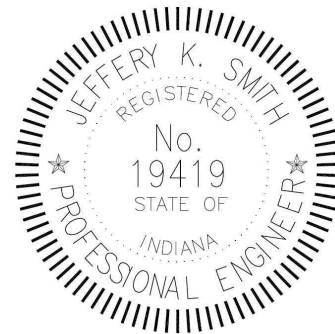


**Final Drainage Report for**  
**189 Umbarger Lane**  
**Building Expansion**

**Dated: November 30, 2023**



**Calculations Prepared By:**

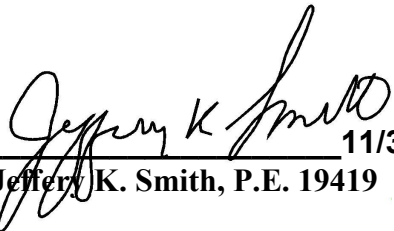
**PROJECTS plus**

1257 Airport Parkway, Suite A  
Greenwood, Indiana 46143

OFFICE (317) 882-5003  
FAX (317) 882-1082

LAND PLANNING · ENGINEERING · SURVEYING · PROJECT MANAGEMENT

**Certified By:**

  
**Jeffery K. Smith, P.E. 19419** 11/30/23

# **REPORT INDEX:**

## **I. Technical Information Data**

- Development Conditions
- Area Map
- FEMA Flood Map
- Soils Map
- Rainfall Data and Distribution

## **II. Approved Existing Conditions and Future Conditions Calculations**

- Existing Conditions
- Future Conditions

## **III. Watershed Delineation Maps**

- Drainage Area Map

## **TECHNICAL INFORMATION DATA**

### **Development Conditions:**

The proposed building expansion is located at the 189 Umbarger Lane, Franklin, IN 46131 on Lot 13 in the Early Interstate Park in the City of Franklin, Johnson County, Indiana. Existing ground cover is grass with soil hydrologic groups type 'B' and 'C'. The proposed development includes the construction of a 5,800 S.F. building expansion with asphalt pavement. Drainage will be provided by a combination of sheet flow and drainage swales.

The drainage watershed for the site is part of an approved drainage system for Early Interstate Park, prepared by Steven B. Williams, Franklin Engineering dated December 28, 1992. This tract, known as lot 13, is shown in as part of Basin "B" on the Future Drainage watershed basin map of the report prepared by Steven B. Williams. The approved drainage report for Basin "B" had a post-development runoff area of 5 acres that consisted of 2.5 acres of assumed 80% impervious coverage (labeled GB-1) and 2.5 acres of assumed 60% impervious coverage (labeled I-1). These coverages combine for an assumed impervious coverage of 70% maximum for lots in this watershed. This watershed releases to ditch storage along the east side of Umbarger Lane to culverts that release to (2) 12" RCP outlet control pipes, then release west toward an existing detention pond.

The calculations listed below for the proposed development project is to verify that the site is under the allowable impervious coverage and runoff coefficient.

Lot 13 – 1.05 acres

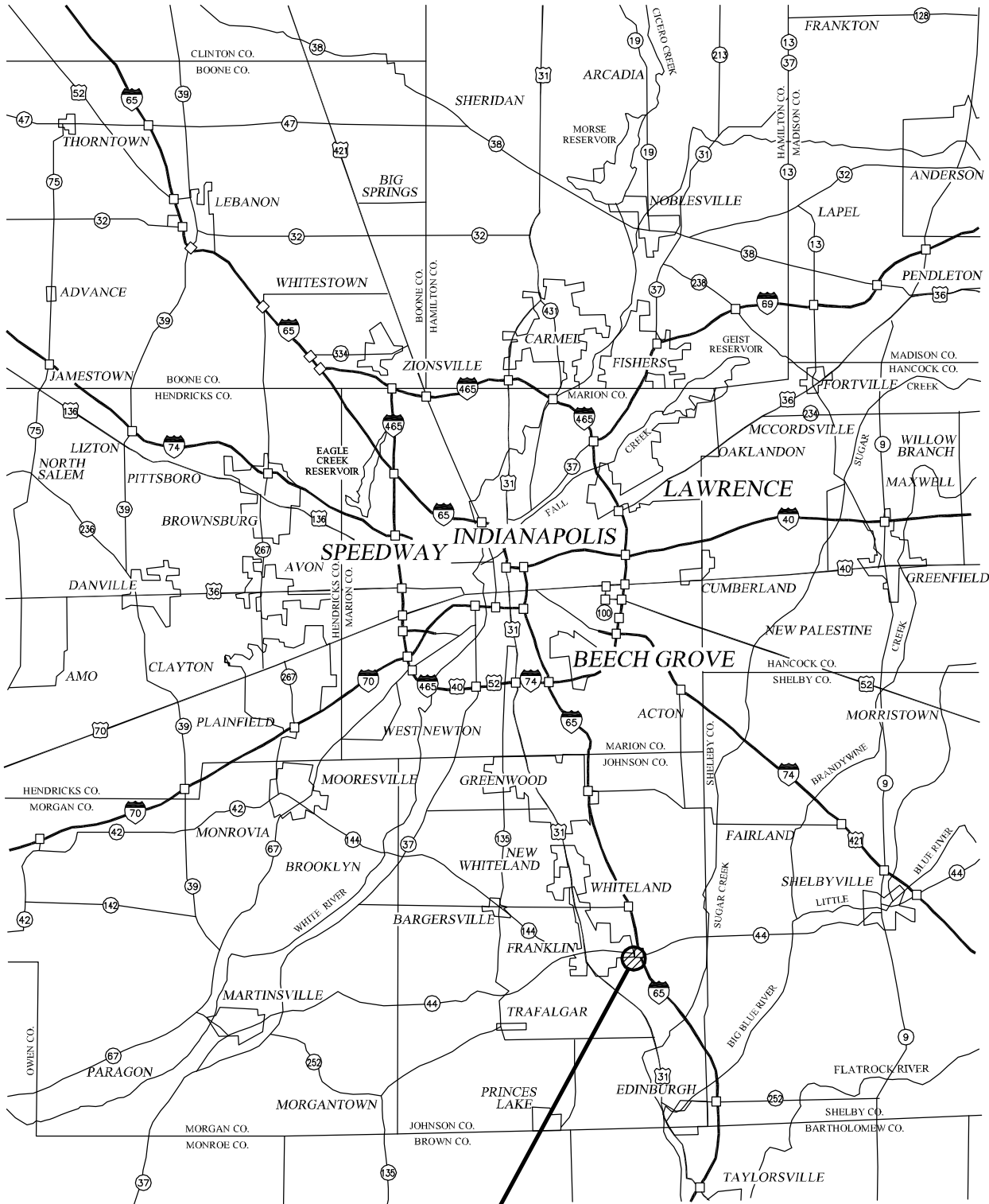
Existing impervious = 0.36 acres

Existing Coverage = 34.9% impervious

Proposed impervious = 0.57 acres

Proposed Coverage = 54.2% impervious

The proposed runoff coefficient for lot #13 is less than the computed impervious for future developments included in the Franklin Engineering report, no additional detention is required for this project.

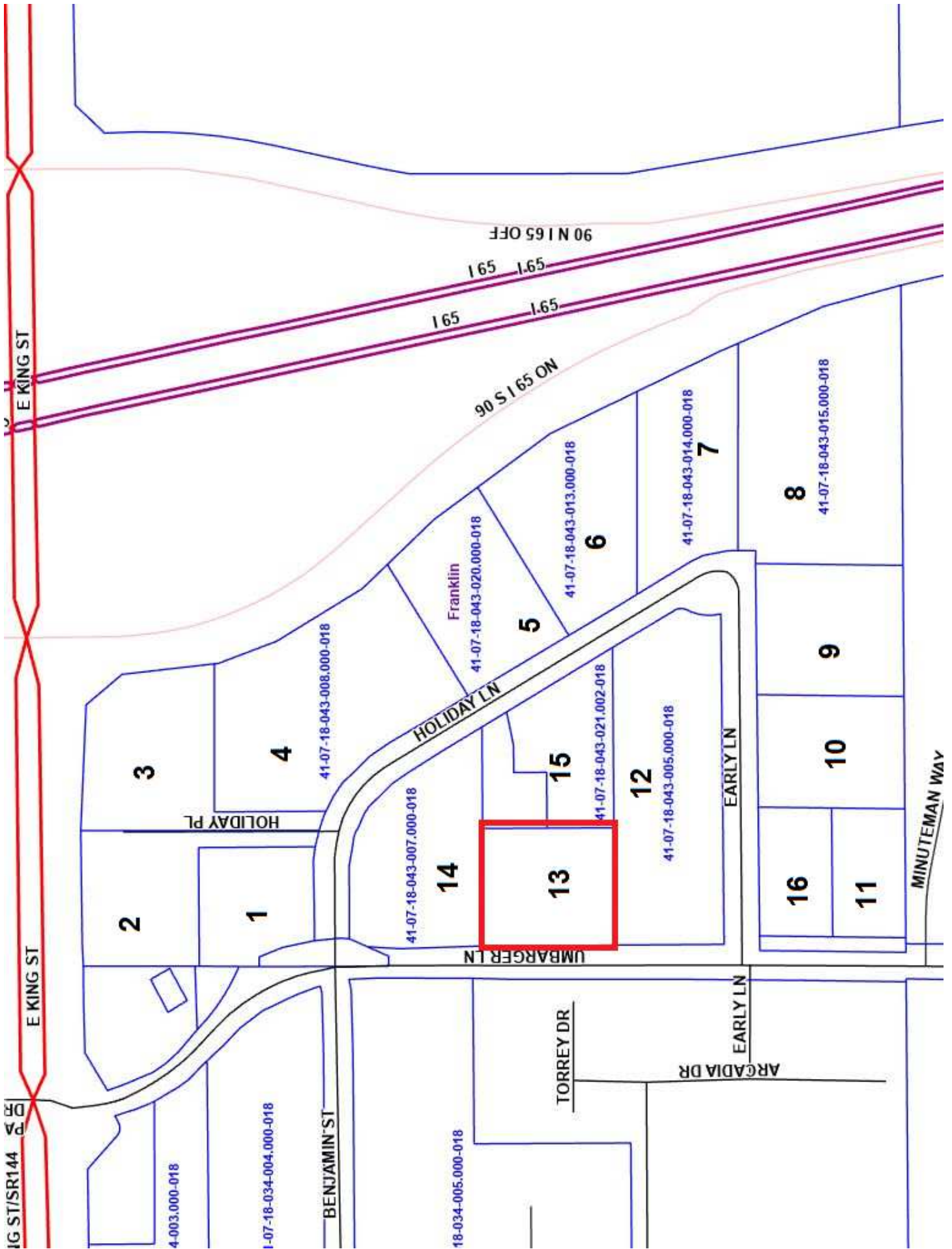


**SITE LOCATION**

**AREA MAP**







# National Flood Hazard Layer FIRMette

86°1'19"W 39°29'4"N



## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

**SPECIAL FLOOD HAZARD AREAS**

- Without Base Flood Elevation (BFE)  
*Zone A, V, A99*
- With BFE or Depth  
*Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile  
*Zone X*

Future Conditions 1% Annual Chance Flood Hazard  
*Zone X*

Area with Reduced Flood Risk due to Levee. See Notes.  
*Zone X*

Area with Flood Risk due to Levee  
*Zone D*

NO SCREEN  
*Zone X*

Effective LOMR  
*Zone D*

Area of Undetermined Flood Hazard  
*Zone D*

Channel, Culvert, or Storm Sewer  
Levee, Dike, or Floodwall

Cross Sections with 1% Annual Chance Water Surface Elevation

Coastal Transect

Base Flood Elevation Line (BFE)

Limit of Study

Jurisdiction Boundary

Coastal Transect Baseline

Profile Baseline

Hydrographic Feature

Digital Data Available

No Digital Data Available

Unmapped

MAP PANELS

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **11/30/2023 at 10:43 AM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



86°0'42"W 39°28'37"N

1:6,000

Feet

2,000

1,500

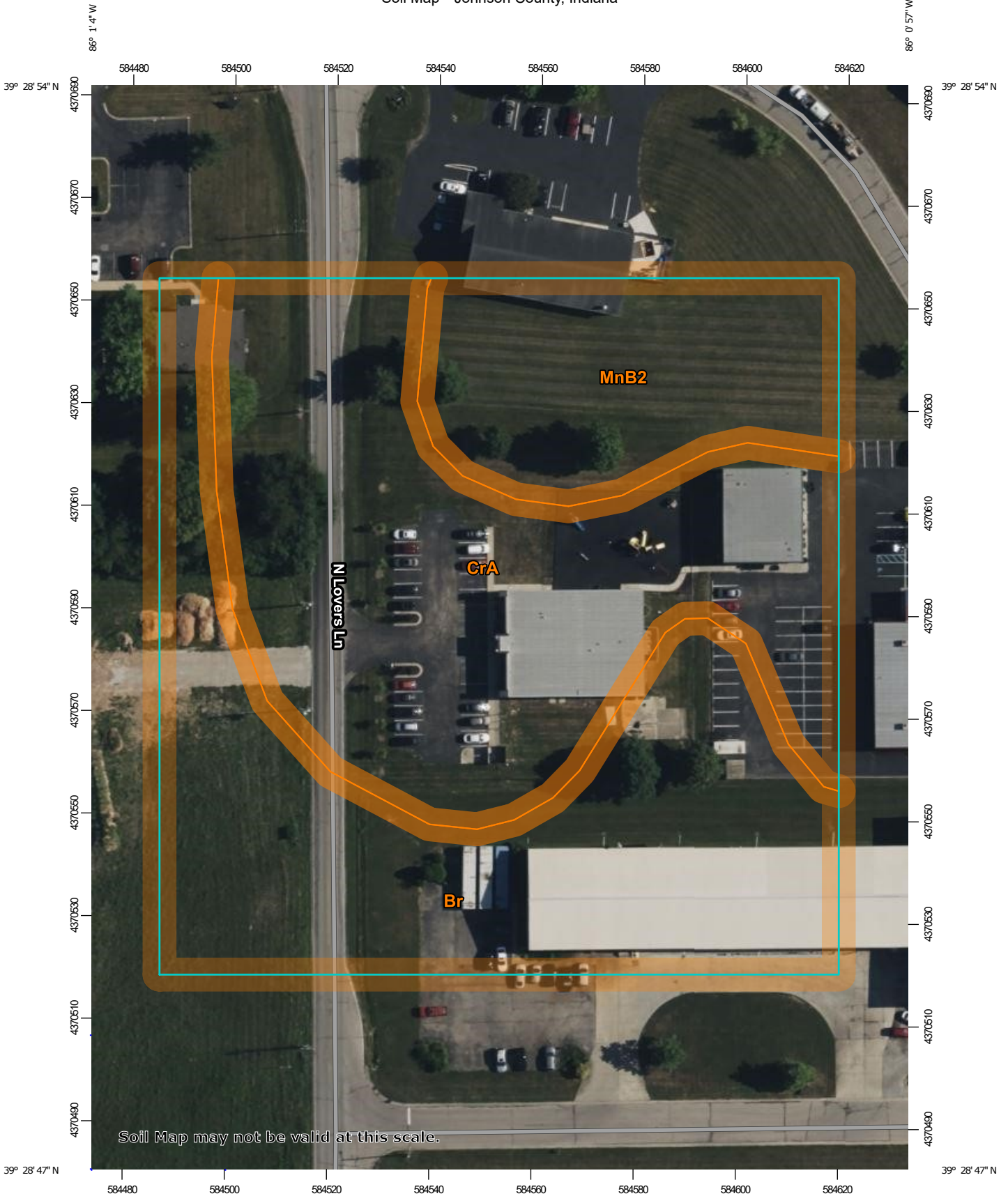
1,000

500

0

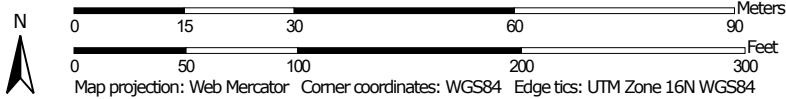


Soil Map—Johnson County, Indiana



Soil Map may not be valid at this scale.

Map Scale: 1:1,030 if printed on A portrait (8.5" x 11") sheet.



## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Br	Brookston silty clay loam, 0 to 2 percent slopes	1.8	39.6%
CrA	Crosby silt loam, fine-loamy subsoil, 0 to 2 percent slopes	1.9	43.2%
MnB2	Miami silt loam, 2 to 6 percent slopes, eroded	0.8	17.1%
<b>Totals for Area of Interest</b>		<b>4.5</b>	<b>100.0%</b>

# **Approved Existing Conditions and Future Conditions Calculations**

**Prepared by Steven B. Williams, Franklin Engineering  
for the  
Early Interstate Park  
Dated: December 28, 1992**

## EARLY INTERSTATE 65 PARK

### DRAINAGE REPORT

#### EXISTING CONDITIONS:

BASIN "A": Discharges Northeast to I-65 Ditch

$$\begin{aligned} \text{Area} &= 6 \text{ Ac.} & C &= .4 \text{ (cropland)} \\ L &= 500' & H &= 5' & T_c &= 5.5 \times 2 = 11 \text{ min.} \\ I_{10} &= 5 & I_{100} &= 7 \end{aligned}$$

$$\begin{aligned} Q_{10} &= 6 (.4) 5 = 12 \text{ cfs} \\ Q_{100} &= 6 (.4) 7 = 16.8 \text{ cfs} \end{aligned}$$

BASIN "B": Discharges West to pond south of the Cove

$$\begin{aligned} \text{Area} &= 11 \text{ Ac.} & C &= .4 \text{ (cropland)*} \\ L &= 900' & H &= 15' & T_c &= 7 \text{ min} \times 2 = 14 \text{ min.} \\ I_{10} &= 4.3 & I_{100} &= 6.2 \end{aligned}$$

$$\begin{aligned} Q_{10} &= 11 (.4) 4.3 = 19 \text{ cfs} \\ Q_{100} &= 11 (.4) 6.2 = 27.3 \text{ cfs} \end{aligned}$$

\* As Monroe had no detention, it will be considered as part of the new development.

BASIN "C": Discharges Southeast to I-65 ditch

$$\begin{aligned} \text{Area} &= 8.8 \text{ Ac.} & C &= .4 \text{ (cropland)} \\ L &= 950' & H &= 18.5 & T_c &= 7 \text{ min} \times 2 = 14 \text{ min.} \\ I_{10} &= 4.3 & I_{100} &= 6.2 \end{aligned}$$

$$\begin{aligned} Q_{10} &= 8.8 (.4) 4.3 = 15.1 \text{ cfs} \\ Q_{100} &= 8.8 (.4) 6.2 = 21.8 \text{ cfs} \end{aligned}$$

#### FUTURE CONDITIONS:

BASIN "A": Construct 1/3 detention acre pond Northeast with restrictive pipe discharge.

$$\begin{aligned} \text{Area} &= 6 \text{ Ac.} \\ \text{Assume } 80\% \text{ impervious areas (GB-1): } & 4.8 \text{ Ac @ } C = .9 & \text{CA} &= 4.32 \\ & \text{(gross): } 1.2 \text{ Ac @ } C = .3 & \text{CA} &= \underline{.36} \\ & & \text{TOTAL CA} &= 4.68 \\ T &= 5 \text{ min.} & I_{10} &= 6.4 & I_{100} &= 8.5 \end{aligned}$$

$$\begin{aligned} Q_{10} &= 4.68 (6.4) = 30.0 \text{ cfs} \\ Q_{100} &= 4.68 (8.5) = 39.8 \text{ cfs} \end{aligned}$$

Restrictive Pipe: Use 15" CMP @ .5% HW/D = 2  $Q_{cap} = 5.7 \text{ cfs}$

**Page 2**  
**Early Interstate 65 Park**  
**Drainage Report**

**Storage Hydrograph:**

<u>Time(min)</u>	<u>CA</u>	<u>I<sub>100</sub></u>	<u>Q<sub>100</sub></u>	<u>Q<sub>release</sub></u>	<u>Q<sub>store</sub></u>	<u>Volume(cf)</u>
5	4.68	8.5	39.8	5.7	34.1	10,230
15	4.68	6.1	28.5	5.7	22.8	20,520
30	4.68	4.5	21.1	5.7	15.4	27,720
45	4.68	3.7	17.3	5.7	11.6	31,320
60	4.68	3.0	14.0	5.7	8.3	29,880
75	4.68	2.7	12.6	5.7	6.9	31,050
90	4.68	2.4	11.2	5.7	5.5	29,700
120	4.68	2.0	9.4	5.7	3.7	26,640

Peak Storage Required = 31,050 cf or .71 Ac. Ft.  
 Storage Provided = 0.4 Ac @ 24" depth = .80 Ac. Ft.

**BASIN "B": Reduce overall contributing area: Provide ditch storage**

A = 5 Ac. Assume 80% Impervious (GB-1): 2.5 x .8 @ C = .9 CA = 2.25  
 Assume 60% Impervious (I-1): 2.5 x .6 @ C = .9 CA = 1.35  
 1.6 Ac @ C = .3 CA = .45  
**TOTAL CA = 4.05**

T = 7 min. I<sub>10</sub> = 5.8 I<sub>100</sub> = 8.0

Q<sub>10</sub> = 4.05 (5.8) = 23.5 cfs

Q<sub>100</sub> = 4.05 (8.0) = 32.4 cfs

Q<sub>cap</sub> 10" CMP = 1.5 cfs

Replace: 10" CMP with 2-12" RCP's @ .5% HW/D = 1 Q<sub>cap</sub> = 4.4 cfs

**Storage Hydrograph:**

<u>Time(min)</u>	<u>CA</u>	<u>I<sub>100</sub></u>	<u>Q<sub>100</sub></u>	<u>Q<sub>release</sub></u>	<u>Q<sub>store</sub></u>	<u>Volume(cf)</u>
7	4.05	8.0	32.4	4.4	28.0	11,760
15	4.05	6.1	24.7	4.4	20.3	18,270
30	4.05	4.5	18.2	4.4	13.6	24,480
45	4.05	3.7	15.0	4.4	10.6	28,620
60	4.05	3.0	12.2	4.4	7.8	28,080
75	4.05	2.7	10.9	4.4	6.5	29,250
90	4.05	2.4	9.7	4.4	5.3	28,620
120	4.05	2.0	8.1	4.4	3.7	26,640
150	4.05	1.7	6.9	4.4	2.5	22,500

Peak Storage Required = 29,250 cf or .67 Ac. Ft.  
 Storage Provided in Ditches = .67 Ac. Ft.

**Page 3**  
**Early Interstate 65 Park**  
**Drainage Report**

BASIN "C": Construct 1/2 Ac. detention pond Southeast with restrictive pipe outlet.  
 A = 14.8 Ac.

"I-2" 60% Impervious:	8 Ac x .6 @	C = .9 CA = 4.32
gross:	8 Ac x .4 @	C = .3 CA = .96
"GB-1" 80% Impervious:	6.8 Ac x .8 @	C = .9 CA = 4.90
gross:	6.8 Ac x .2 @	C = .3 CA = .41
		<b>TOTAL CA 10.59</b>

T = 5 min.    I<sub>10</sub> = 4.5    I<sub>100</sub> = 8.5  
 Q<sub>10</sub> = 4.5 (10.59) = 47.7 cfs  
 Q<sub>100</sub> = 8.5 (10.59) = 90.0 cfs

Restrictive Pipe: Use 18" CMP @ .5%    HW/D = 2    Q<sub>cap</sub> = 10 cfs

**Storage Hydrograph:**

<u>Time(min)</u>	<u>CA</u>	<u>I<sub>100</sub></u>	<u>Q<sub>100</sub></u>	<u>Q<sub>release</sub></u>	<u>Q<sub>store</sub></u>	<u>Volume(cf)</u>
5	10.59	8.5	90.0	10	80.0	24,000
15	10.59	6.1	64.6	10	54.6	49,140
30	10.59	4.5	47.7	10	37.7	67,860
45	10.59	3.7	39.2	10	29.2	78,840
60	10.59	3.0	31.8	10	21.8	78,480
75	10.59	2.7	28.6	10	18.6	83,700
90	10.59	2.4	25.4	10	15.4	83,160
120	10.59	2.0	21.2	10	11.2	80,640
150	10.59	1.7	18.0	10	8	72,000

Peak Storage Required = 83,700 cf or 1.9 Ac. Ft.  
 Storage Provided = 1/2 Ac @ 4' depth = 2.0 Ac. Ft.

**10 year undeveloped versus 100 year developed reductions in runoff:**

Basin "A": 53%  
 Basin "B": 78%  
 Basin "C": 17%  
 Net site reduction: 56%

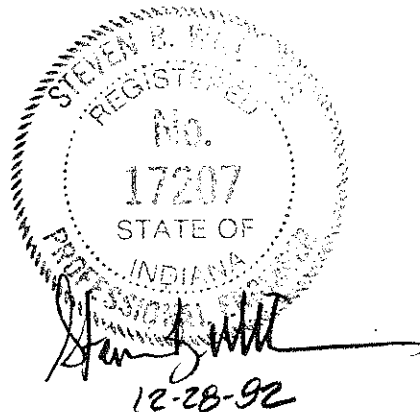
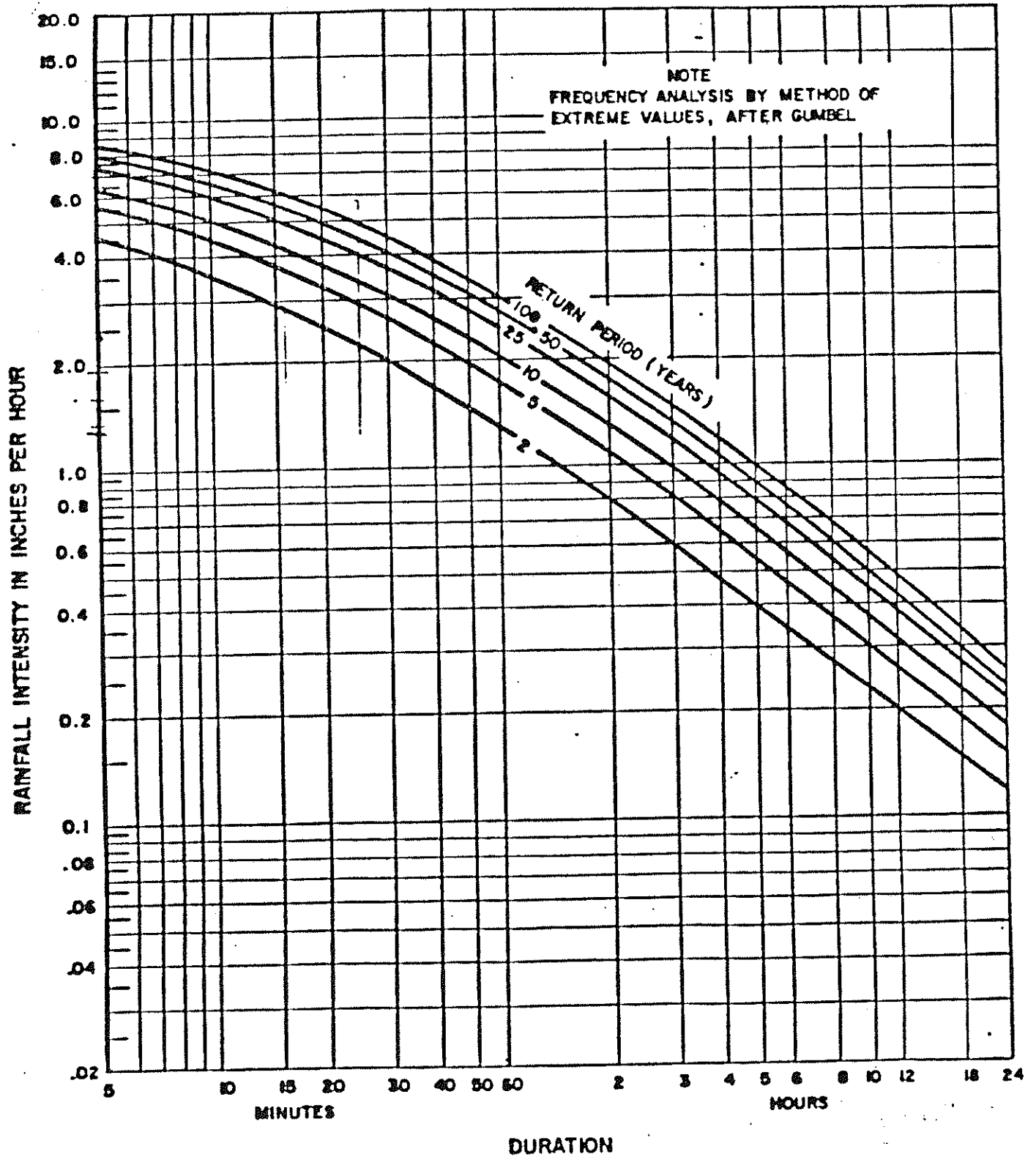




Figure 1

U.S. DEPARTMENT OF COMMERCE · WEATHER BUREAU · COOPERATIVE STUDIES SECTION

RAINFALL INTENSITY - DURATION - FREQUENCY CURVES  
INDIANAPOLIS, INDIANA  
1903 - 1951







DESIGNED:  
DRAWN: SEN  
CHECKED:

PRELIMINARY PLAN  
INTERSTATE 65 - PARK  
EARLY BIRD DEVELOPMENT, INC.  
FRANKLIN, IN.

Engineers and Land Surveyors  
**Franklin Engineering Company**  
151 West Jefferson Street  
Franklin, Indiana 46151  
(317) 736-4549



REVISIONS

DATE	REVISION

PROJ. NO. 92-  
SCALE 1"=50'  
DATE 12-26-98  
FILE NO.  
SHT / OF /

EXISTING DRAINAGE





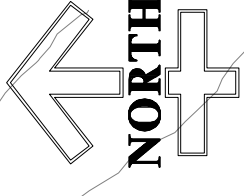
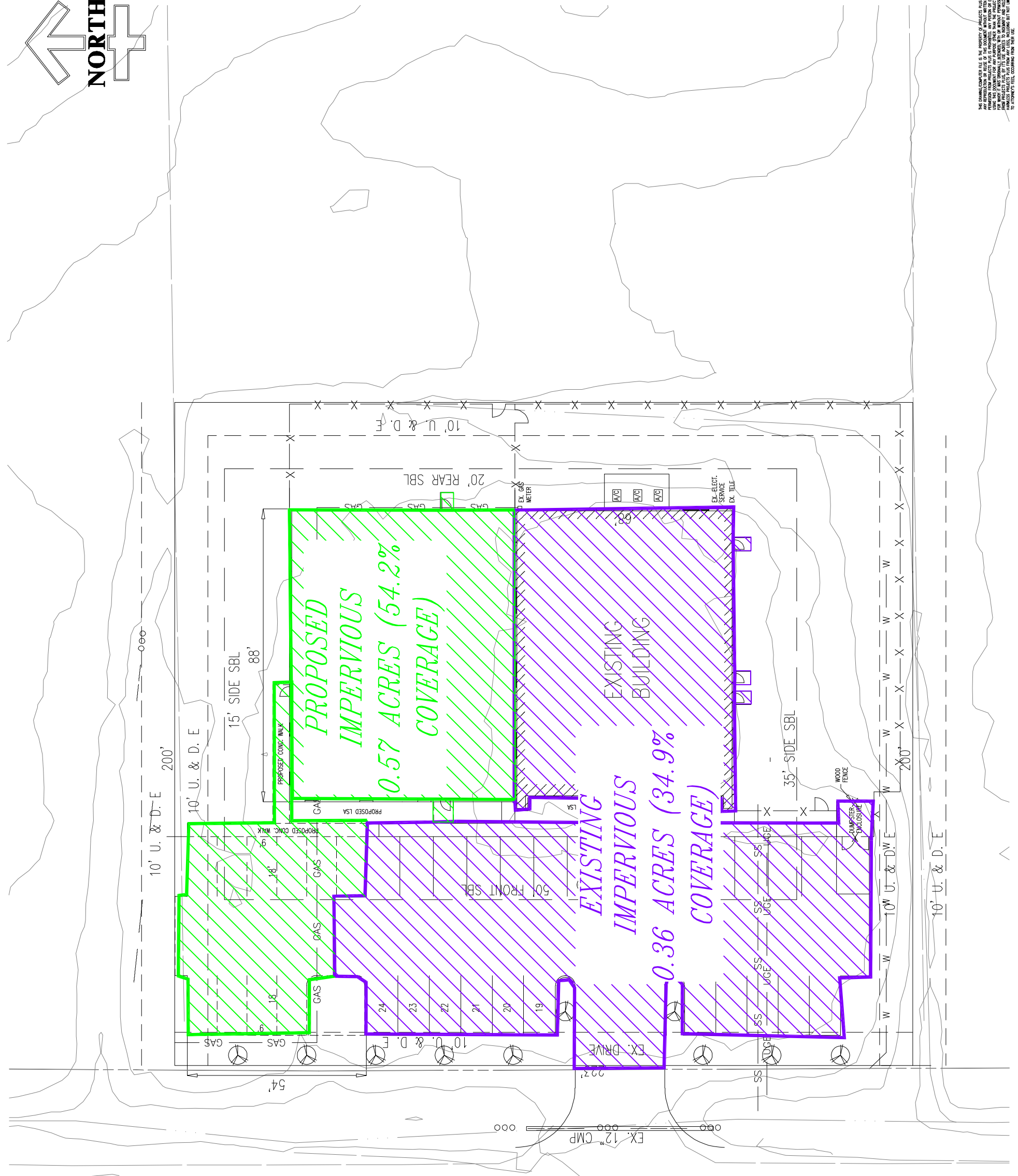


# **Watershed Basin Maps**

Drainage Area Map

**UMBARGER LANE**

736



PROJECT 189 UMBARGER LANE CITY OF FRANKLIN, JOHNSON COUNTY, INDIANA TITLE DRAINAGE AREA MAP		SITE ENGINEERING-LAND SURVEYING-CONSTRUCTION LAYOUT 1257 Airport Parkway Suite A - Greenwood, Indiana 46143 (317)-882-5003 <b>GREENWOOD SURVEYING COMPANY</b>		JOB NUMBER <b>23023</b>	SHEETS <b>1</b>	DATE <b>NOVEMBER 30, 2023</b>
SCALE 1" = 100'	DRAWN JPH	CHECKED JKS	CERTIFIED JKS	SHEET <b>1</b>	OF <b>1</b>	DATE
SYMBOLO	REVISION	DATE	DATE	DATE	DATE	DATE

THE INFORMATION ON THIS PLAN IS THE PROPERTY OF GREENWOOD SURVEYING COMPANY. IT IS TO BE USED ONLY FOR THE PROJECT AND SITE SPECIFICALLY IDENTIFIED ON THIS PLAN. NO PART OF THIS PLAN IS TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF GREENWOOD SURVEYING COMPANY. GREENWOOD SURVEYING COMPANY SHALL NOT BE LIABLE FOR ANY DAMAGES, INCLUDING BUT NOT LIMITED TO, PROPERTY LOSS, OCCURRING FROM THE USE OF THIS PLAN.