

DRAINAGE CALCULATIONS

ATB-45-19.13

Final Tracings Submission
August 2019
CT Consultants, Inc.

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HYDRAULIC NARRATIVE

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The existing drainage along S.R. 45, within the project limits, consists of stormwater flowing over the side of the existing bridge over a stream known as Coffee Creek. Beyond the bridge, the stormwater flows into roadway ditches on both sides of the road, which carry the stormwater into Coffee Creek. Also, an existing 12" storm sewer collects storm water on the east side of S.R. 45, South of the bridge and empties into Coffee Creek.

The proposed drainage along S.R. 45 will be identical to the existing drainage. Over the side flow will occur on the bridge and stormwater flowing into ditches will occur beyond the bridge. The stormwater in these ditches will be conveyed to Coffee Creek. Also, the existing storm sewer will be maintained.

Since the E.D.A. for this project is under 1 acre, BMP's are not necessary.

DRAINAGE CRITERIA

PROJECT INFORMATION:

ASHTABULA	S.R. 45	19.13	101798
COUNTY	ROUTE	SECTION	PID

PIPE POLICY:

The Pipe Policy of _____ ODOT _____ will be used for this project.

(Attach a copy of the written pipe policy or furnish a link to the policy. In lieu of a written policy, documentation of locally funded construction practices may be provided)

POST CONSTRUCTION BMP POLICY:

The Post Construction BMP Policy of _____ ODOT _____ will be used for this project..

If a policy other than ODOT's is being used, the following BMP's are permitted:

DRAINAGE WATERSHED(S):

___ COFFEE CREEK ___

PROJECT SPECIFIC INFORMATION AFFECTING DRAINAGE:

DITCH CALCULATIONS



DITCH ANALYSIS

PID : 101798 **Date :** 01/31/2019 **Project :** ATB-45-19.13

Location : Ashtabula County, Ohio

Description : S.R. 45, South of Bridge, Sta. 509+00 to Sta. 512+00, Rt.

Designer : E.J.T.

Rainfall Area : A

Allowable Shears

	Seed:	0.40	Jute Mat:	0.45	Temporary Mat:	1.00
Permanent Mat	Type 1:	2.00	Type 2:	3.00	Type 3:	5.00
RCP	Type B:	6.00				

(*) Warning: Grade is steeper than allowable.

If value is parantheses, design parameters have been exceeded. - See user manual.

STATION BEGIN	STATION END	SIDE	LENGTH (ft.)	RADIUS WIDTH (ft.)	IN SLOPE (ft./ft.)	BACK SLOPE (ft./ft.)	GRADE (ft./ft.)	AREA (acres)	AREA SUM (acres)	RUNOFF COEFF.	CA (Sum)	PROTECT TYPE	RAIN INT. (in./hr.)	STORM FREQ. (yrs.)	MANN. COEFF.	TIME FLOW (min.)	VEL. FLOW (fps.)	SHEAR (lbs./ sq.ft.)	DESIGN FLOW (cfs.)	DEPTH FLOW (ft.)	WIDTH FLOW (ft.)
509+00	510+00	R	100.00	0.00	12.00	2.00	0.0200	0.21	0.21	0.70	0.15	Seed	3.50	5	0.030	16.06	1.59	0.27	0.51	0.21	3.01
												Seed	4.02	10	0.040	16.26	1.33	0.32	0.59	0.25	3.53
510+00	510+50	R	50.00	0.00	12.00	2.00	0.0220	0.10	0.31	0.70	0.22	Seed	3.45	5	0.030	16.53	1.79	0.34	0.75	0.24	3.42
												Seed	3.95	10	0.040	16.81	1.48	0.39	0.86	0.29	4.02
510+50	511+00	R	50.00	2.00	12.00	2.00	0.0300	0.08	0.39	0.70	0.27	Seed	3.41	5	0.030	16.95	1.98	0.29	0.93	0.15	4.14
												Seed	3.89	10	0.040	17.30	1.69	0.35	1.06	0.19	4.65
511+00	511+25	R	25.00	2.00	3.00	2.00	0.0560	0.03	0.42	0.70	0.29	Seed	3.39	5	0.030	17.09	2.91	0.51	1.00	0.15	2.73
												Jute Mat	3.39	5	0.040	17.12	2.39	0.60	1.00	0.17	2.86
												Temp. Mat	3.39	5	0.040	17.12	2.39	0.60	1.00	0.17	2.86
												Temp. Mat	3.87	10	0.040	17.47	2.49	0.65	1.14	0.19	2.93
511+25	511+50	R	25.00	0.00	2.00	2.00	0.1240*	0.04	0.46	0.70	0.32	Seed	3.38	5	0.030	17.21	4.91	2.58	1.09	0.33	1.33
												Jute Mat	3.38	5	0.040	17.23	3.96	2.87	1.09	0.37	1.48
												Temp. Mat	3.38	5	0.040	17.23	3.96	2.87	1.09	0.37	1.48



DITCH ANALYSIS

STATION BEGIN	STATION END		SIDE LENGTH (ft.)	RADIUS WIDTH (ft.)	IN SLOPE (ft./ft.)	BACK SLOPE (ft./ft.)	GRADE (ft./ft.)	AREA (acres)	AREA SUM (acres)	RUNOFF COEFF.	CA (Sum)	PROTECT TYPE	RAIN INT. (in./hr.)	STORM FREQ. (yrs.)	MANN. COEFF.	TIME FLOW (min.)	VEL. FLOW (fps.)	SHEAR (lbs./ sq.ft.)	DESIGN FLOW (cfs.)	DEPTH FLOW (ft.)	WIDTH FLOW (ft.)
												Perm, Type 1	3.38	5	0.040	17.23	3.96	2.87	1.09	0.37	1.48
												Perm, Type 2	3.38	5	0.040	17.23	3.96	2.87	1.09	0.37	1.48
												Perm, Type 2	3.86	10	0.040	17.57	4.10	3.01	1.24	0.39	1.56
511+50	512+00	R	50.00	0.00	2.00	2.00	0.1600*	0.07	0.53	0.70	0.37	Seed	3.36	5	0.030	17.38	5.58	3.34	1.25	0.33	1.34
												Jute Mat	3.36	5	0.040	17.41	4.47	3.73	1.25	0.37	1.49
												Temp. Mat	3.36	5	0.040	17.41	4.47	3.73	1.25	0.37	1.49
												Perm, Type 1	3.36	5	0.040	17.41	4.47	3.73	1.25	0.37	1.49
												Perm, Type 2	3.36	5	0.040	17.41	4.47	3.73	1.25	0.37	1.49
												Perm, Type 3	3.36	5	0.040	17.41	4.47	3.73	1.25	0.37	1.49
												Perm, Type 3	3.84	10	0.040	17.75	4.63	3.91	1.42	0.39	1.57

DRAINAGE MAP

H:\2017\170482\0001\ProjectData\01798_ATB45\Design\Roadway\Sheets\01798_06002.dgn Sheet 7/30/2019 3:19:44 PM troyer

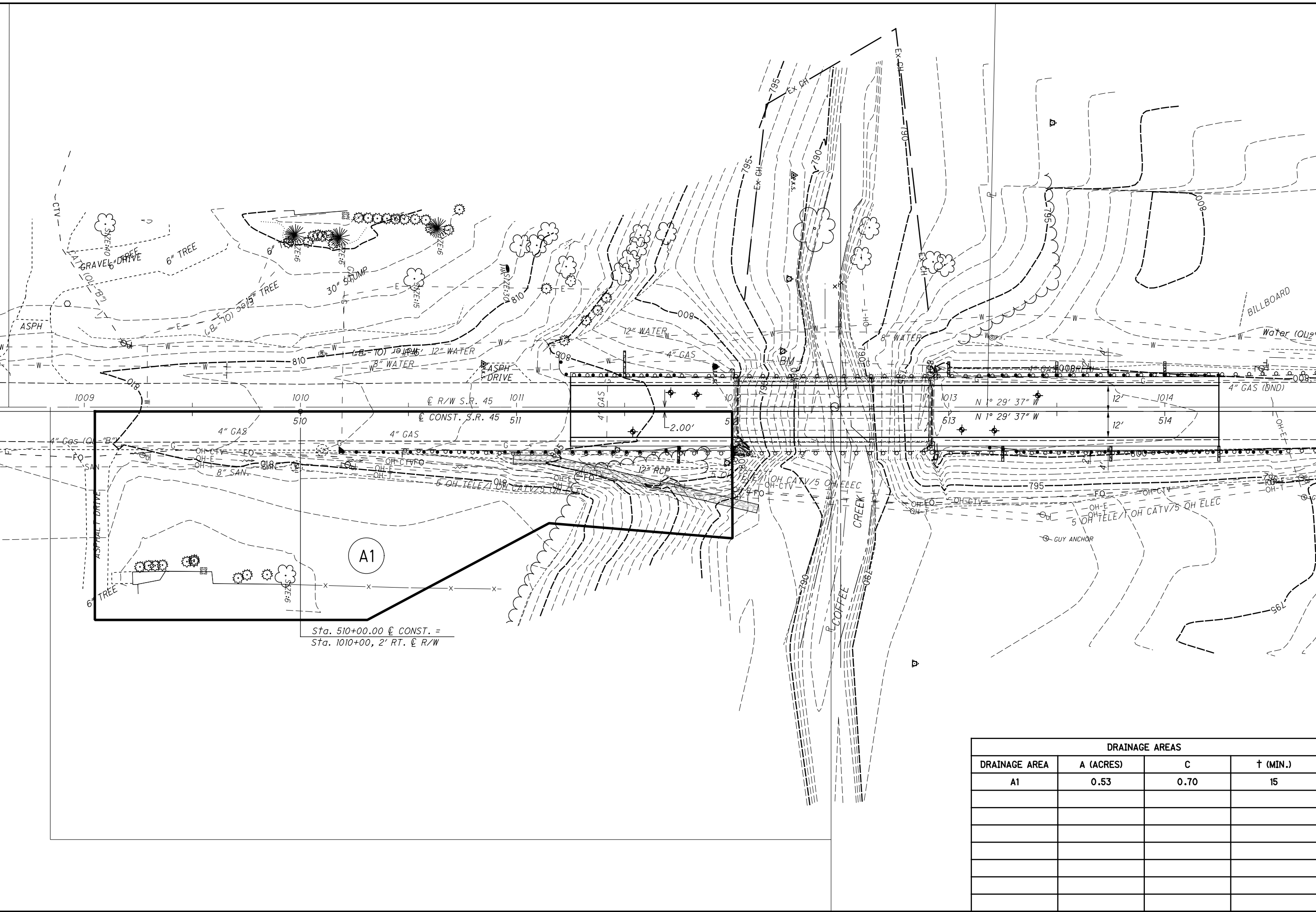


0 20 40
HORIZONTAL
SCALE IN FEET

CALCULATED
KPA
CHECKED
EJT

DRAINAGE MAP
STA. 510+00 TO STA. 515+00

ATB-45-19.13



Sta. 510+00.00 @ CONST. =
Sta. 1010+00, 2' RT. @ R/W

DRAINAGE AREAS			
DRAINAGE AREA	A (ACRES)	C	† (MIN.)
A1	0.53	0.70	15