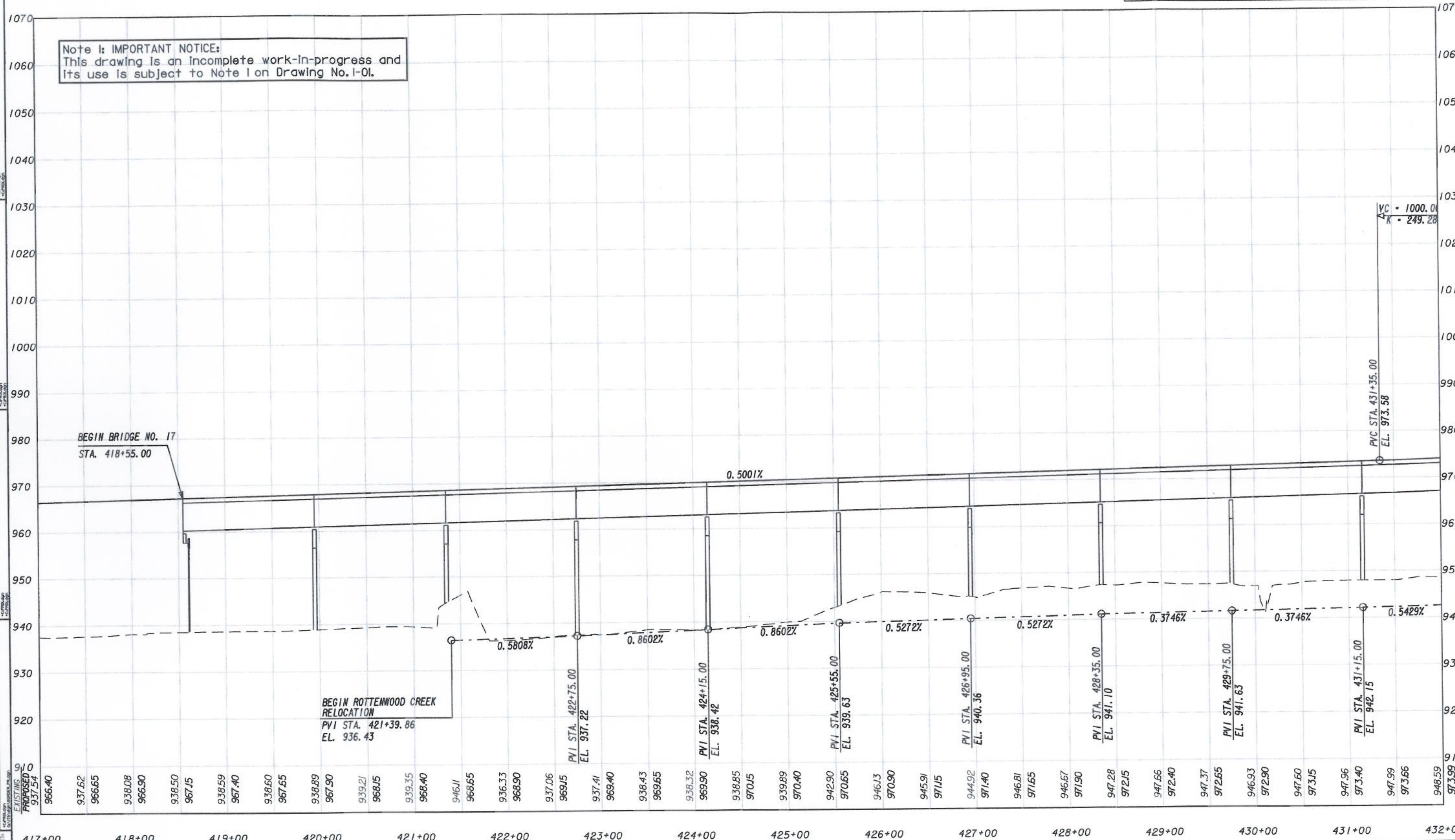
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		



CLARA CASH	9/23/09
DRAWN BY	DATE
CHECKED BY	DATE
SUPERVISOR	DATE
APPROVED	DATE

REVISIONS

NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	CEC			
B	9/25/09	50% SUBMITTAL	CEC			
C	11/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	CEC			

GTP GEORGIA TRANSPORTATION PARTNERS

SCALE: 1" = 50' HORIZ. 1" = 10' VERT.

NORTHWEST I-75/I-575 CORRIDOR

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PBS&J

I-75 / I-575 NORTHWEST CORRIDOR

MAINLINE PROFILE

I-75 REVERSIBLE

DRAWING No. 15-16

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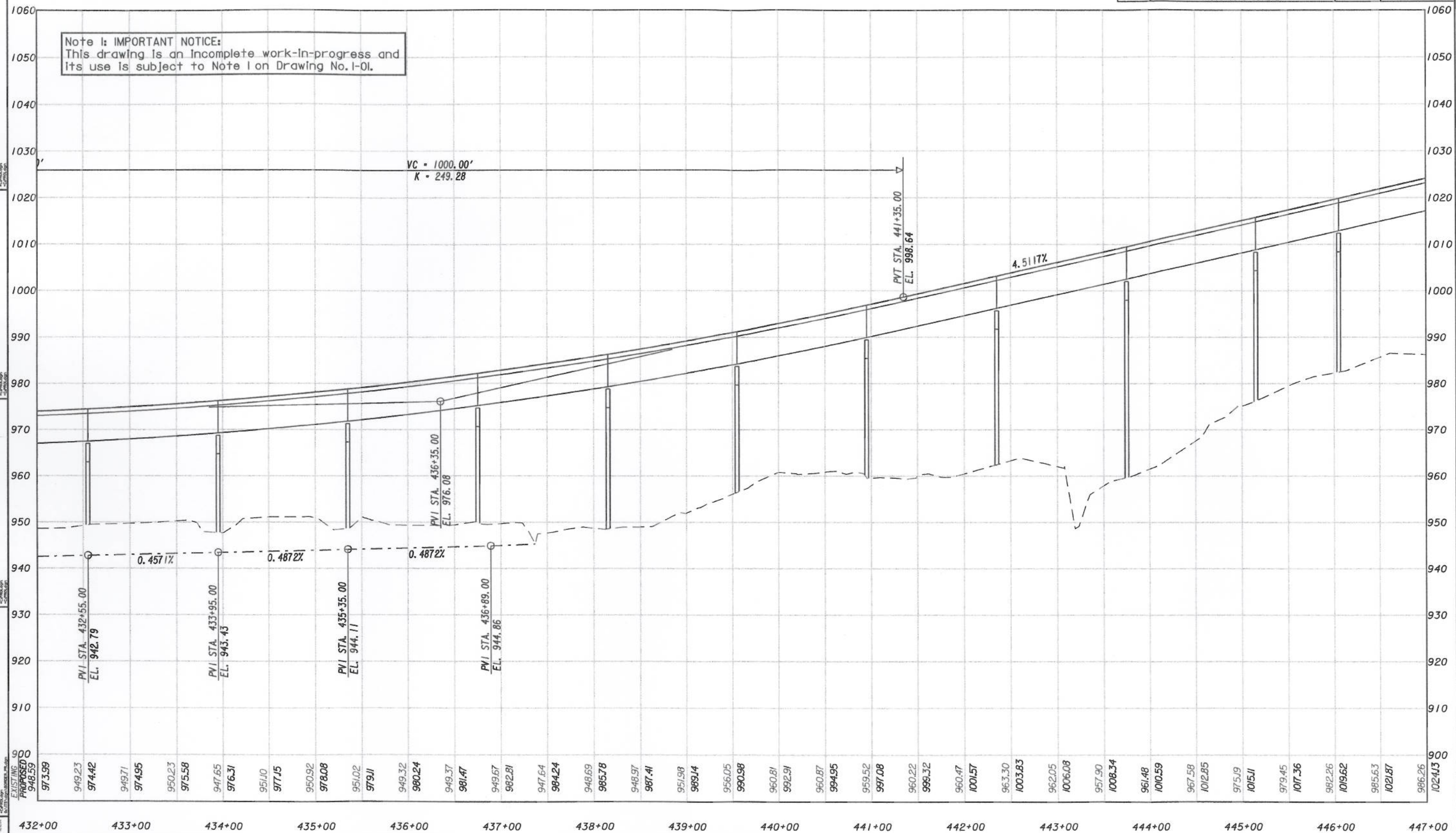
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		

Note 1: IMPORTANT NOTICE:
This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. 1-01.



CLARA CASH	DRAWN BY	9/23/09 DATE
	CHECKED BY	DATE
	SUPERVISOR	DATE
	APPROVED	DATE

REVISIONS

NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	CEC			
B	9/25/09	50% SUBMITTAL	CEC			
C	11/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	CEC			

GTP GEORGIA TRANSPORTATION PARTNERS

SCALE: 1" = 50' HORIZ. 1" = 10' VERT.

NORTHWEST I-75/I-575 CORRIDOR

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PBS&J

I-75 / I-575 NORTHWEST CORRIDOR

MAINLINE PROFILE

I-75 REVERSIBLE

DRAWING No. 15-17

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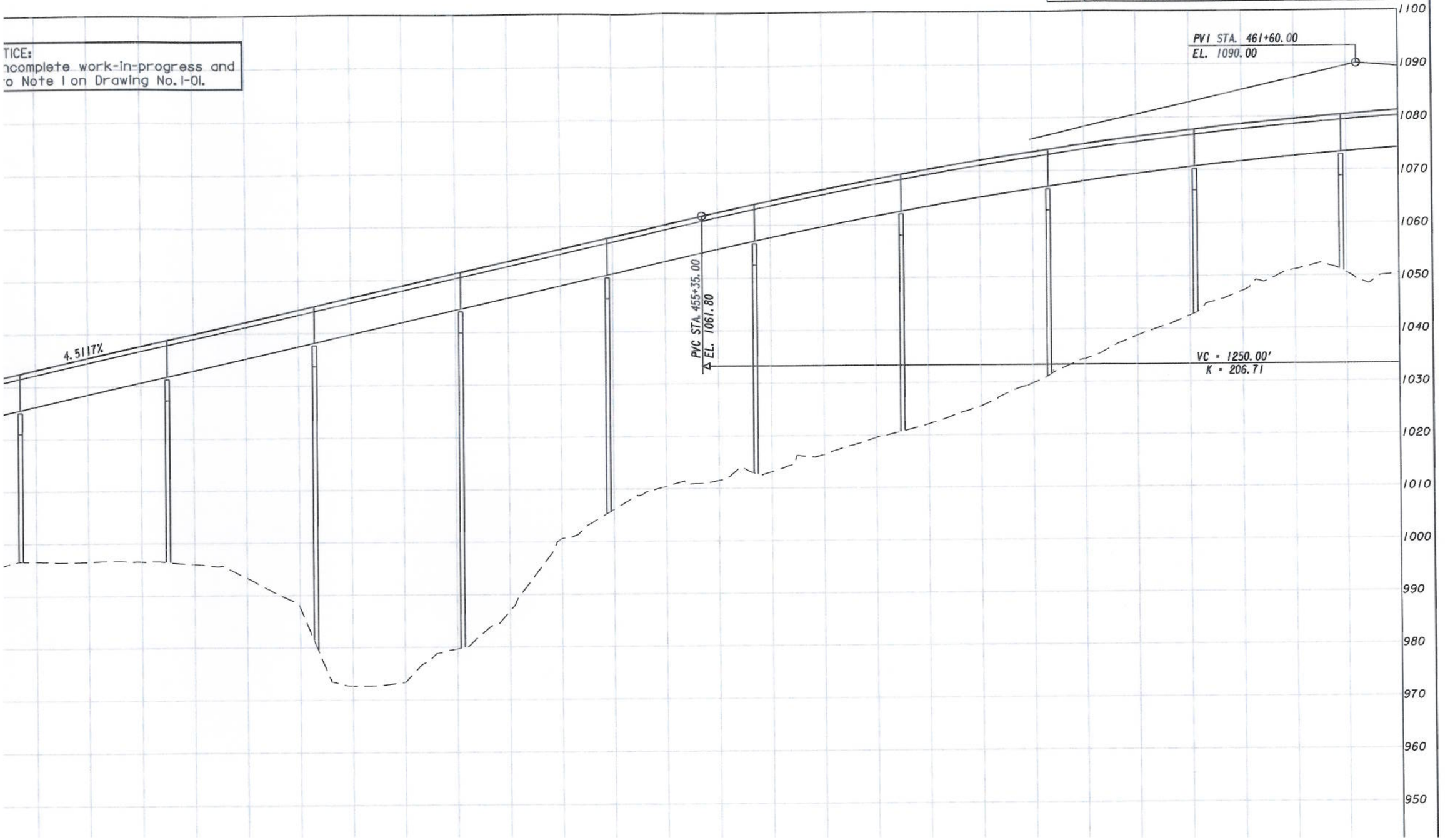
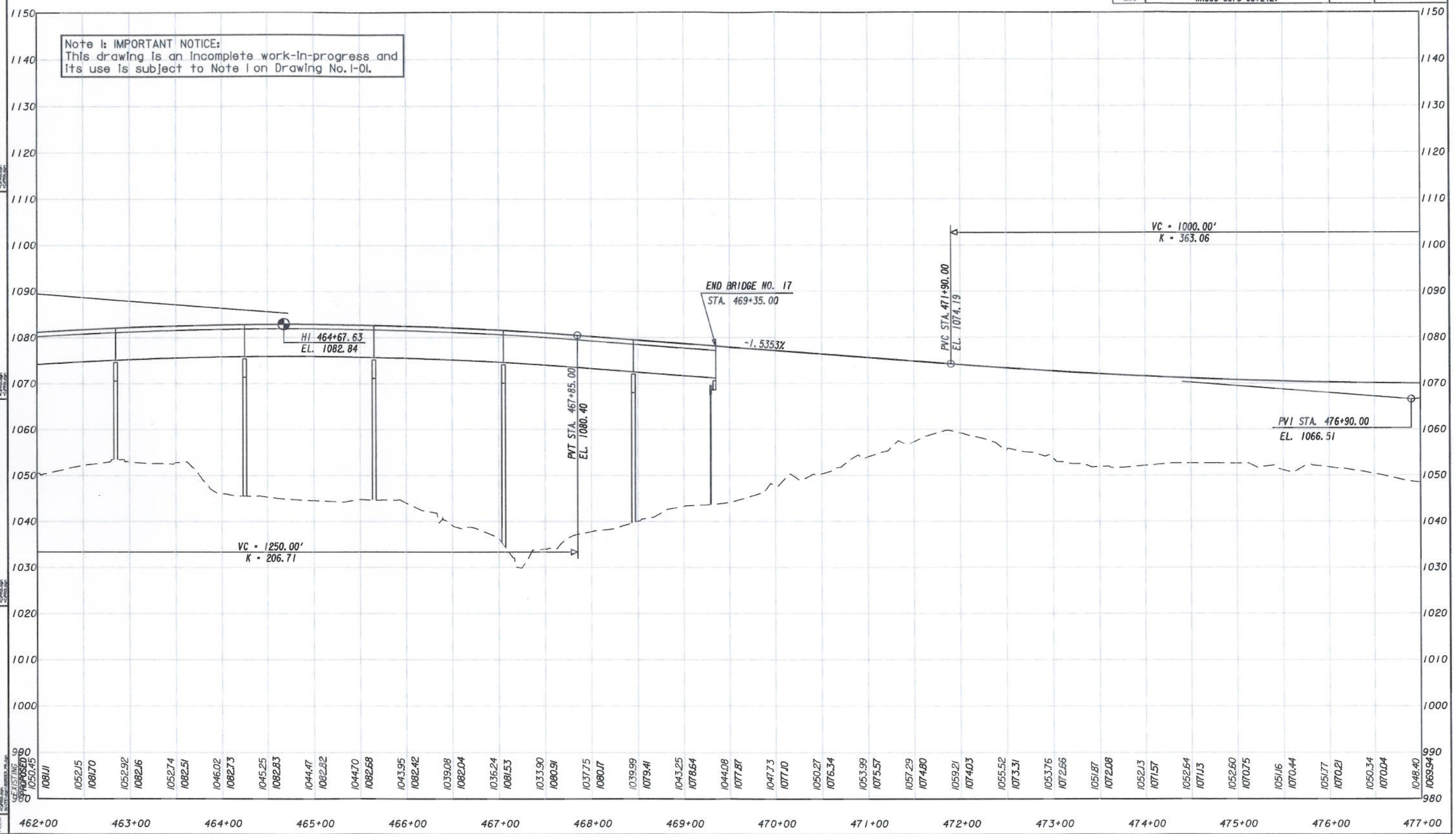
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		

TICE:
ncomplete work-in-progress and
o Note 1 on Drawing No. 1-01.



STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		

Note 1: IMPORTANT NOTICE:
This drawing is an incomplete work-in-progress and its use is subject to Note 1 on Drawing No. 1-01.



CLARA CASH	9/23/09	DRAWN BY DATE
		CHECKED BY DATE
		SUPERVISOR DATE
		APPROVED DATE

REVISIONS

NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	CEC			
B	9/25/09	50% SUBMITTAL	CEC			
C	6/30/09	PLOTTED PER GDOT'S TERMINATION FOR CONVENIENCE DIRECTION	CEC			

GTP GEORGIA TRANSPORTATION PARTNERS

SCALE: 1" = 50' HORIZ.
1" = 10' VERT.

NORTHWEST I-75/I-575 CORRIDOR

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PBSJ

I-75 / I-575 NORTHWEST CORRIDOR

MAINLINE PROFILE

I-75 REVERSIBLE

DRAWING No. 15-19

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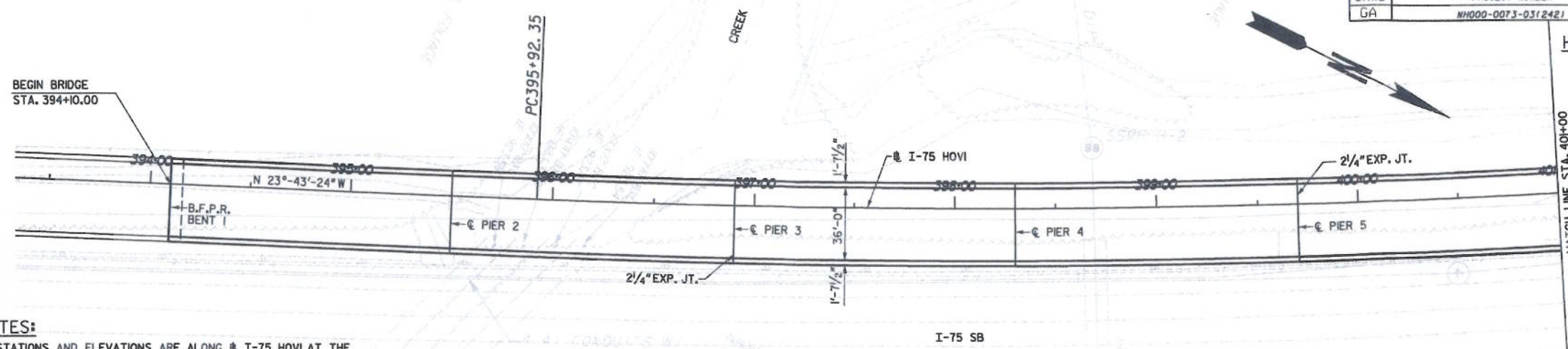
Section 12a:
Preliminary Bridge Layout – Bridge #16

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		



HORIZONTAL CURVE DATA

℄ I-75 HOVI

PI STA. 410+25.86
Δ = 29°56'47"LT.
D = 1°04'08"
T = 1433.51FT.
L = 2801.46 FT.
R = 5360.00 FT.

SE = ?

This information should be on roadway plans - can't check.

NOTES:

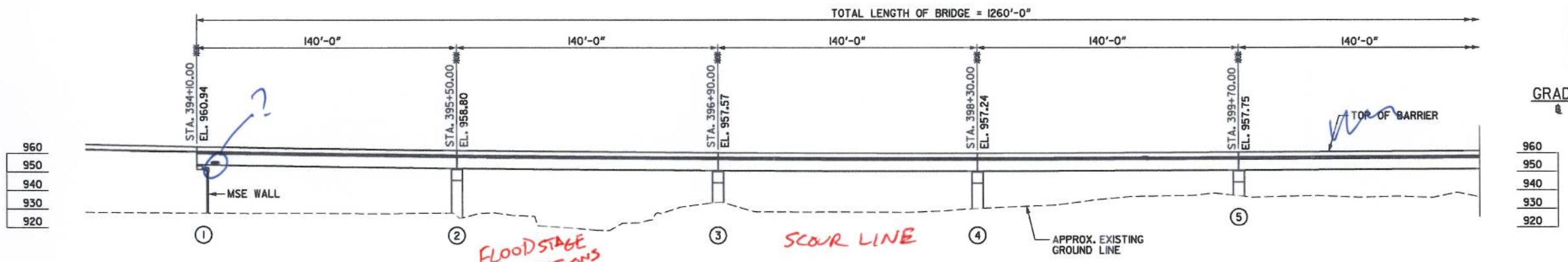
*** STATIONS AND ELEVATIONS ARE ALONG ℄ I-75 HOVI AT THE INTERSECTION OF ℄ I-75 HOVI WITH B.F.P.R. OR ℄ PIER.

END BENT PILES NOT SHOWN.

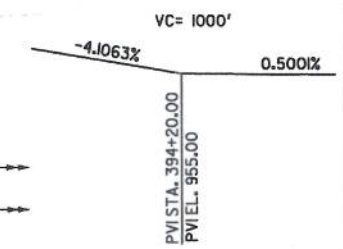
BENTS / PIERS ARE RADIAL.

CROSS SLOPE NOTE

PLAN



ELEVATION



GRADE DATA

℄ I-75 HOVI

DRAINAGE DATA
SCOUR TABLE
UTILITIES

DESIGN DATA

SPECIFICATIONS ---------- AASHTO 17TH EDITION, 2002
(DESIGNED FOR SEISMIC PERFORMANCE CATEGORY A)

TYPICAL HS20-44 AND/OR MILITARY LOADING ---------- IMPACT ALLOWED

FUTURE PAVING ALLOWANCE ---------- 30 LBS PER SQ FT

BRIDGE CONSISTS OF

9 - 140'-0" BULB TEE, 74 IN, PSC BEAM SPANS ---------- SPECIAL DESIGN

2 - ~~STEEL~~ PILE END BENTS ---------- SPECIAL DESIGN

8 - CONCRETE HAMMERHEAD PIERS ---------- SPECIAL DESIGN

PROJECT P.I. NO. 714130

BRIDGE NO. 16

CAB/DRB DRAWN BY	9-18-09 DATE
FAO/DRB CHECKED BY	10-18-09 DATE
BLB SUPERVISOR	10-19-09 DATE
BLB APPROVED	10-20-09 DATE

REVISIONS

NO	DATE	DESCRIPTION	DRIG	CHKR	SUPV	APPR
A	6-30-09	Progress Drawings (RollPlots)	CAB	DRB	BLB	BLB
B	9-25-09	50% SUBMISSION	CAB	DRB	BLB	BLB
C	10-20-09	90% SUBMISSION	CAB	DRB	BLB	BLB

GEORGIA TRANSPORTATION PARTNERS

SCALE IN FEET 0 30 60 120

NORTHWEST I-75/I-575 CORRIDOR

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PBS&J

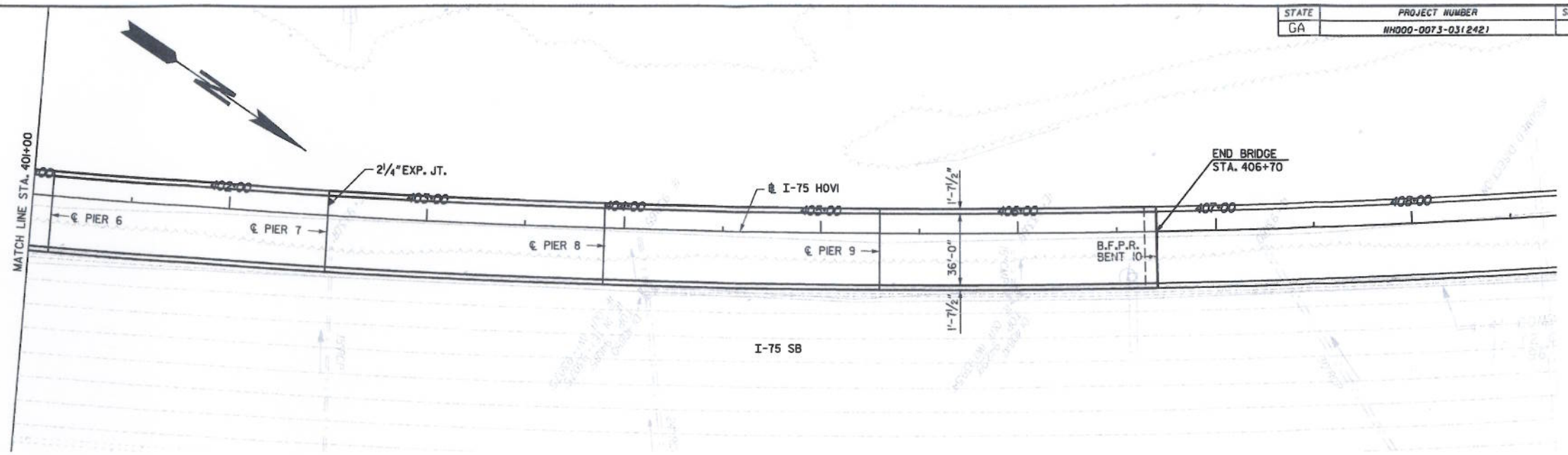
I-75 / I-575 NORTHWEST CORRIDOR

I-75 REV. OVER ROTTENWOOD CREEK AND HOPE CREEK PRELIMINARY LAYOUT
STA. 394+10 TO STA. 406+70
COBB COUNTY NH000-0073-03(242)

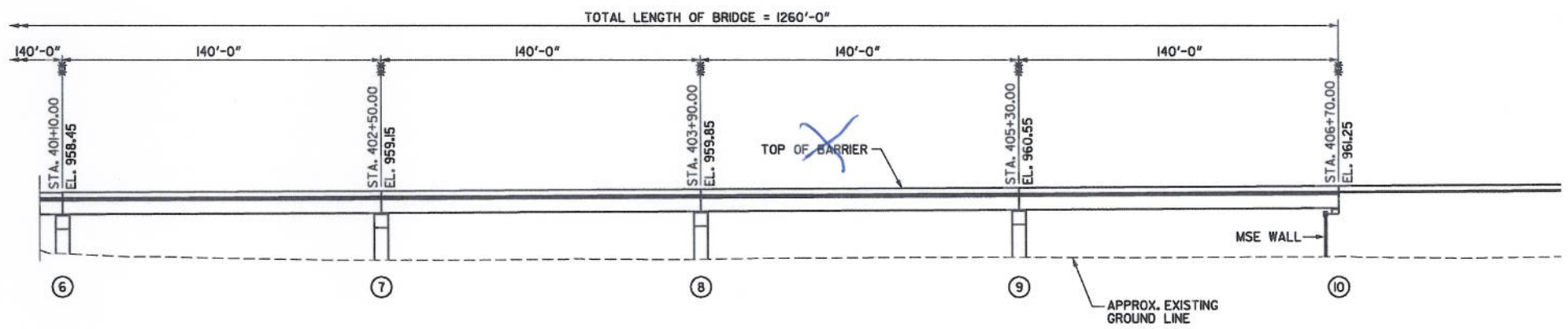
DRAWING NO. 35-

12:49:24 PM 10/21/2009
a:\I75\origpa\pbsk\Bris 8-75overRottenwood.Cr\pa.1.dgn
pa_1.dgn

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		



PLAN



ELEVATION

NOTES:

** STATIONS AND ELEVATIONS ARE ALONG ℄ I-75 HOVI AT THE INTERSECTION OF ℄ I-75 HOVI WITH B.F.P.R. OR ℄ PIER.

END BENT PILES NOT SHOWN.

BENTS / PIERS ARE RADIAL.

CROSS SLOPE NOTE

PROJECT P.I. NO. 714130

BRIDGE NO. 16

CAB/DRB	9-18-09	DRAWN BY / DATE
FAO/DRB	10-18-09	CHECKED BY / DATE
BLB	10-19-09	SUPERVISOR / DATE
BLB	10-20-09	APPROVED / DATE

REVISIONS

NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6-30-09	Progress Drawings (Roll Plots)	CAB	DRB	BLB	BLB
B	9-25-09	50% SUBMISSION	CAB	DRB	BLB	BLB
C	10-20-09	90% SUBMISSION	CAB	DRB	BLB	BLB

GTP GEORGIA TRANSPORTATION PARTNERS

SCALE IN FEET 0 30 60 120

NORTHWEST I-75/I-575 CORRIDOR

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PBS&J

I-75 / I-575 NORTHWEST CORRIDOR

I-75 REV. OVER ROTTENWOOD CREEK AND HOPE CREEK
STA. 394+10 TO STA. 406+70
COBB COUNTY NH000-0073-03(242)

DRAWING No. 35-

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pa_2.dgn
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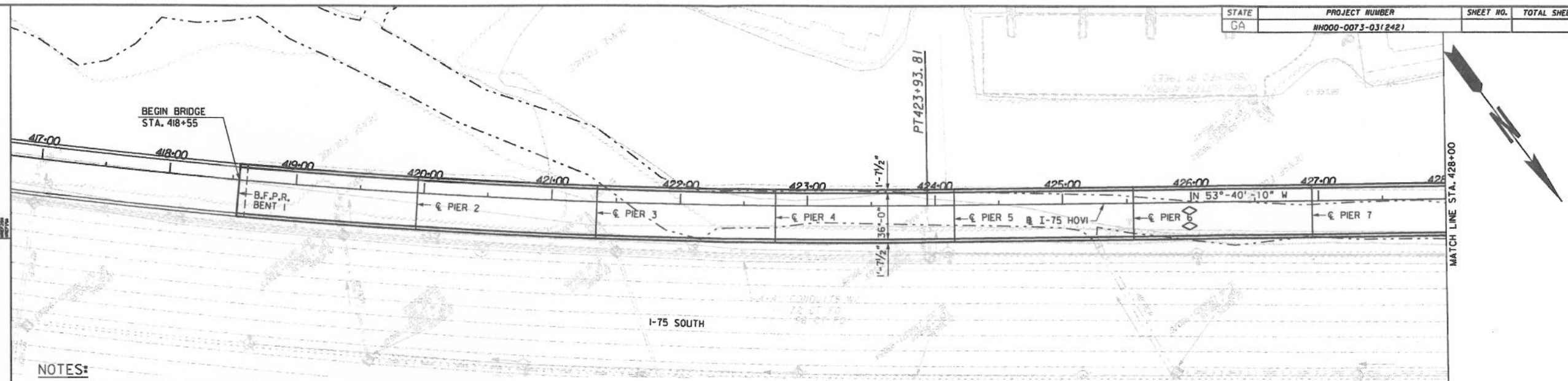
Section 12b:
Preliminary Bridge Layout – Bridge #17

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		



PLAN

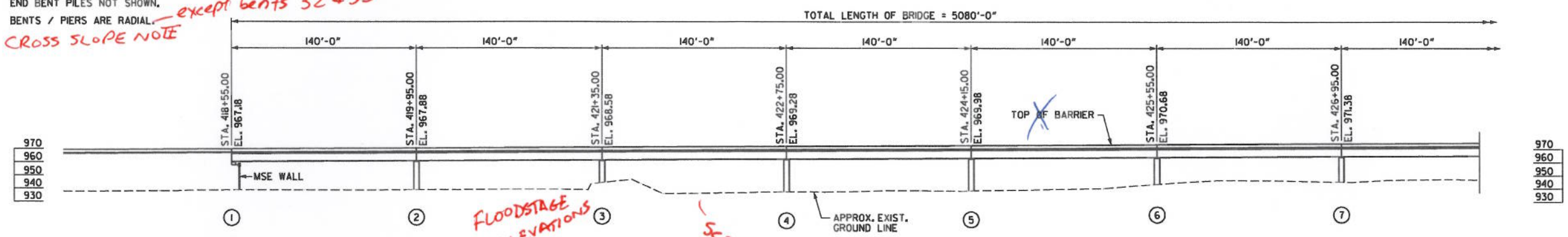
NOTES:

** STATIONS AND ELEVATIONS ARE ALONG @ I-75 HOVI AT THE INTERSECTION OF @ I-75 HOVI WITH B.F.P.R. OR ℄ PIER.

END BENT PILES NOT SHOWN.

BENTS / PIERS ARE RADIAL. except bents 32 & 33

CROSS SLOPE NOTE



ELEVATION

DRAINAGE DATA
SCOUR TABLE
UTILITIES

DESIGN DATA

SPECIFICATIONS ---------- AASHTO 17TH EDITION, 2002
(DESIGNED FOR SEISMIC PERFORMANCE CATEGORY A)

TYPICAL HS20-44 AND/OR MILITARY LOADING ---------- IMPACT ALLOWED

FUTURE PAVING ALLOWANCE ---------- 30 LBS PER SQ FT

BRIDGE CONSISTS OF

2 - 90'-0" BULB TEE, 74 IN, PSC BEAM SPANS ---------- SPECIAL DESIGN

33 - 140'-0" BULB TEE, 74 IN, PSC BEAM SPANS ---------- SPECIAL DESIGN

1 - 143'-0" BULB TEE, 74 IN, PSC BEAM SPANS ---------- SPECIAL DESIGN

1 - 137'-0" BULB TEE, 74 IN, PSC BEAM SPANS ---------- SPECIAL DESIGN

2 - STEEL H PILE END BENTS ---------- SPECIAL DESIGN

36 - CONCRETE HAMMERHEAD PIERS ---------- SPECIAL DESIGN

HORIZONTAL CURVE DATA

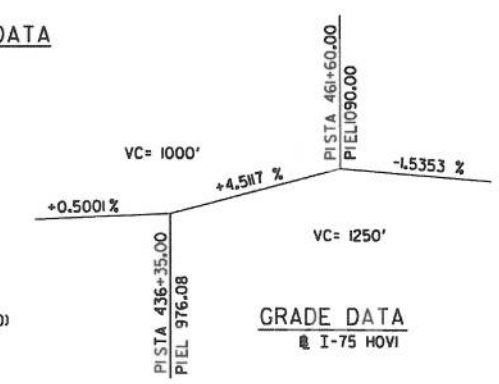
@ I-75 HOVI

PI STA. 410+25.86
Δ = 29°56'47" LT.
D = 1°04'08"
T = 1433.51 FT.
L = 2801.46 FT.
R = 5360.00 FT.

PI STA. 448+34.11
Δ = 10°44'18" LT.
D = 3°05'49"
T = 173.87 FT.
L = 346.73 FT.
R = 1850.00 FT.

I-75 REVERSIBLE HOV (KC50)

PI STA. 459+15.44
Δ = 19°22'20" RT.
D = 3°05'49"
T = 315.77 FT.
L = 625.50 FT.
R = 1850.00 FT.



GRADE DATA

@ I-75 HOVI

PROJECT P.I. NO. 714130

BRIDGE NO. 17

CAB/DRB	9-18-09	REVISIONS						
DRAWN BY	DATE	NO	DATE	DESCRIPTION	DRIG	CHKR	SUPV	APPR
FAQ/DRB	10-18-09	A	6-30-09	Progress Drawings (Roll Plots)	CAB	DRB	BLB	BLB
CHECKED BY	DATE	B	9-25-09	50% SUBMISSION	CAB	DRB	BLB	BLB
BLB	10-19-09	C	10-20-09	90% SUBMISSION	CAB	DRB	BLB	BLB
SUPERVISOR	DATE							
BLB	10-20-09							
APPROVED	DATE							

GTP GEORGIA TRANSPORTATION PARTNERS

SCALE IN FEET
0 40 80 160

NORTHWEST I-75/I-575 CORRIDOR

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PBSJ

I-75 / I-575 NORTHWEST CORRIDOR

I-75 REV. OVER S. MARIETTA PKWY
STA. 418+55 TO STA. 469+35

COBB COUNTY NH000-0073-03(242)

DRAWING No. 35-

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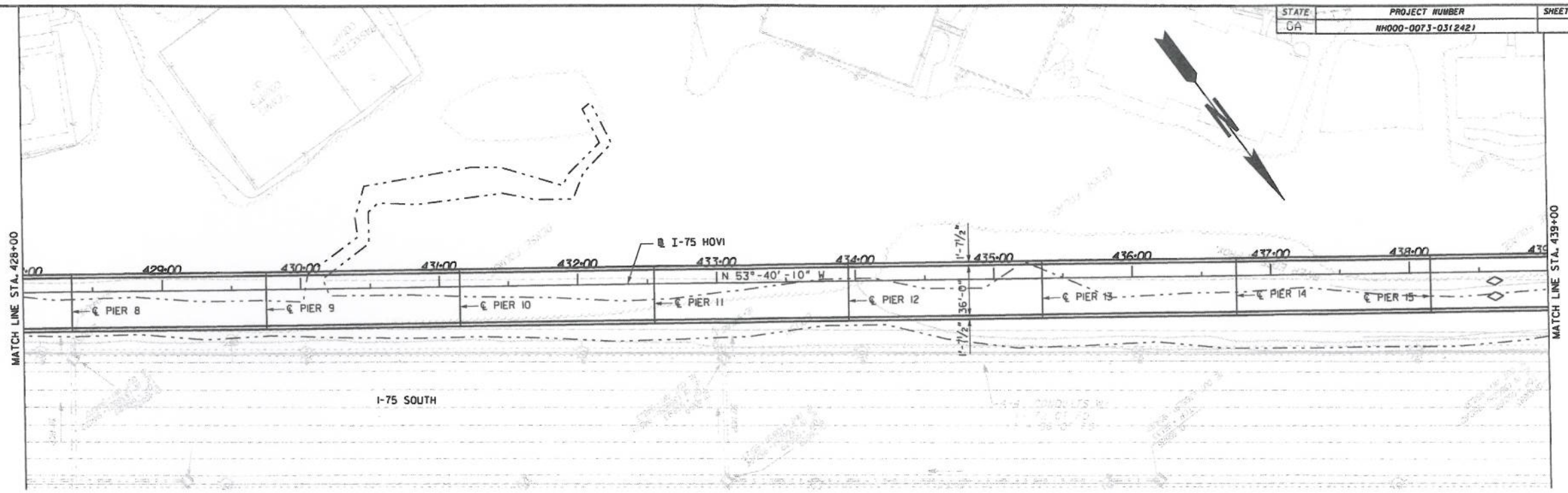
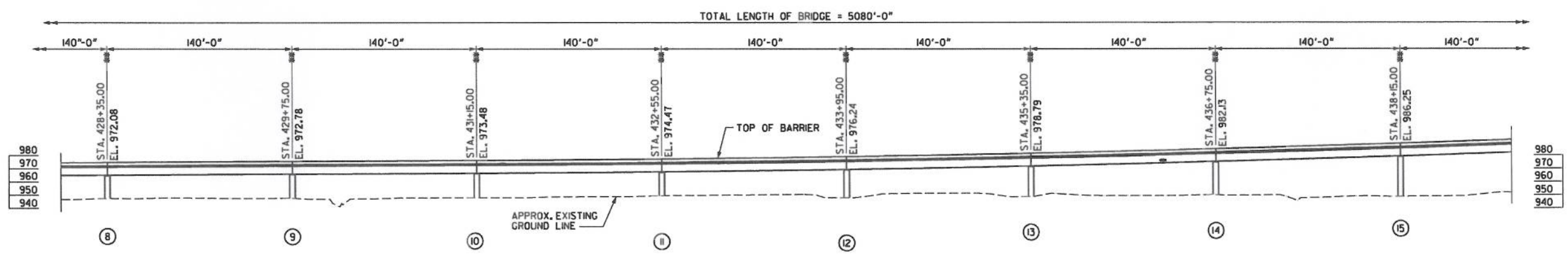
pw:\\jbrigaps\pbsj\Brf (Junior)etto.Pkwy\bpe.Ldgn

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		



PLAN



ELEVATION

PROJECT P.I. NO. 714130

BRIDGE NO. 17

CAB/DRB	9-18-09	REVISIONS						
DRAWN BY	DATE	NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
FAQ/DRB	10-18-09	A	6-30-09	Progress Drawings (Roll Plots)	CAB	DRB	BLB	BLB
CHECKED BY	DATE	B	9-25-09	50% SUBMISSION	CAB	DRB	BLB	BLB
BLB	10-19-09	C	10-20-09	90% SUBMISSION	CAB	DRB	BLB	BLB
SUPERVISOR	DATE							
BLB	10-20-09							
APPROVED	DATE							

GTP GEORGIA TRANSPORTATION PARTNERS

SCALE IN FEET 0 40 80 160

NORTHWEST I-75/I-575 CORRIDOR

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PBS&J

I-75 / I-575 NORTHWEST CORRIDOR

I-75 REV. OVER S. MARIETTA PKWY
STA. 418+55 TO STA. 469+35

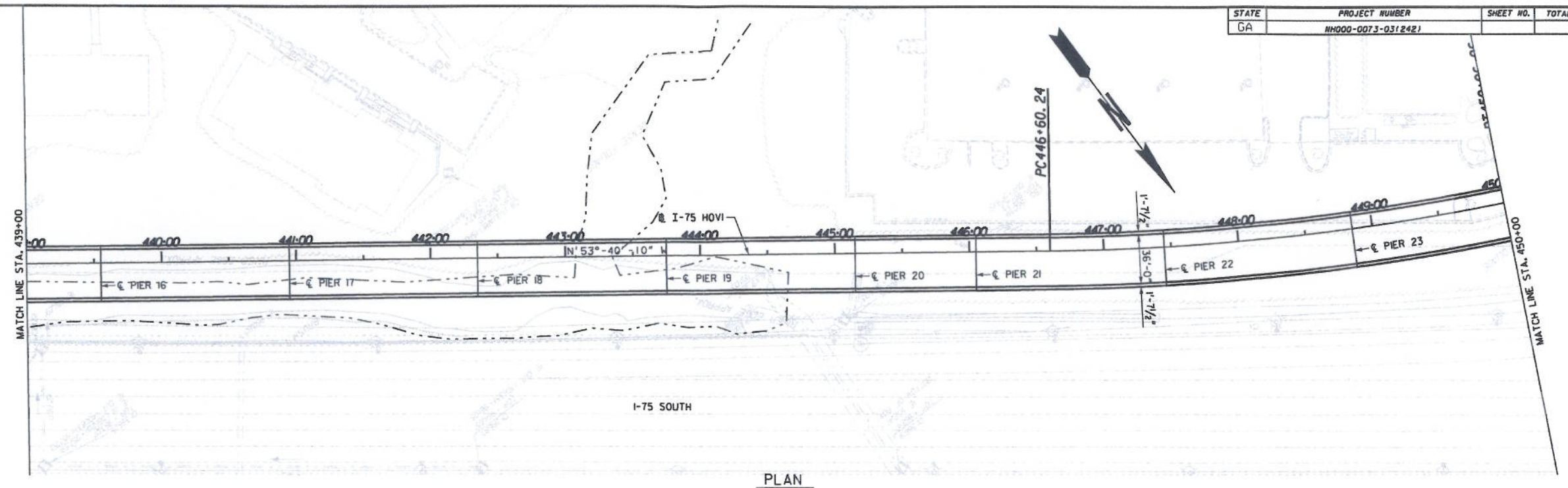
COBB COUNTY NH000-0073-03(242)

DRAWING No. 35-

12:49:59 PM 10/21/2009

pw:..\Bridges\bbs3\Br17 (S.Marietta Pkwy)\ps_2.dgn

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		



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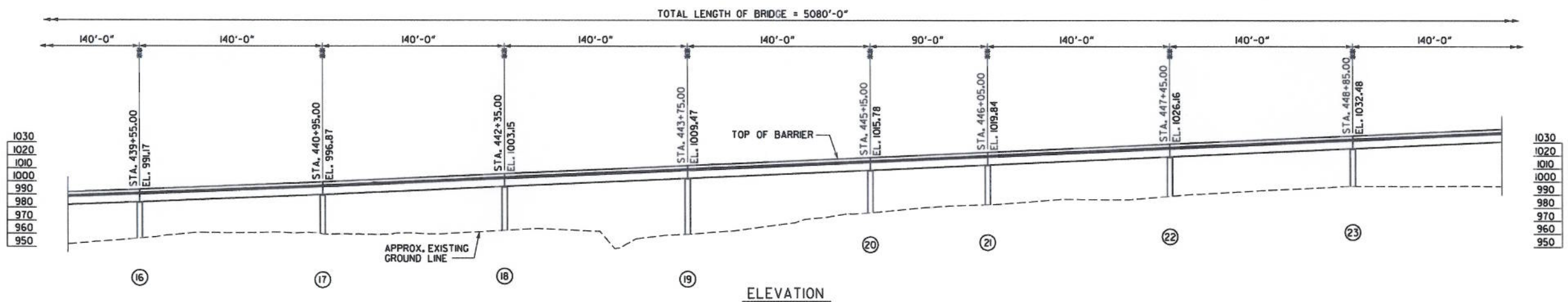

ELEVATION

PROJECT P.I. NO. 714130

BRIDGE NO. 17

CAB/DRB	9-18-09	REVISIONS						
DRAWN BY	DATE	NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
FAQ/DRB	10-18-09	A	6-30-09	Progress Drawings (Rollplots)	CAB	DRB	BLB	BLB
CHECKED BY	DATE	B	9-25-09	50% SUBMISSION	CAB	DRB	BLB	BLB
BLB	10-19-09	C	10-20-09	90% SUBMISSION	CAB	DRB	BLB	BLB
SUPERVISOR	DATE							
BLB	10-20-09							
APPROVED	DATE							

GTP GEORGIA TRANSPORTATION PARTNERS

SCALE IN FEET
0 40 80 160

NORTHWEST I-75/I-575 CORRIDOR

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PBSJ

I-75 / I-575 NORTHWEST CORRIDOR

I-75 REV. OVER S. MARIETTA PKWY
STA. 418+55 TO STA. 469+35

COBB COUNTY NH000-0073-03(242)

DRAWING No. 35-

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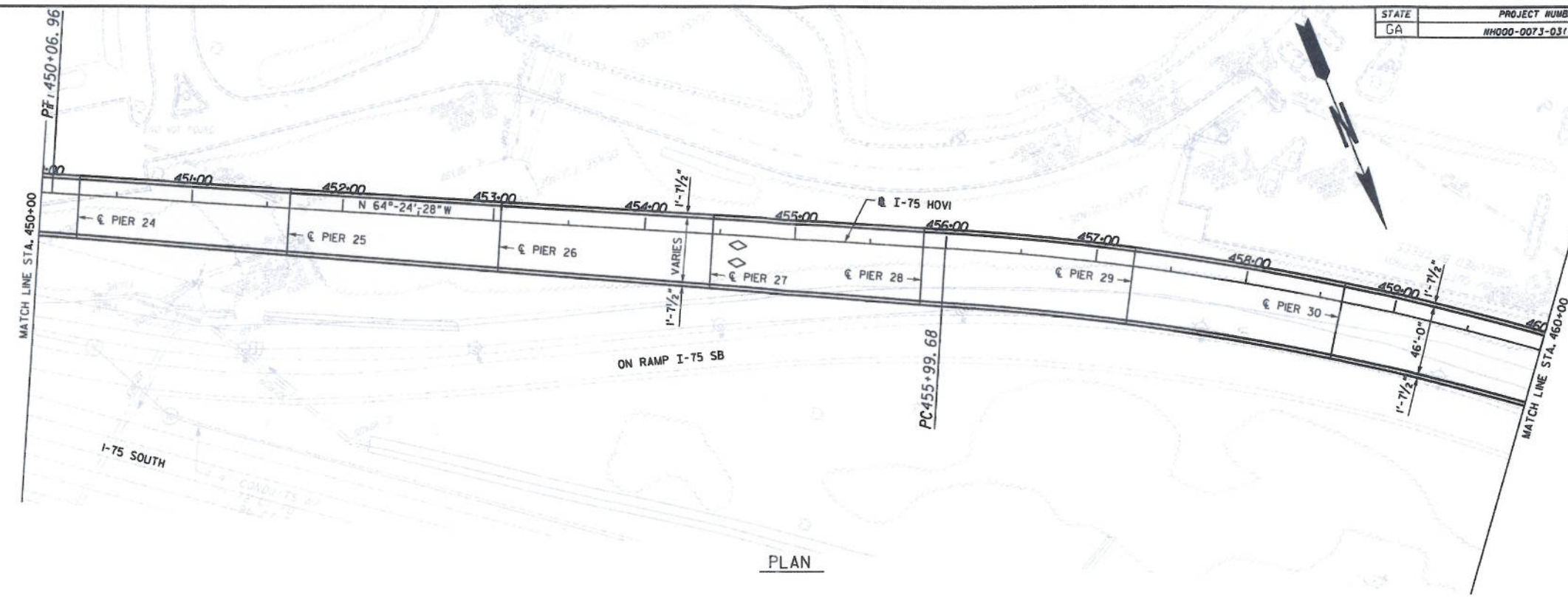
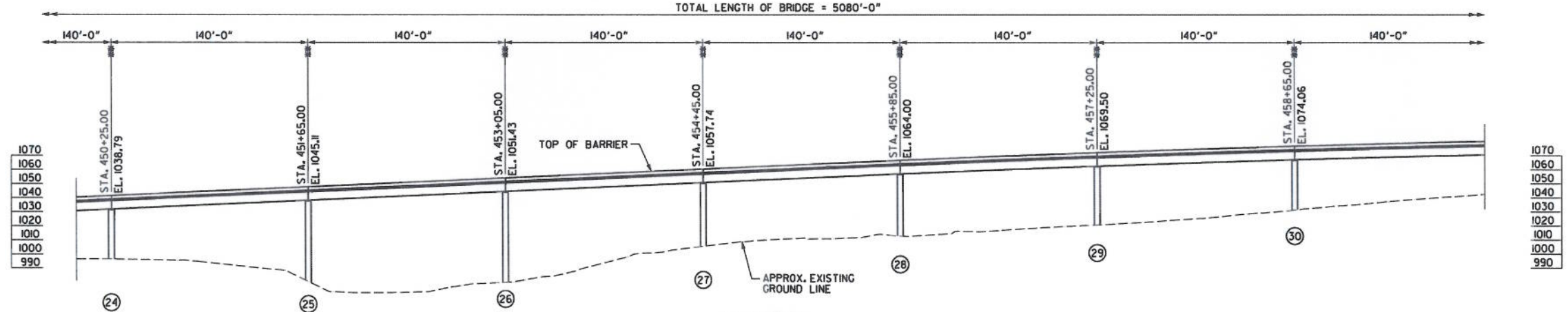
10/21/2009
12:59:01 PM

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		



PLAN



ELEVATION

PROJECT P.I. NO. 714130

BRIDGE NO. 17

CAB/DRB	9-18-09	REVISIONS					
DRAWN BY	DATE	NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
FAQ/DRB	10-18-09	A	6-30-09	Progress Drawings (Roll Plots)	CAB	DRB	BLB	BLB
CHECKED BY	DATE	B	9-25-09	50% SUBMISSION	CAB	DRB	BLB	BLB
BLB	10-19-09	C	10-20-09	90% SUBMISSION	CAB	DRB	BLB	BLB
SUPERVISOR	DATE							
BLB	10-20-09							
APPROVED	DATE							

GTP GEORGIA TRANSPORTATION PARTNERS

SCALE IN FEET 0 40 80 160

NORTHWEST I-75/I-575 CORRIDOR

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PBS&J

I-75 / I-575 NORTHWEST CORRIDOR

I-75 REV. OVER S. MARIETTA PKWY
STA. 418+55 TO STA. 469+35

COBB COUNTY NH000-0073-03(242)

DRAWING No. 35-

12:58:03 PM 10/21/2009

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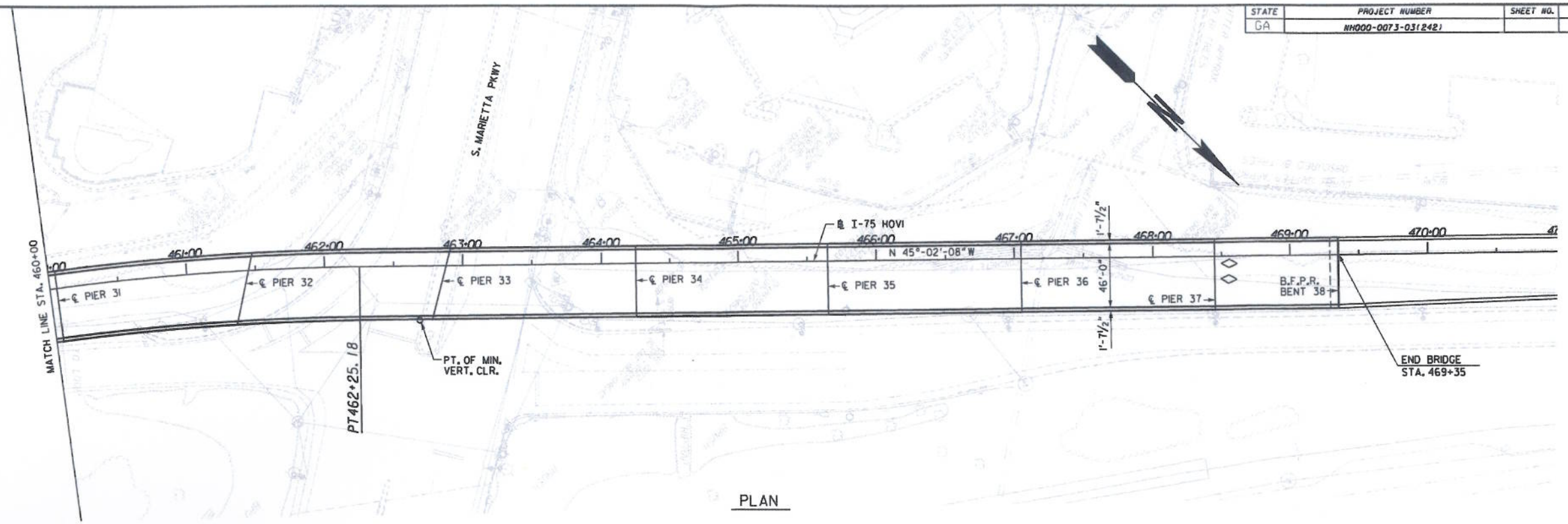
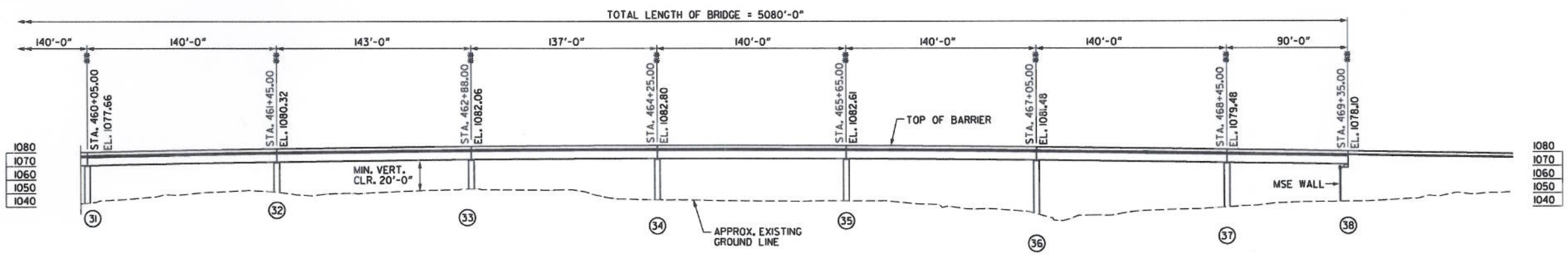
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		



PLAN



ELEVATION

PROJECT P.I. NO. 714130

BRIDGE NO. 17

CAB/DRB	9-18-09	REVISIONS							
DRAWN BY	DATE	NO	DATE	DESCRIPTION	DRIG	CHKR	SUPV	APPR	
FAQ/DRB	10-18-09	A	6-30-09	Progress Drawings (Roll Plots)	CAB	DRB	BLB	BLB	
CHECKED BY	DATE	B	9-25-09	50% SUBMISSION	CAB	DRB	BLB	BLB	
BLB	10-19-09	C	10-20-09	90% SUBMISSION	CAB	DRB	BLB	BLB	
SUPERVISOR	DATE								
BLB	10-20-09								
APPROVED	DATE								

GTP GEORGIA TRANSPORTATION PARTNERS

SCALE IN FEET 0 40 80 160

NORTHWEST I-75/I-575 CORRIDOR

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PBSJ

I-75 / I-575 NORTHWEST CORRIDOR

I-75 REV. OVER S. MARIETTA PKWY
STA. 418+55 TO STA. 469+35

COBB COUNTY NH000-0073-03(242)

DRAWING No. 35-

12:50:05 PM 10/21/2009

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pe_5.dgn