

## STORMWATER & DRAINAGE REPORT

FRA-270-32.92 PID 113663 – Final Tracings

ODOT District 6

November, 2025



*Robert S. Hoops* 11/14/25



Engineers, Surveyors, Planners, Scientists  
5500 New Albany Rd., Columbus, OH 43054  
p. 614.775.4500 f. 614.775.4800  
emht.com

20200412



## TABLE OF CONTENTS

1.0	Introduction .....	1
2.0	Drainage Outfall Identification .....	1
2.1	Outfall 1 (Middle) Sta 1384+60.....	1
2.2	Outfall 2 (North) Sta 1372+82.....	2
2.3	Outfall 3 (South) .....	2
3.0	Roadway Drainage Design Methodology .....	4
3.1	Ditches .....	4
3.2	Spread .....	5
3.3	Storm Sewer.....	5
3.4	Culvert Analysis.....	5
3.5	BMP .....	5

## APPENDICES

Appendix A:	Ditch Calculations
Appendix B:	Spread Calculations
Appendix C:	Storm Sewer Calculations
Appendix D:	Culvert Analysis
Appendix E:	Storm Sewer Tributary Map
Appendix F:	BMP Calculations
Appendix G:	Outfall Map (Stormwater Tributary Area Map)
Appendix H:	Outfall 3 (South) ODOT Plans

## **1.0 INTRODUCTION**

This analysis has been prepared in support of the following plan set, in order to document design and calculations related to roadway drainage and stormwater management:

- FRA-270-32.92 PID 113663

The goal of FRA-270-32.92 is to improve safety and reduce congestion. Extending westbound left turn queue storage on Easton way approaching Stelzer Road by modifying the existing raised median in this area signaling the IR-270 southbound off ramp at Easton Way. By widening the IR-270 southbound off ramp to create a two-lane exit and three approaches lanes to the signalized ramp termini extending the south bound off ramps storage and deceleration. The project includes approximately 5,200 feet of constructing a lane, resurfacing, proposed curb and gutter, proposed drainage, proposed traffic control, and post construction BMPs.

## **2.0 DRAINAGE OUTFALL IDENTIFICATION**

Across this project, tributary areas have been delineated using a combination of topographic field surveys and GIS mapping.

In the proposed condition, the roadway profile is maintained to keep the delineation of the existing tributary areas. Ditches will be utilized to collect and expel drainage to its current, respective outfall.

Note: Outfalls 1 and 2 are reversed in the referenced reports FRA-270-32.92 (EASTON WAY) Stormwater Management Plan (SWMP) dated March 4, 2024 and Easton Way Hydraulic Memo Rev2 dated May 10, 2023. The outfall numbers in the tables from these reports have been revised to match the outfall numbers used in the FRA-270-32.92 PID 113663 Plans. See Appendix G: Outfall Map (Stormwater Tributary Area Map)

### **2.1 Outfall 1 (Middle) Sta 1384+60**

On the right side of IR-270 south/Easton entrance ramp beginning east of the project and continuing until it's outfall at Big Walnut Creek, there is an existing 48" storm sewer within the project limits. The existing condition within the project area is mostly sheet flow to the road drainage system of ditches and pipes. The typical divide is 24 feet east of the centerline of IR-270. In the proposed condition the pattern of flow will be maintained. The existing roadside ditches will be maintained at a lower capacity. Existing pipe will be maintained using extension and headwalls. Existing structures needing relocation or replacement will be replaced with manholes. See FRA-270-32.92 (EASTON WAY) Stormwater Management Plan (SWMP) dated March 4, 2024 for analysis of downstream impacts.

## 2.2 Outfall 2 (North) Sta 1372+82

On the right side of IR-270 beginning east of the project and continuing until it's outfall at Big Walnut Creek, there is an existing storm sewer that ranges from 42" to 48" within the project limits. The west trunk line is being maintained and outlet into Big Walnut Creek. The existing condition within the project area is sheet flow divided 24 feet east of the centerline of IR-270. The proposed outlet location is maintained. This maintains the existing drainage pattern which the storm sewer discharges to a ditch which carries the water to the roadside drainage system. The results of the HGL elevation of key locations within the limited site show that there is not a adverse effect to the existing system. See FRA-270-32.92 (EASTON WAY) Stormwater Management Plan (SWMP) dated March 4, 2024 for analysis of downstream impacts.

**Table 6 - Existing vs. Proposed Conditions Headwater Elevations at Key Locations within Limited Site (from May 10, 2023 Easton Way Hydraulic Memo Rev2)**

Location	Top of Casting Elevation (ft)	10-year Existing HGL Elevation (ft)	10-year Proposed HGL Elevation (ft)	25-year Existing HGL Elevation (ft)	25-year Proposed Condition Elevation (ft)
Upstream of Sewer that Passes Under Building	839.0	829.21	829.23	830.01	830.04
Southern Parking Lot CB 6	830.4	822.17	822.37	824.82	824.88

## 2.3 Outfall 3 (South)

On the right side of IR-270 north of the Easton IR-270 south exit ramp and project limits continuing its outfall to the IR-270 truck line. There are existing storm sewers that range from 12" to 15" inside of the project limits to Pond B. Outlet #3 (Pond B) discharges to a roadside ditch along the west side of IR-270 before it enters a 27" storm sewer that takes the water to the east side of IR-270 and travels in ODOT's owned and maintained storm sewer that goes south until it reaches the outlet at Big Walnut Creek in ODOT's LA RW. The existing storm sewer is being maintained and outlets to the trunk line in the middle of IR-270. The existing condition within the project area is sheet flow divided 24 feet east of the centerline of connection ramp B. The existing outlet location is maintained. This maintains the existing drainage pattern which the storm sewer discharges to a ditch which carries the water to the roadside drainage system. See FRA-270-32.92 (EASTON WAY) Stormwater Management Plan (SWMP) dated March 4, 2024 for analysis of downstream impacts. See Appendix H: Outfall 3 (South) ODOT plans for the complete storm sewer system that discharges directly to Big Walnut Creek.



**TABLE 2-1**  
**Existing Subarea Characteristics for the Overall Analysis Area**

**(From FRA-270-32.92 (EASTON WAY) Stormwater Management Plan (SWMP) dated March 4, 2024)**

Subarea Identifier	Tributary Area (acres)	Outfall ID	Land Usage	Runoff Curve Number	% Impervious (%)	Time of Concentration (min)
To Area 1 Post	68.42	Outfall #2	Open Space and Impervious Area	94	83%	12.0
To Subarea 6A	14.35	Outfall #2		94	83%	12.0
To Ex Stelzer Storm	8.77	Outfall #2		90	66%	15.0
To Easton Gateway	45.96	Outfall #2		94	83%	12.0
To 1372+50	17.38	Outfall #2		83	41%	36.0
To ODOT Trib Area 1	11.63	Outfall #2		87	53%	15.0
To Limited Basin 2	15.77	Outfall #2		87	53%	12.9
To Limited Building Crossing	9.64	Outfall #2		83	43%	10.0
To Limited Basin 3	11.71	Outfall #2		94	83%	10.0
To MH7	6.35	Outfall #1		88	59%	5.0
To MH8	14.45	Outfall #1		90	66%	10.0
To 1384+54	2.51	Outfall #1		92	55%	15.0
To 1384+46.68	27.33	Outfall #1		78	19%	30.0
To Aladdin Basin	19.38	Outfall #1		84	57%	15.0
To Basin A	13.99	Outfall #1		79	23%	20.0
To Basin B	11.34	Outfall #3		83	39%	10.0

**TABLE 2-2**  
**Existing Peak Flow Rates at Each Outfall**

(From FRA-270-32.92 (EASTON WAY) Stormwater Management Plan (SWMP) dated March 4, 2024)

Storm Event (Recurrence Interval)	Outfall #2 at Junction 1372+81.69 Peak Flow Rates* (cfs)	Outfall #1 at Junction 1384+55.56 Peak Flow Rates** (cfs)	Outfall #3 Peak Flow Rates*** (cfs)	Total Existing Peak Flow Rates [#1 + #2 + #3] (cfs)
1-year	32.99	21.92	7.06	61.97
2-year	40.93	30.87	7.72	79.52
5-year	50.55	44.05	8.45	103.05
10-year	57.05	59.55	8.93	125.53
25-year	63.63	64.84	9.48	137.95
50-year	68.18	67.85	9.87	145.90
100-year	71.85	70.08	17.32	159.25

\*Flow rates were pulled from Link-07 in SSA output

\*\*Flow rates were pulled from Link-03 in SSA output

\*\*\*Flow rates are the summation of Outfall #3a (pipe outflow) and Outfall #3b (spillway) in SSA output

### 3.0 ROADWAY DRAINAGE DESIGN METHODOLOGY

#### 3.1 Ditches

The drainage areas to the proposed inlets are as shown on the Appendix E Storm Sewer Tributary Map.

Ditch design calculations were completed to comply with requirements per ODOT L&D Manual Vol. 2, Section 1102. Per ODOT L&D Manual Vol. 2 Section 1102.3, the design frequency to determine the depth is a 10-year storm with a 5-year storm to determine the shear stress and width of the ditch lining.

The ditches along IR-270 were designed within the right-of-way to have foreslopes ranging between 6:1 and 2:1 and backslopes ranging between 6:1 and 2:1. These ditches allow for maintaining the existing overall drainage patterns. The ditches are paired with a storm sewer system to keep the design year storm within the ditch and off the traveled way. The appropriate ditch lining has been provided based on the shear stress using CDSS.

See Appendix A for attached Ditch Calculations.

### **3.2 Spread**

The drainage areas to the proposed inlets are as shown on the Appendix E Storm Sewer Tributary Map.

Spread calculations were completed to comply with requirements per ODOT L&D Manual Vol. 2, Section 1103. Per ODOT L&D Manual Vol. 2 Section 1103.2, the design frequency to determine the allowable spread is a 5-year storm being 16.84'. 0' within the through lane (35mph, 3 lanes) and 1.0' from the gutter.

See Appendix B for attached Spread Calculations.

### **3.3 Storm Sewer**

The drainage areas to the proposed inlets are as shown on the Appendix E Storm Sewer Tributary Map. Storm Sewer calculations were completed to comply with requirements per ODOT L&D Manual Vol. 2, Section 1104.

After the contributing areas were determined the storm sewer sizing was checked using a 10-year frequency rainfall event. The HGL check was calculated using a 25-year frequency rainfall event.

See Appendix C for attached Storm Sewer Calculations.

### **3.4 Culvert Analysis**

The drainage areas to the proposed Culverts are as shown on the Appendix E Tributary Map. Culvert calculations were completed to comply with requirements per ODOT L&D Manual Vol. 2, Section 1105.

After the contributing areas were determined, the culvert sizing was checked using a 25-year frequency rainfall event. The HGL check was calculated using a 100-year frequency rainfall event.

See Appendix D for attached Culvert Calculations.

### **3.5 BMP**

BMP's were calculated using ODOT Location and Design Manual, Volume 2 – Drainage Design, Section 1111, 1112, and 1113. By ODOT L&D Vol2, only water quality is required. The water quality requirement is being met with the use of vegetated bio filters.

See Appendix F for attached BMP Calculations.

APPENDIX A  
Ditch Calculations (CDSS)



# DITCH ANALYSIS

**PID :** 113663    **Date :** 05/30/2025    **Project :** FRA-270-32.92

**Location :** Easton Mall

**Description :** CD Road 1367+27 to 1372+46

**Designer :** TGW

**Rainfall Area :** C

**Allowable Shears**

	<b>Seed:</b>	0.40	<b>Jute Mat:</b>	0.45	<b>Temporary Mat:</b>	1.00
<b>Permanent Mat</b>	<b>Type 1:</b>	2.00	<b>Type 2:</b>	3.00	<b>Type 3:</b>	5.00
<b>RCP</b>	<b>Type B:</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.)
1367+27	1373+22	R	2419.0	4.00	2.00	2.00	0.0067	13.40	13.40	0.57	7.64	Seed	2.04	5	0.030	45.53	3.02	0.37	15.57	0.89	7.57
												Seed	2.26	10	0.040	47.85	2.53	0.46	17.23	1.10	8.39



# DITCH ANALYSIS

**PID :** 113663    **Date :** 05/30/2025    **Project :** FRA-270-32.92

**Location :** Easton Mall

**Description :** CD Road 1373+47 to Ramp A 1384+42

**Designer :** TGW

**Rainfall Area :** C

**Allowable Shears**

	<b>Seed:</b>	0.40	<b>Jute Mat:</b>	0.45	<b>Temporary Mat:</b>	1.00
<b>Permanent Mat</b>	<b>Type 1:</b>	2.00	<b>Type 2:</b>	3.00	<b>Type 3:</b>	5.00
<b>RCP</b>	<b>Type B:</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.)
1373+22	1388+48	R	1494.0	4.00	4.00	2.00	0.0056	58.53	58.53	0.47	27.51	Seed	1.92	5	0.030	49.55	3.71	0.56	52.84	1.61	13.68
												Jute Mat	1.88	5	0.040	51.10	2.98	0.64	51.69	1.83	14.97
												Temp. Mat	1.88	5	0.040	51.10	2.98	0.64	51.69	1.83	14.97
												Temp. Mat	2.16	10	0.040	50.82	3.09	0.68	59.52	1.95	15.72



# DITCH ANALYSIS

**PID :** 113663    **Date :** 05/30/2025    **Project :** FRA-270-32.92

**Location :** Easton Mall

**Description :** Easton Way 62+70 to Ramp A 1384+42

**Designer :** TGW

**Rainfall Area :** C

**Allowable Shears**

	<b>Seed:</b>	0.40	<b>Jute Mat:</b>	0.45	<b>Temporary Mat:</b>	1.00
<b>Permanent Mat</b>	<b>Type 1:</b>	2.00	<b>Type 2:</b>	3.00	<b>Type 3:</b>	5.00
<b>RCP</b>	<b>Type B:</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.)
62+70	1384+42	R	1306.0	4.00	4.00	3.00	0.0059	3.18	3.18	0.71	2.26	Seed	2.47	5	0.030	34.34	1.97	0.18	5.58	0.49	7.46
												Seed	2.72	10	0.040	36.25	1.65	0.22	6.14	0.61	8.25

APPENDIX B

Spread Calculations (CDSS)





# INLET SPACING DESIGN

**PID :** 113663      **Date :** 05/30/2025      **Project :** FRA-270-32.92

**Location :** City of Columbus, Franklin County

**Description :** CD Road RT Sta 1356+00 to 1369+23 RT

**Designer :** RSH

**Rainfall Area:** C

**Storm Frequency (yr.) :** 10

**Total Allow. Spread (ft.) :** 10.00

**Allowable Depth (ft.)** 0.42

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)
1356+00	Begin																	
1359+25	I-3D	325.00	0.90	0.30	10.00	1.74	11.74	0.0351	0.0400	0.0156	8.00	0.0000	4.99	0.86	0.48	1.35	0.161	4.03
1364+65	I-3D	540.00	0.90	0.46	10.00	2.48	12.48	0.0351	0.0400	0.0156	8.00	0.0000	4.86	1.31	1.19	2.50	0.203	5.08
1367+27	I-3D	262.00	0.90	0.24	10.00	1.23	11.23	0.0351	0.0400	0.0160	10.00	0.0000	5.08	1.23	1.05	2.29	0.197	4.92
1369+06	CB-3A	179.00	0.90	0.20	10.00	0.87	10.87	0.0351	0.0400	0.0271	10.00	0.0000	5.15	1.41	0.57	1.98	0.186	4.66
1369+23	CB-3A	17.00	0.90	0.04	10.00	0.10	10.10	0.0351	0.0400	0.0270	10.00	0.0000	5.30	*****	*****	0.76	0.130	3.26 End



# INLET SPACING DESIGN

**PID :** 113663      **Date :** 05/30/2025      **Project :** FRA-270-32.92

**Location :** City of Columbus, Franklin County

**Description :** Easton Way Median Sta 61+30 to Sta 72+00 LT

**Designer :** RSH

**Rainfall Area:** C

**Storm Frequency (yr.) :** 5

**Total Allow. Spread (ft.) :** 31.00

**Allowable Depth (ft.)** 0.04

STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)
61+25	Begin																	
61+30	CB-3A	5.00	0.90	0.12	10.00	0.11	10.12	0.0031	0.0208	0.0156	1.00	0.0000	4.80	0.33	0.19	0.52	0.129	7.97
62+50	CB-3A	120.00	0.90	0.08	10.00	2.41	12.41	0.0031	0.0208	0.0208	1.00	0.0000	4.39	0.37	0.14	0.50	0.137	6.60
64+00	CB-3A	150.00	0.90	0.10	10.00	2.98	12.98	0.0031	0.0208	0.0208	1.00	0.0000	4.30	0.38	0.15	0.52	0.139	6.71
65+05	I-2-6	105.00	0.90	0.07	10.00	2.20	12.20	0.0031	0.0208	0.0208	1.00	0.0000	4.42	0.33	0.09	0.42	0.129	6.20
66+24	CB-3	119.00	0.90	0.07	10.00	2.58	12.58	0.0031	0.0208	0.0208	1.00	0.0000	4.36	*****	*****	0.37	0.122	5.87 Sag
72+00	Begin																	
69+25	CB-3A	275.00	0.90	0.07	10.00	3.49	13.49	0.0161	0.0208	0.0208	1.00	0.0000	4.22	0.23	0.04	0.27	0.079	3.82
66+98	CB-3	227.00	0.90	0.08	10.00	4.21	14.21	0.0050	0.0208	0.0208	1.00	0.0000	4.11	0.31	0.02	0.33	0.108	5.18
66+24	CB-3	74.00	0.90	0.04	10.00	1.94	11.94	0.0030	0.0208	0.0208	1.00	0.0000	4.46	*****	*****	0.18	0.094	4.54 End

## SUMP DATA

**Total Flow (cfs) :** 0.55

**Ponded Depth (ft.) :** 0.045

**Spread on Pavement (ft.) :** 3.55

APPENDIX C

Storm Sewer Calculations (CDSS)



# STORM SEWER SYSTEM

**PID :** 113663      **Date :** 05/29/2025      **Project :** FRA-270-32.92

**Location :** City of Columbus, Franklin County

**Description :** Storm Sewer Sta 1369+06 RT

**Designer :** RSH

**Rainfall Area:** C

**Just Full Capacity Frequency (yrs.) :** 10

**Hydraulic Gradient Frequency (yrs.) :** 25

**Minimum Pipe Size :** 15.00

**Tailwater Elevation (ft.):** 843.09

JUNCTION		STATION	ΔAREA	ΔCA	BEGIN	RAINFALL		DISCHARGE		PIPE			F/L PIPE	MEAN	JUST FULL	FRICT	HYGR EL.	COVER	COVER	COVER	INLET TYPE
From	To	From To	Σ AREA (acres)	Σ CA	TIME (min.)	INTENSITY (10 yrs.)	(25 yrs.)	(10 yrs.)	(25 yrs.)	DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	IN / OUT (ft.)	VEL (fps.)	CAPACITY (cfs.)	SLOPE (ft./ft.)	IN / OUT (ft.)	IN / OUT (ft.)	MINUS HY GR	MINUS CROWN	MANNING'S 'n'
5	5A	1369+06	0.20	0.18	10.00	5.32	6.00	1.0	1.1	15	6.8	0.0088	859.83	3.27	5.67	0.0004	860.60	864.83	4.23	3.75	CB 3A
	begin	1369+06	0.20	0.18									859.77				860.60	863.02			0.015
5A	5B	1369+06	0.00	0.00	10.03	5.31	6.00	1.0	1.1	15	30.1	0.5665	859.77	14.14	45.33	0.0004	859.91	863.02	3.11	2.00	MH 3
		1369+06	0.20	0.18									842.73				843.56	845.98			0.015
5B	HW5	1369+06	0.00	0.00	10.07	5.31	5.98	1.0	1.1	15	14.0	0.0100	842.73	3.40	6.02	0.0004	843.42	845.98	2.56	2.00	MH 3
	final	1369+06	0.20	0.18									842.59				843.42	843.84			0.015



# STORM SEWER SYSTEM

**PID :** 113663      **Date :** 05/27/2025      **Project :** FRA-270-32.92

**Location :** Franklin County, City of Columbus

**Description :** Easton Way Sta 64+00 to 74+17 Median LT

**Designer :** TGW

**Rainfall Area:** C

**Just Full Capacity Frequency (yrs.) :** 10

**Hydraulic Gradient Frequency (yrs.) :** 25

**Minimum Pipe Size :** 12.00

**Tailwater Elevation (ft.):** 0.00

JUNCTION		STATION	ΔAREA	ΔCA	BEGIN	RAINFALL	DISCHARGE			PIPE			F/L PIPE	MEAN	JUST FULL	FRICT	HYGR EL.	COVER	COVER	COVER	INLET TYPE
From	To	From To	Σ AREA (acres)	Σ CA	TIME (min.)	INTENSITY (10 yrs.) (25 yrs.)	(cfs.) (10 yrs.) (25 yrs.)			DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	IN / OUT (ft.)	VEL (fps.)	CAPACITY (cfs.)	SLOPE (ft./ft.)	IN / OUT (ft.)	IN / OUT (ft.)	MINUS HY GR	MINUS CROWN	MANNING'S 'n'
ECB7	CB4	64+00	0.10	0.09	10.00	5.32	5.88	0.5	0.5	12	103.6	0.0101	845.38	2.88	3.34	0.0003	845.66	849.46	3.80	3.08	CB 3A
	begin	65+05	0.10	0.09									844.33				844.98	848.66			0.015
CB4	EMH1	65+05	0.07	0.06	10.60	5.20	5.86	0.8	0.9	12	22.9	0.0100	844.33	3.29	3.33	0.0008	844.82	848.66	3.84	3.33	1 2A
		65+26	0.17	0.15									844.10				844.80	849.66			0.015
EMH1	EMH2	65+26	0.00	0.00	10.72	5.18	5.75	0.8	0.9	12	98.0	0.0080	843.82	3.02	2.96	0.0008	844.21	849.66	5.45	4.84	MH 3
		66+24	0.17	0.15									843.04				843.74	849.62			0.015
CB2	CB3	66+98	0.08	0.07	10.00	5.32	5.94	0.4	0.4	12	73.9	0.0212	844.94	3.52	4.84	0.0002	845.15	848.35	3.20	2.41	CB 3A
	begin	66+24	0.25	0.23									843.37				844.01	848.10			0.015
CB3	EMH2	66+24	0.04	0.04	10.35	5.25	5.93	0.6	0.6	12	4.9	0.0713	843.37	6.06	8.87	0.0004	843.69	848.10	4.41	3.73	CB 3
		66+24	0.29	0.26									843.02				843.69	849.62			0.015
EMH2	EMH3	66+24	0.00	0.00	11.26	5.08	5.46	1.3	1.4	12	296.7	0.0063	843.00	3.18	2.64	0.0021	843.55	849.62	6.07	5.62	MH 3
		69+25	0.29	0.26									841.13				841.88	852.40			0.015
CB1	EMH3	69+25	0.07	0.06	10.00	5.32	6.00	0.3	0.4	12	8.0	0.0275	847.02	3.70	5.51	0.0001	847.43	851.52	4.09	3.50	CB 3A
	begin	69+25	0.36	0.32									846.80				847.43	852.40			0.015
EMH3	EMH4	69+25	0.00	0.00	12.81	4.81	5.42	1.6	1.8	12	47.8	0.0063	841.13	3.30	2.63	0.0032	841.77	852.40	10.63	10.27	MH 3
	final	69+50	0.36	0.32									840.83				841.61	852.31			0.015

APPENDIX D

Culvert Calculations (CDSS)

## Culvert Dischagre Calculations

Design Storm 25 year	
a	95.736
b	14
c	0.871

Design Storm 100 year	
a	80.436
b	11.5
c	0.794

### Existing 42" Culvert Discharge Calculations

42" Culvert drainage Area 25 year storm		
Q	76.18	cfs
C	0.46	
i	2.83	
Area #1	58.53	Acres
Tc	43.00	Minutes

42" Culvert drainage Area 100 year storm		
Q	90.55	cfs
C	0.46	
i	3.36	
Area #1	58.53	Acres
Tc	43.00	Minutes

### Proposed 42" Culvert Discharge Calculations

42" Culvert drainage Area 25 year storm		
Q	77.84	cfs
C	0.47	
i	2.83	
Area #1	58.53	Acres
Tc	43.00	Minutes

42" Culvert drainage Area 100 year storm		
Q	92.52	cfs
C	0.47	
i	3.36	
Area #1	58.53	Acres
Tc	43.00	Minutes

### Existing 24" Culvert Discharge Calculations

24" Culvert drainage Area 25 year storm		
Q	7.74	cfs
C	0.68	
i	3.55	
Area #1	3.21	Acres
Tc	30.00	Minutes

24" Culvert drainage Area 100 year storm		
Q	9.11	cfs
C	0.68	
i	4.18	
Area #1	3.21	Acres
Tc	30.00	Minutes

### Proposed 24" Culvert Discharge Calculations

24" Culvert drainage Area 25 year storm		
Q	8.31	cfs
C	0.73	
i	3.55	
Area #1	3.21	Acres
Tc	30.00	Minutes

24" Culvert drainage Area 100 year storm		
Q	9.78	cfs
C	0.73	
i	4.18	
Area #1	3.21	Acres
Tc	30.00	Minutes

### Existing 48" Culvert Discharge Calculations

48" Culvert drainage Area 25 year storm		
Q	24.22	cfs
C	0.55	
i	3.29	
Area #1	13.40	Acres
Tc	34.00	Minutes

48" Culvert drainage Area 100 year storm		
Q	28.61	cfs
C	0.55	
i	3.88	
Area #1	13.40	Acres
Tc	34.00	Minutes

### Proposed 48" Culvert Discharge Calculations

48" Culvert drainage Area 25 year storm		
Q	25.10	cfs
C	0.57	
i	3.29	
Area #1	13.40	Acres
Tc	34.00	Minutes

48" Culvert drainage Area 100 year storm		
Q	29.65	cfs
C	0.57	
i	3.88	
Area #1	13.40	Acres
Tc	34.00	Minutes



# CULVERT ANALYSIS

**PID :** 113663      **Date :** 05/30/2025      **Project :** FRA-270-32.92

**Location :** City of Columbus, Franklin County

**Description :** 48" 707.12 CD Road Sta 1372+46 RT - Replace HHHW with FHHW

**Designer :** TGW

**HEADWATER CONTROL CODES:**      INLET - Inlet Control.  
OUTLET - Outlet Control.  
OUTLET\* - Outlet Control with backwater curve used to compute headwater. See Figure III - 7E in HDS 5 for type flow.  
OUTLET\*\* - Outlet Control - See Figure III - 7D in HDS 5 for type flow.  
N/A - Flow is supercritical with low headwater and low tailwater. Control Section is at the inlet.

**Pipe Number :** 1

**Use HW :** 0

**Inlet Invert Elevation (ft.) :** 840.90

**Outlet Invert Elevation (ft.) :** 839.90

**Pipe Quantity :** 1

**Culvert Type :** Circular Corrugated

**Pipe Length (ft.) :** 32.90

**Culvert Slope (ft./ft.) :** 0.0304

**Corrugation Type :** Corrugated Metal Pipe (3 x 1 in. corrugations)

**Pipe Size :** 48 in.

**Design Manning 'n' :** (default)

**Entrance Type :** No Headwall

**Loss Coef. Ke :** 0.9000

FLOW (cfs.)	HEAD LOSS (ft.)	HWI (ft.)	HWO (ft.)	FLOW TYPE	VELOCITY (fps.)	DN (ft.)	DC (ft.)	MANNING N	HEADWATER CONTROL	BURIED DEPTH (ft.)	TAILWATER ELEVATION (ft.)
25.10	0.49	843.13	N/A	1 - C	7.47	1.25	1.48	0.0275	INLET	0.00	839.90
25.60	0.50	843.15	N/A	1 - C	7.52	1.26	1.50	0.0275	INLET	0.00	839.90
26.10	0.52	843.18	N/A	1 - C	7.56	1.28	1.51	0.0275	INLET	0.00	839.90
26.60	0.54	843.20	N/A	1 - C	7.61	1.29	1.53	0.0275	INLET	0.00	839.90
27.10	0.55	843.23	N/A	1 - C	7.64	1.30	1.54	0.0275	INLET	0.00	839.90
27.60	0.57	843.25	N/A	1 - C	7.68	1.31	1.56	0.0275	INLET	0.00	839.90
28.10	0.59	843.27	N/A	1 - C	7.71	1.33	1.57	0.0275	INLET	0.00	839.90
28.60	0.61	843.30	N/A	1 - C	7.76	1.34	1.58	0.0275	INLET	0.00	839.90





# CULVERT ANALYSIS

FLOW (cfs.)	HEAD LOSS (ft.)	HWI (ft.)	HWO (ft.)	FLOW TYPE	VELOCITY (fps.)	DN (ft.)	DC (ft.)	MANNING N	HEADWATER CONTROL	BURIED DEPTH (ft.)	TAILWATER ELEVATION (ft.)
29.10	0.62	843.32	N/A	1 - C	7.80	1.35	1.60	0.0275	INLET	0.00	839.90
29.60	0.64	843.35	N/A	1 - C	7.84	1.36	1.61	0.0275	INLET	0.00	839.90
30.10	0.66	843.37	N/A	1 - C	7.86	1.38	1.63	0.0275	INLET	0.00	839.90



# CULVERT ANALYSIS

**PID :** 113663      **Date :** 05/30/2025      **Project :** FRA-270-32.92

**Location :** Easton Mall

**Description :** EX 42" 707.12 Culvert Extension Ramp A Sta 1384+42 RT

**Designer :** TGW

**HEADWATER CONTROL CODES:** INLET - Inlet Control.  
 OUTLET - Outlet Control.  
 OUTLET\* - Outlet Control with backwater curve used to compute headwater. See Figure III - 7E in HDS 5 for type flow.  
 OUTLET\*\* - Outlet Control - See Figure III - 7D in HDS 5 for type flow.  
 N/A - Flow is supercritical with low headwater and low tailwater. Control Section is at the inlet.

<b>Pipe Number :</b> 1	<b>Use HW :</b> 1	<b>Inlet Invert Elevation (ft.) :</b> 835.41	<b>Outlet Invert Elevation (ft.) :</b> 834.55
<b>Pipe Quantity :</b> 1			
<b>Culvert Type :</b> Circular Corrugated		<b>Pipe Length (ft.) :</b> 85.60	<b>Culvert Slope (ft./ft.) :</b> 0.0100
<b>Corrugation Type :</b> Corrugated Metal Pipe (3 x 1 in. corrugations)			
<b>Pipe Size :</b> 42 in.			
<b>Design Manning 'n' :</b> (default)	<b>Buried Manning 'n' :</b> N/A		
<b>Entrance Type :</b> Headwall		<b>Loss Coef. Ke :</b> 0.2500	<b>K :</b> 0.0083
		<b>CD :</b> 0.6405	<b>c :</b> 0.0379
		<b>M :</b> 2.00	<b>Max. Q :</b> 3.30
		<b>Y :</b> 0.6900	<b>Min. Q :</b> 3.80

FLOW (cfs.)	HEAD LOSS (ft.)	HWI (ft.)	HWO (ft.)	FLOW TYPE	VELOCITY (fps.)	DN (ft.)	DC (ft.)	MANNING N	HEADWATER CONTROL	BURIED DEPTH (ft.)	TAILWATER ELEVATION (ft.)
77.84	3.60	840.29	841.28	2 - F	9.57	3.50	2.76	0.0278	OUTLET**	0.00	834.55
78.84	3.69	840.35	841.38	2 - F	9.64	3.50	2.77	0.0278	OUTLET**	0.00	834.55
79.84	3.79	840.42	841.48	2 - F	9.70	3.50	2.79	0.0278	OUTLET**	0.00	834.55
80.84	3.88	840.48	841.59	2 - F	9.77	3.50	2.81	0.0278	OUTLET**	0.00	834.55
81.84	3.98	840.55	841.69	2 - F	9.84	3.50	2.82	0.0278	OUTLET**	0.00	834.55
82.84	4.08	840.62	841.80	2 - F	9.91	3.50	2.84	0.0278	OUTLET**	0.00	834.55
83.84	4.18	840.69	841.90	2 - F	9.98	3.50	2.85	0.0278	OUTLET**	0.00	834.55
84.84	4.28	840.75	842.01	2 - F	10.05	3.50	2.87	0.0278	OUTLET**	0.00	834.55



# CULVERT ANALYSIS

FLOW (cfs.)	HEAD LOSS (ft.)	HWI (ft.)	HWO (ft.)	FLOW TYPE	VELOCITY (fps.)	DN (ft.)	DC (ft.)	MANNING N	HEADWATER CONTROL	BURIED DEPTH (ft.)	TAILWATER ELEVATION (ft.)
85.84	4.38	840.82	842.12	2 - F	10.12	3.50	2.88	0.0278	OUTLET**	0.00	834.55
86.84	4.48	840.90	842.23	2 - F	10.19	3.50	2.90	0.0278	OUTLET**	0.00	834.55
87.84	4.59	840.97	842.34	2 - F	10.26	3.50	2.91	0.0278	OUTLET**	0.00	834.55
88.84	4.69	841.04	842.45	2 - F	10.34	3.50	2.93	0.0278	OUTLET**	0.00	834.55
89.84	4.80	841.11	842.57	2 - F	10.41	3.50	2.94	0.0278	OUTLET**	0.00	834.55
90.84	4.90	841.19	842.68	2 - F	10.49	3.50	2.95	0.0278	OUTLET**	0.00	834.55
91.84	5.01	841.26	842.80	2 - F	10.56	3.50	2.97	0.0278	OUTLET**	0.00	834.55
92.84	5.12	841.34	842.91	2 - F	10.63	3.50	2.98	0.0278	OUTLET**	0.00	834.55



# CULVERT ANALYSIS

PID : 113663 Date : 05/30/2025 Project : FRA-270-32.92

Location : Easton Mall

Description : Ex 24" 707.12 Ramp A Sta 1388+42 -Extension

Designer : TGW

**HEADWATER CONTROL CODES:** INLET - Inlet Control.  
OUTLET - Outlet Control.  
OUTLET\* - Outlet Control with backwater curve used to compute headwater. See Figure III - 7E in HDS 5 for type flow.  
OUTLET\*\* - Outlet Control - See Figure III - 7D in HDS 5 for type flow.  
N/A - Flow is supercritical with low headwater and low tailwater. Control Section is at the inlet.

Pipe Number : 1	Use HW : 0	Inlet Invert Elevation (ft.) : 843.33	Outlet Invert Elevation (ft.) : 839.18
Pipe Quantity : 1			
Culvert Type : Circular Corrugated		Pipe Length (ft.) : 132.00	Culvert Slope (ft./ft.) : 0.0314
Corrugation Type : Corrugated Metal Pipe (2 2/3 x 1/2 in. corrugations)			
Pipe Size : 24 in.			
Design Manning 'n' : (default)	Buried Manning 'n' : N/A		
Entrance Type : Headwall		Loss Coef. Ke : 0.2500	K : 0.0083
		CD : 0.6405	c : 0.0379
			M : 2.00
			Y : 0.6900
			Max. Q : 3.30
			Min. Q : 3.80

FLOW (cfs.)	HEAD LOSS (ft.)	HWI (ft.)	HWO (ft.)	FLOW TYPE	VELOCITY (fps.)	DN (ft.)	DC (ft.)	MANNING N	HEADWATER CONTROL	BURIED DEPTH (ft.)	TAILWATER ELEVATION (ft.)
8.31	4.10	844.79	N/A	1 - C	6.32	0.87	1.03	0.0247	INLET	0.00	839.18
8.51	4.11	844.81	N/A	1 - C	6.36	0.88	1.04	0.0247	INLET	0.00	839.18
8.71	4.13	844.83	N/A	1 - C	6.39	0.90	1.05	0.0247	INLET	0.00	839.18
8.91	4.14	844.86	N/A	1 - C	6.43	0.91	1.07	0.0247	INLET	0.00	839.18
9.11	4.16	844.88	N/A	1 - C	6.47	0.92	1.08	0.0247	INLET	0.00	839.18
9.31	4.18	844.90	N/A	1 - C	6.50	0.93	1.09	0.0247	INLET	0.00	839.18
9.51	4.19	844.92	N/A	1 - C	6.55	0.94	1.10	0.0247	INLET	0.00	839.18
9.71	4.21	844.94	N/A	1 - C	6.58	0.95	1.11	0.0247	INLET	0.00	839.18



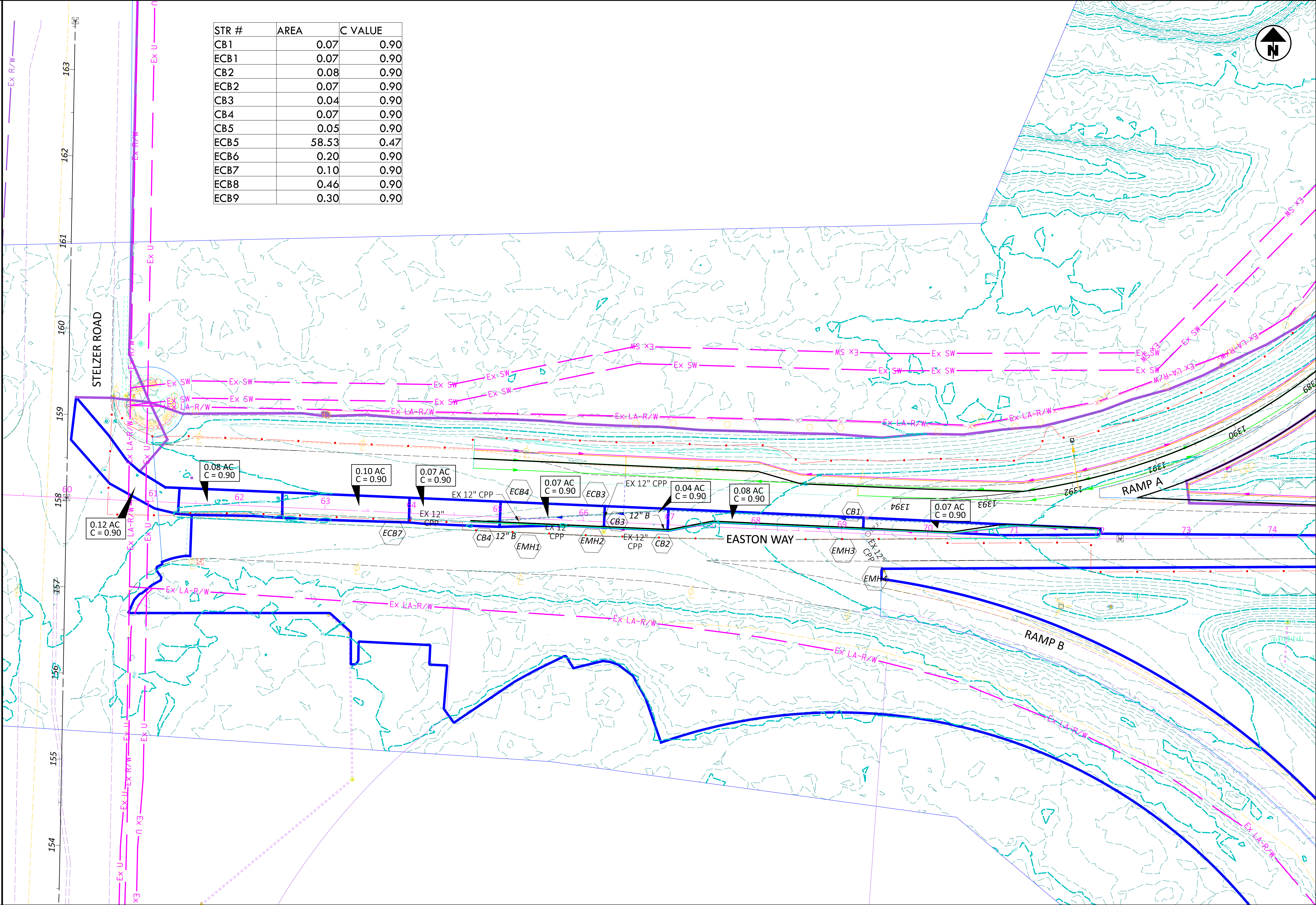
# CULVERT ANALYSIS

FLOW (cfs.)	HEAD LOSS (ft.)	HWI (ft.)	HWO (ft.)	FLOW TYPE	VELOCITY (fps.)	DN (ft.)	DC (ft.)	MANNING N	HEADWATER CONTROL	BURIED DEPTH (ft.)	TAILWATER ELEVATION (ft.)
9.91	4.22	844.97	N/A	1 - C	6.61	0.96	1.13	0.0247	INLET	0.00	839.18

## APPENDIX E

### Storm Sewer Tributary Map





HORIZONTAL SCALE IN FEET

0

25

50

100

DRAINAGE TRIB MAP

EASTON WAY

DESIGN AGENCY

DESIGNER

REVIEWER

PROJECT ID

SHEET

TOTAL

RSH

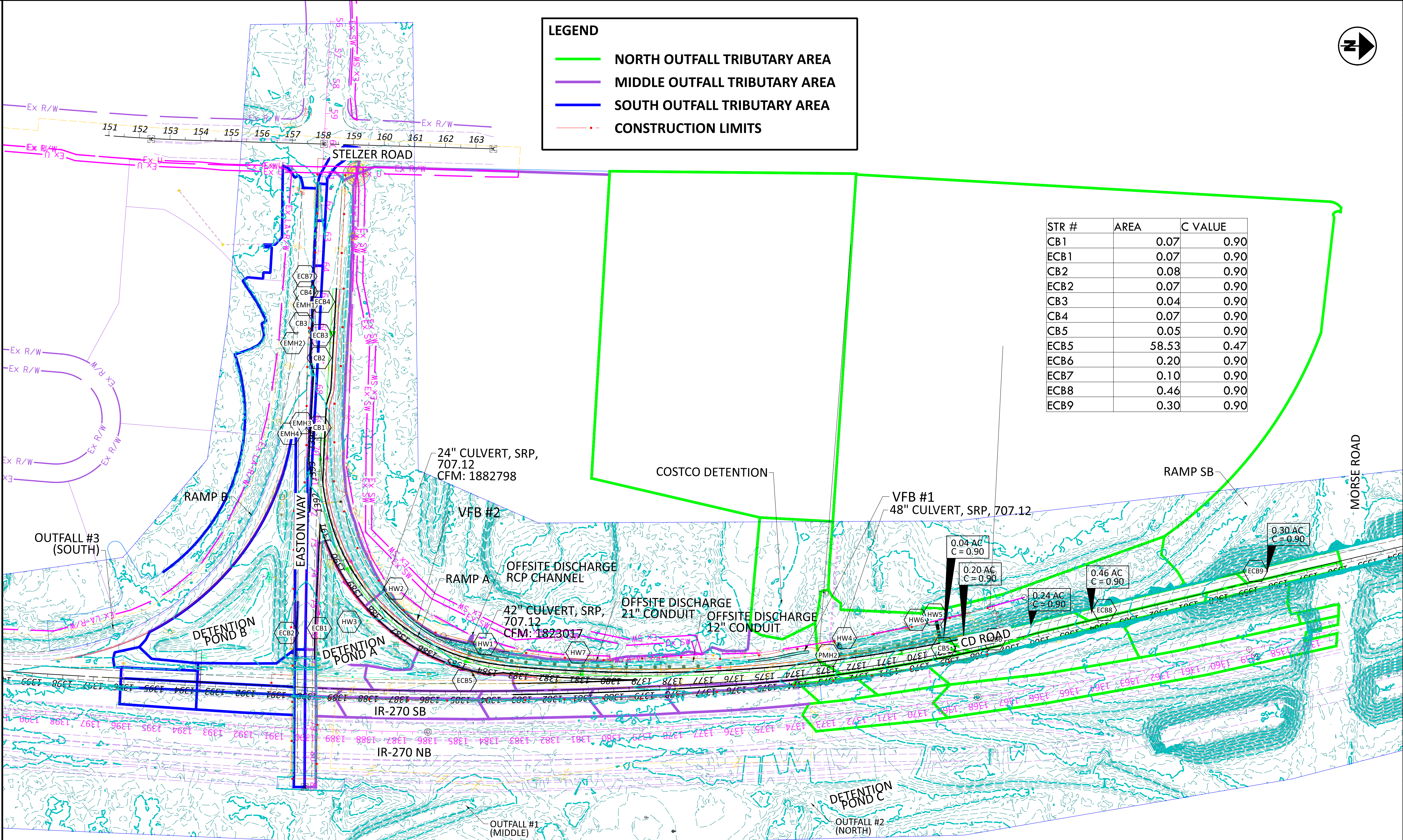
HRB 11-14-25

113663

1

1





LEGEND

NORTH OUTFALL TRIBUTARY AREA

MIDDLE OUTFALL TRIBUTARY AREA

SOUTH OUTFALL TRIBUTARY AREA

CONSTRUCTION LIMITS

STR #	AREA	C VALUE
CB1	0.07	0.90
ECB1	0.07	0.90
CB2	0.08	0.90
ECB2	0.07	0.90
CB3	0.04	0.90
CB4	0.07	0.90
CB5	0.05	0.90
ECB5	58.53	0.47
ECB6	0.20	0.90
ECB7	0.10	0.90
ECB8	0.46	0.90
ECB9	0.30	0.90

HORIZONTAL  
SCALE IN FEET

0

75

150

300

DESIGN AGENCY

DESIGNER

REVIEWER

PROJECT ID

SHEET

TOTAL

RSH

HRB 11-14-25

113663

1

1

DRAINAGE TRIB MAP

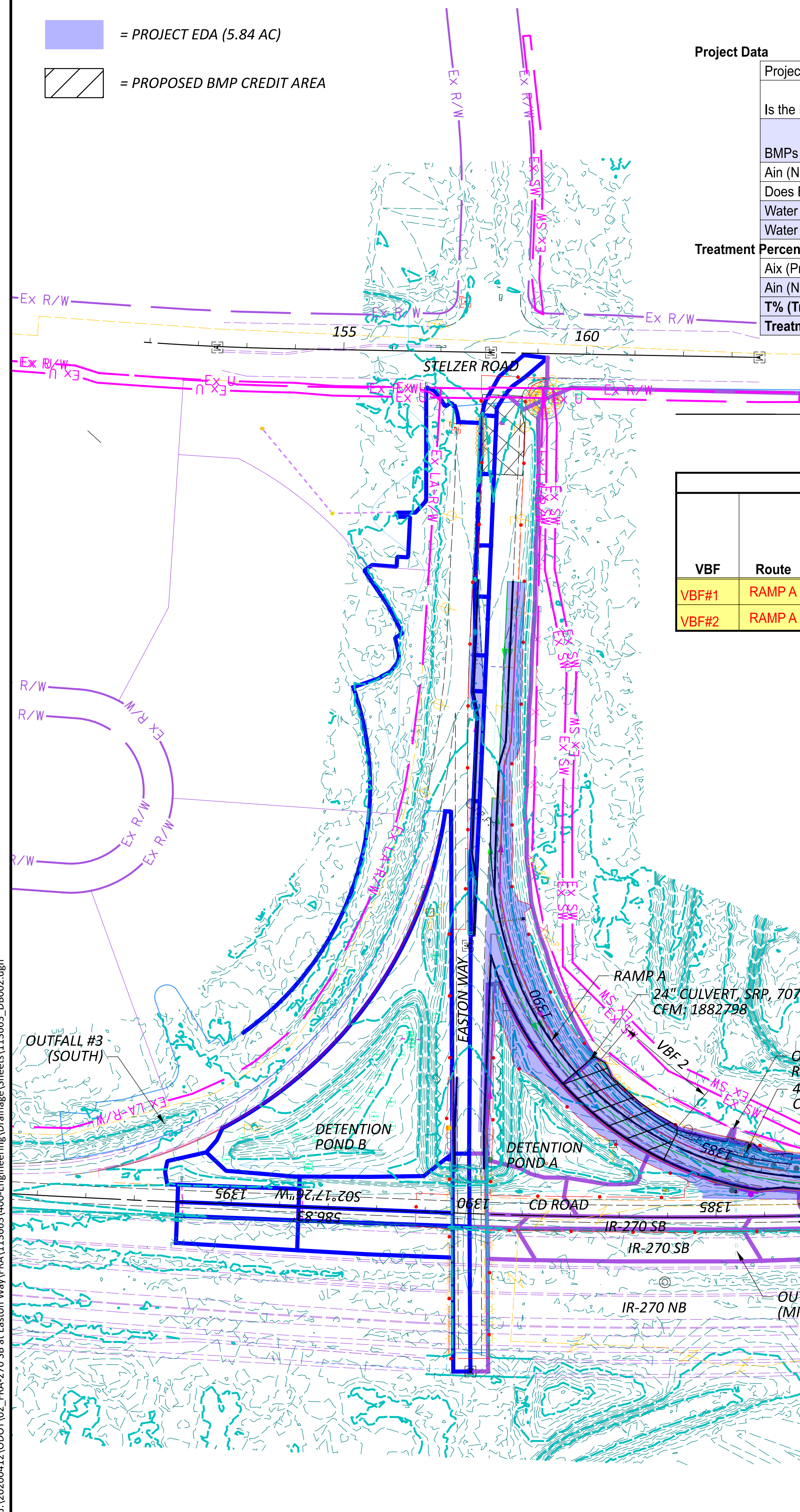
270 CD ROAD AND RAMP A CULVERTS AND STORM



## APPENDIX F

### BMP Calculation (ODOT Spreadsheet)





## Post Construction - Project Summary

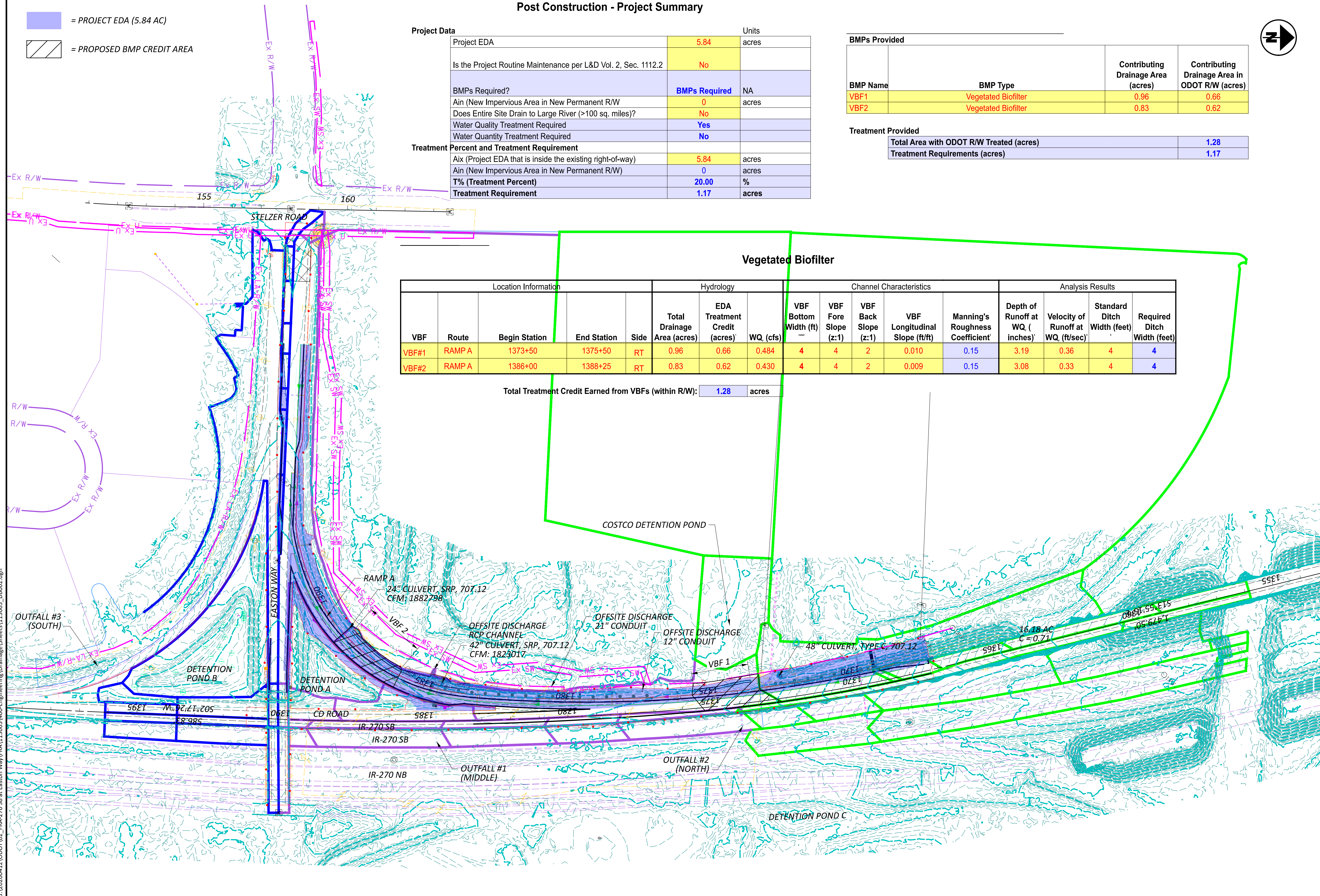
Project Data		Units
	Project EDA	5.84 acres
	Is the Project Routine Maintenance per L&D Vol. 2, Sec. 1112.2	No
	BMPs Required?	BMPs Required NA
	Ain (New Impervious Area in New Permanent R/W	0 acres
	Does Entire Site Drain to Large River (>100 sq. miles)?	No
	Water Quality Treatment Required	Yes
	Water Quantity Treatment Required	No
Treatment	Percent and Treatment Requirement	
	Aix (Project EDA that is inside the existing right-of-way)	5.84 acres
	Ain (New Impervious Area in New Permanent R/W	0 acres
	T% (Treatment Percent)	20.00 %
	Treatment Requirement	1.17 acres

BMPs Provided			
BMP Name	BMP Type	Contributing Drainage Area (acres)	Contributing Drainage Area in ODOT R/W (acres)
VBF1	Vegetated Biofilter	0.96	0.66
VBF2	Vegetated Biofilter	0.83	0.62

Treatment Provided	
Total Area with ODOT R/W Treated (acres)	1.28
Treatment Requirements (acres)	1.17

Location Information					Hydrology			Channel Characteristics					Analysis Results			
VBF	Route	Begin Station	End Station	Side	Total Drainage Area (acres)	EDA Treatment Credit (acres)'	WQ. (cfs)	VBF Bottom Width (ft)	VBF Fore Slope (z:1)	VBF Back Slope (z:1)	VBF Longitudinal Slope (ft/ft)	Manning's Roughness Coefficient'	Depth of Runoff at WQ. (inches)'	Velocity of Runoff at WQ. (ft/sec)'	Standard Ditch Width (feet)'	Required Ditch Width (feet)
VBF#1	RAMP A	1373+50	1375+50	RT	0.96	0.66	0.484	4	4	2	0.010	0.15	3.19	0.36	4	4
VBF#2	RAMP A	1386+00	1388+25	RT	0.83	0.62	0.430	4	4	2	0.009	0.15	3.08	0.33	4	4

<b>Total Treatment Credit Earned from VBFs (within R/W):</b>	<b>1.28</b>	<b>acres</b>
--	-------------	--------------







## Post Construction - Project Summary

## Project Data

Project EDA	5.84	Units acres
Is the Project Routine Maintenance per L&D Vol. 2, Sec. 1112.2	No	
BMPs Required?	BMPs Required	NA
Ain (New Impervious Area in New Permanent R/W	0	acres
Does Entire Site Drain to Large River (>100 sq. miles)?	No	
Water Quality Treatment Required	Yes	
Water Quantity Treatment Required	No	

## Treatment Percent and Treatment Requirement

Aix (Project EDA that is inside the existing right-of-way)	5.84	acres
Ain (New Impervious Area in New Permanent R/W)	0	acres
T% (Treatment Percent)	20.00	%
Treatment Requirement	1.17	acres

## BMPs Provided

BMP Name	BMP Type	Contributing Drainage Area (acres)	Contributing Drainage Area in ODOT R/W (acres)
VBFB1	Vegetated Biofilter	0.96	0.66
VBFB2	Vegetated Biofilter	0.83	0.62

## Treatment Provided

Total Area with ODOT R/W Treated (acres)	1.28
Treatment Requirements (acres)	1.17
Treatment Check	Good

## BMP Submittal Requirements (Per L&amp;D, Vol. 2, Sec. 1116.2)

1. Estimated Project Earth Disturbed Area	Yes	Good
2. Treatment Percent Calculation	Yes	Good
3. BMP Selected for use	Yes	Good
4. Drainage area mapping for post-construction BMPs that show the total contributing drainage area and the amount of contributing area within ODOT right-of-way	Yes	Good
5. Plan sheets showing locations of post-construction BMP	Yes	Good
6. Calculations for each BMP	Yes	Good
7. Explanation for any area that is not treated	Yes	Good

Water Quality Flow Rate (WQ<sub>F</sub>)

Drainage Area VBF #1	Area (acres)	Coefficient of Runoff (C)
Tributary Area within Existing R/W	0.37	0.9
Impervious Trib. Area Outside Existing R/W	0.29	0.9
Tributary Area Land Use #3	0.30	0.5
Tributary Area Land Use #4		0.3
Total Tributary Area	0.96	0.775
BMP Type	Vegetated Biofilter	
Time of Concentration (minutes)	NA	
Intensity, i (in/hr)	0.65	
Water Quality Flow (WQ <sub>F</sub> )	0.484	cfs

Drainage Area VBF #2	Area (acres)	Coefficient of Runoff (C)
Tributary Area within Existing R/W	0.29	0.9
Impervious Trib. Area Outside Existing R/W	0.33	0.9
Tributary Area Land Use #3	0.21	0.5
Tributary Area Land Use #4		
Total Tributary Area	0.83	0.799
BMP Type	Vegetated Biofilter	
Time of Concentration (minutes)	NA	
Intensity, i (in/hr)	0.65	
Water Quality Flow (WQ <sub>F</sub> )	0.430	cfs

Drainage Area #3	Area (acres)	Coefficient of Runoff (C)
Tributary Area within Existing R/W		0.9
Impervious Trib. Area Outside Existing R/W		0.9
Tributary Area Land Use #3		
Tributary Area Land Use #4		
Total Tributary Area	0.00	
BMP Type		
Time of Concentration (minutes)		
Intensity, i (in/hr)		
Water Quality Flow (WQ <sub>F</sub> )		cfs

Drainage Area #4	Area (acres)	Coefficient of Runoff (C)
Tributary Area within Existing R/W		0.9
Impervious Trib. Area Outside Existing R/W		0.9
Tributary Area Land Use #3		
Tributary Area Land Use #4		
Total Tributary Area	0.00	
BMP Type		
Time of Concentration (minutes)		
Intensity, i (in/hr)		
Water Quality Flow (WQ <sub>F</sub> )		cfs



Ohio Department of Transportation - Office of Hydraulic Engineering  
Post-Construction BMP Calculation Spreadsheet

Vegetated Biofilter

Location Information					Hydrology			Channel Characteristics					Analysis Results			
VBF	Route	Begin Station	End Station	Side	Total Drainage Area (acres)	EDA Treatment Credit (acres) <sup>1</sup>	WQ <sub>F</sub> (cfs)	VBF Bottom Width (ft) <sup>note2</sup>	VBF Fore Slope (z:1)	VBF Back Slope (z:1)	VBF Longitudinal Slope (ft/ft)	Manning's Roughness Coefficient <sup>3</sup>	Depth of Runoff at WQ <sub>F</sub> (inches) <sup>4</sup>	Velocity of Runoff at WQ <sub>F</sub> (ft/sec) <sup>4</sup>	Standard Ditch Width (feet) <sup>5</sup>	Required Ditch Width (feet)
VBF#1	RAMP A	1373+50	1375+50	RT	0.96	0.66	0.484	4	4	2	0.010	0.15	3.19	0.36	4	4
VBF#2	RAMP A	1386+00	1388+25	RT	0.83	0.62	0.430	4	4	2	0.009	0.15	3.08	0.33	4	4
												0.15				
												0.15				
												0.15				
												0.15				
												0.15				
												0.15				
												0.15				
												0.15				

Total Treatment Credit Earned from VBFs (within R/W): **1.28** acres  
(Treatment is for quality only, not quantity)

Yellow: Requires Input (See instructions tab)

BMP Design Considerations

1	Do the VBF characteristics match the calculated flow and velocity checks using Manning's Equation above?	Yes	Good
2	Is the VBF a trapezoidal ditch with a flat bottom, not a radius ditch?	Yes	Good
3	Is the VBF width at least 4 feet?	Yes	Good
4	Is the depth of runoff for the WQ <sub>F</sub> for each VBF less than or equal to 4 inches?	Yes	Good
5	Is the velocity of runoff for the WQ <sub>F</sub> for each VBF less than or equal to 1.0 ft/sec?	Yes	Good
6	Does the "Total Drainage Area" include all onsite and off-site drainage to the VBF?	Yes	Good
7	Does each VBF include 4" of Item 659 Topsoil on the vegetated portion of the shoulder and foreslope?	Yes	Good
8	Does each VBF include Item 670, Ditch Erosion Protection?	Yes	Good
9	Are the station ranges and locations of the VBFs labeled on the Project Site Plan drawing?	Yes	Good

## APPENDIX G

### Outfall Map (Stormwater Tributary Area Map)







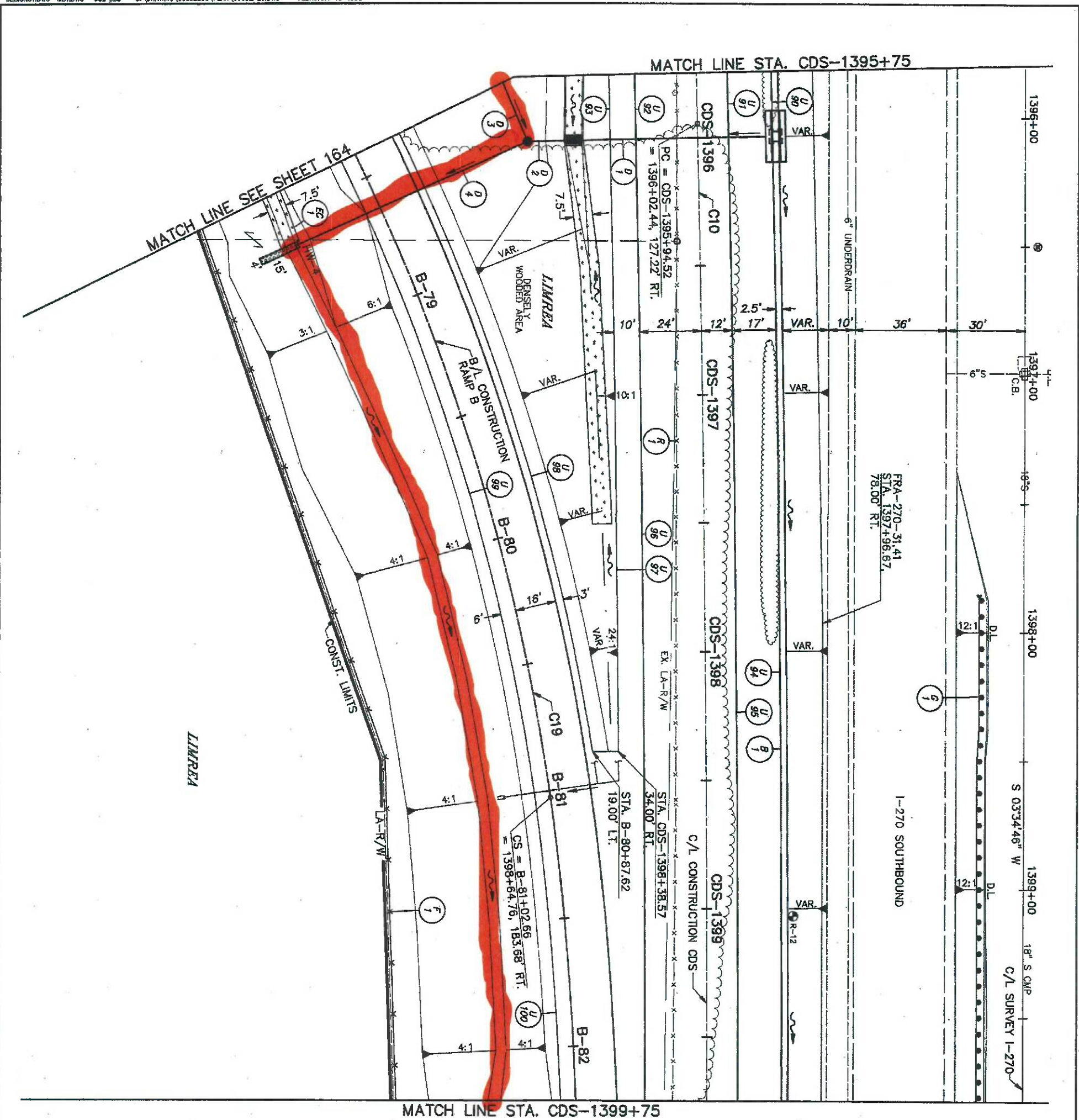
## APPENDIX H

### Outfall 3 (South) ODOT Construction Plans









CROSS REFERENCES												
SHEET NO.	DESCRIPTION											
4	C10, C19	CURVE INFO.										
132	ROADWAY PROFILE											
67	(4) UNDERDRAIN DATA AND QUANTITIES											
362	LIGHTING PLAN											
REFERENCE No.			STATION TO STATION		SIDE							
B1	1395+75 ~ 1399+75	L.T.	380									
* STATIONING REFERS TO RAMP B ALIGNMENT			L.F.	L.F.	L.F.	E.A.	L.F.	L.F.	L.F.	E.A.		
F1	* 78+40 ~ 82+21	R.T.		353								
R1	1395+75 ~ 1399+75	R.T.			400							
D1	1396+00	L-R				1	78					
G1	1397+80.96 ~ 1399+73.73	L.T.						175	1			
SHEET TOTALS			380	353	400	1	78	175	1			
REFERENCE No.			STATION TO STATION		SIDE							
* STATIONING REFERS TO RAMP B ALIGNMENT			E.A.	E.A.	L.F.	L.F.	C.Y.	C.Y.	S.Y.			
D2	1395+00	R.T.	1		18					146		
D3	1395+83 ~ 1398+00	L.T.			24							
D4	* 78+63	L-R		1			99	0.46	3.33			
E1	* 78+40 ~ 78+63	L.T.								18		
SHEET TOTALS			1	1	42	99	0.46	3.33	164			

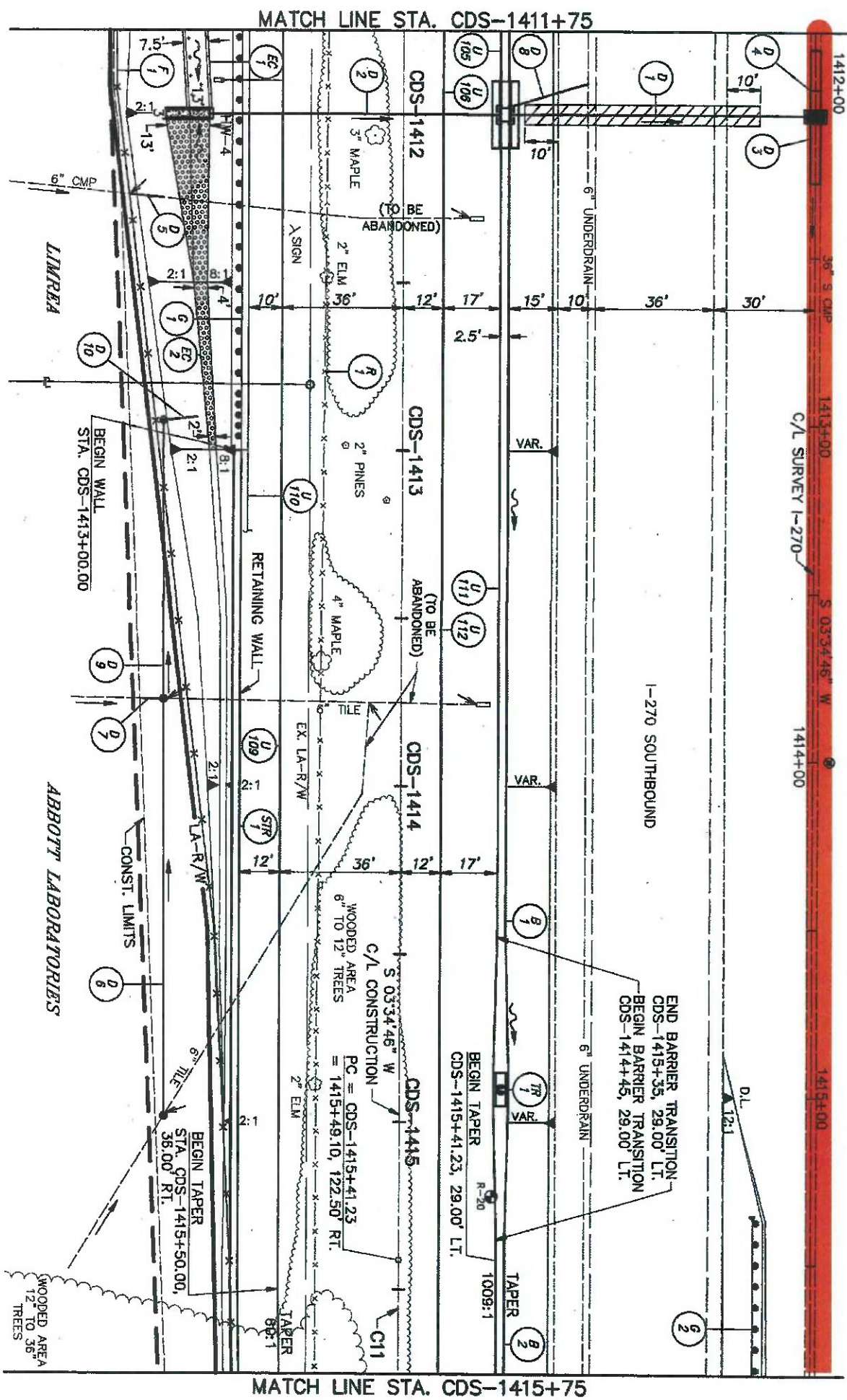








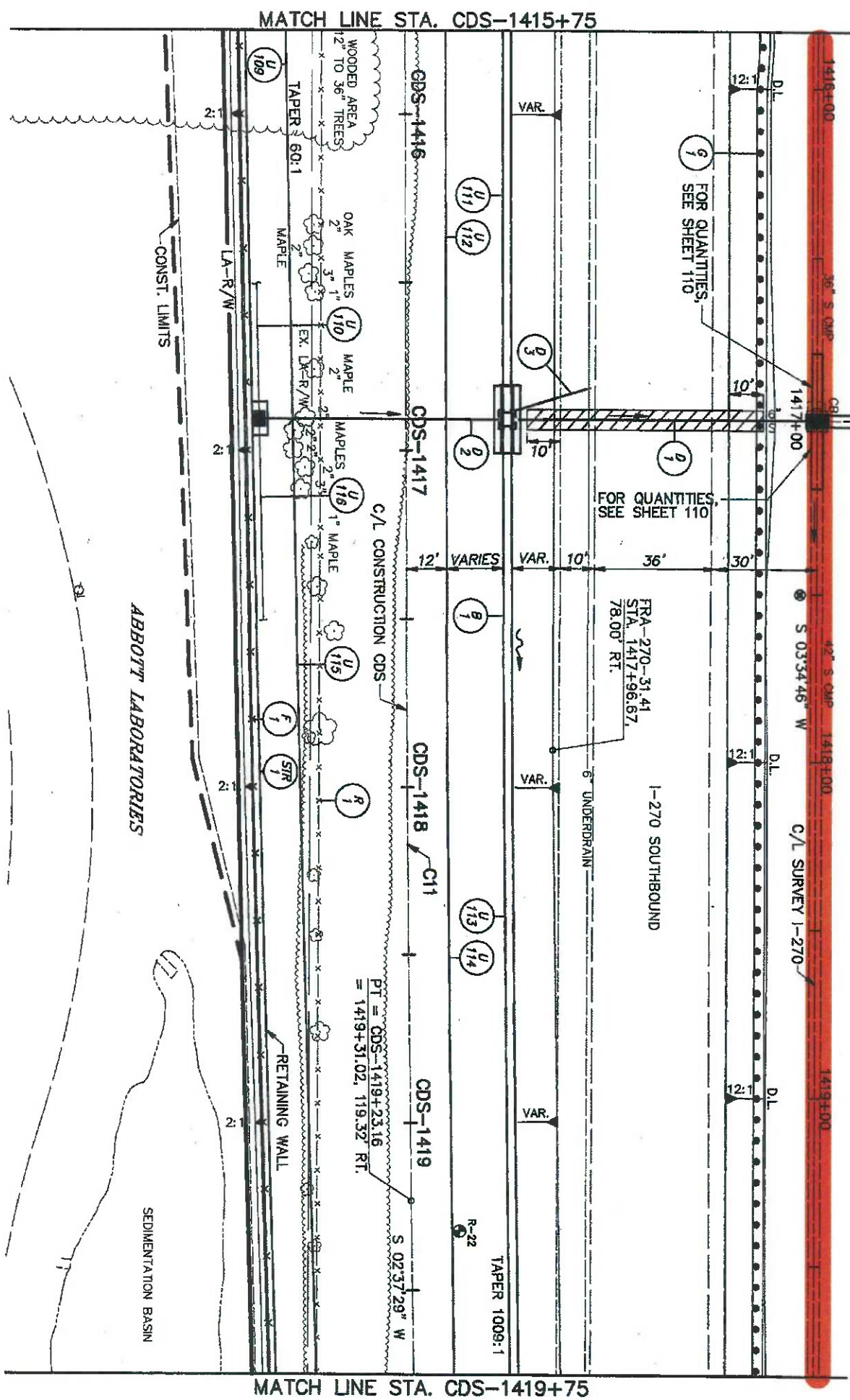




825	830	835	840	845	850
841.0 837.51					837.64
	+29.52, 6" TILE INV. 838.54				
841.0 837.38					837.53
840.7 837.25	EX. GRND. EX. EOP				837.42
		0.22%			
840.1 837.13					837.31
	+75.07, 6" TILE INV. 837.57				
840.1 837.00					837.20
840.5 836.89					837.09
840.3 836.77					836.98
840.1 836.63					836.87
825	830	835	840	845	850

[illegible]

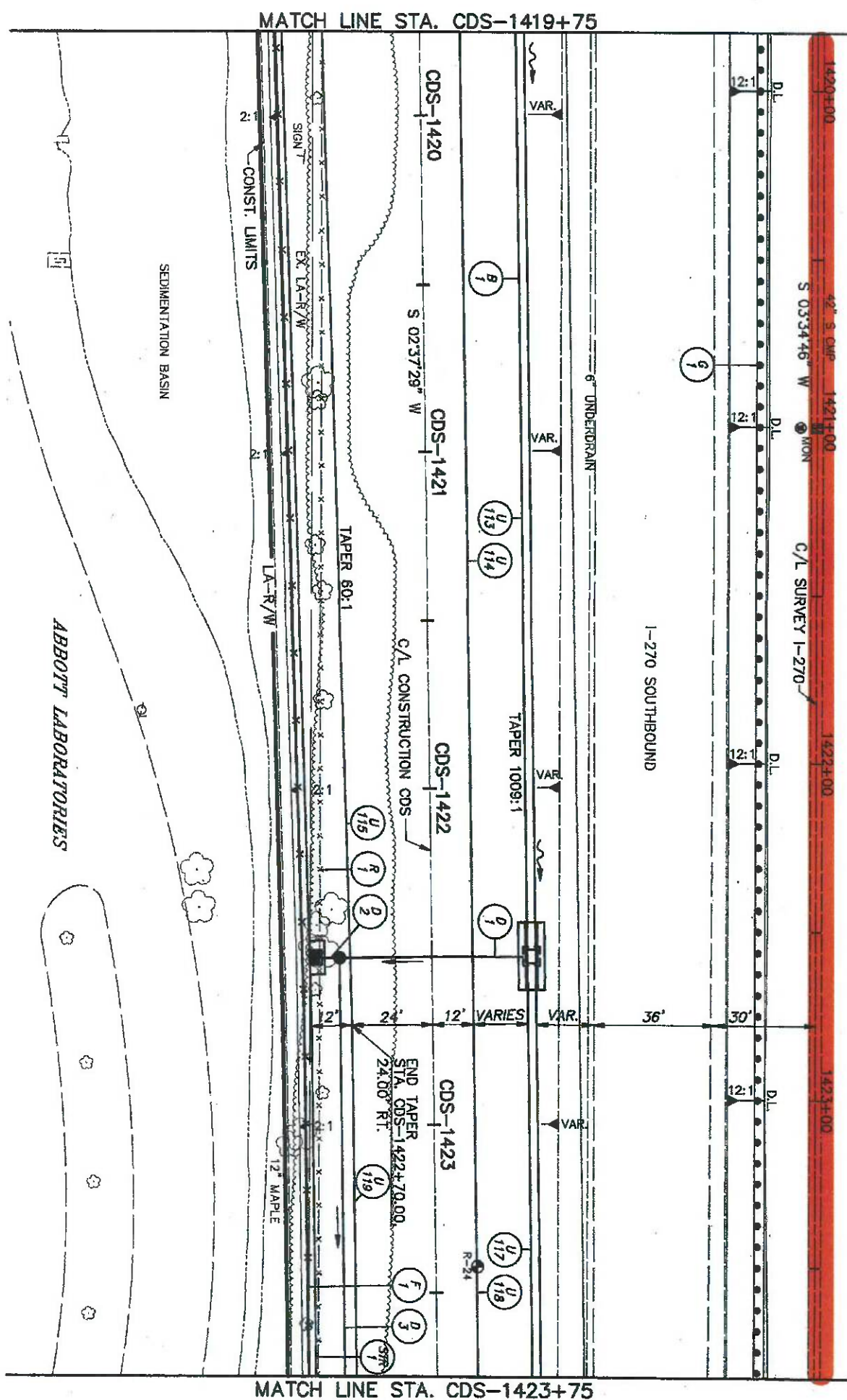





	825	830	835	840	845	850
840.0 836.50						836.76
840.1 836.40						836.65
840.8 836.29	EX. GRND. EX. ROP					836.54
840.2 836.19						836.43
840.2 836.08			-0.22%			836.32
840.0 835.95						836.21
839.2 835.82						836.10
838.5 835.69						835.99
	825	830	835	840	845	850

CROSS REFERENCES					
SHEET NO.	DESCRIPTION				
4	C11	CURVE INFO.			
67	(1)	UNDERDRAIN DATA AND QUANTITIES			
524	(S/R) 1	RETAINING WALL			
362	LIGHTING PLAN				
REFERENCE No.			622	607	202
STATION TO STATION  ALL STATIONING REFERS TO CDS ALIGNMENT			SIDE		
B1	1415+75 ~ 1419+75 LT.	L.F.	CONCRETE BARRIER, TYPE B	L.F.	FENCE, TYPE CL AS PER PLAN
F1	1415+75 ~ 1419+75 RT.		400		
R1	1415+75 ~ 1419+75 RT.		400		
G1	1415+79.80 ~ 1419+81.32 LT.		400		
SHEET TOTALS			380	400	400
REFERENCE No.			603	603	603
STATION TO STATION  ALL STATIONING REFERS TO CDS ALIGNMENT			SIDE		
D1	1416+90.50	L.T.	1	E.A.	INLET, NO. 3D
D2	1416+90.50	L-R		E.A.	INLET, NO. 3E
D3	1416+80 ~ 1416+90 L.T.		1	L.F.	15" CONDUIT, TYPE B
			75	L.F.	18" CONDUIT, TYPE B
			22	L.F.	6" CONDUIT, TYPE B 707.17
			26	L.F.	CONDUIT, BORED OR JACKED, 18", TYPE B
			70	L.F.	
SHEET TOTALS			1	1	75
			22	26	70





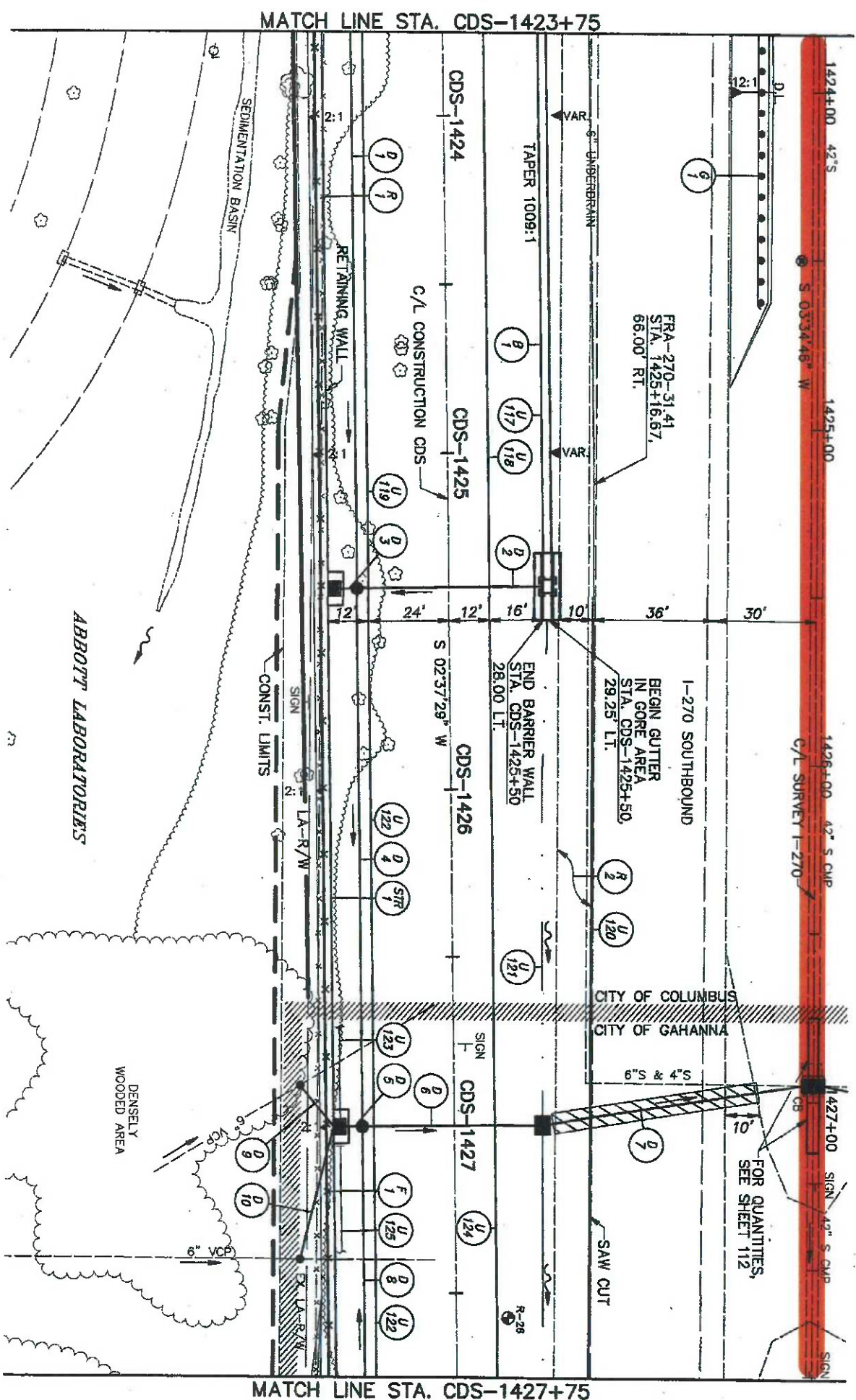
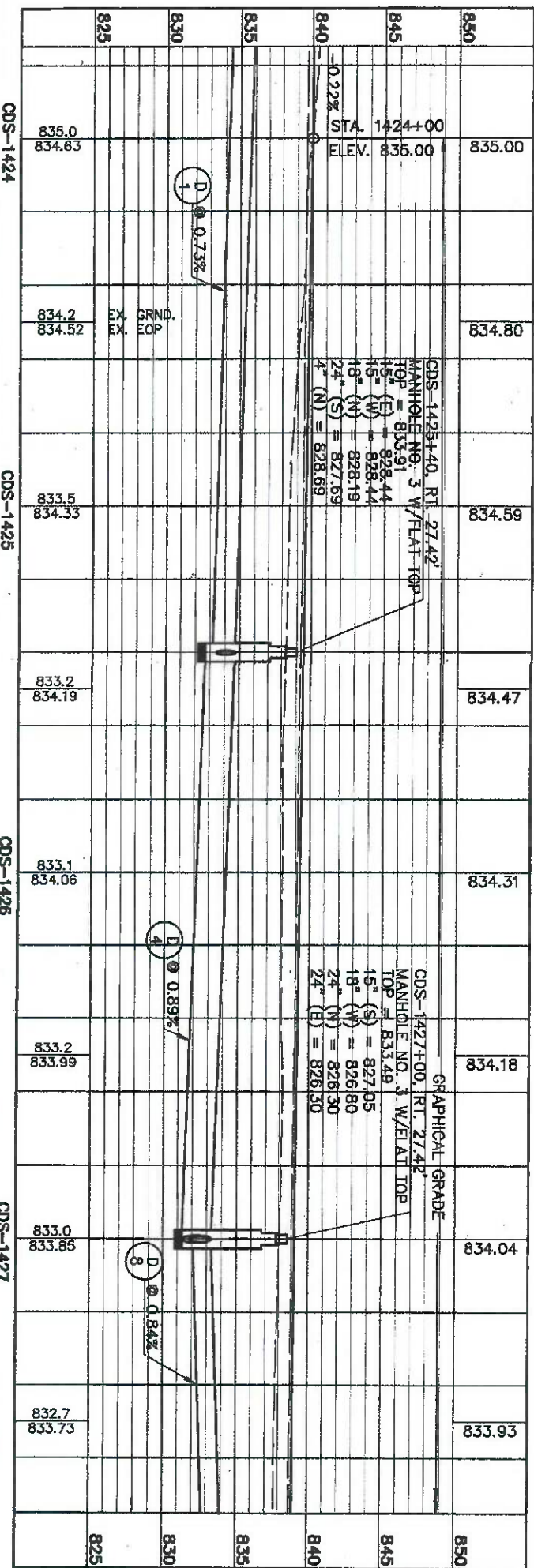
CROSS REFERENCES	
SHEET NO.	DESCRIPTION
67	UNDERDRAIN DATA AND QUANTITIES
524	RETAINING WALL
362	LIGHTING PLAN



20  
10 40  
HORIZONTAL  
SCALE IN FEET

[illegible][illegible]





REFERENCE No.		STATION TO STATION		SIDE	
D9	1426+86 ~ 1427+00 RT.	16	1	L.F.	EA.
D10	1427+00 ~ 1427+40 RT.	42	1		
SHEET TOTALS		58	2		

REFERENCE No.		STATION TO STATION		SIDE	
D2	1425+40	L-R	1		
D3	1425+40	RT.			
D4	1425+40 ~ 1427+00 RT.		1		
D5	1427+00	RT.			
D6	1427+00	L-R			
D7	1426+87 ~ 1427+00 LT.		1		
D8	1427+00 ~ 1427+75 RT.		75		
SHEET TOTALS		1	2	2	148

REFERENCE No.		STATION TO STATION		SIDE	
B1	1423+75 ~ 1425+50 LT.	155		L.F.	
F1	1423+75 ~ 1427+75 RT.		400		
R1	1423+75 ~ 1427+75 RT.				
R2	1425+50 ~ 1427+75 RT.		400		
G1	1423+81.27 ~ 1424+50.28 LT.		62.5		
D1	1423+75 ~ 1425+40 RT.				
SHEET TOTALS		155	400	400	62.5

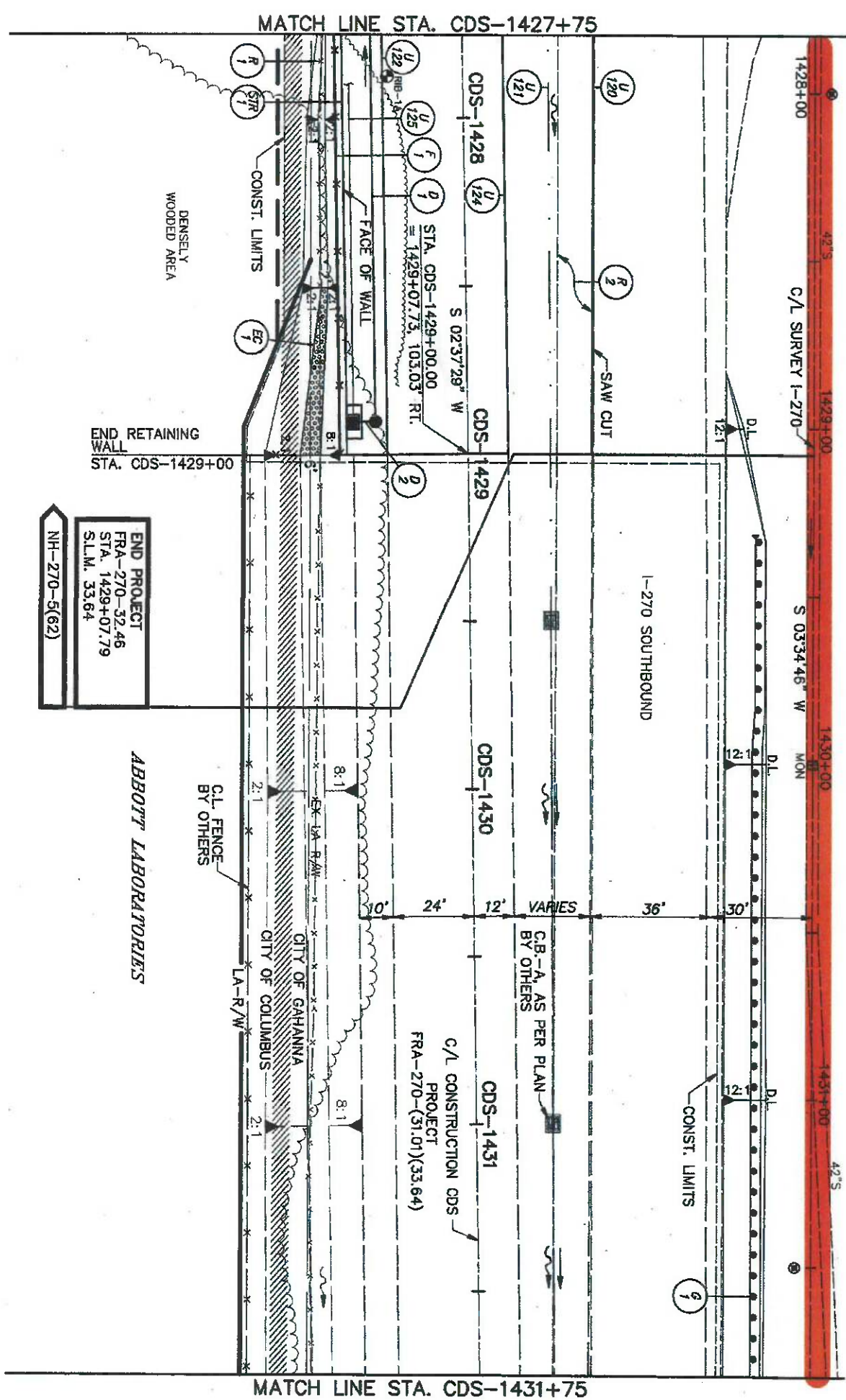
REFERENCE No.		STATION TO STATION		SIDE	
B2	1423+75 ~ 1425+50 LT.	155		L.F.	
F2	1423+75 ~ 1427+75 RT.		400		
R3	1423+75 ~ 1427+75 RT.				
R4	1425+50 ~ 1427+75 RT.		400		
G2	1423+81.27 ~ 1424+50.28 LT.		62.5		
D2	1423+75 ~ 1425+40 RT.				
SHEET TOTALS		155	400	400	62.5

FRA-270-32.46

PLAN & PROFILE  
STA CDS-1423+75 TO STA. CDS-1427+75

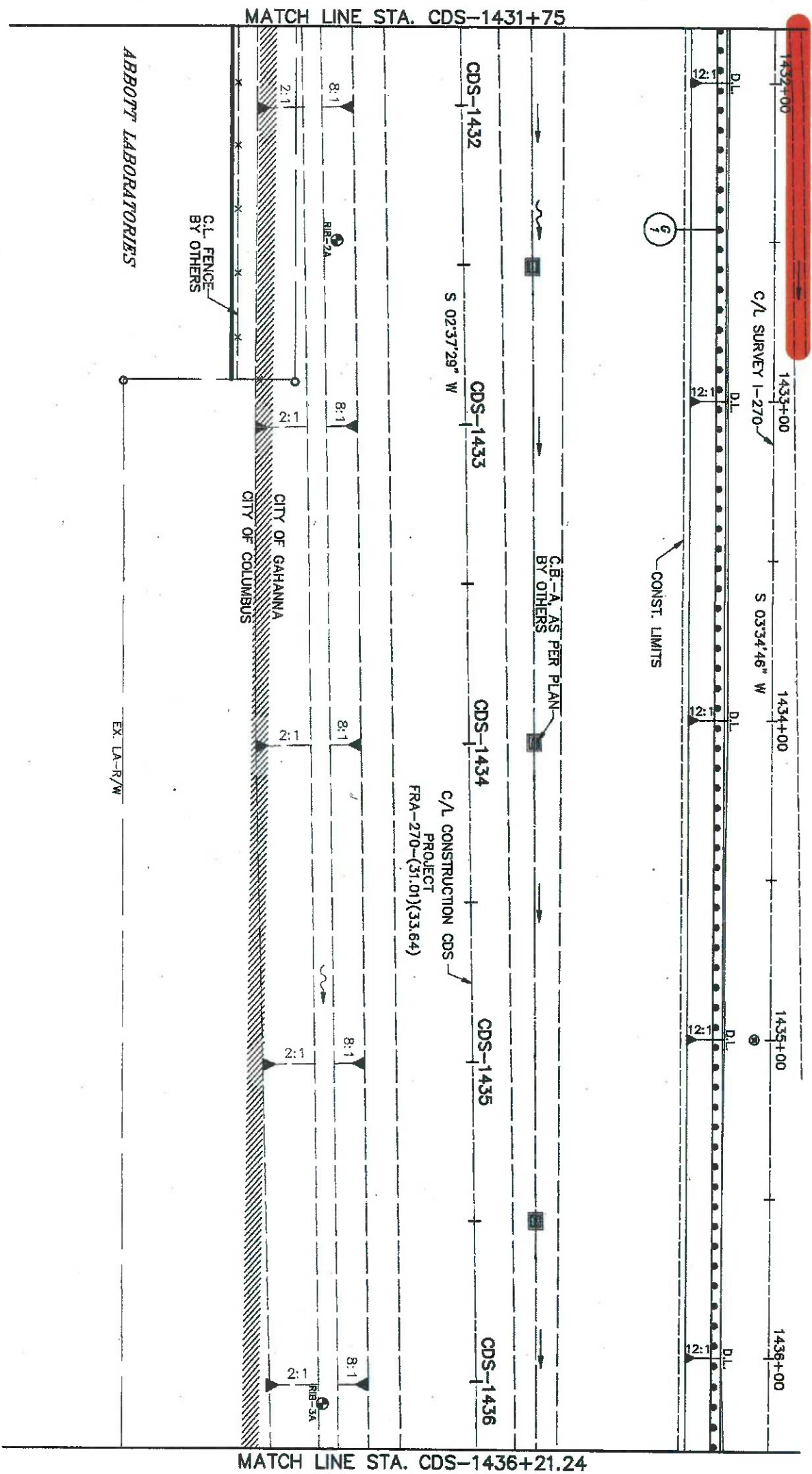






CROSS REFERENCES	
SHEET NO.	DESCRIPTION
67	4 UNDERDRAIN DATA AND QUANTITIES
524	5 RETAINING WALL
362	6 LIGHTING PLAN

[illegible][illegible]



CROSS REFERENCES		REFERENCE No.	
SHEET NO.	DESCRIPTION	STATION TO STATION	SIDE
362	● LIGHTING PLAN	ALL STATIONING REFERS TO CDS ALIGNMENT	L.F.
		G1 1431+77.32 ~ 1436+21.25	L.T. 450
SHEET TOTALS		450	



PLAN  
STA. CDS-1431+75 TO STA. CDS-1436+21.24

FRA-270-32.46

143  
593









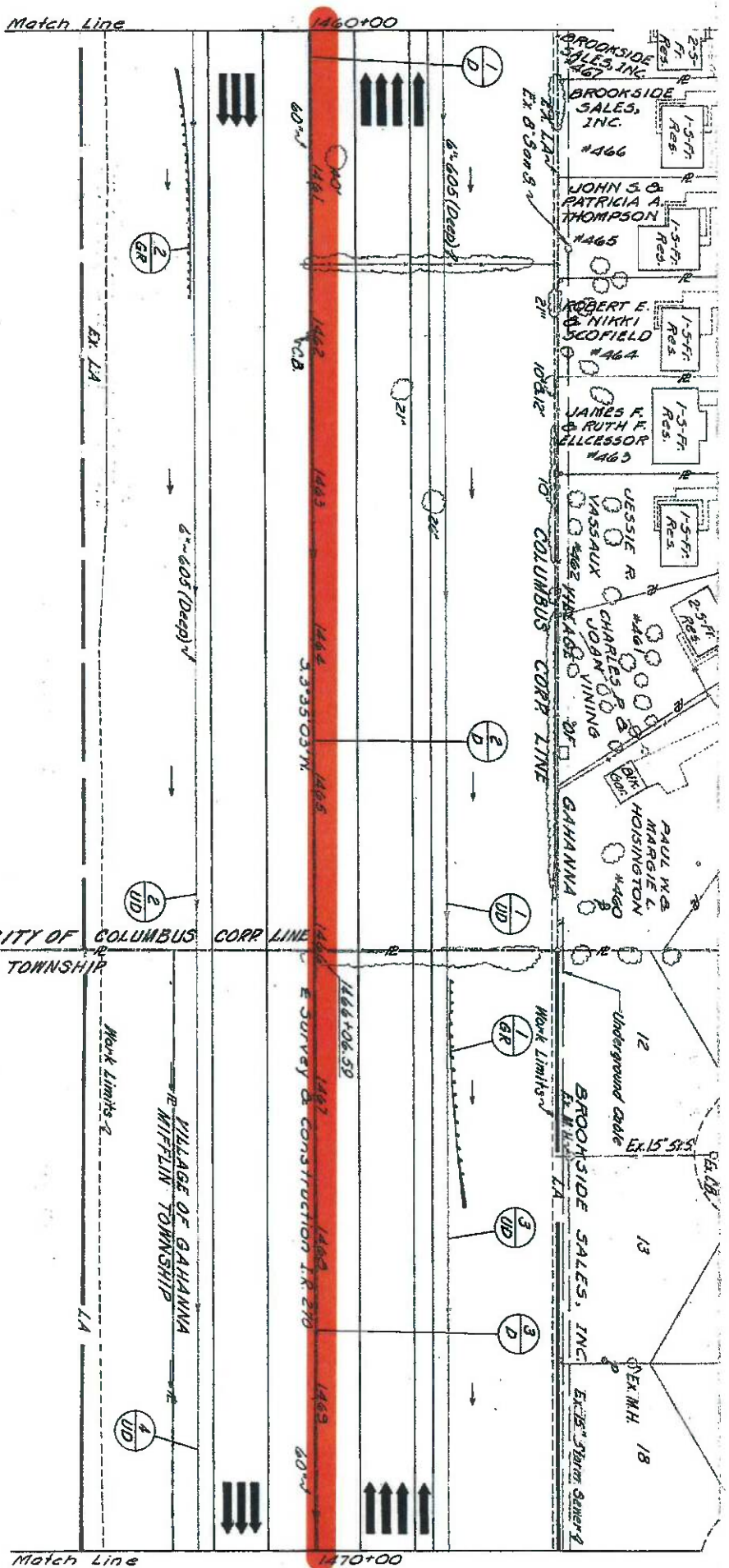




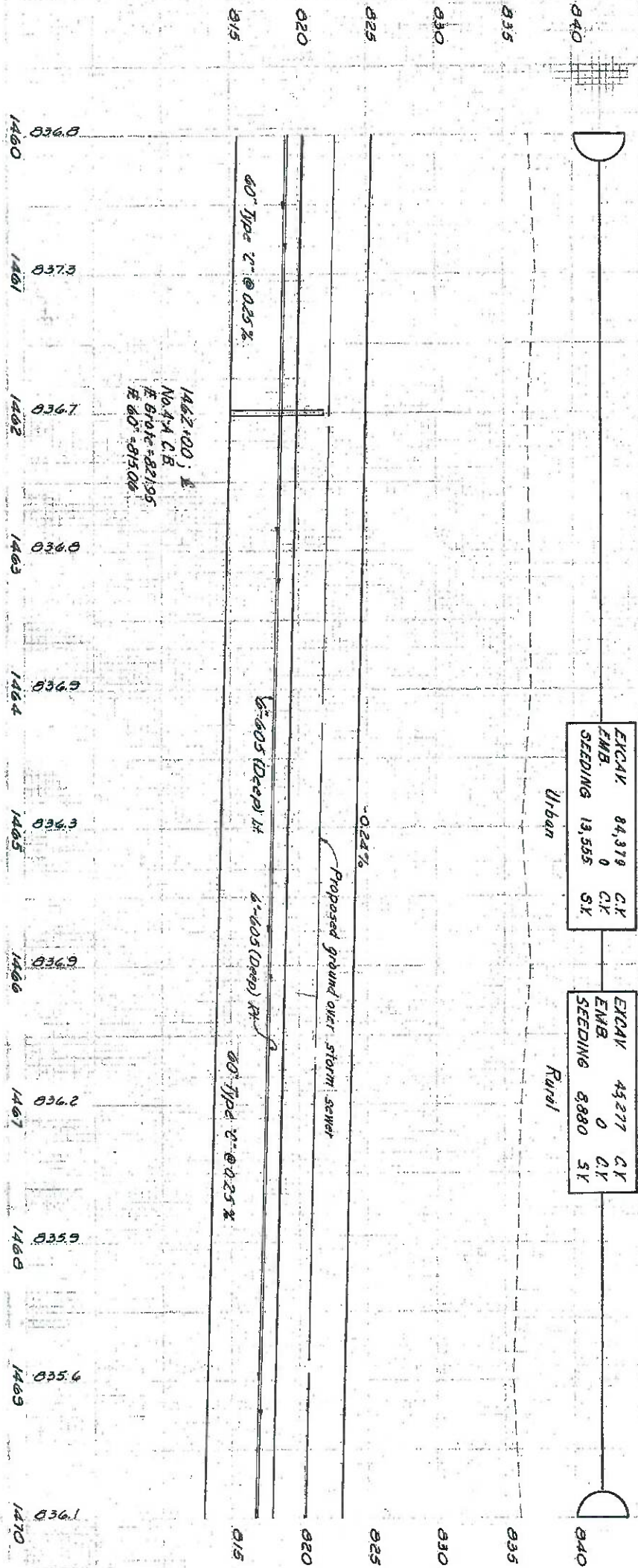








Profile  
Grade



B.M. 20 Elev. 841.66  
Sta. 1462+95 16.4' L.R.  
Spike in Utility Pole

EXCAV. 84,379 C.Y.  
EMB. 0 C.Y.  
SEEDING 13,555 S.Y.

EXCAV. 43,277 C.Y.  
EMB. 0 C.Y.  
SEEDING 8,880 S.Y.

Urban

Rural

Proposed ground over storm sewer

60" Type C @ 0.25%

6"-605 (Deep) H

6"-605 (Deep) H

60" Type C @ 0.25%

NOTES:

1. Cross Slope of the City shall be maintained across left lane.

545 1-70  
W.O.B. 2-70

FRANKLIN COUNTY  
FRA-270-25.39 N.  
FRA-62-20.83

# Urban

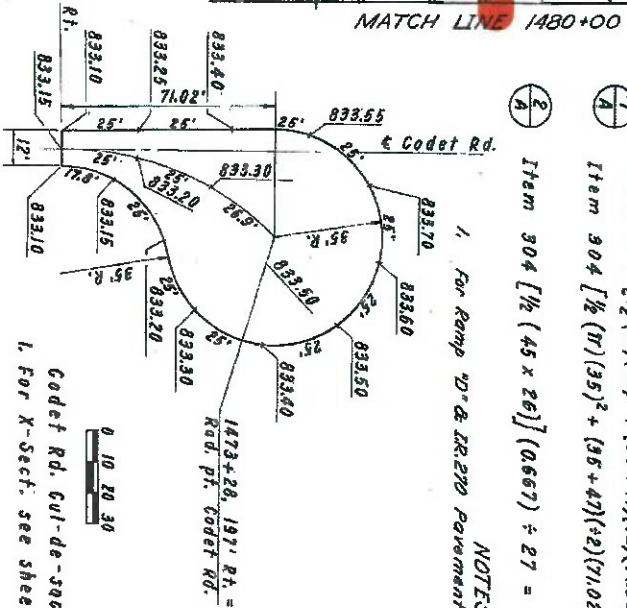
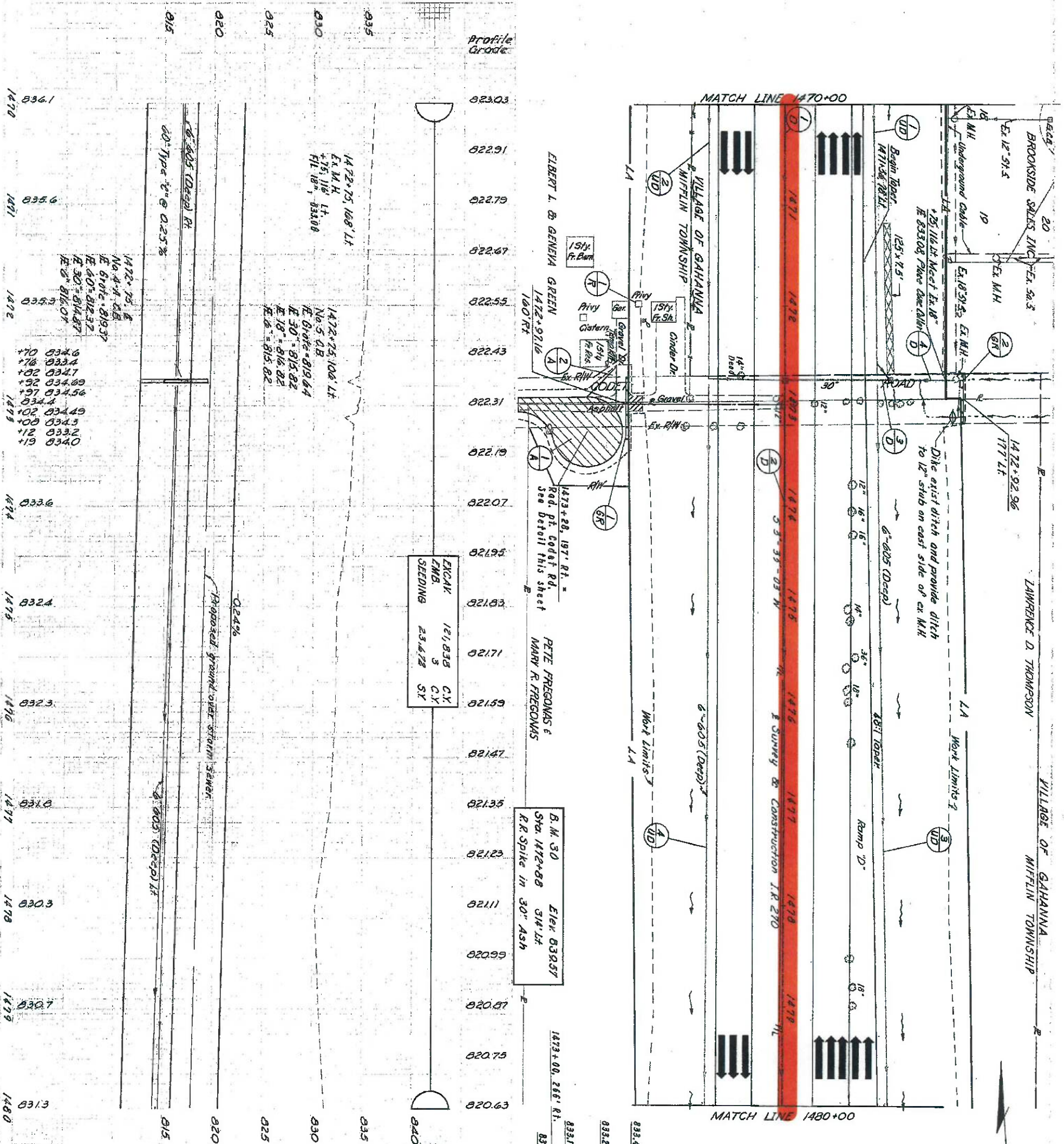
REF. STATION TO STATION	SIDE	603	604	GUARD	APP	ANCHOR	SEE
		60" <td>Nº 44<td>RAIL<td>END<td>ASSY<td>DETAIL</td></td></td></td></td>	Nº 44 <td>RAIL<td>END<td>ASSY<td>DETAIL</td></td></td></td>	RAIL <td>END<td>ASSY<td>DETAIL</td></td></td>	END <td>ASSY<td>DETAIL</td></td>	ASSY <td>DETAIL</td>	DETAIL
		C <td>C.B.<td>TYPE<td>ASSY<td></td><td>SHEET</td></td></td></td>	C.B. <td>TYPE<td>ASSY<td></td><td>SHEET</td></td></td>	TYPE <td>ASSY<td></td><td>SHEET</td></td>	ASSY <td></td> <td>SHEET</td>		SHEET
		IF <td>EA.<td>IF<td>EA.<td>EA.<td>Nº</td></td></td></td></td>	EA. <td>IF<td>EA.<td>EA.<td>Nº</td></td></td></td>	IF <td>EA.<td>EA.<td>Nº</td></td></td>	EA. <td>EA.<td>Nº</td></td>	EA. <td>Nº</td>	Nº
1-D. 1166+00 to 1166+00	E	200±					
2-D. 1166+00 to 1166+06.59	E	40±	1±				
3-D. 1166+06.59 to 1170+00	E	30±					66
168 1166+25 to 1167+75	Lt			150	1	1	
268 1167+25 to 1167+75	Rt.			150±	1±	1±	
					</		

REF. STATION TO STATION	SIDE	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
1-1111 1460+00 TO 1466+06.59	LT	2. F																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		</

STA. 1460+00 TO STA. 1470+00



Profile  
Grade



(1)  $\textcircled{A}$  Item 404  $\left[\frac{1}{2}(n)(.35)^2 + (.35 + .47) \div 2\right](71.02)(.0667) \div 27 = 29.9 \text{ C.Y.}$   
 Item 304  $\left[\frac{1}{2}(n)(.35)^2 + (.35 + .47) \div 2\right](71.02)(.075) \div 27 = 34.3 \text{ C.Y.}$

(2)  $\textcircled{B}$  Item 304  $\left[\frac{1}{2}(45 \times 26)\right](.0667) \div 27 = 14.5 \text{ C.Y.}$

CALC:	SAS	1-70
OME:	W.O.H.	2-70

FRANKLIN COUNTY  
FRA - 270 - 25.39 N  
FRA - 68 - 20.83

[illegible]

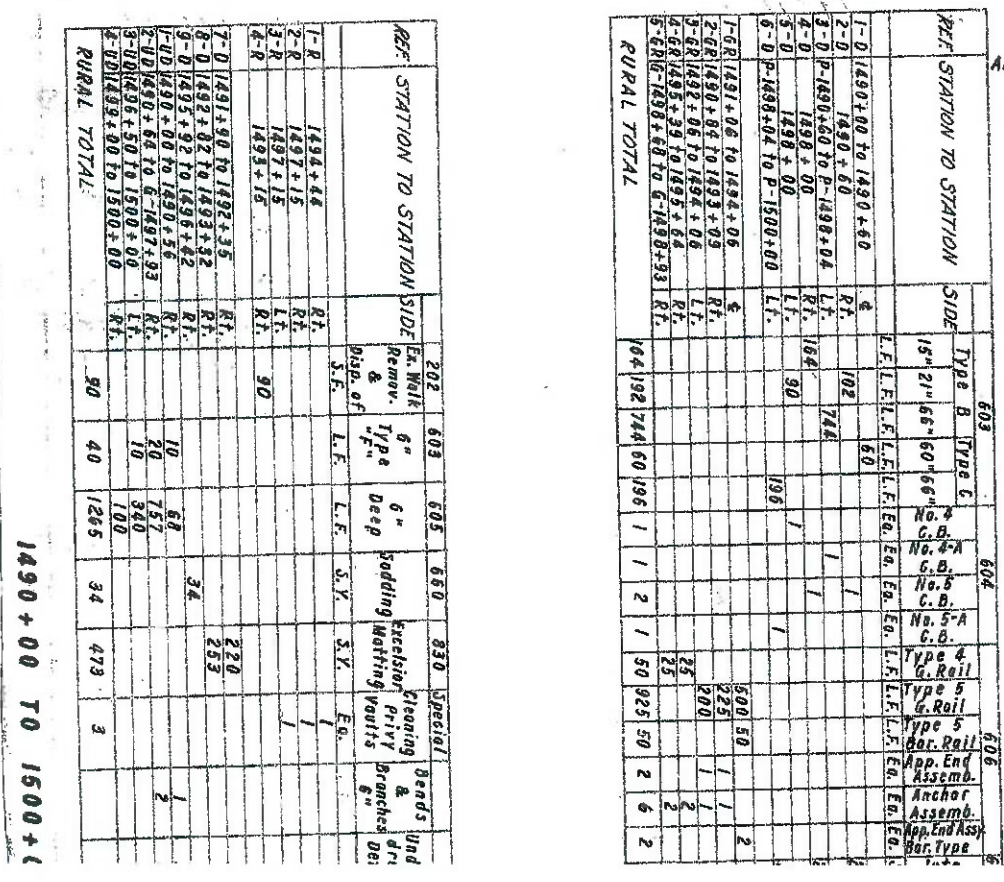
REF.	STATION TO STATION	SIDE	304	404	603	605	Bends & Branches	Undrained Delta
			Average gate Base	Approximate Concrete (25-100)	Type Type	Type Type		
1-D	1479+00 to 1482+71	Lt	21	C.Y.	L.F.	L.F.	5	B
2-D	1479+00 to 1482+75	Rt			76	283	1	D
3-D	1479+79 to 1480+00	Lt				275		
4-D	1482+79 to 1480+00	Rt				721		
1-A	1473+28	Rt			30			
2-A	1472+85	Rt			13			
			</					







1. For Ramp "D" Plan, See Sheet No. 90-91
2. For Ramp "D" Profile, See Sheet No. 98
3. For Ramp "G" Plan, See Sheet No. 94
4. For Ramp "G" Profile, See Sheet No. 101
5. For Ramp "G" & R 210 Reinforcement Details, See Sheet No. 151
6. For Aquifer "B" Profile, See Sheet No. 234, 235 & 2
7. For Storm Sewer Profile, See Sheet No. 251-252
8. For Interchange Geometrics See Sheet 82, 83 & 84

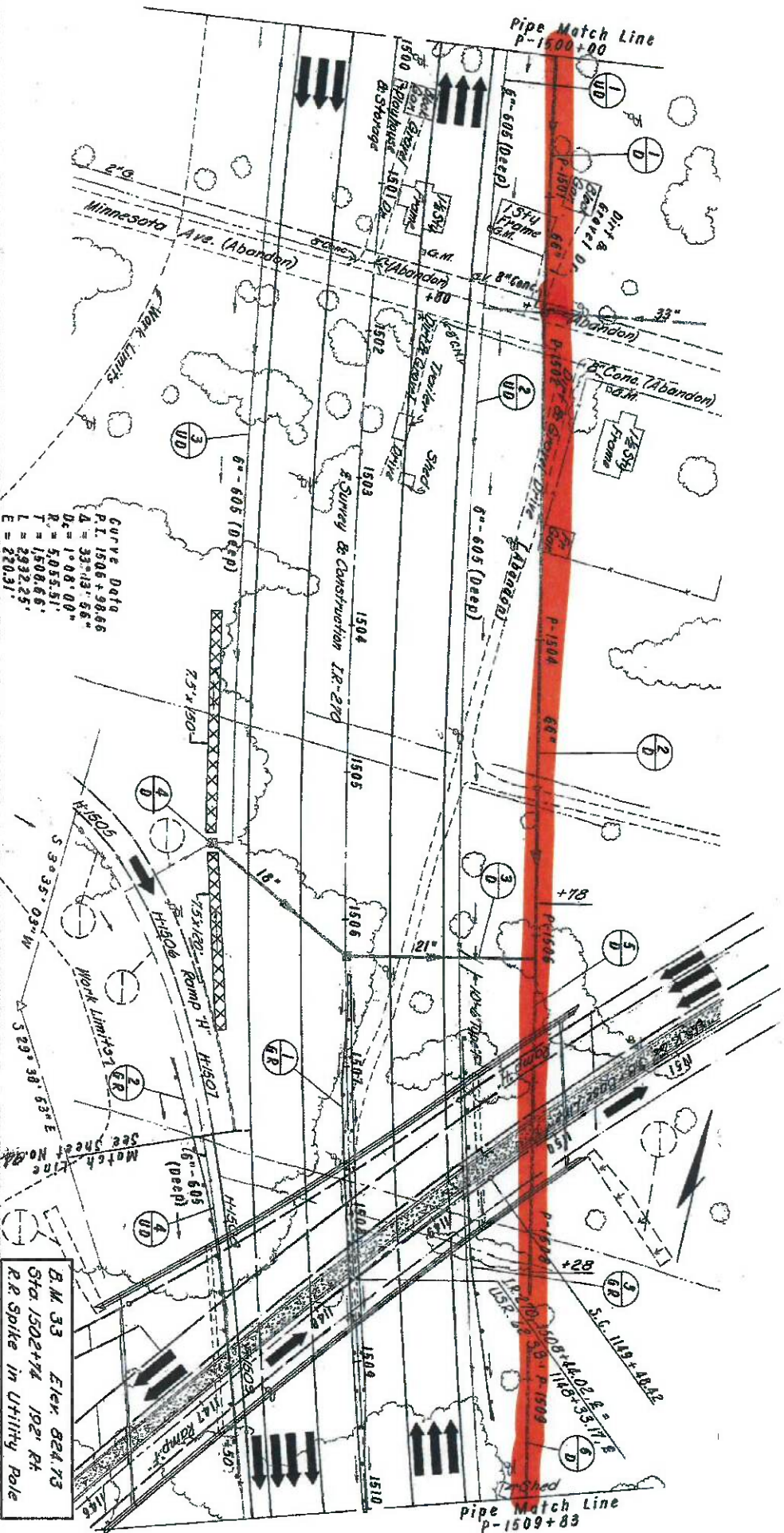




345 1-70  
2402.2-70

NOTES:

1. For Storm Sewer Profile See Sheet No. 251-232
2. For US R 62 S.B. Plan & Profile, See Sheet No. 176-177
3. For Ramp "H" Plan, See Sheet No. 94
4. For Ramp "H" Profile, See Sheet No. 102
5. For Ramp "H" & I.R.-270 Pavement Details, See Sheet No. 192
6. For Interchange Geometrics, See Sheet No. 82, 83 & 84



B.M. 33 Elev. 824.73  
Sta. 1502+74 192' R4  
R.R. Spike in Utility Pole

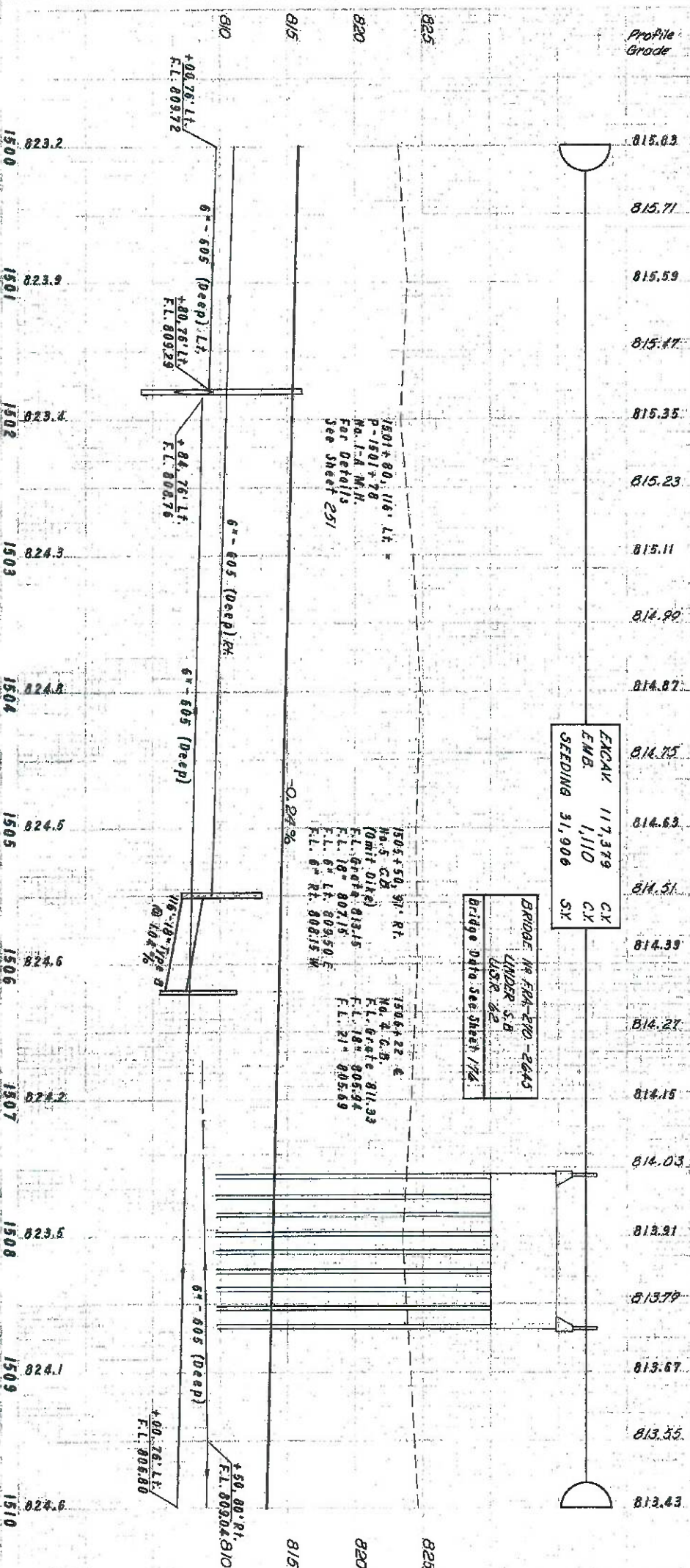
Curve Data  
P.I. 1506+38.66  
A = 33'-13'-56"  
D = 1'-08'-00"  
R = 5055.51'  
T = 1508.66'  
L = 2932.25'  
E = 220.31'

ENCAV 117,379 C.Y.  
EMB. 1,110 C.Y.  
SEEDING 31,906 SX

BRIDGE No. FRA-270-2645  
UNDER S.B.  
USR 62  
Bridge Data See Sheet 174

1501+80, 116' L.R.  
No. 1-A M.H.  
For Details  
See Sheet 251

1505+50, 91' R.T.  
No. 5 C.B.  
(omit Dike)  
F.L. 8074.813.15  
F.L. 10' 80715  
F.L. 6' L.R. 808.50 E  
F.L. 6' R.T. 808.15 W



* 70602 Class III or 70713									
REF	STATION TO STATION	SIDE	66"	603	604	667	668	669	670
			Type	Type	Type	Type	Type	Type	Type
1-0	P-1500+00 to P-1501+78	L.F.	18"	21"	No. 1-A	No. 4	No. 5	Joint	Bends & Branches
2-0	P-1501+78 to P-1505+78	L.F.	18"	21"	No. 1-A	No. 4	No. 5	Joint	Bends & Branches
3-0	P-1505+78 to P-1506+22	L.F.	18"	21"	No. 1-A	No. 4	No. 5	Joint	Bends & Branches
4-0	P-1506+22 to P-1508+22	R.T.	18"	21"	No. 1-A	No. 4	No. 5	Joint	Bends & Branches
5-0	P-1508+22 to P-1509+20	L.F.	18"	21"	No. 1-A	No. 4	No. 5	Joint	Bends & Branches
6-0	P-1509+20 to P-1509+83	L.F.	18"	21"	No. 1-A	No. 4	No. 5	Joint	Bends & Branches
RURAL TOTALS			963	106 120	1	1	1	225	

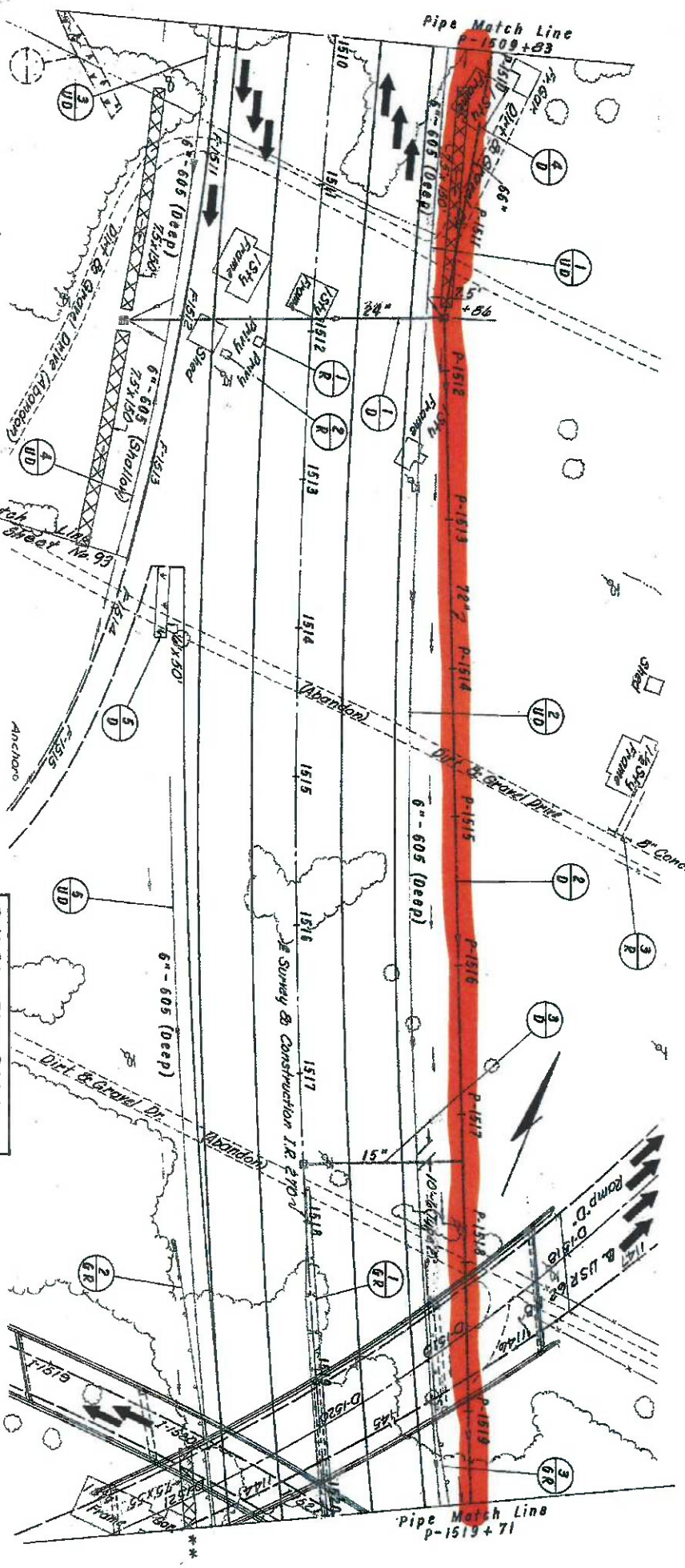
REF	STATION TO STATION	SIDE	66"	603	604	667	668	669	670
			Type	Type	Type	Type	Type	Type	Type
1-0	P-1500+00 to P-1501+80	L.F.	18"	21"	No. 1-A	No. 4	No. 5	Joint	Bends & Branches
2-0	P-1501+80 to P-1505+00	L.F.	18"	21"	No. 1-A	No. 4	No. 5	Joint	Bends & Branches
3-0	P-1505+00 to P-1505+50	R.T.	18"	21"	No. 1-A	No. 4	No. 5	Joint	Bends & Branches
4-0	P-1505+50 to P-1510+00	R.T.	18"	21"	No. 1-A	No. 4	No. 5	Joint	Bends & Branches
RURAL TOTALS			30	1026	50 WTS	2	2	2	



Sheet  
44.0.2  
2-70

NOTES:

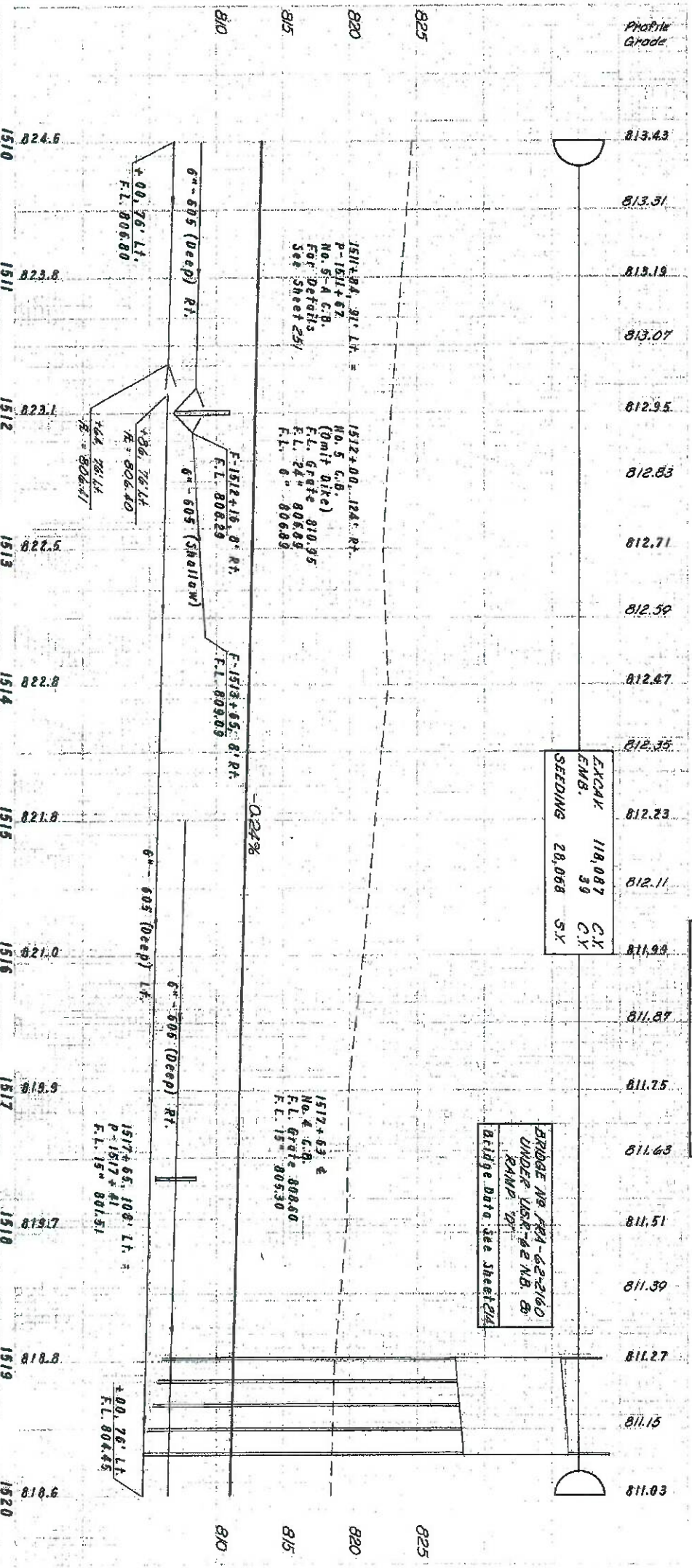
1. For USR-62 N.B. Plan & Profile, See Sheet No. 214
2. For Ramp "F" Plan, See Sheet No. 93
3. For Ramp "F" Profile, See Sheet No. 100
4. For Ramp "F" & I.R. 270 Pavement Details, See Sheet No. 153
5. For Ramp "I" Plan, See Sheet No. 89 & 93
6. For Ramp "I" Profile, See Sheet No. 103
7. \*\* Jute Matting carried to next sheet
8. For Interchange Geometrics, See Sheet No. 82, 83 & 84



B.M. 34 Elev. 826.12  
Sta. 1510+03 374' L.H.  
R.R. Spike in Utility Pole

EXCAV. 118,087 C.Y.  
EMB. 39 C.Y.  
SEEDING 28,068 S.Y.

BRIDGE No. 704-62-2160  
UNDER USR-62 N.B. &  
RAMP "I"  
Bridge Date: See Sheet 214



REF. STATION TO STATION		SIDE		* 706.02 CL III or 707.13		603		604		606		607		Bends & Branches		For Details See Sheet	
						15° 24' 68" 72"		No. 4		No. 5		No. 5-A		72"			
						Hyp. Hyp. Hyp. Hyp.		C. D.		C. D.		C. D.		Sodding		Jute	
						D. D. D. D.		C. D.		C. D.		C. D.		ting		ting	
						L. F. L. F. L. F. L. F.		C. D.		C. D.		C. D.		S. Y.		S. Y.	
						216		004		1		1		230		125	
														34		79	



FRANKLIN COUNTY  
FRA-270-25.30N  
FRA-02-20.83

CH  
SAS  
44.0 L. 2-70

LEGEND  
Existing Concrete Walk removed under Item 203 Excavation

- NOTES:
- For Ramp "I" Plan, See Sheet No. 80 & 93
  - For Ramp "I" Profile, See Sheet No. 103 & 93
  - For USR 62 N.B. Plan & Profile, See Sheet No. 214
  - For Storm Sewer Profile See Sheet No. 251 & 252
  - Typical Section on adjacent Project will be similar to Fra - 270-25.30 N
  - For Interchange Geometrics, See Sheet No. 82, 83 & 84
- \* Jute Matting carried from previous sheet.  
\* Guard Rail carried on previous sheet.

CURVE DATA  
P.T. 1524+51.89  
D = 50° 07' 25"  
Dc = 200' - 00"  
R = 264.79'  
T = 133.64'  
L = 250.619'  
E = 297.75'

B.M. 36 Elev 818.01.  
Sta. 1524+67 241' L.H.  
R.R. Spike in Utility Pole

END PROJECT  
FRA-270-25.30N  
STA. 1524+00.00

B.M. 35 Elev 822.16  
Sta. 1520+85 276' L.H.  
R.R. Spike in Utility Pole

BRIDGE No. FRA-270-26.67  
UNDER  
RAMP "I"  
Bridge Data see sheet 80

EXCAV. 28,592 C.Y.  
EMB. 33 C.Y.  
SEEDING 7,095 S.Y.

1524+00, 99' L.H. =  
P-1523+55.  
End Pipe  
For Details  
See Sheet 252

1521+00, 91' L.H. =  
P-1520+72  
No. 5 A.C.B.  
For Details  
See Sheet 252

6" - 605 (Deep) R.T.  
F.L. 805.37

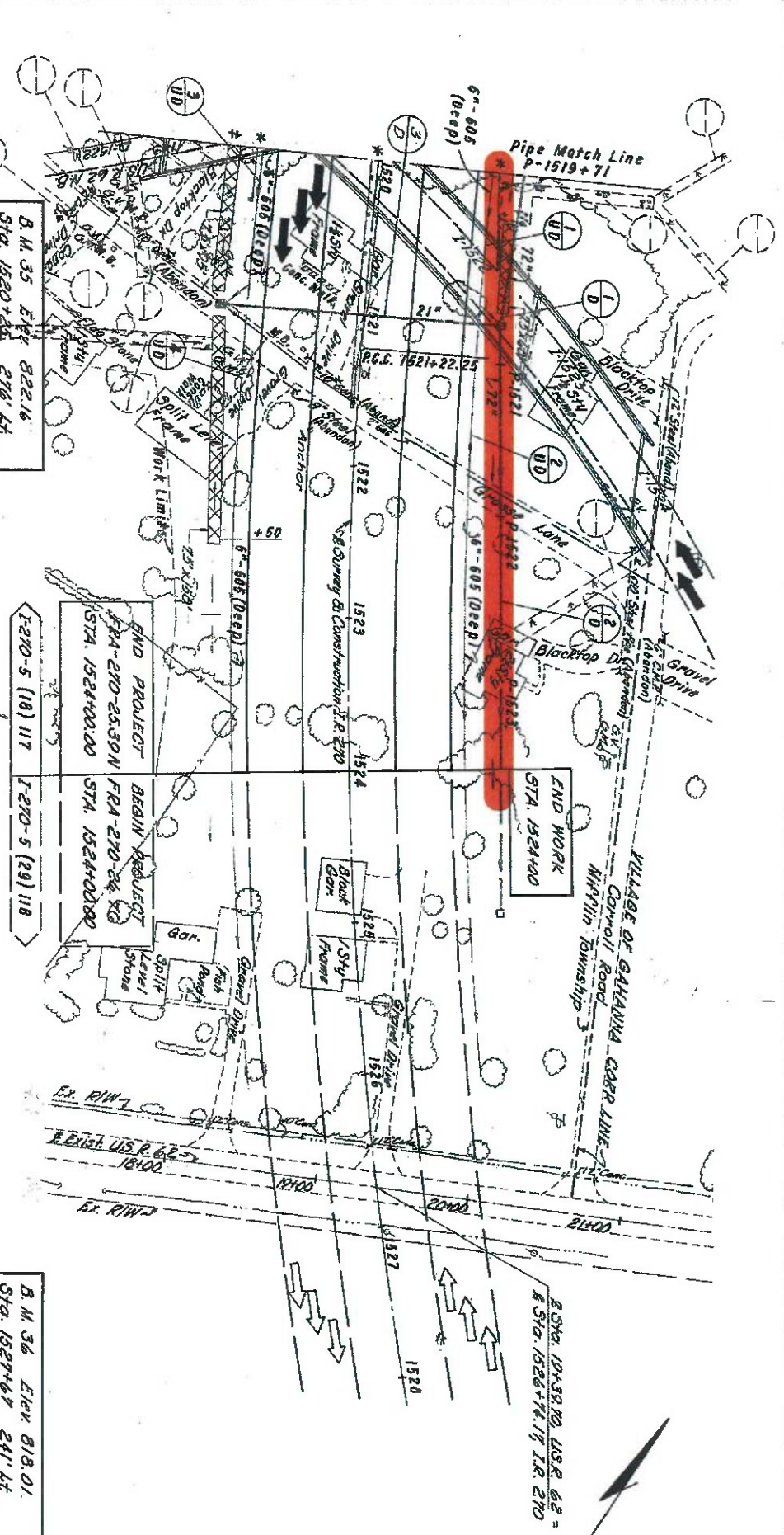
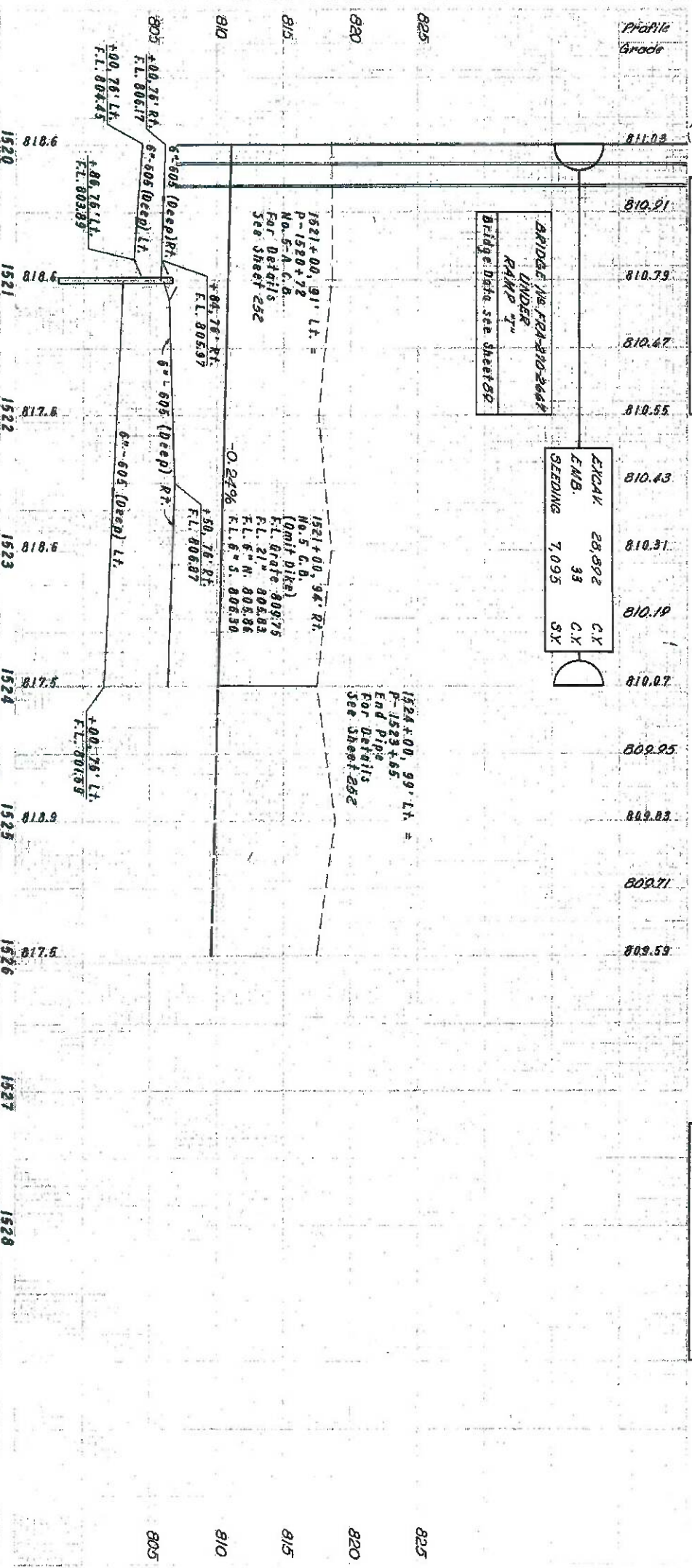
6" - 605 (Deep) L.H.  
F.L. 805.37

6" - 605 (Deep) L.H.  
F.L. 805.37

6" - 605 (Deep) L.H.  
F.L. 805.37

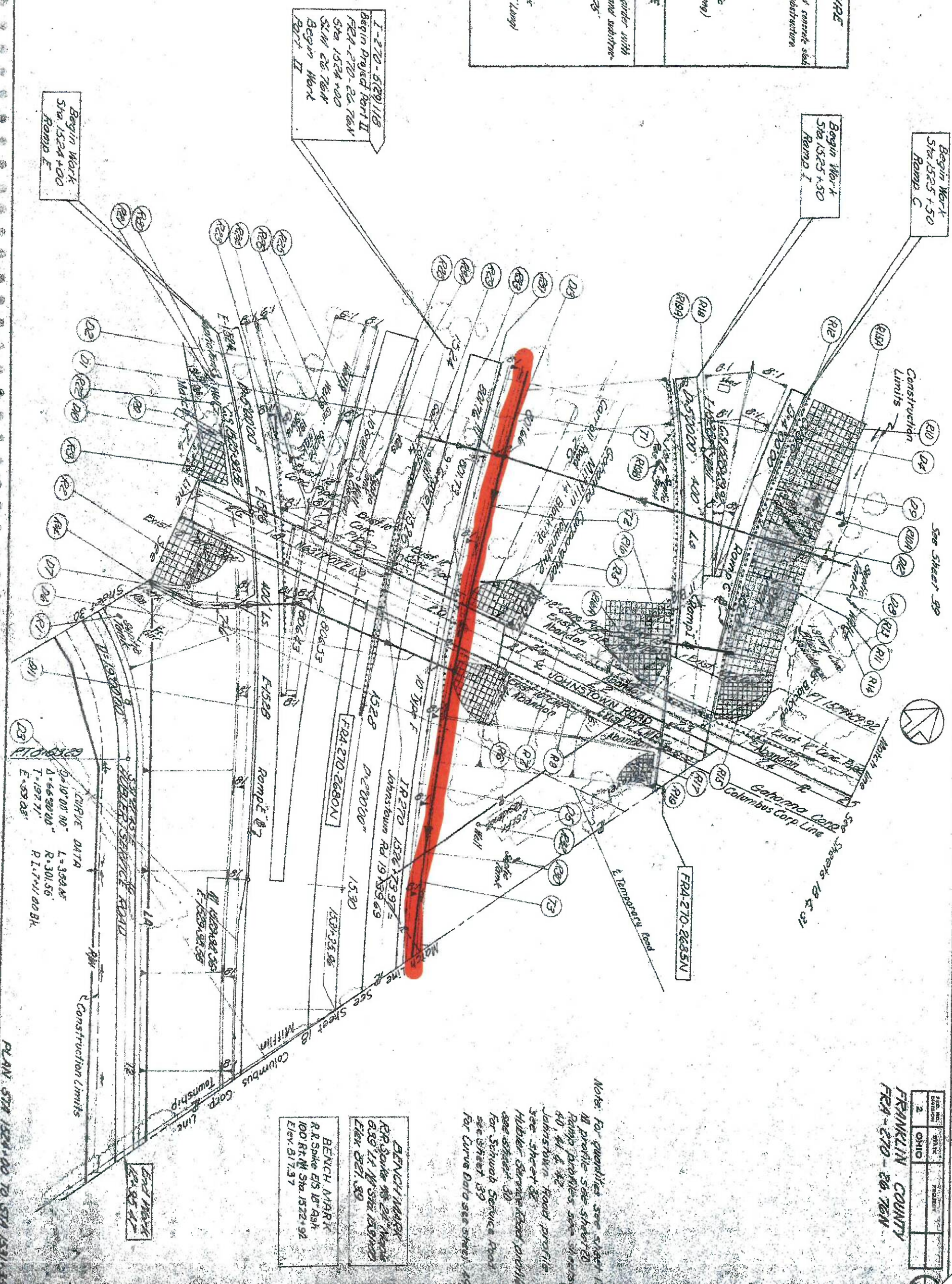
REF	STATION TO STATION	SIDE	603	604	605	606	607
1-D	P-1519+71 to P-1520+72	L.H.	100	100	100	100	100
2-D	P-1520+72 to P-1524+00	L.H.	328	1	1	1	250
3-D	1521+00	L.H.	184	428	1	1	300
RURAL TOTALS			184	428	1	1	300

REF	STATION TO STATION	SIDE	603	605	606	607
1-D	1520+00 to 1520+96	L.H.	10	107	107	107
2-D	1521+00 to 1524+00	L.H.	10	107	107	107
3-D	1521+00 to 1524+00	R.T.	10	307	307	307
RURAL TOTALS			30	817	817	817





<b>PROPOSED STRUCTURE</b>	
<b>FRA-270-2685N</b>	
TYPE: 3 span continuous reinforced concrete slab with reinforced concrete substructure	
SPANS: 43.0', 51.75', 43.0'	
LOADING: HS20-44	
SKEW: 18°13'37" L.R.	
WEARING SURFACE: 1" Monolithic	
APPROACH SLAB: 45'-1'-67" (23' long)	
ALIGNMENT: Left spiral	
SUPERELEVATION: Varies	
<b>PROPOSED STRUCTURE</b>	
<b>FRA-270-2680N</b>	
TYPE: 4 span continuous steel girder with reinforced concrete deck and substructure	
SPANS: 75'-0", 115'-0", 84'-25", 54'-25"	
LOADING: HS 20-44	
ROADWAY: 44'-0" to parapets	
SKEW: 13°57'46" R.F.	
WEARING SURFACE: 1" Monolithic	
APPROACH SLAB: 80'-4'-7' (25' long)	
ALIGNMENT: Tangent	
SUPERELEVATION: None	



FRANKLIN COUNTY  
FRA-270-26.76N

NO.	DATE	BY	PROJECT
2	OHIO		

**BENCH MARK**  
R.R. Spike #8 23' High  
6.89' 1/4" W. Side (ASPH)  
Elev 621.30

**BENCH MARK**  
R.R. Spike #5 15' Ash  
100 Rt. N. Sta. 1522+92  
Elev. 617.57

PLAN STA 1524+00 TO STA 1534+00

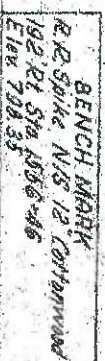












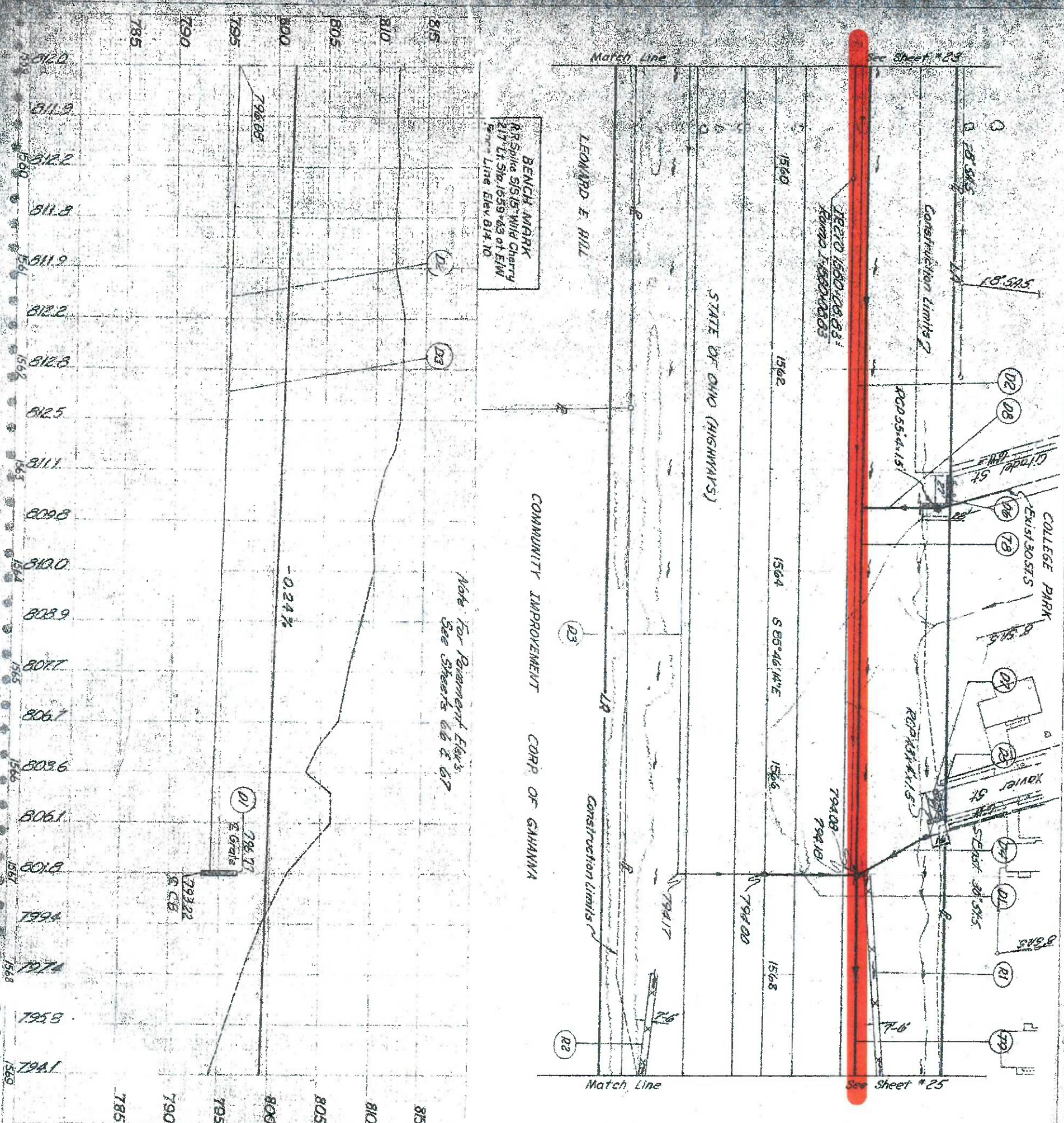
FRA-270-2676N

ROADWAY					
CODE	LOCATION				
P1	1545-00 to 1570-00 @ 100' R/L	104	Seeding w/ Jute Matting	667	
TOTALS		104			

DRAINAGE	
CODE	LOCATION
D1	1556+00 to 107 L+
D2	1550+25 to 1556+00 L+
D3	1556+05 to 1559+00 L+
D4	1549+00 to 1556+00 L+
D5	1556+05 to 1559+00 R+
D6	1549+00 to 1549+29 L+
D7	1549+05 to 1549+42 L+
T6	1539+00 to 1550+29 L+R3
T7	1539+25 to 1546+00 L+R1
T8	1556+00 to 1559+00 L+R3
TOTALS	
	See Sheet No.
	84" Conduit, Type B
	6" Conduit, Type B
	84" Conduit, Type C
	15" Conduit, Type B
	6" Conduit, Type F
	Std. No. 1A Manhole
	Std. No. A Catch Basin
	6" Pipe-Deep Underdrain
	6" Pipe-Unclas Underdrain
	6" Berms

EARTHWORK & SEEDING		203	659
LOCATION	Excavation		
	Embankment		
	Seeding and Mulching		
TOTALS			

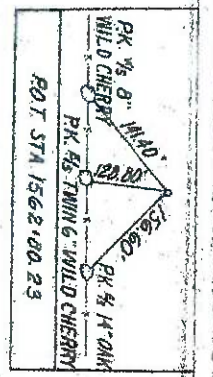




DRAINAGE									
CODE	LOCATION	LF	LF	LF	LF	LF	LF	LF	LF
D1	1567+00 to 93' LT	85	93						
D2	1559+00 to 1567+00 LT	24							
D3	1559+00 to 1567+00 RT	24							
D4	1566+30 LT to 1567+00 LT 93'	85							
D5	1566+30 LT to 1567+00 LT 93'	85							
D6	1563+20 LT 175'								
D7	1560+30 LT 170'								
D8	1563+38 LT 93' to 1563+38 LT 168.5'	45							
T8	1559+00 to 1567+00 LT 93'	47							
T9	1567+00 to 1569+00 LT 93'	47							
TOTALS		93	89	1000	83	6	8	77	1

ROADWAY									
CODE	LOCATION	LF	LF	LF	LF	LF	LF	LF	LF
R1	1567+00 to 1569+00 LT	167							
R2	1568+00 to 1569+00 RT	85							
TOTALS		252							

EARTHWORK & SEEDING									
LOCATION	C.Y.	C.Y.	5.Y.	5.Y.	5.Y.	5.Y.	5.Y.	5.Y.	5.Y.
1559+00 to 1569+00	167	85	252						
TOTALS	167	85	252						



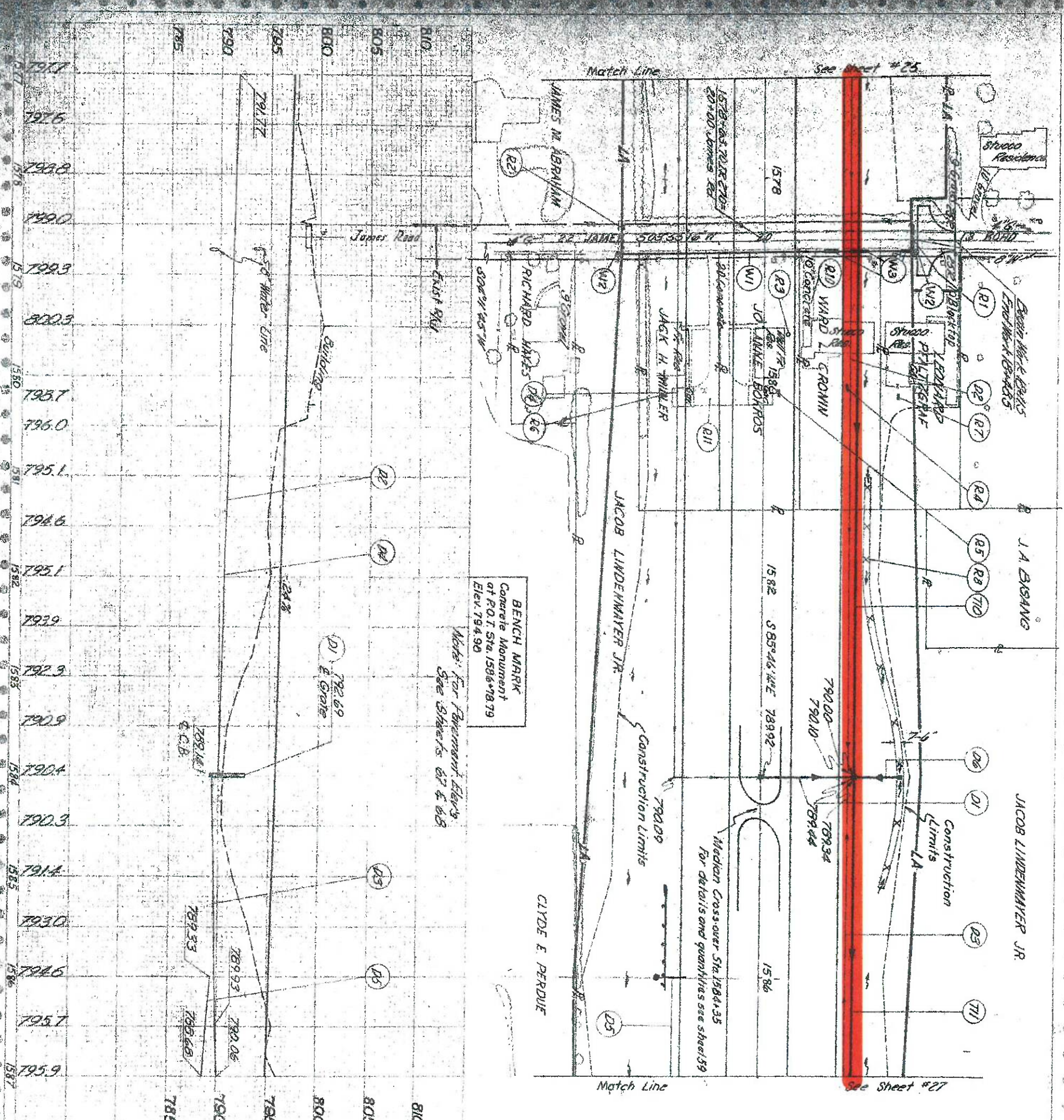
FRANKLIN COUNTY  
FRA-270-26.76 N

PLAN & PROFILE STA. 1559 TO 1569









DRAINAGE			
CODE	LOCATION	Sheet No.	
D1	1584+00 to 1584+00.4	88	93
D2	1577+00 to 1584+00.4	88	93
D3	1584+00 to 1587+00.4	88	93
D4	1577+00 to 1584+00.4	88	93
D5	1584+00 to 1587+00.4	88	93
D6	1584+00 to 1587+00.4	88	93
TOTALS		93	700

WATERLINE			
CODE	LOCATION	Sheet No.	
W1	1578+75 to 1581+00	87	302
W2	1578+75 to 1581+00	87	302
W3	1578+75 to 1581+00	87	302
TOTALS		87	302

ROADWAY			
CODE	LOCATION	Sheet No.	
R1	1578+00 to 1584+00.4	88	93
R2	1578+00 to 1584+00.4	88	93
R3	1578+00 to 1584+00.4	88	93
R4	1578+00 to 1584+00.4	88	93
R5	1578+00 to 1584+00.4	88	93
R6	1578+00 to 1584+00.4	88	93
R7	1578+00 to 1584+00.4	88	93
R8	1578+00 to 1584+00.4	88	93
TOTALS		88	93

2 JAMES RD

31.20' 8 PK 1/2 0.81' 456

31.68' 0 PK 1/2 12" MAPLE

7100'

0 PK 1/2 TWIN 10" MAPLE

P.O.T. STA. 1578+63.70

MON. P.O.T. STA. 1586+78.79

FRANKLIN COUNTY

FRA-270-26.76V

2 OHIO

24

EMPHASIS & SEEDING

LOCATION

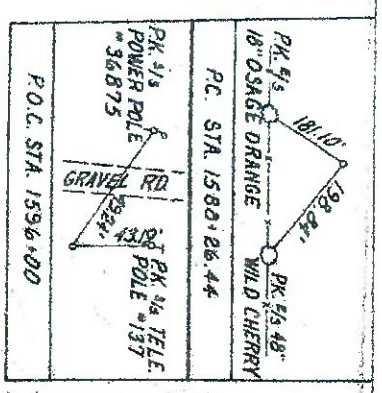
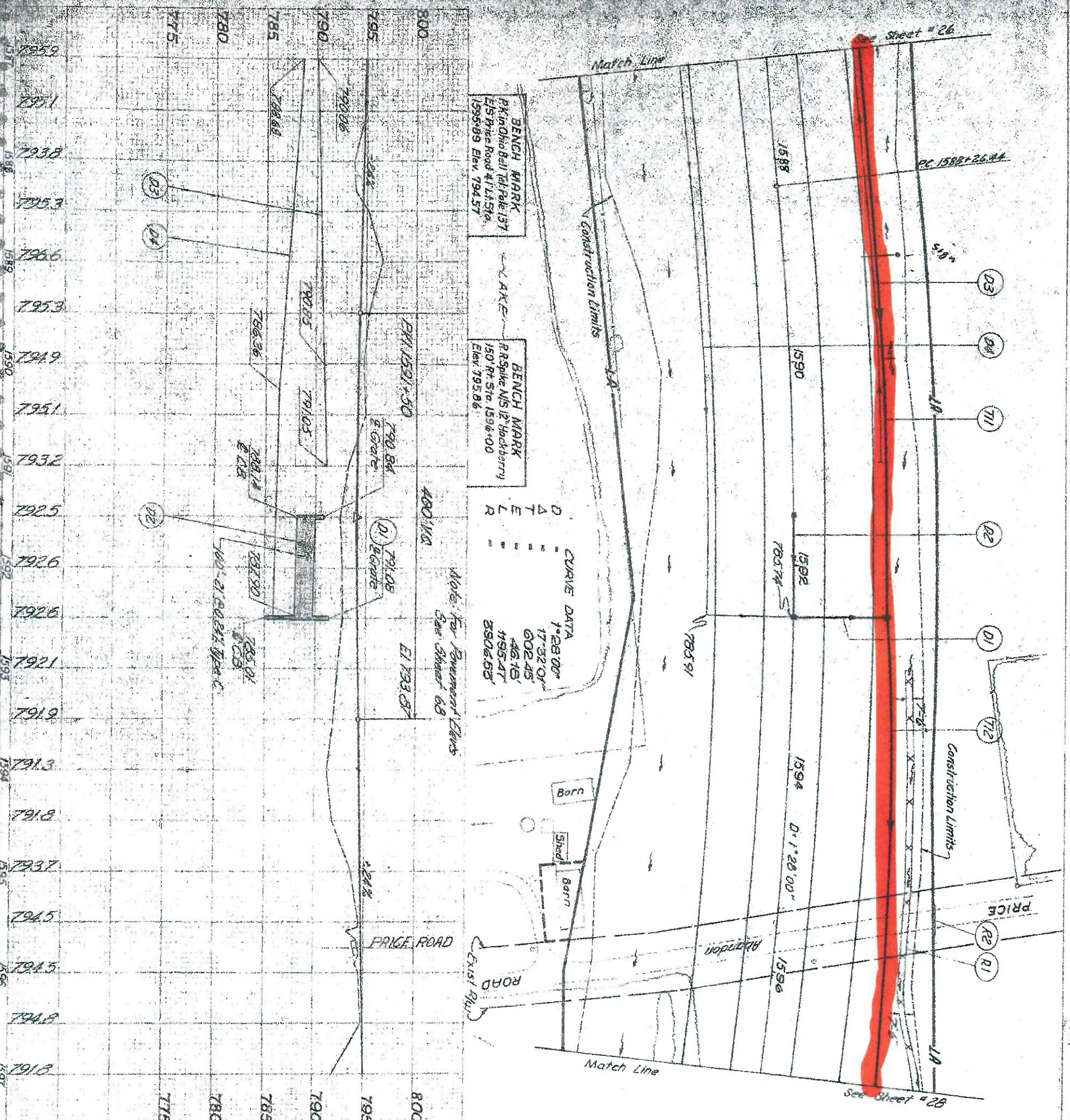
1577+00 to 1587+00

TOTALS

1500' 1500' 1500'

PLAN & PROFILE STA. 1578 TO 1587





FRANKLIN COUNTY		FRA-270-26.76N	
EARTHWORK & SEEDING		TOTALS	
LOCATION	Excavation	Embankment	Seeding & Mulching
1587+00 to 1597+00	1581.6919	1581.6919	1581.6919
TOTALS	1581.6919	1581.6919	1581.6919

ROADWAY		TOTALS	
CODE	LOCATION	See Sheet No.	21' Conduit, Type B
R1	1593+00 to 1597+00	347	347
R2	1590+37.8 to 1597+00	2	2
TOTALS		347	347

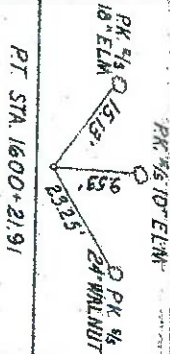
DRAINAGE		TOTALS	
CODE	LOCATION	See Sheet No.	21' Conduit, Type B
D1	1592+50 to 93.11	89	89
D2	1591+50 to 1592+50	27	27
D3	1587+00 to 1591+00	27	27
D4	1587+00 to 1592+50	89	89
TOTALS		152	152

NY Trunk Sewer		Table of Offsets	
Station	Distance	Left of &	Right of &
1592+50	93	93	93
1593+00	97	97	97
1594+00	105	105	105
1595+00	105	105	105
1596+00	110	110	110
1597+00	115	115	115



JACOB LINDENMAYER JR.

SHEPARD CHURCH OF THE NAZARENE



FRANKLIN COUNTY  
FRA-270-86.76N

NO.	DATE	PROJECT
2	OHIO	

See Sheet # 27

See Sheet # 29

END PROJECT  
PART II  
FRA-270-26.76N  
STA 1605+08.90

### ROADWAY

CODE	LOCATION	SY	LF	EA	ED	EA
R1	1597+00 to 1598+25.81	100	125	75	1	1
R2	1598+25.81 to 1601+74	150	150	1	1	1
R3	1601+74 to 1602+07.81	150	150	1	1	1
R4	1602+07.81 to 1603+03.04	150	150	1	1	1
TOTALS		400	400	75	2	1

### DRAINAGE

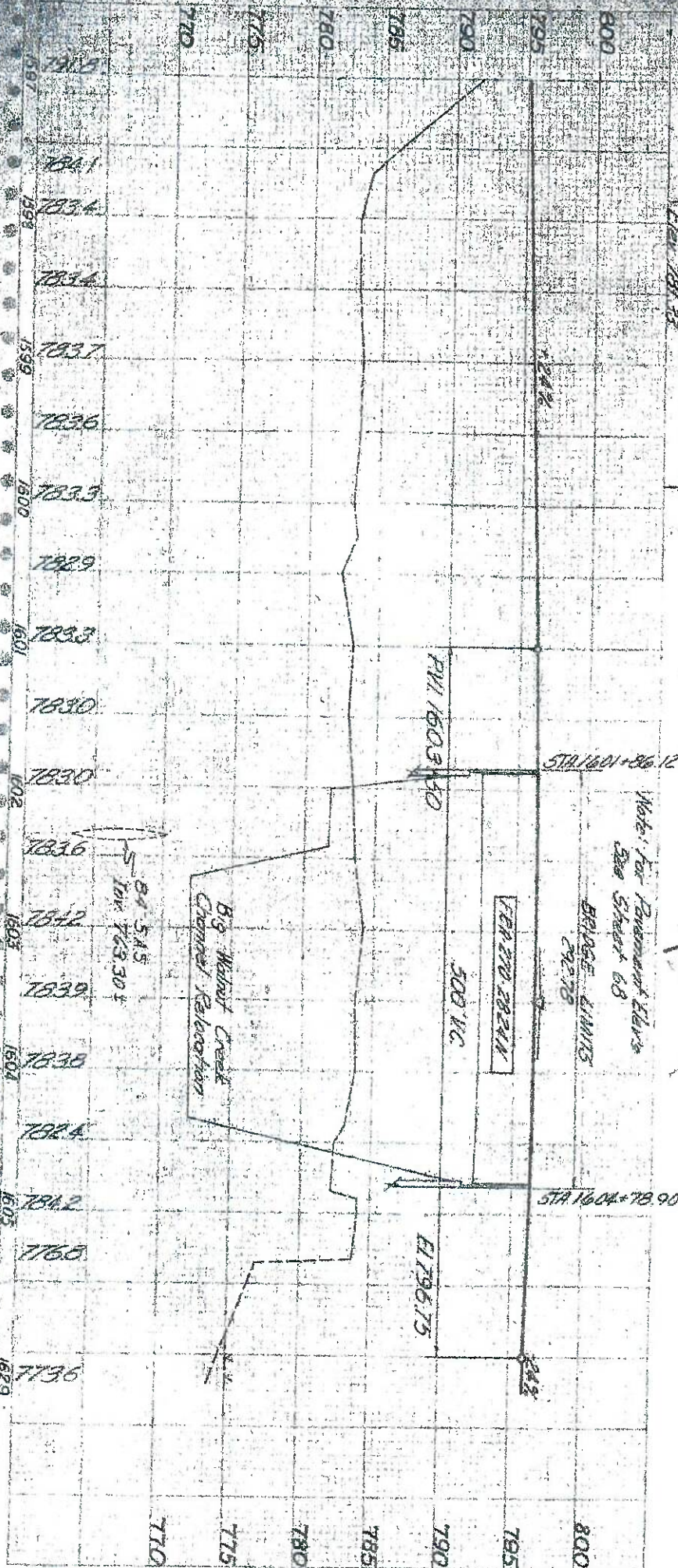
CODE	LOCATION	See Sheet No.	SY	LF	EA	ED	EA
D1	1601+25.15 to 1604+43.15	270-26.76N	603	603	603	603	603
D2	1604+43.15 to 1605+08.90	270-26.76N	603	603	603	603	603
D3	1605+08.90 to 1606+14.14	270-26.76N	603	603	603	603	603
D4	1606+14.14 to 1607+19.14	270-26.76N	603	603	603	603	603
TOTALS			2409	2409	2409	2409	2409

NO	Trunk Sewer	Table of Offsets
Station	Distance	Left of &
1597+00	115	
1598+00	120	
1599+00	125	
1600+00	130	
1601+00	130	
1601+25	130	

### EARTHWORK & SEEDING

LOCATION	Excavation	Embankment	Seeding	Mulching
1597+00 to 1605+08.90	206,772.81	0	0	0
1605+08.90 to 1606+14.14	599,007	0	0	0
1606+14.14 to 1607+19.14	755,410.00	0	0	0
TOTALS	1,561,189.81	0	0	0

PROPOSED STRUCTURE  
FRA-270-26.76N  
TYPE: 4 span concrete slab deck on  
precast concrete T-beam  
piers, and concrete abutments.  
SPAN: 20.00'-20.00'-20.00'-20.00'  
LOADING: HS-20-44  
ROADWAY: Left bridge width 75'-0.00'-  
Right bridge 80'-0.00'-18.00' lanes  
SHEW: 20'00" W-RT  
WEARING SURFACE: 1" Minimum  
APPROACH SLABS: AS-14.71(25.00')  
ALIGNMENT: Tangent  
SURFACE ELEVATION: None



BENCH MARK  
PE 115.4 Root of Sycamore  
at Sta 1603+42  
On Big Walnut Creek  
Elev 781.21

Note: For Foundation Elevation  
See Sheet 68

Note for Channel Plan  
See Sheet 118

PLAN & PROFILE STA 1597 to 1629





EMH & T