TO:	Jill Asher, PE
	Project Management Coordinator
	Division of Highway Design

FROM: Bart Asher, PE, PLS Geotechnical Branch Manager Division of Structural Design

BY: Erik Scott, PE Geotechnical Branch

DATE: March 12, 2015

SUBJECT: Henry County JL03 052 0146 002-010 KY 146 Reconstruction Segment No. 1: KY 153 to Lost Creek Mileposts 2.1 to 6.8 Item No. 5-8300.00 Mars No. 8304401D Geotechnical Engineering Roadway Report Addendum

The project involves reconstruction of KY 146 in Henry County from KY 153 to Lost Creek (approximate mileposts 2.1 to 6.8). The original geotechnical report for this project (R-034-2013) was completed by ICA Engineering, Inc. in November, 2014 and formally issued by KYTC Geotechnical Branch on November 21, 2014.

The structures for the project were drilled subsequent to the roadway investigation. The drilling was performed by Thelen Associates, Inc. under the Statewide Drilling Contract. The structure drilling included rockline soundings for six proposed Reinforced Concrete Pipes (RCPs). A plan view showing the borings obtained for each pipe is attached to this report. The pipe locations and proposed sizes are below.

Proposed Pipe Size	Mainline Station	Boring Numbers
54-inch	124+21.61	1001-1005
66-inch	191+83.53	1014-1016
54-inch	204+39.58	1017-1019
54-inch	209+26.19	1020-1022
60-inch	251+97.73	1029-1031
78-inch	263+38.62	1032-1033

The purpose of this addendum is to update the geotechnical profile sheets to include the pipe sounding information so the rockline information at these locations will be available to the Contractor. The geotechnical notes sheet will be revised to include a note that discusses the pipe borings. A note will also be added concerning construction methods for shale within new embankments. These revised geotechnical notes and profile sheets should replace the previous versions. The CADD input for these sheets, in DGN format, is being provided to the Design Consultant, GRW Engineers, Inc., for inclusion in the roadway plans.

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REVISED GEOTECHNICAL RECOMMENDATIONS:

21.) Rockline soundings were performed for the culvert pipes at the following approximate locations. See the Geotechnical Profile Sheets for rockline sounding information.

<u>KY 146</u>

Station 124+22 Station 191+84 Station 204+40 Station 209+26 Station 251+98 Station 263+39

- **22.**) All embankment construction using non-durable shale will be in accordance with Section 206 of the current Standard Specifications for Road and Bridge Construction, Embankments Principally of Non-Durable Shale.
- cc: Division of Design (Plan Processing Section) TEBM for Project Delivery & Preservation (District) TEBM for Project Development (District) Division of Construction Project Manager (District) GRW Engineers, Inc. ICA Engineering, Inc.

Attachments:

GEOTECHNICAL NOTES

- Clearing and grubbing of roadway areas shall be completed in accordance with the requirements 1 of Section 202 of the current Kentucky Department of Highways Standard Specifications for Road and Bridge Construction.
- 2. In accordance with Section 206 of the current Standard Specifications, the moisture content of embankment fill material shall not vary from the optimum moisture content as determined by KM 64-511 by more than +2 percent or less than -2 percent. This moisture content requirement shall have equal weight with the density requirement when determining the acceptability of embankment construction. Refer to the Family of Curves for moisture/density correlation.
- 3. All water wells or cisterns, septic tanks, catch basins, manholes, etc., that may be encountered within the limits of the construction, whether shown on plans or not, shall be plugged and/or capped in accordance with Section 708 of the current Kentucky Department of Highways Standard Specifications for Road and Bridge Construction.
- All soils, whether from roadway or borrow, may require manipulation to obtain proper moisture 4 content prior to compaction. Direct payment shall not be permitted for rehandling, hauling, stockpiling, and/or manipulating soils.
- The contractor shall conduct grading operations in such a manner that limestone and/or durable 5. rock obtained from roadway excavation shall be stockpiled separately or otherwise manipulated so that quantities are available for those areas requiring said material. No direct payment for hauling, stockpiling, and/or manipulating excavated material shall be permitted.
- The Contractor shall conduct grading operations in such a manner that soil (free of rock larger 6 than 4 inches and shale) from roadway excavation be stockpiled separately or otherwise manipulated so that ample quantities are available for a chemically stabilized roadbed meeting the requirements of Section 208 of the current Standard Specifications for Road and Bridge Construction. No direct payment will be allowed for such necessary manipulating as stockpiling, hauling and/or handling the material.
- 7. Excavation of surface ditches and channel changes adjacent to embankment areas shall be performed prior to the placement of the adjacent embankments. The material excavated for the channel changes and surface ditches is suitable for embankment construction if dried to proper moisture content in accordance with Section 206 of the current Standard Specifications.
- 8 Foundation embankment benches shall be placed in accordance with Standard Drawing RGX-010 at the locations listed below and/or as directed by the Engineer:

Approximate Station Limits Mainline 110+75 to 112+25, Right 113+75 to 115+75, Left & Right 117+25 to 118+75. Left & Right 124+75 to 125+25, Left 129+25 to End Bent No. 1 Sta.135+14 Left End Bent No. 2 Sta.136+42 to 138+75, Left & Right 159+25 to 160+25, Left & Right 162+25 to 165+75, Right 166+25 to 167+25. Left & Right 211+25 to 213+75, Right 217+75 to 218+75, Right 245+75 to 250+75, Right 251+75 to 252+75, Left 255+25 to 255+75, Left End Bent No. 2 Sta. 268+00 to 269+25, Right 289+25 to 290+75, Left & Right 322+25 to End Bent No. 1 Sta. 323+85 Left

Conventional transverse benches at cut to fill transitions shall be constructed and perforated 9 pipe be placed in accordance with Standard Drawings RDP-005 & RDP-006 at the following approximate locations and/or as directed by the Engineer. Contrary to Standard Drawing RDP-006 the transverse benching and perforated pipe underdrains shall be installed on both the upgrade and the downgrade cut to fill transitions.

Approximate Station Limits

Main	line
118+69	19
122+40	19
125+06	19
128+42	20
150+64	20
159+31	21
161+02	21
166+15	23
168+24	23
175+49	24
180+88	24
182+75	31
186+21	31

Perforated pipe for subgrade drainage is typically placed in accordance with Standard Drawing 10. RDP-005 in vertical sags. The following mainline locations shall use perforated pipe at the specified stations, or as directed by the Engineer:

Mainline
134+33
148+07
178+13
204+03
222+03
262+44
306+75
331+00

- As directed by the Engineer, adequate drainage shall be provided for any natural spring outlets 11. encountered within the construction limits, whether shown on plans or not. Adequate drainage shall be provided by constructing spring box inlets, if there is a defined throat, in accordance with the Kentucky Department of Highway Standard Drawings RDX-010-04 or RDX-011-04. The outlet pipes should extend to the downstream embankment toes for discharge of water onto exterior grades. If there is no defined throat then a one (1) foot drainage blanket wrapped with Type IV Geotextile Fabric shall be used.
- 12 A minimum of one foot of Kentucky Coarse Aggregate #2's, 3's, or 23's shall be constructed in the areas that chemical stabilization is not feasible due to maintenance of traffic considerations (entrances, cross-overs, or approaches), tie-ins, tapers, etc. The Kentucky Coarse Aggregate shall be in accordance with the current edition of Section 805 and shall be wrapped with Geotextile Fabric, Type IV in accordance with Sections 214 & 843 of the current Standard Specifications. The actual locations and thicknesses shall be determined by the Engineer during construction and may fluctuate due to seasonal changes in the ground water table. At the discretion of the Engineer, quantities may be increased or decreased during construction.

HENRY 5-8300.00 G002	HENRY
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90+11 92+93 95+92 05+18 07+37 11+09 15+91 36+05 38+75 40+87 43+45 16+18 18+65

GEOTECHNICAL NOTES

- In areas where shale or limestone bedrock is encountered at the top of subgrade in the cuts, the 13. roadbed shall be undercut one (1) foot below the proposed grade and the limits of the roadbed excavation shall be extended to the ditchlines. The refill shall consist of soil and shall be constructed as specified in Section 204 of the Standard Specifications for Road and Bridge Construction, current edition. Shale cannot be used in the top one foot of the subgrade. For Roadway Excavation projects, the excavation of the shale or limestone material shall be paid at the unit bid price for Roadway Excavation and the placement of soil refill shall be incidental. For Embankment-In-Place projects, the placement of soil refill shall be paid at the unit bid price for Embankment-In-Place and the excavation of the shale material shall be incidental. For either case, no compensation shall be made for the incidental portions of this work.
- Construct a chemically modified soil subgrade with a CBR value of 3.0 for the underlying soil. 14. Where soft and/or wet subgrade is encountered during construction, the thickness of the chemically modified soil may need to be adjusted to also serve as a working platform for subgrade stabilization. These adjustments shall be as directed by the Engineer, and may depend on seasonal fluctuations in the water table.
- 15. Any saturated, soft foundation areas, and/or drainage swales within embankment foundation limits shall be drained if necessary and stabilized with durable rock from roadway excavation. A thickness of 3 feet is estimated for this treatment, for quantity estimation purposes only. Soft, saturated foundation areas and/or drainage swales were noted within the following intervals, but the occurrence of such areas is not limited to these locations. The actual locations will be determined by the Engineer during construction.

Approximate Station Limits Mainline Station 337+55 to 338+06 (Pond)

- As directed by the Engineer, existing bituminous concrete located at a distance greater than three 16 feet below the proposed subgrade elevation within the limits of new roadway embankments, shall be scarified or broken until all cleavage planes are destroyed, or the pavement shall be removed entirely as conditions demand. This shall be performed in compliance with Section 206 of the Standard Specifications for Road and Bridge Construction.
- 17. Existing bituminous concrete that is not being overlaid, and is located at a distance less than three feet below the proposed subgrade elevation within the limits of new roadway embankments, shall be removed entirely. This shall be performed in compliance with Section 206 of the Standard Specifications for Road and Bridge Construction.
- Borrow material, if required for subgrade, shall meet the minimum CBR design value of 3.0. 18.
- Some of the soil horizons and slopes on the project are subject to erosion. Necessary procedures 19. in accordance with Sections 212 and 213 of the current Standard Specifications shall be followed on construction.
- Slope protection will be required for bridge spill-through slopes meeting the requirements of 20. Sections 703 & 805 of the Standard Specifications for Road and Bridge Construction, current edition. The limits, size, and thickness of the slope protection shall be as specified in HEC 23. Place a Type I Geotextile Fabric, in accordance with Sections 214 & 843 of the current Standard Specifications between the embankment and the slope protection.

Rockline soundings were performed for the culvert pipes at the following approximate locations. 21. See the Geotechnical Profile Sheets for rockline sounding information.

> Mainline Station 124+22 Station 191+84 Station 204+40 Station 209+26 Station 251+98 Station 263+39

All embankment construction using non-durable shale will be in accordance with Section 206 of 22. the current Standard Specifications for Road and Bridge Construction, Embankments Principally of Non-Durable Shale.

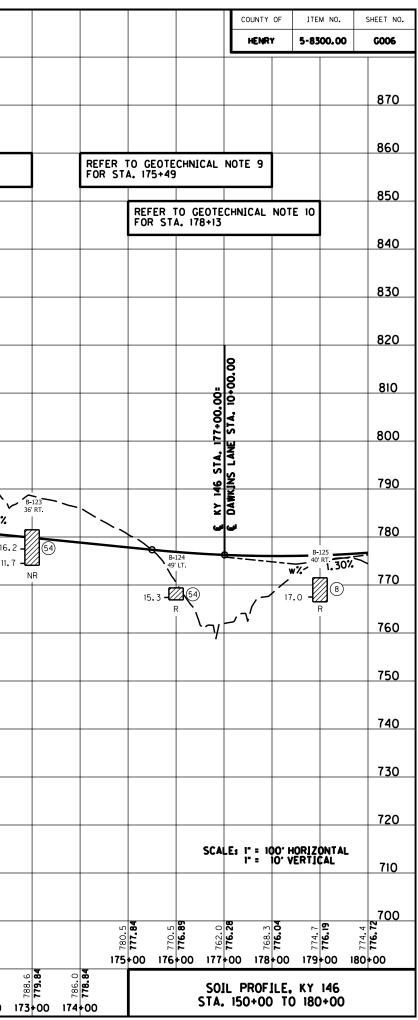
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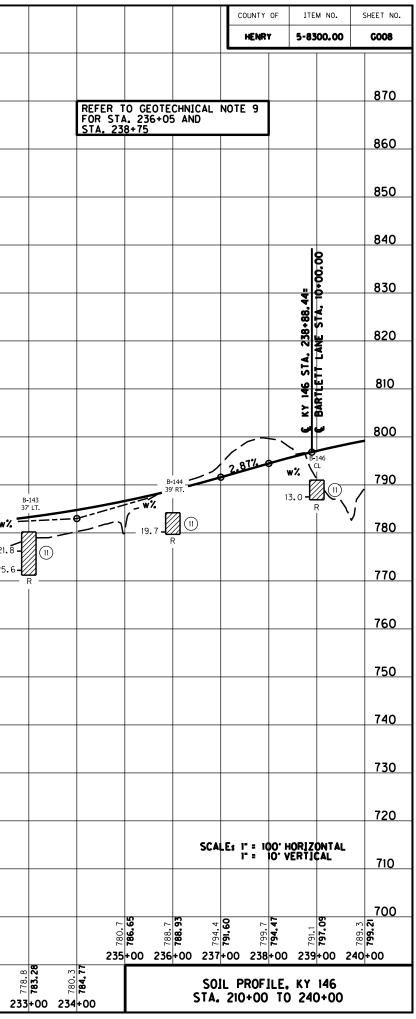
880	REFER TO GEOTECHNICAL NOTE 9 FOR STA. 150+64		RE	FER TO EMBANKMENT CTION FOR STA. 160+	STABILITY 00		REFER TO GEOTECHNICA FOR STA. 166+15 AND S	AL NOTE 9 STA. 168+24	
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740	OFFSET DEPTH COMPOSITION GRAVEL (-3" + N0.10) SAND (-N0.10 + N0.200)	36' LT. 36' LT. 0.0'-4.7' 4.7'-9.1' 32 30 5 8	0.0'-7.1' 0.5	8' LT. 40' LT. 5'-5.0' 0.5'-8.7' 17 16 7 28					
730	SAMPLE SILT (-N0.200 + 0.002 mm CLAY (-0.002 mm)	29 30 33 32 53 46	36 42 47	52 37 25 19 28 24					
700	PLASTIC LIMIT PLASTICITY INDEX ACTIVITY INDEX SPECIFIC GRAVITY	27 23 26 23 0.78 0.71 2.78 2.80	22 0.53	18 16 10 8 0.41 0.41 2.78 2.72					
720	AASHTO CLASSIFICATION UNIFIED CLASSIFICATION CALF. BEARING RATIO	A-7-6(15) A-7-6(12) CH CL 2.6 2.3	A-7-6(17) A CL 2.3	A-4(6) A-4(2) CL CL 3.0 6.0					
710	DRY DENSITY, AASHTO T-99(pcf) OPTIMUM MOISTURE (%) % + No. 4	98.1 103.8 22.8 19.3 7 21	21.3	115.9 117.1 14.5 13.5 9 5					
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830										Hole No	. <u>Station</u>	Offset	Surface Elev.	Refusal	Depth to Refusal				1018 1019	204+39.52 204+26.77		763.6 766.9	760.6 758.9
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790			126					w%						w%									
		₩%.	ст. Z л					28.2	R		-	0.50%		18.5						B-1 36'	132 LT.		
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770	~~		<u>२</u> 	$\left \right\rangle$	F	3-127					13	129 ' RT. 	<i>'</i>				30	131 ' RT.	-1.78%	13.3 -			
110					w% 3	3' RT. ———					19.8 -	1 0	/				w% 16.2	 `	V		1		w%
760					22.6-	<i>I</i> _R [™]						₽ R H					11.4 1 2						21.8
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740																							
		SAMPLE N STATION OFFSET	0.		1	8 182+00 36' LT.	9 194+00 36' LT.	10 206+00 35' LT.															
730			GRAVEL (-3" + N0.10)		0.0'-7.1	0.0'-6.2'	' 0.0'-2.1' 17	,														
		OF TOTAL SAMPLE		0.10 + N0.200 0.200 + 0.002 .002 mm)		7 36 42	15 37 35	19 40 25	_														
720		LIQUID LIMIT PLASTIC LIM PLASTICITY	<i>I</i> IT			47 25 22	40 21 19	33 20 13	_														
710		ACTIVITY IN SPECIFIC GF AASHTO CL	DEX RAVITY	NI		0.53 2.79 A-7-6(17)	0.54 2.76 A-6(13)	0.52 2.74 A-6(6)	_														
		UNIFIED CLA CALF. BEAR	SSIFICATION	1		CL 2.3	CL 3.7	CL 3.7															
700		DRY DENSIT OPTIMUM M % + No. 4				102.3 21.3 3	107.1 18.8 8	111.3 16.8 10	_														
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690	774.4 776.72	779.4 777.63 782.6	778.88	780.18 780.18	781.47	782.72 782.0	783.66	784.24	784.46	791.9 784.32	783.86 768.5	783.36 765.7	2.86 .₄	782.36	781.70 784.1	780. 72 779. 2	6 7	777.80 767.6	776.02	774.24 771.6	2.46).7	0.73	9.45
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880 870 860 850 840 830	REFER FOR ST	REFER T FOR STA		CHNICAL NO AND STA. NOTE 8 213+75	OTE 9 215+91		REFER T FOR STA	0 GEOTE(. 275+75	CHNICAL N 5 TO STA.		REFER FOR ST	TO GEOTI											
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850	REFER FOR ST	TO GEOTE(A. 211+25	CHNICAL N TO STA.	NOTE 8 213+75							REFER FOR ST			NOTE									
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780	2.36	×				<u> </u>	<u></u>	0.50%			w% 20.0_			B	140 'LT. O		B-141 36' LT.	0.50%		B-14 52' R	42 RT.		- %%
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740		SAMPLE NO	0.			10	11	12	17]													
730		STATION OFFSET DEPTH COMPOSITION OF TOTAL	GRAVEL (-3 SAND (-NO	3" + N0.10) .10 + N0.200)		206+00 35' LT. 0.0'-2.1' 17 19	233+00 37' LT. 0.0'-9.0' 6 14	224+00 45' RT. 0.0'-5.0' 1 14	215+00 36' LT. 0.0'-5.7' 15 20														
720		SAMPLE	SILT (-N0.2 CLAY (-0.0	200 + 0.002 m		40 25 33	42 38 45	49 36 40	38 27 31														
		PLASTIC LIN PLASTICITY	IT INDEX			20 13	26 19	24 16	16 15														
710			AVITY ASSIFICATION ASSIFICATION			0.52 2.74 A-6(6) CL 3.7	0.51 2.73 A-7-6(16) CL 4.7	0.45 2.78 A-6(14) CL 4.4	0.56 2.75 A-6(7) CL 3.3														
700		DRY DENSIT	Y, AASHTO T DISTURE (%)			111.3 16.8 10	102.9 20.2 3	99.9 20.9 0	110.5 17.0 5														
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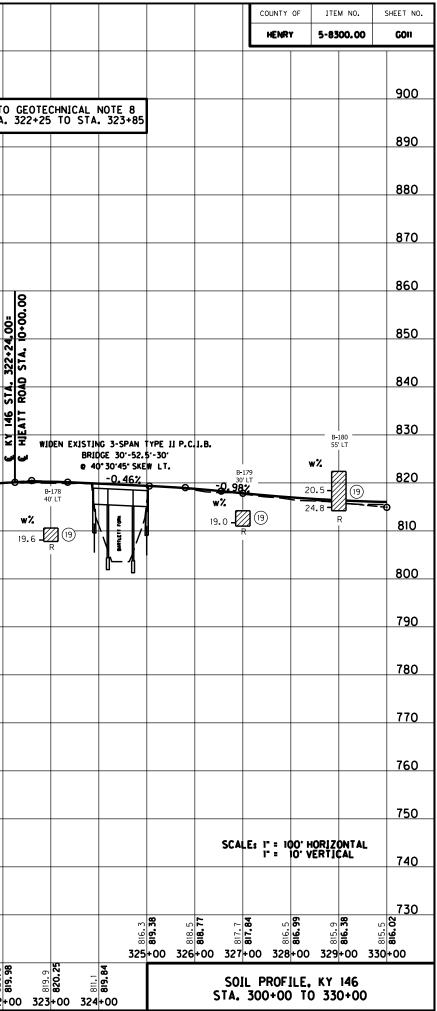
880																						
870	REFER	TO GEOTE	CHNICAL	NOTE 9			REFER					REFER										
860	FOR ST STA. 24	TO GEOTE A. 240+8 3+45	7 AND				FOR ST	A. 245+7		NOTE 8 . 250+75		FOR ST	TO GEOTE A. 251+75									
850											ional Rock ert Pipe		dings for on 251+98		REFER T	O GEOTECHNICAL 255+25 TO ST	NOTE 8 A. 255+75	5				REF FOR
		70							Hole N	w. Statio		Sur fac	e Refusa	Depth to Refusal								
840		7 241+70		FARM	VEHICLE	LANE RT.	<u>& LT.</u>		₽ 1029 V 1030 1031	251+94.	51 50.7'L 52 20.0'R 45 75.1'R	t. 785.1 t. 784.3	782.7	2.4 [,] 4.2 [,] 2.1 [,]						Additic	nal Rockli	ine So
830										TO GEOT] <u> </u> 8						t Pipe a	
820															254+52.84= STA. 10+00.00				1032	<u>Station</u> 263+44.33 263+35.28	45.8'Lt.	. 783
810		B-	148												KY 146 STA. 2' BROKO LANE S'				REFER T	Ο GEOTE	CHNICAL	NOTE
		22		<u> </u>				E	151 / LT.					В-						-156 ' LT.		
800	2.87%-	23.4	1 <u>3</u>					10 w% - 20.0 -0		<u>-0.</u>	64%			36 w%			B-155 31' RT.		*			
790	/				w%	3 150 4' RT		20.04	R 		в.	152		20.2		w%		-1.02%	21.2	R R		
780					18.3	R R					w%	кі. (3)				27.3-						W 27
770											23.7-											
760																						
750		SAMPLE N).			13	14	16														
740		STATION OFFSET DEPTH				245+00 84' RT. 0.0'-3.5'	260+00 36' LT. 0.0'-4.8'	263+00 39' RT. 0.0'-4.1'	-													
		COMPOSITION OF TOTAL SAMPLE	SAND (-N	-3" + N0.10) 0.10 + N0.20 0.200 + 0.000	0) 2 mm)	11 13 40 36	6 19 42 33	1 8 72 20														
730		LIQUID LIMIT PLASTIC LIN PLASTICITY	AIT.			40 21 19	43 20 23	20 39 23 16	-	<u> </u>												
720		ACTIVITY IN SPECIFIC GR AASHTO CL	DEX AVITY ASSIFICATIO			0.53 2.73 A-6(14)	0.69 2.75 A-7-6(16)	0.80 2.67 A-6(16)														
710		UNIFIED CLA CALF. BEARI DRY DENSIT OPTIMUM MO	NG RATIO Y, AASHTO	T-99(pcf)		CL 5.2 105.1 20.4	CL 5.2 104.4 20.7	CL 7.7 104.1 19.2	-													
110		% + No. 4				6	3	0] 													
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690		~ 83	<u> </u>	1 2	- 9 -	51	- <mark>2</mark> ~	86 ^	- M	5	<u> </u>		92 ~~	2.	K	<u> </u>						35
	9-108 240+00 241	800.800.80 800.80 804.3 *00 242	801.9	55.56 605.52 805.52 805.52	802.66	12.208 240 5+00 240	5901.62 249 801.62	86.008 7+00 248			50.67 795. 0 7 95.0	798.41	796. 2 736. 2	795.7	796.4	50.367 8.467 8.467 792 8.467 792 8.467 700 726 700 700 700 700 700 700 700 700 700 70	794.1	91.67 193.66 700 52	0.192.0 792.14 791.0 791.0	0.067 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12 7.1.12	1.061 +00 263	789.35

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				WIDEN	I EXIST				TYPE	IV P.	с.і.в.		800
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800		8-160 23'LT.	B-161 24' RT.		B-162 32' LT.	<u><u> </u></u>	36' RT.	0.59%	B-164 32'LT.		R 15	24.9		
790		16.3 20.4 NR	0.34% w%		20.0 13.9 R		11.7 - R		15.2 - (15) 18.4 - NR					
780														
770		SAMPLE NO.	15	16	21									
760		STATION OFFSET DEPTH COMPOSITION SAND (-NOJO +		39' RT.	299+00 35' RT. 0.0'-12.5' 42 13									
750		OF TOTAL SAMPLE SLIT (-N0.200 CLAY (-0.002 n LIOUID LIMIT PLASTIC LIMIT	mm) 19 26 15	72 20 39 23	33 13 26 15									
740		PLASTICITY INDEX ACTIVITY INDEX SPECIFIC GRAVITY AASHTO CLASSIFICATION UNIFIED CLASSIFICATION	11 0.58 2.80 A-6(4 CL	16 0.80 2.67 A-6(16) CL	11 0.87 2.76 A-6(2) CC									
730		CALF. BEARING RATIO CALF. BEARING RATIO DRY DENSITY, AASHTO T-99(OPTIMUM MOISTURE (%) % + No. 4	2.0	7.7 104.1 19.2 0	2.8 122.6 11.4 28									
720														
710	<u></u>	<u>- 67 % 83 % </u>		<u>6 8 8</u>		<u>19</u> 19	∞ Θ	- Co m		<u>800</u> 8		O N		
	270+00	66 56 1 56 1 56 1 56 1 56 1 36 1 36 1 36 1 36 1 37 1 36 1 37 1 36 1 37 1 36 1 37 1 36 1 37 1 36 1 37 3	0 274+00 275+00 2	1.72 1.72 1.72 1.72 1.72 1.72 1.72 1.72	00 278+00 279	55.00 55.00 1.008 1.	0 281+00 28	2+00 283+0	00 284+00 285	601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 601.5 60	⁹⁰⁸ 908 287+00 288+00	0 1 1 1 1 1 1 1 1 1 1 1 1 1	+ 265 00+16 815.8 818.5 + 265 00+16 818.5 + 818.5	00 2

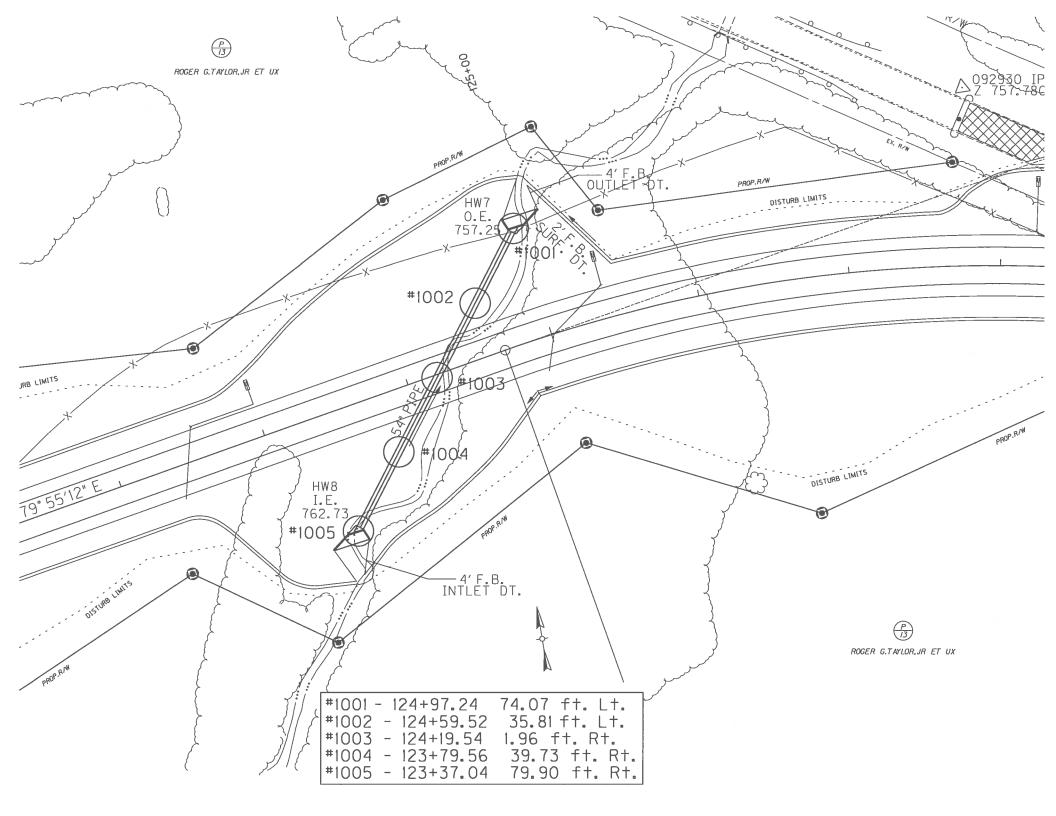
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21.2	22.23	23.4	824.30					SO	LF	ROF	ILF.	KY			
593	ക് +00	82 294	ക് +00				S	TA.	27	PROF 0+00	TC	300	0+00		

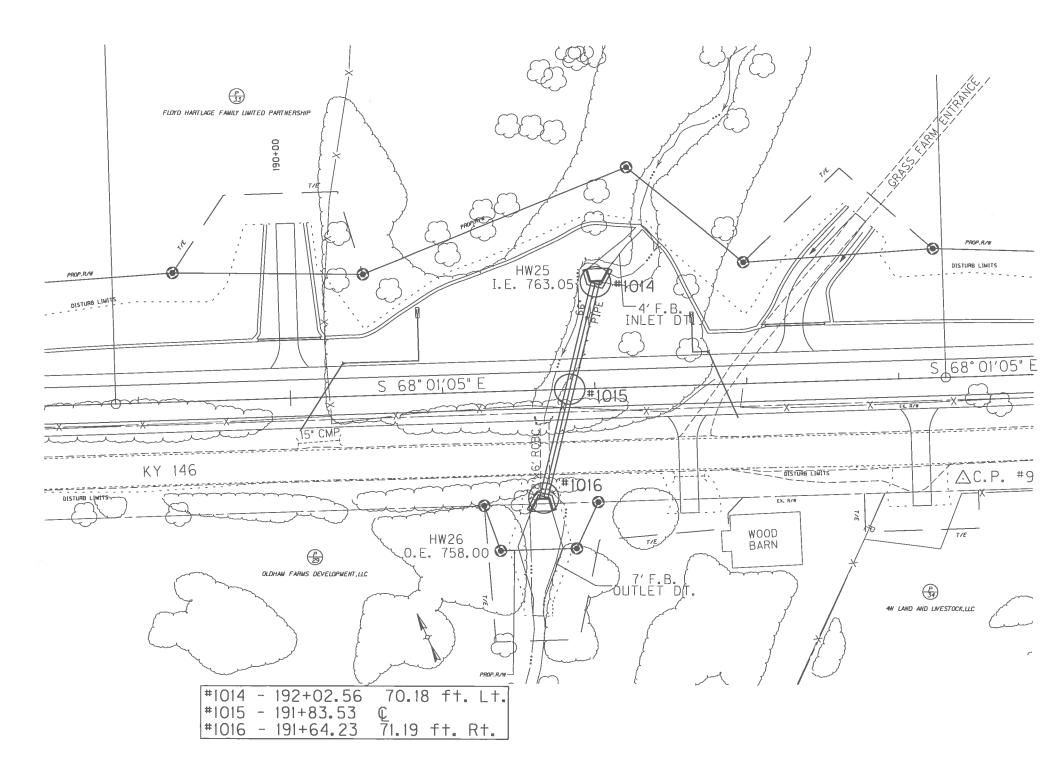
910																				
900				REFER TO GI		. NOTE 10							REFER 1		CHNICAL	NOTE 9 A. 318+65			REFER TO	
890				FOR STA. 30	6+75		4						FOR ST	A. 316+18	AND ST	A. 318+65		Ľ	FOR STA.	322+
880																				
870																				
860																				
850																				KY 146 STA, 322+24,00= Hjeatt Road Sta, 10+00.00
840														в.	-176					<u>- 322-</u> AD ST/
														42 W%	2' RT					11 R0
830									B-174 36' RT.					23.7	2 R 18—		B-1	77		
820		B-171		B-172 48' RT.				2	24.1 R						<u> </u>			L	82%	
		-2.82		w%			B-173					 B-175 CL 		Ĺ			- 26.8 -	18		w%
810				13.5		w%	a		0.66%				- ~							19.6
800						21.2	(18) R				23.3. 22.0									
790							<u> </u>													
780																				
180		SAMPLE NO. STATION OFFSET		308	+00 329+00	_														
770		DEPTH COMPOSITION GRAVEL (-3" + N0.10) 0.10 + N0.200)	C 0.0' 1	5.5' 0.0'-8.2 7															
760		OF TOTAL SAMPLE SILT (-NC CLAY (-O	.200 + 0.002 m		2 <u>35</u> 340	-														
		PLASTIC LIMIT PLASTICITY INDEX ACTIVITY INDEX		22	1 23 2 23	-														
750		SPECIFIC GRAVITY AASHTO CLASSIFICATIO UNIFIED CLASSIFICATION		2. A-7- C	77 2.82 6(16) A-7-6(17 - CL	 }														
740		CALF. BEARING RATIO DRY DENSITY, AASHTO OPTIMUM MOISTURE (%	T-99(pcf)	5. 103 19	0 5.2 5 102.4 6 20.2															
		% + No. 4			3															
730																				
720				- la		•	<u>6</u>	_	N											
	€18 300+00 30	01+00 302+00 30		67.908 00 305+00	306+00 305-11 305-11	301.4	±;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;	6.908 9+00 310+00	00.10 808.02 904-115	- ⁸⁰⁸ 808 312+00	313+00 3	808.3 14+00 31	8.008 8.0 8.0 8.0 8.0 7 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0	+00 317	813.44 813.44	815. 8 815.8 815.8 815.8	817.05 817.05 817.4	67.0 10.618 +00 321+	820.0	8 618 +00 32
	300+00 30	01+00 302+00 30	5+00 304+	00 305+00	306+00 30	07+00 3 0	8+00 30	9+00 310+00	311+00	312+00	313+00 3	4+00 31	5+00 316	+00 317	1+00 31	8 <u>+</u> 00 319	+00 320	+00 321+	00 322	00 3

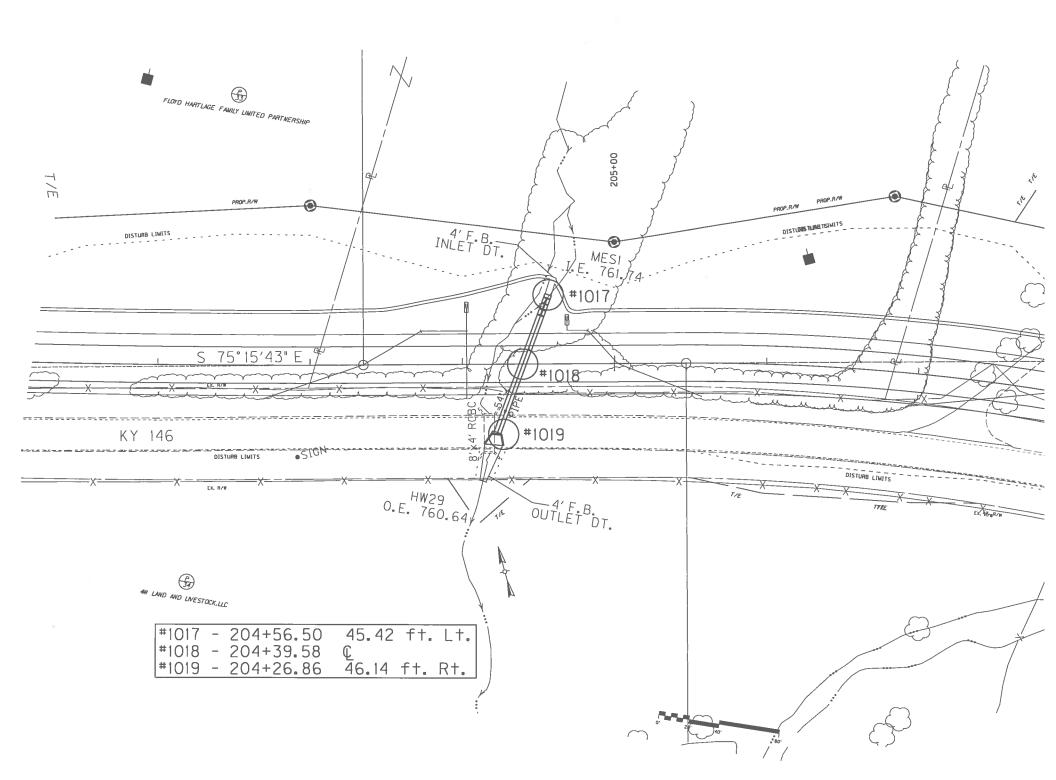


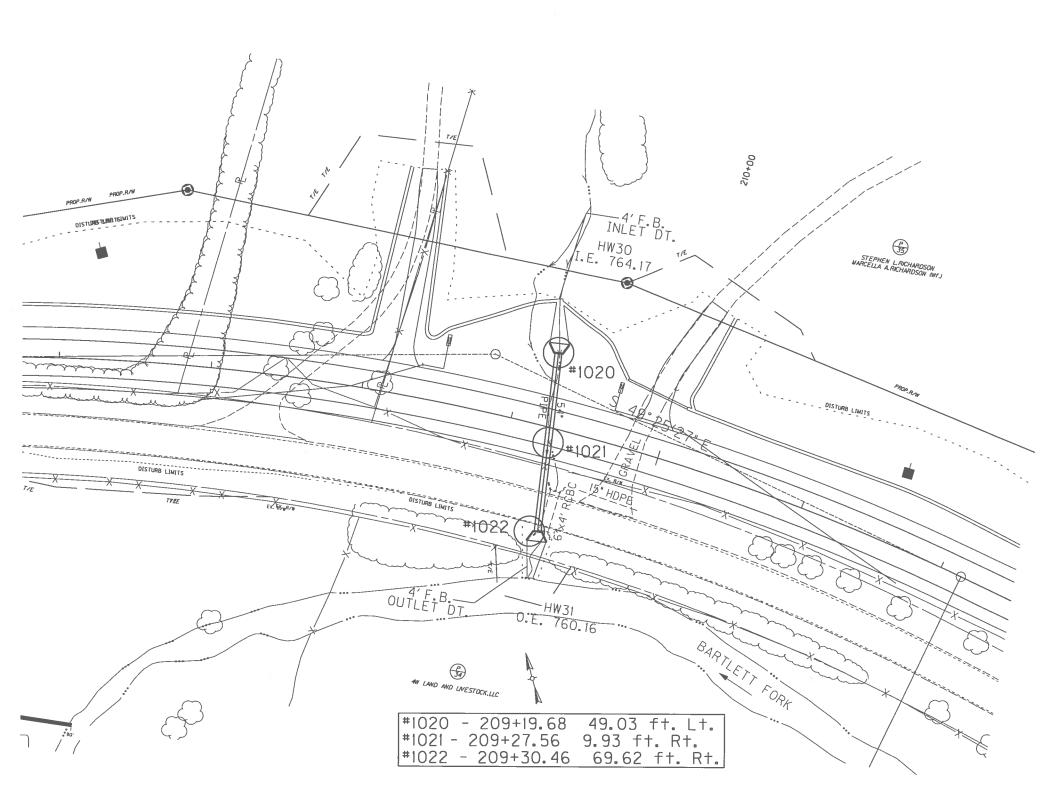
910											
900	REFER	TO GEOTECHNICAL NOTE 10	REFER 1	O GEOTECHNICAL	NOTE 15						
890	FORS	TO GEOTECHNICAL NOTE IO TA. 331+00	FOR ST	O GEOTECHNICAL A. 337+55							
880											
870											
860											
850			SEGMENT I BEGIN CONS SEGMENT 2					0.00			
840											
830							B-192 13 RT 1		B-232 36' LT	B-233 41' RT	w%
820		B-181 38' RT 0.50%	B-182 36 LT w%	B-185 20' RT		<u> </u>	w%	₩ 23.4		26.2 NR	24.4 24.6
810		0.50	24.6 -				22.9 -				
800		R									
790											
780		SAMPLE NO.	19 20	2-2 2-4							
770		STATION OFFSET DEPTH COMPOSITION GRAVEL (-3" + NO.IO) SAND (-NO.IO + NO.2OO)	329+00 338+00 55' LT. 20' RT. 0.0'-8.2' 0.0'-5.3' 7 3 18 16	356+00 347+00 13' RT. 36' LT. 0.0'-5.0' 0.0'-5.0' 7 0 21 9							
760		SAMPLE SILT (-N0.200 + 0.002 mm) CLAY (-0.002 mm) LIQUID LIMIT PLASTIC LIMIT	35 15 40 24 46 35 23 21	45 62 26 29 39 34 20 19							
750		PLASTICITY INDEX ACTIVITY INDEX SPECIFIC GRAVITY AASHTO CLASSIFICATION UNIFICE CLASSIFICATION	23 14 0.57 0.57 2.82 2.73 A-7-6(17) A-6(11)	19 15 0.72 0.52 2.79 2.69 A-6(12) A-6(13)							
740		UNIFIED CLASSIFICATION CALF. BEARING RATIO DRY DENSITY, AASHTO T-99(pcf) OPTIMUM MOISTURE (%) % + No. 4	CL CL 5.2 5.4 102.4 103.2 200.2 17.8 3 1	CL CL 5.6 10.4 107.8 103.6 18.5 16.6 1 0							
730											
720	2			n -	ل ان ال	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	<u>نہ</u> ہ	N 1	<u>v</u> v	<u> </u>	o
	20,985.5 310,400 315,50 316,02	<u>∠ '518</u> 6 <u>6</u> 5 <u>6</u> 5 <u>6</u> 5 5	8 '918 8 '918 335+00 336+00 337	88.43 816.3 816.3 816.3 821.8	819.91 819.91 820.75 00+000+000	90+158 822.6 822.43 822.42 822.42	823.8 823.8 824.5 824.5 824.5	241.6 824.92 824.92 825.67 825.67	92 94 853.4 855.0 856.0 84 876.1 84 <td>249+00 350+00 351+ 549+00 350+00 350+00 351+ 549+00 350+00 350+000 351+ 549+000 350+00 350+000 350+000+000+ 549+000+000+ 549+000+00+ 549+000+ 549+000+ 549+000+ 549+000+ 549+000+ 549+000+ 549+000+ 549+000+ 549+000+ 549+000+ 549+000+ 549+000+ 549+000+ 549+000+ 549+000+ 549+00+ 54</td> <td>878 878 878 878 878 878 878 878 878 878</td>	249+00 350+00 351+ 549+00 350+00 350+00 351+ 549+00 350+00 350+000 351+ 549+000 350+00 350+000 350+000+000+ 549+000+000+ 549+000+00+ 549+000+ 549+000+ 549+000+ 549+000+ 549+000+ 549+000+ 549+000+ 549+000+ 549+000+ 549+000+ 549+000+ 549+000+ 549+000+ 549+000+ 549+000+ 549+00+ 54	878 878 878 878 878 878 878 878 878 878

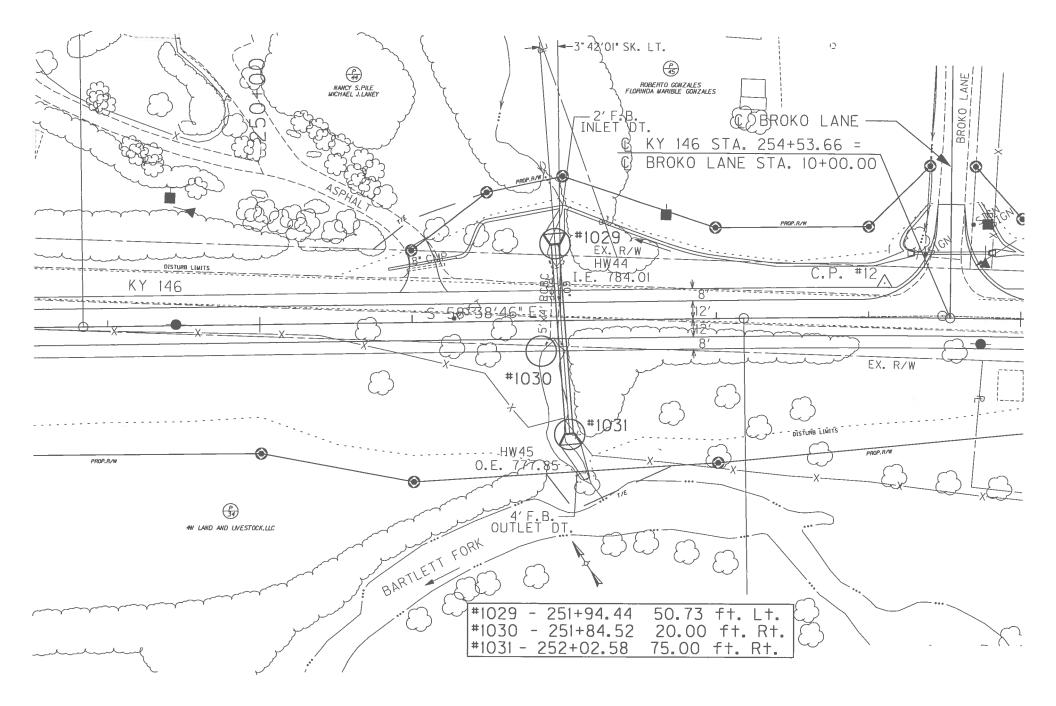
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														000
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	EA	DM	VEHJC		ANE	DT	• •	•			-			860
	F#		VENIC	<u>LE L</u>		R1.	<u>a L</u>							
														850
														840
В- 36	235 ' LT				B-	237					B-2 36'	39 LT		
%	0.5	0%				237 ' RT		<u>، م</u>		_ *		71~~	-	830
	(2-2)	\sim	,	— w	<u>,</u> 7	2	N N	•		2	3.4-L		-1	
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			829.7	30.26	30.0	830.76	831.0	31.26	30.3	831.76	829.3	32.26	829.4	32.76
			8 355	∞ +00	356	∞ +00	ଞ 357	ಹ +00	ີ 358	∞ +00	8 359	∞ +00_3	ة 60	₩ +00
7.9	829.26 826.9	829.76							PROF					
₈₂ 353	ଛି ି +00 354	¦₩ 1+00				S	TA.	33	0+00	TO	360	0+00		

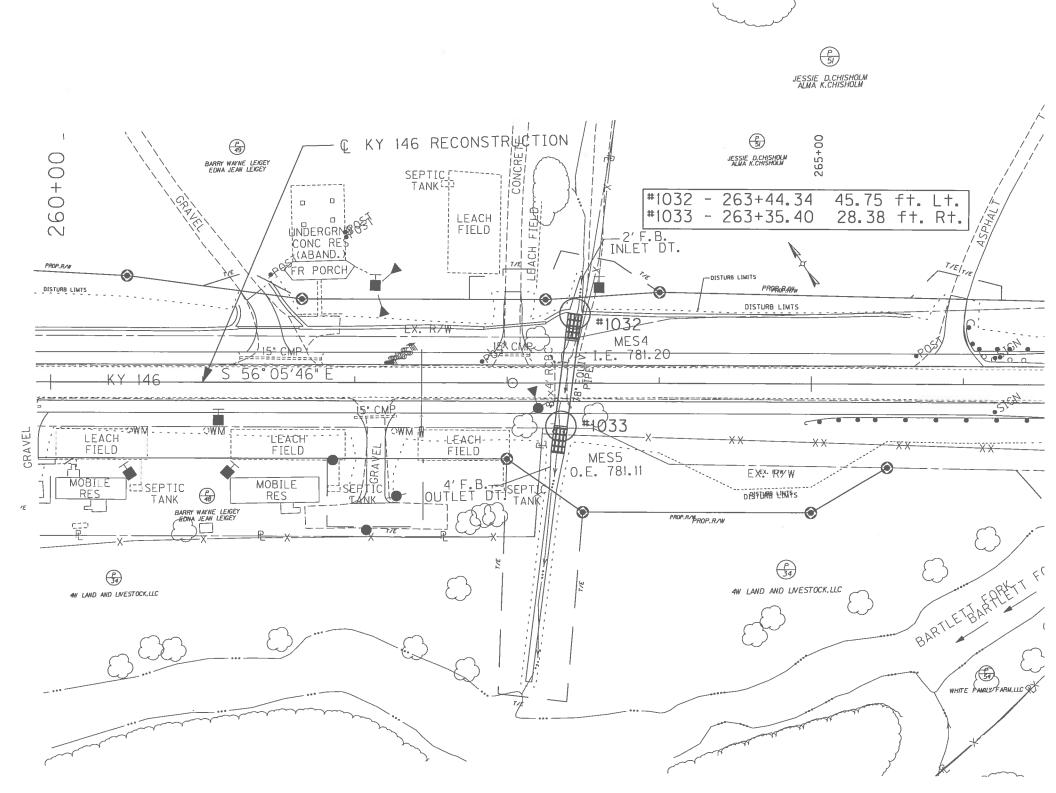












COORDINATE DATA SUBMISSION FORM KYTC DIVISION OF STRUCTURAL DESIGN -- GEOTECHNICAL BRANCH

County	HENRY		Date12/1/2014	4
Road Num	ber	KY 146		
Survey Cre	ew / Consultant	GRW ENGINEERS, INC.	Notes:	
Contact Pe	erson	Tim Robinson	_	
Item #	5-8300.00			
Mars #	PON2-625-110000	0003		
Project #	JL03 052 0146 002	2-010		

Elevation Datum = NAVD88 or ASSUMED

PIPES

HOLE	LATITUDE	LONGITUDE	HOLE	STATION	OFFSET	ELEVATION (ft)
NUMBER	(Decimal Degrees)	(Decimal Degrees)	NUMBER			
		KY 146	MAINLINE		•	-
1001	38.45300	-85.28585	1001	124+97.04	-74.1	757.97
1002	38.45288	-85.28597	1002	124+59.69	-36.2	760.40
1003	38.45276	-85.28608	1003	124+19.77	2.2	759.29
1004	38.45264	-85.28620	1004	123+79.51	39.5	763.40
1005	38.45251	-85.28632	1005	123+37.03	79.9	763.22
1014	38.45139	-85.26456	1014	192+02.54	-70.2	764.52
1015	38.45123	-85.26472	1015	191+83.48	0.2	763.04
1016	38.45107	-85.26487	1016	191+73.34	67.4	768.38
1017	38.45021	-85.26048	1017	204+56.42	-45.3	763.43
1018	38.45011	-85.26058	1018	204+39.52	0.0	763.60
1019	38.44999	-85.26066	1019	204+26.77	46.2	766.92
1020	38.44976	-85.25893	1020	209+19.62	-49.0	764.23
1021	38.44961	-85.25901	1021	209+27.68	9.9	761.66
1022	38.44946	-85.25910	1022	209+30.45	69.6	764.98
1029	38.44316	-85.24661	1029	251+94.51	-50.7	785.08
1030	38.44301	-85.24676	1030	251+80.41	22.5	784.25
1031	38.44286	-85.24681	1031	252+01.45	75.1	779.55
1032	38.44140	-85.24327	1032	263+44.33	-45.8	783.47
1033	38.44125	-85.24344	1033	263+35.28	28.3	782.57