

STORMWATER MANAGEMENT REPORT

Prepared by GPD Group for:

City of Franklin
70 E Monroe Street
Franklin, Indiana 46131

TACO BELL

1579 Morton Street
Franklin, Indiana 46131

Owner:

Taco Bell of America, Inc.
1900 Colonel Sanders Lane
Louisville, KY 40213

Designer:

Timothy Wright

Project Manager:

Kenneth Bukowski, P.E.

Design Date:

March 2021

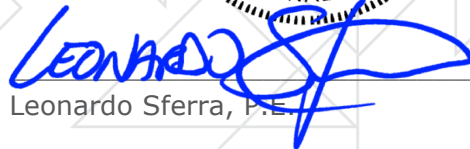
Revision Date:

- -

GPD Project Number:

2018088.31




Leonardo Sferra, P.E.

03/30/21

Date

Table of Contents

Section 1:

- Project Background
- Water Quality Analysis
- Stormwater Runoff Control Criteria
- Storm Sewer Design
- Soil Erosion and Sediment Control

Section 2:

- National Resources Conservation Services (NRCS) Site Soils Map

Section 3:

- Stormwater Management Map – Pre-Development Conditions
- Stormwater Management Map – Post-Development Conditions

Section 4:

- Drainage Delineation Map
- Rainfall Intensity Table
- Storm Sewer calculations
- Storm Profiles

Figures

Figure 1: *Location Map*



Section 1



Project Background

The following report includes stormwater management calculations as required by the City of Franklin. This report accompanies the site development plans.

The project parcel is owned by Taco Bell of America, Inc. with a total acreage of 0.77 acres located on North Morton Street (north of Lemley Street, East of U.S. Highway 31, South of North Main street, and west of N Morton Street in the City of Franklin, Johnson County, Indiana. See Figure 1 below (pink dot indicates project location).

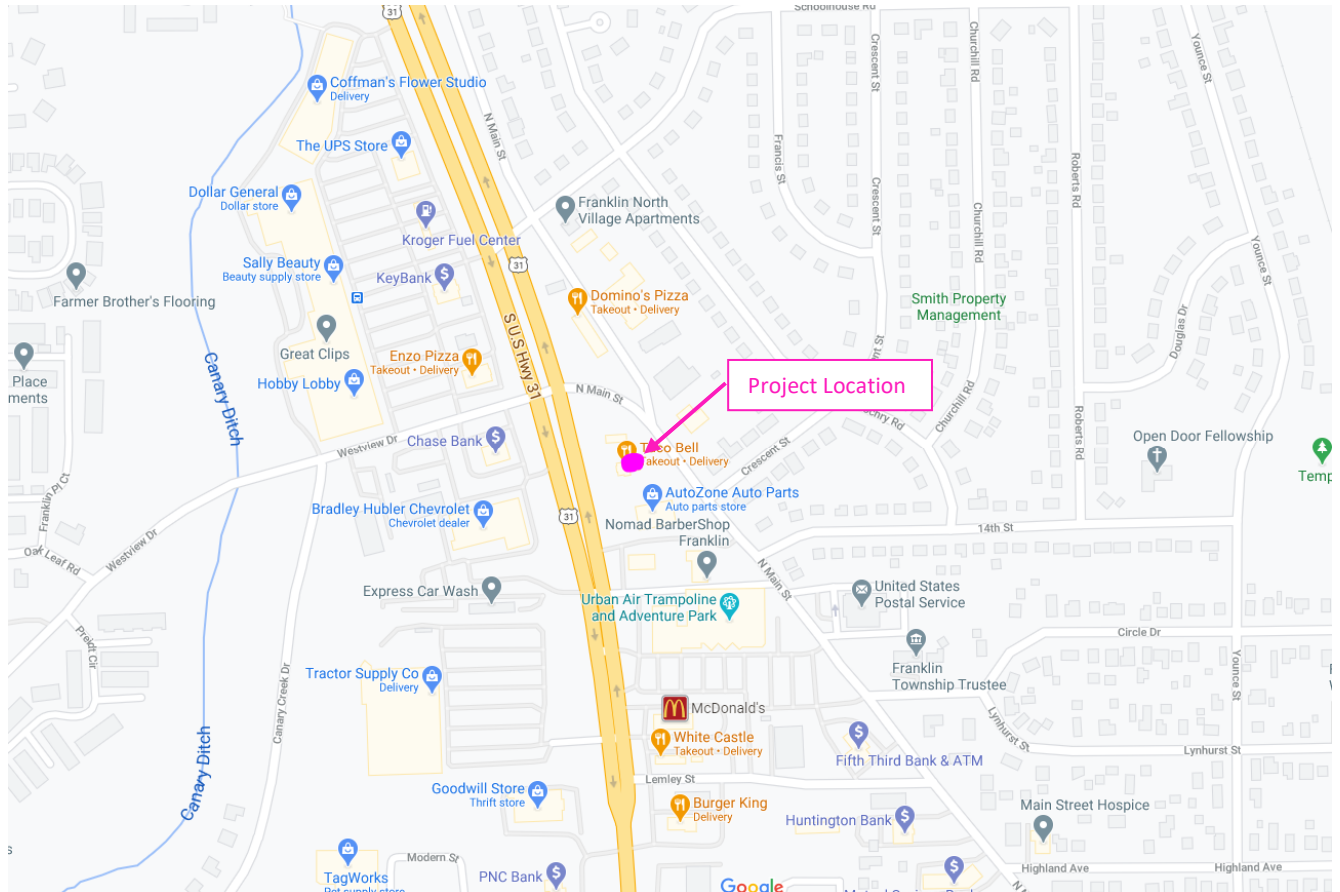



Figure 1: Location Map

A National Resources Conservation Service (NRCS) web soil survey was performed for the property to determine the soil type(s) that underlie the existing site. The soil type was determined to be Urban Land-Crosby silt loam complex, fine-loamy subsoil (UcfA). The underlying soil on the property has no hydrologic soil rating. The NRCS site soils map, including more detailed description of the existing soil properties and qualities, can be found in Section 2 of this report.

The existing site previously consisted of a Taco Bell building with associated drive thru and asphalt parking lot.

(The following existing land use breakdown is based off total parcel acreage, not land disturbance)

The existing project site, broken down by land use, is 66% impervious surface (runoff coefficient = .95) and 34% urban lawn surface cover (runoff coefficient = .25). The stormwater management map for pre-developed conditions can be found in Section 3 of this report. In general, the existing topography for the project area drains from a high point in the middle of the site to the west and east. U.S. Route 31's stormwater sheet flows to curb openings in the entrance /exit drives and overland through a swale into existing storm sewer network. N. Morton's stormwater flows from the north and south into existing swales / depressions towards catch basins of the existing storm network. The pavement sheets flows to the southeast and out the entrance /exit drive into the road and then is collected in the existing storm network.



The demolition components of this project will consist of demolition of the existing Taco Bell building, removal of the asphalt parking areas, and removal of other site amenities within the project boundaries to allow for the construction of a new Taco Bell building and exterior site layout.

(The following proposed land use breakdown is based off total parcel acreage, not land disturbance)

The proposed project site, broken down by land use, is 63% impervious surface (runoff coefficient = .95) and 37% urban lawn surface cover (runoff coefficient = .25). The stormwater management map for post-developed conditions can be found in Section 3 of this report. In general, the proposed topography after construction will be similar to the existing in that the site will have the same high point and sheet flow in a similar manner. U.S. Route 31's stormwater majority sheet flows to the southwest corner where it is collected and conveyed into the exiting storm sewer network. The rest sheet flow to curb openings in the entrance /exit drives and overland through a proposed swale into a yard drain that is conveyed to the existing storm network. N. Morton's stormwater flows from the north and south into proposed swales towards existing catch Basins. The pavement sheets flows to the southeast and to a new inlet to capture the water before it runs out of the drive and is collected and conveyed to the existing storm network. The proposed construction will include a new Taco Bell building, concrete patio, concrete sidewalks, asphalt pavement, and other site amenities pertinent to the daily function of the Taco Bell store. Stormwater runoff for the proposed site is described in later sections of this report.

Water Quality Analysis

Per the requirements of the *City of Franklin* and the *Indiana Department of Environmental Management (IDEM)*, sites disturbing over one acre of land are required to provide post construction BMPs to treat runoff before it leaves the site. With a total disturbance of approximately 0.80 acres, post-construction BMP's will not be required for this site.

Stormwater Runoff Control Criteria

Per initial conversation with the City of Franklin, the project will not require stormwater detention if there is no increase in impervious area. Due to the 0.02 acre decrease in impervious area for the proposed construction, stormwater detention will not be required.

Storm Sewer Design

The on-site storm sewer system has been designed to be in accordance with the requirements set forth in the City of Franklin Standard Specifications via AutoCAD's Hydraflow Storm Sewers Extension which utilizes the rational method for determining pipe flows and capacity. The storm system has been designed to convey the 10-year storm frequency and the hydraulic grade line (HGL) was checked for the 100-year storm frequency with the system starting HGL 80% full flow conditions. The resulting calculations confirmed that the HGL remains below the inlet structure castings.

The drainage delineation map, pipe intensity capacity calculations, storm sewer calculations, and storm profiles can be found in Section 4 of this report.



Soil Erosion and Sediment Control

The proposed construction will disturb approximately 0.80 acres of the project site.

The proposed development shall provide erosion and sedimentation control measures as detailed on the site improvement plans. It is the contractor's responsibility during construction to maintain all sedimentation and stormwater pollution prevention items at all times which includes regular removal and disposal of accumulated debris. Until the site is stabilized, all erosion and sediment controls must be maintained properly. Maintenance must include inspections of all erosion and sediment controls after each runoff event and on a weekly basis. All preventative and remedial maintenance work, including clean out, repair, replacement, regrading, reseeding, remulching must be performed immediately. If erosion and sediment controls fail to perform as expected, replacement controls or modifications of those installed will be required.



Section 2



Soil Map may not be valid at this scale.

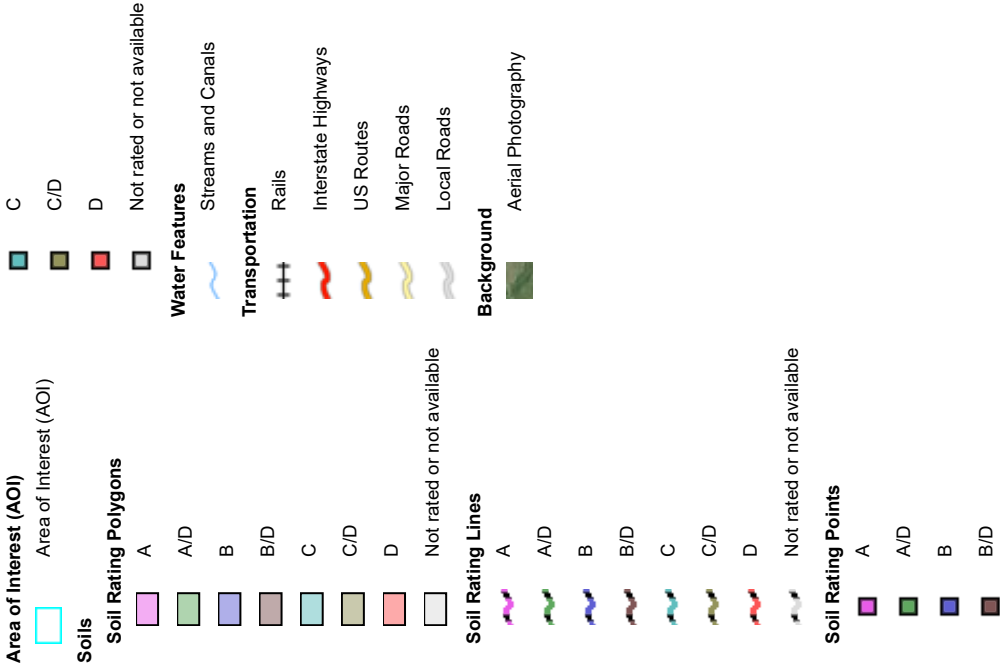
Map Scale: 1:963 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84



MAP LEGEND



MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Johnson County, Indiana
Survey Area Data: Version 28, Jun 4, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 27, 2019—Sep 26, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
UcfA	Urban land-Crosby silt loam complex, fine-loamy subsoil, 0 to 2 percent slopes		3.2	84.4%
YclA	Crosby silt loam, fine-loamy subsoil-Urban land complex, 0 to 2 percent slopes	C/D	0.6	15.6%
Totals for Area of Interest			3.8	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

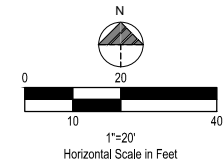
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



Section 3



US ROUTE 31 - PRE DEVELOPMENT

IMPERVIOUS = 0.26 AC

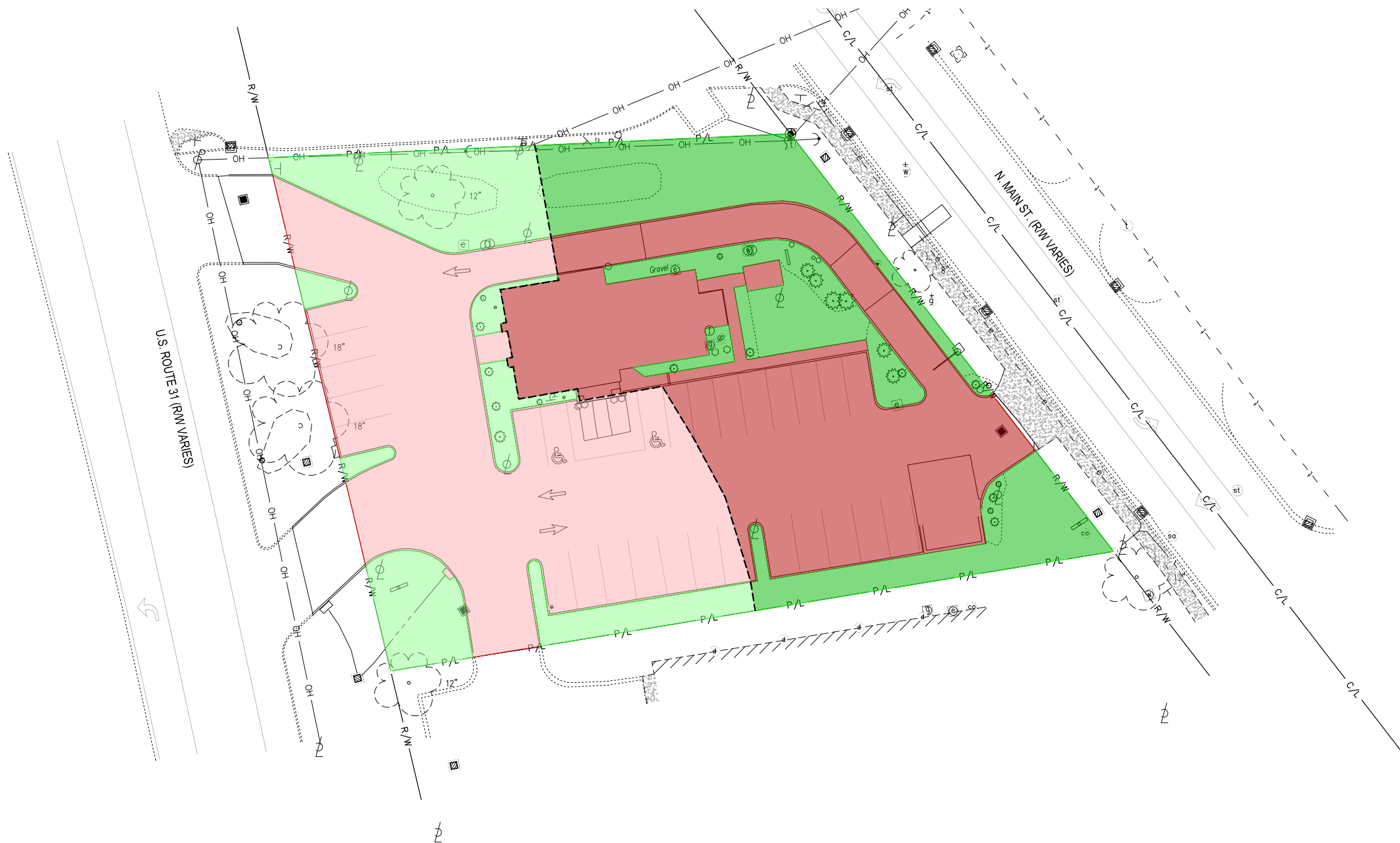
PERVIOUS = 0.11 AC

N MAIN STREET - PRE DEVELOPMENT

IMPERVIOUS = 0.25 AC

PERVIOUS = 0.15 AC

TOTAL AREA = 0.77 AC



DATE	REMARKS

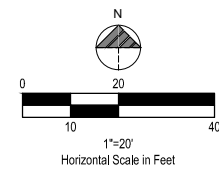
CONTRACT DATE: 02.01.21
BUILDING TYPE: END20
PLAN VERSION: MARCH 2020
BRAND DESIGNER:
SITE NUMBER: 294252
STORE NUMBER: 2679
PA/PM: JW
DRAWN BY.: TW
JOB NO.: 2018088.31

TACO BELL
1579 N. MORTON ST.
FRANKLIN, IN 46131

TACO BELL
ENDEAVOR 2.0
PRE
DEVELOPEMENT
MAP

PRE

PLOT DATE:



US ROUTE 31 - PRE DEVELOPMENT

IMPERVIOUS = 0.24 AC

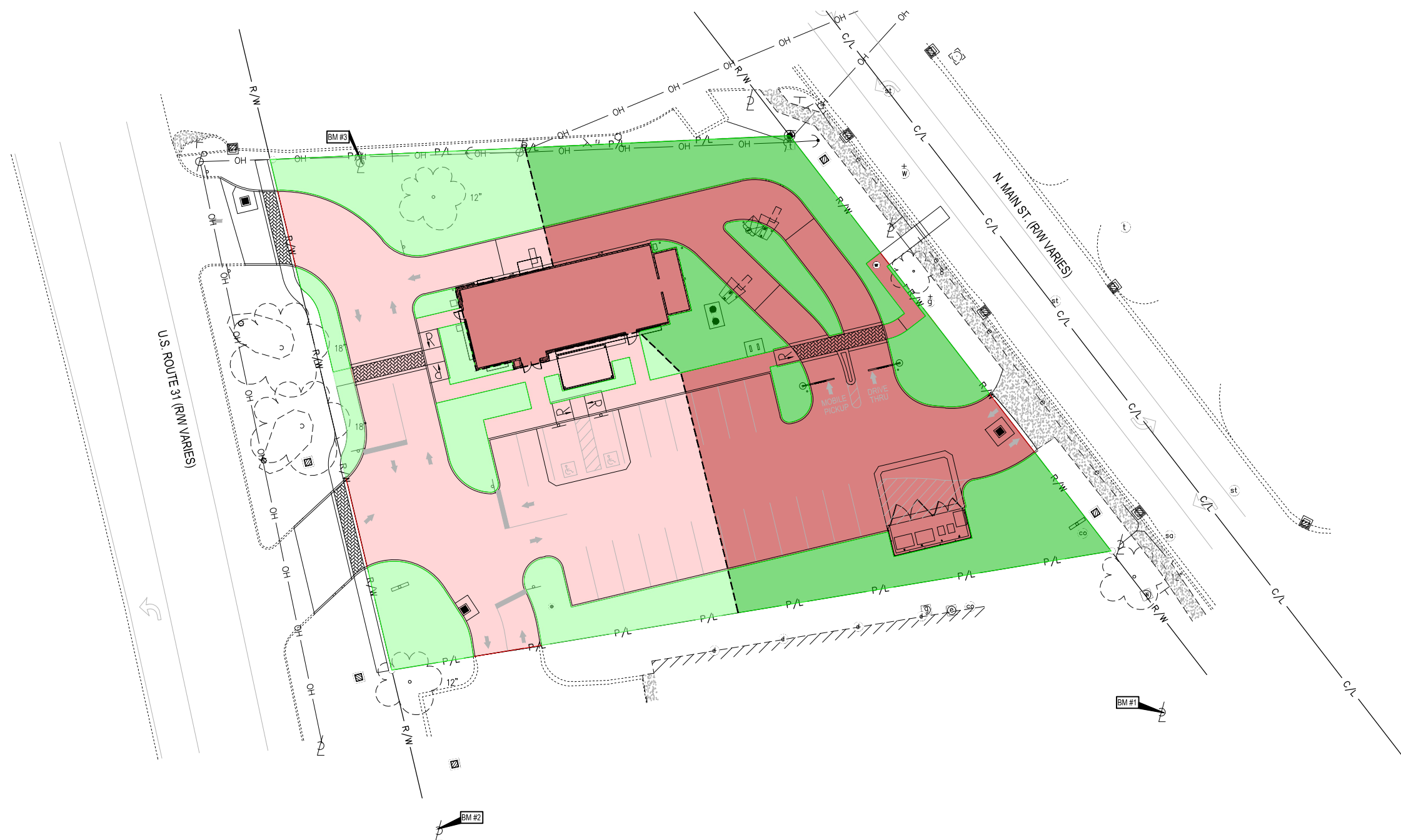
PERVIOUS = 0.13 AC

N MAIN STREET - PRE DEVELOPMENT

IMPERVIOUS = 0.24 AC

PERVIOUS = 0.16 AC

TOTAL AREA = 0.77 AC



DATE	REMARKS

CONTRACT DATE: 02.01.21
BUILDING TYPE: END20
PLAN VERSION: MARCH 2020
BRAND DESIGNER:
SITE NUMBER: 294252
STORE NUMBER: 2679
PA/PM: JW
DRAWN BY.: TW
JOB NO.: 2018088.31

TACO BELL
1579 N. MORTON ST.
FRANKLIN, IN 46131

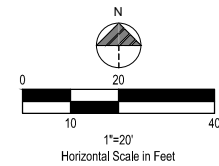
TACO BELL
ENDEAVOR 2.0
POST
DEVELOPEMENT
MAP

POST
PLOT DATE:



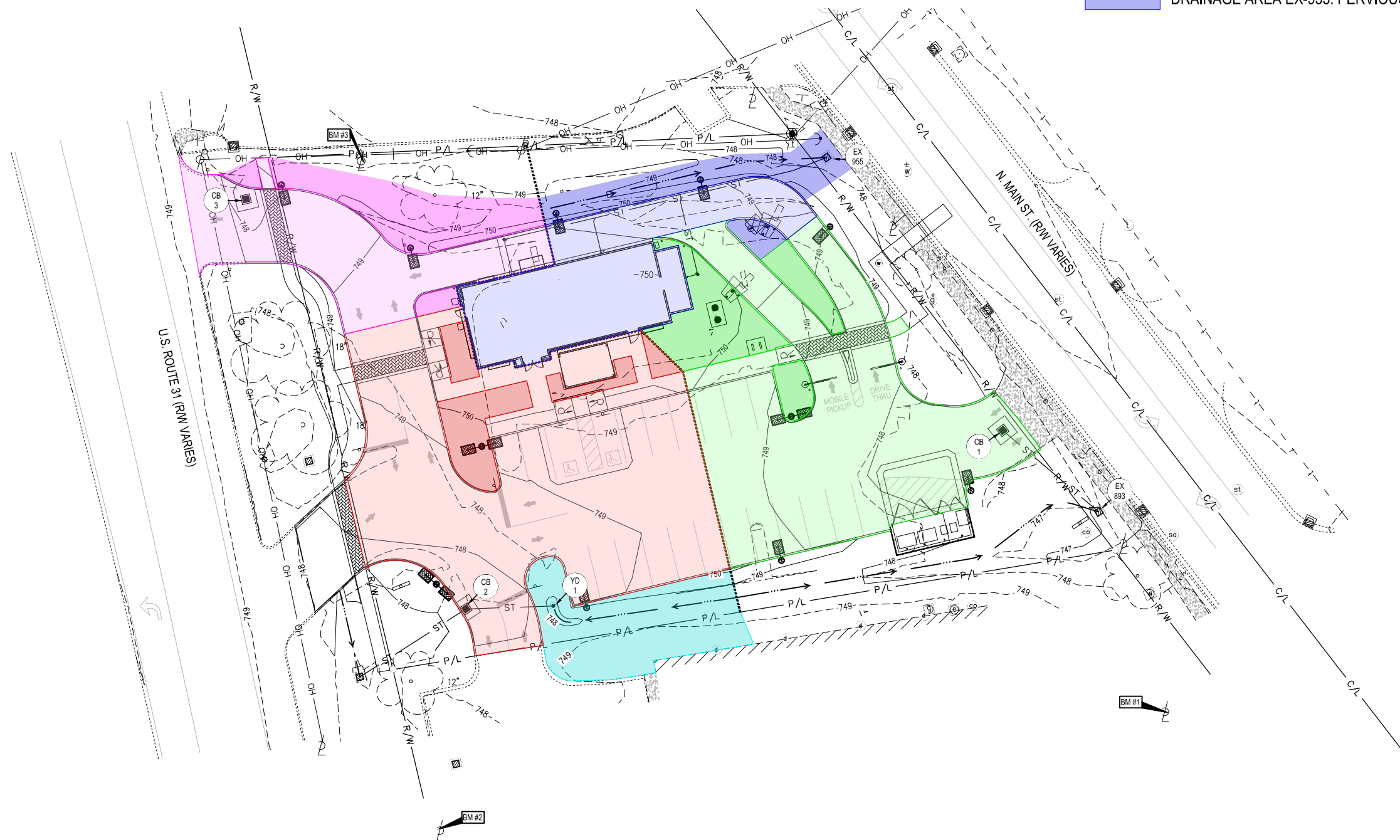
Section 4





DRAINAGE AREA LEGEND

- DRAINAGE AREA CB-1: IMPERVIOUS = 0.16 AC
- DRAINAGE AREA CB-1: PERVIOUS = 0.03 AC
- DRAINAGE AREA CB-2: IMPERVIOUS = 0.20 AC
- DRAINAGE AREA CB-2: PERVIOUS = 0.02 AC
- DRAINAGE AREA YD-1: PERVIOUS = 0.04 AC
- DRAINAGE AREA CB-3: IMPERVIOUS = 0.07 AC
- DRAINAGE AREA CB-3: PERVIOUS = 0.03 AC
- DRAINAGE AREA EX-955: IMPERVIOUS = 0.07 AC
- DRAINAGE AREA EX-955: PERVIOUS = 0.03 AC



UTILITIES SHOWN ON SURVEY WERE LOCATED BASED
ON FIELD MARKINGS PROVIDED BY 1/13/2021 811 REQUEST
CONFIRMATION NO.: 2101134995

BENCHMARKS:
STATE PLANE GRID NORTH, NAD 83 (2011), INDIANA EAST ZONE.
ELEVATIONS ARE NAVD 88, GEOID 12B.
TIED BY GNSS TO THE IN.D.O.T. VRS.

BENCHMARK #1 - BOX CUT E-SIDE LIGHTPOLE BASE
N 1546573, E 216072
ELEVATION=752.05

BENCHMARK #2 - BOX CUT N-SIDE LIGHTPOLE BASE
N 1546534, E 215831
ELEVATION=751.11

BENCHMARK #3 - SE ANCHOR BOLT LIGHTPOLE BASE
N 1546756, E 215806
ELEVATION=750.40

DATE	REMARKS

CONTRACT DATE: 02.01.21
BUILDING TYPE: END20
PLAN VERSION: MARCH 2020
BRAND DESIGNER:
SITE NUMBER: 294252
STORE NUMBER: 2679
PA/PM: JW
DRAWN BY.: TW
JOB NO.: 2018088.31

TACO BELL

1579 N. MORTON ST.
FRANKLIN, IN 46131



ENDEAVOR 2.0

DRAINAGE MAP

D-MAP

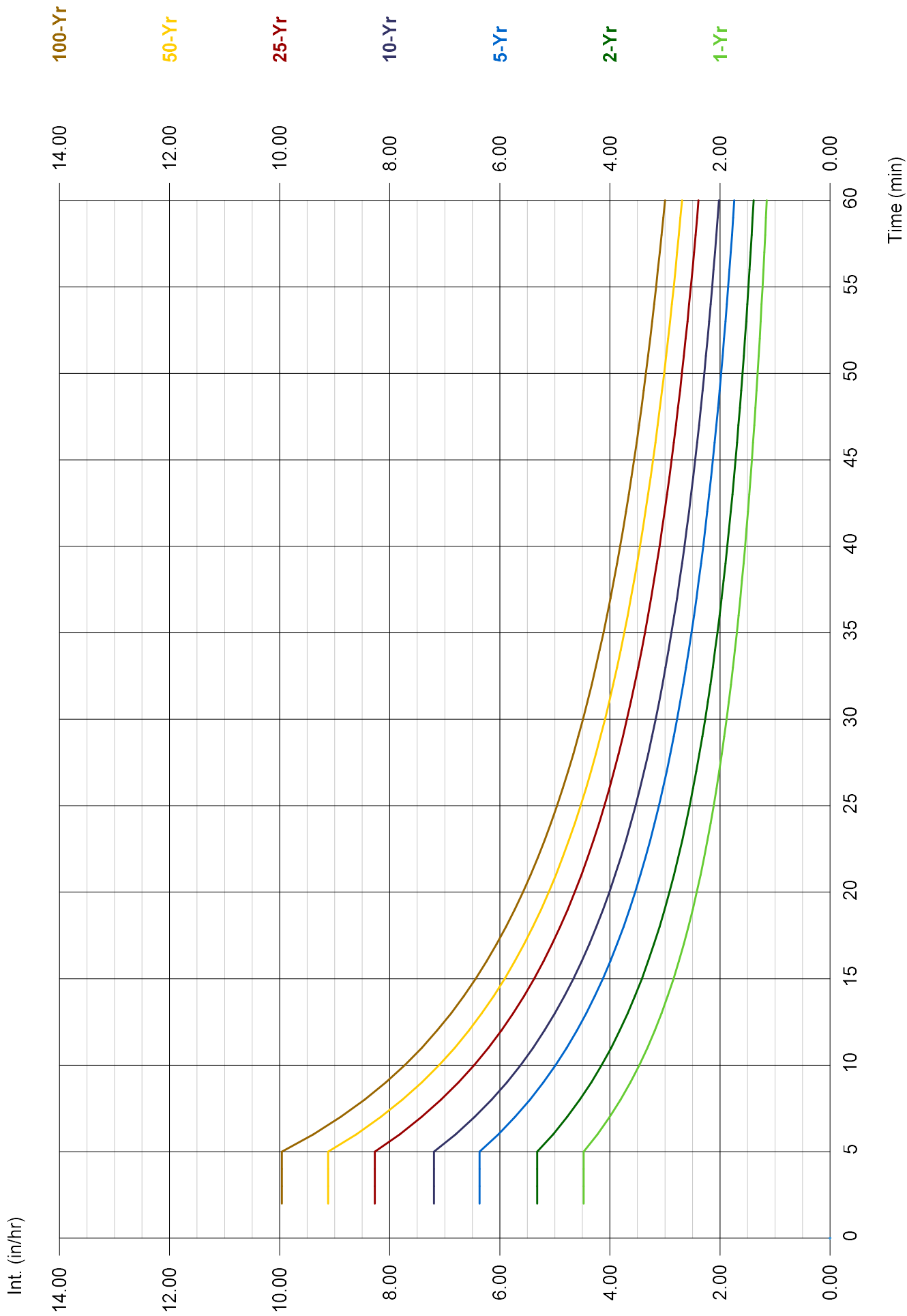
PLOT DATE:

Storm Sewer IDF Rain Fall intensity numbers utilized for design

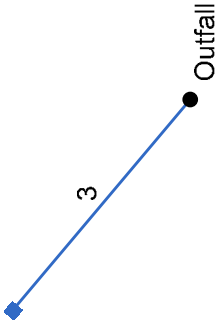
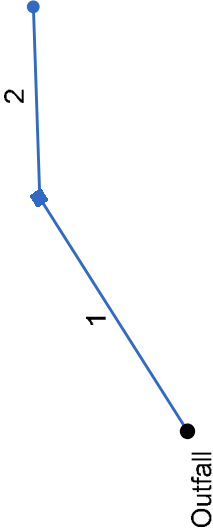
US Customary Units				
Intermediate Intensity Values (In/hr)				
Return Period	5-Minute	15-Minute	30-Minute	60-Minute
1-Yr	4.48	2.84	1.88	1.15
2-Yr	5.33	3.39	2.27	1.39
3-Yr	6.00	3.90	2.60	1.60
5-Yr	6.38	4.06	2.78	1.74
10-Yr	7.21	4.56	3.17	2.02
25-Yr	8.29	5.22	3.69	2.39
50-Yr	9.14	5.72	4.09	2.69
100-Yr	9.96	6.21	4.49	3.00

Storm Sewer IDF Curves

IDF file: FRANKLIN, IN_Intensity.IDF



Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: Franklin Pipe Calcs.stm	Number of lines: 3	Date: 3/24/2021
---------------------------------------	--------------------	-----------------

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (l)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr	Total	(C)	Incr	Total	Inlet	Syst	(in/hr)	(cfs)	(cfs)	(ft/s)	Size	Slope	Dn	Up	Dn	Up	Dn	Up	
			(ac)	(ac)				(min)	(min)					(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
3	End	42,000	0.19	0.19	0.86	0.16	0.16	10.0	10.0	5.6	0.92	3.65	2.24	12	1.05	743.56	744.00	744.36	744.40	746.96	747.25	CB-1
2	1	29,000	0.04	0.04	0.40	0.02	0.02	10.0	10.0	5.6	0.09	4.28	0.99	10	3.83	743.97	745.08	744.43	745.21	747.51	747.88	YD-1
1	End	42,000	0.22	0.26	0.90	0.20	0.21	10.0	10.5	5.5	1.18	3.20	2.56	12	0.81	743.63	743.97	744.43	744.43	747.63	747.51	CB-2
Project File: Franklin Pipe Calcs.stm																						Run Date: 3/24/2021
Number of lines: 3																						
NOTES: Intensity = 55.09 / (Inlet time + 8.50) ^ 0.78; Return period = Yrs. 10 ; c = cir e = ellip b = box																						

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (l)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr	Total	(C)	Incr	Total	Inlet	Syst	(in/hr)	(cfs)	(cfs)	(ft/s)	Size	Slope	Dn	Up	Dn	Up	Dn	Up	
			(ac)	(ac)				(min)	(min)					(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
3	End	42.000	0.19	0.19	0.86	0.16	0.16	10.0	10.0	7.7	1.26	3.65	2.66	12	1.05	743.56	744.00	744.36	744.47	746.96	747.25	CB-1
2	1	29.000	0.04	0.04	0.40	0.02	0.02	10.0	10.0	7.7	0.12	3.56	1.04	12	1.00	744.05	744.34	744.59	744.48	747.51	747.88	YD-1
1	End	42.000	0.22	0.26	0.90	0.20	0.21	10.0	10.5	7.6	1.62	3.56	3.08	12	1.00	743.63	744.05	744.43	744.59	747.63	747.51	CB-2
Project File: Franklin Pipe Calcs.stm																						Run Date: 3/15/2021
Number of lines: 3																						
NOTES: Intensity = 47.72 / (Inlet time + 5.70) ^ 0.66; Return period = Yrs. 100 ; c = cir e = ellip b = box																						

