



PLANNING & INSPECTIONS DEPARTMENT

Joshua L. Grant, Manager

To: Board of County Commissioners

From: Joshua Grant, Division Manager

Date: July 11, 2025

Re: WSSUP #42  
McDonald's USA, LLC, applicant  
Parcel ID# 71129

*The following information is for use by the Lincoln County Board of Commissioners at their meeting/public hearing on August 4, 2025*

Request

The applicant is requesting a special use permit to allow the use of the high-density option in the WS-IV Protected Area of the Catawba River/Lake Norman Watershed. The applicant is planning to develop a 1.36-acre site. The high-density option would allow the development to have a built-upon surface area covering up to 70 percent of the site, with the use of engineered stormwater controls. Otherwise, in this watershed district, non-residential developments that require an erosion control plan are limited to a built-upon area of 24 percent. In this case, a built-upon area of approximately 67 percent is proposed.

Site Area and Description

The request involves a 1.3-acre parcel located on the east side of NC 16 Business about 500 feet north of the intersection with Fairfield Forest Road in Catawba Springs Township. The subject property is located in the B-G (General Business) zoning district and the ELDD (Eastern Lincoln Development District) overlay. The subject property is adjoined by property zoned B-G (General Business). Land uses in this area include business and residential uses primarily. This property is located within an area that is designated by the Lincoln County Land Use Plan as Suburban Commercial Center, suitable for a variety of commercial uses to serve the daily needs of surrounding residential neighborhoods.



## PLANNING & INSPECTIONS DEPARTMENT

Joshua L. Grant, Manager

### High Density Option Requirements

Under the water-supply watershed regulations of the Lincoln County Unified Development Ordinance, the Catawba River/Lake Norman watershed is designated for the use of the high-density option. The option requires the use of stormwater control structures to control and treat the runoff from the first one-inch of rain. The structures must be designed to meet the Best Management Practices (BMP) standards of the N.C. Department of Environment Quality. In this case, the plans call for a tie into an existing stormwater structure on the site.

The regulations require the developer to post a bond or other financial security in an amount not less than 1.25 times the cost of constructing the necessary stormwater control structure. In addition, a binding agreement must be signed, requiring the owner to maintain, repair and, if necessary, reconstruct the structure in accordance with an approved operations and maintenance plan. Once the stormwater control structure have been constructed and inspected, and prior to the release of the financial security, the applicant is required to deposit with the county either cash or a similar approved instrument in an amount equal to 15 percent of the total construction cost or 100 percent of the cost of maintaining the structure over a 20-year period, whichever is greater.



## **Watershed Special Use Permit Application**

Lincoln County Planning and Inspections Department  
Zoning Administrator  
115 W. Main St., Lincolnton, NC 28092  
Phone: (704) 736-8440 Fax: (704) 732-9010

### **PART I**

Applicant Name **McDonald's USA, LLC**

Applicant Address **110 N. Carpenter Street, Chicago, IL 60607**

Applicant Phone Number **(404) 307-6794**

Property Owner Name **Westport Market Limited Partnership**

Property Owner Address **2900 One First Union Center**

Property Owner Phone Number **(704) 927-2881**

### **PART II**

Property Location **N NC-16 Business HWY, Denver, NC 28037**

Property ID (10 digits) **4604620980** Property size **1.36**

Parcel # (5 digits) **71129** Deed Book(s) **849** Page(s) **611**

### **PART III**

Watershed District **WS IV-P Catawba-Lake Norman**

Briefly describe how the property is being used and any existing structures.

**The current property is a vacant outparcel to a Food Lion anchored shopping center. It is grassed with street trees along NC-16 and no existing building or paving.**

Briefly describe the proposed project and the why it would require a Watershed Special Use Permit.

**The proposed use would be for a quick-serve restaurant and associated infrastructure - parking, sidewalks, landscaping, utilities, stormwater, etc. The Special Use Permit is needed to increase impervious up to 70%.**

**\$1,000.00 APPLICATION FEE MUST BE RECEIVED BEFORE PROCESSING.**

I hereby certify that all knowledge of the information provided for this application and attachments is true and correct to the best of my knowledge.

*Vivian Valdivia*

5/28/2025

EF9745ECA7E744F

Applicant's Signature

Date

Application # \_\_\_\_\_ Date \_\_\_\_\_

Applicant's Name McDonald's USA, LLC

Applicant's Address 110 N. Carpenter Street, Chicago, IL 60607

Property Location N NC-16 Business HWY, Denver, NC 2 Existing Zoning GB

Proposed Special Use Proposed fast food restaurant - up to 70% impervious

### **PROPOSED FINDINGS OF FACT**

1. The use will not materially endanger the public health or safety if located where proposed and developed according to plan. YES \_\_\_\_\_ NO x

FACTUAL REASONS CITED: The proposed impervious is within an existing shopping center and the development is consistent with the area.

2. The use meets all required conditions and specifications. YES x NO \_\_\_\_\_

FACTUAL REASONS CITED: The development complies with all jurisdictional requirements. The site plan has been coordinated with County staff and NCDOT.

3. The use will not substantially injure the value of adjoining or abutting property unless the use is a public necessity. YES x NO \_\_\_\_\_

FACTUAL REASONS CITED: The development will increase value in the area with additional services and amenities.

4. The location and character of use, if developed according to the plan as submitted and approved, will be in harmony with the area in which it is to be located and will be in general conformity with the Land Use Plan for the area in question. YES x NO \_\_\_\_\_

FACTUAL REASONS CITED: This particular parcel was designed for a commercial use and it is consistent with the development patterns and intent for this area.



# Lincoln County, NC

## Office of the Tax Administrator, GIS Mapping Division

Neither Lincoln County nor its employees, elected officials, agents, or contractors assume any legal responsibility for the information contained herein, which is provided "as is" with no warranties of any kind. Lincoln County disclaims all liability of any kind arising out of the use of, or misuse of, this information and disclaims all express or implied warranties, including warranties of merchantability, fitness for a particular purpose, and non-infringement of proprietary rights.

Date: 7/11/2025

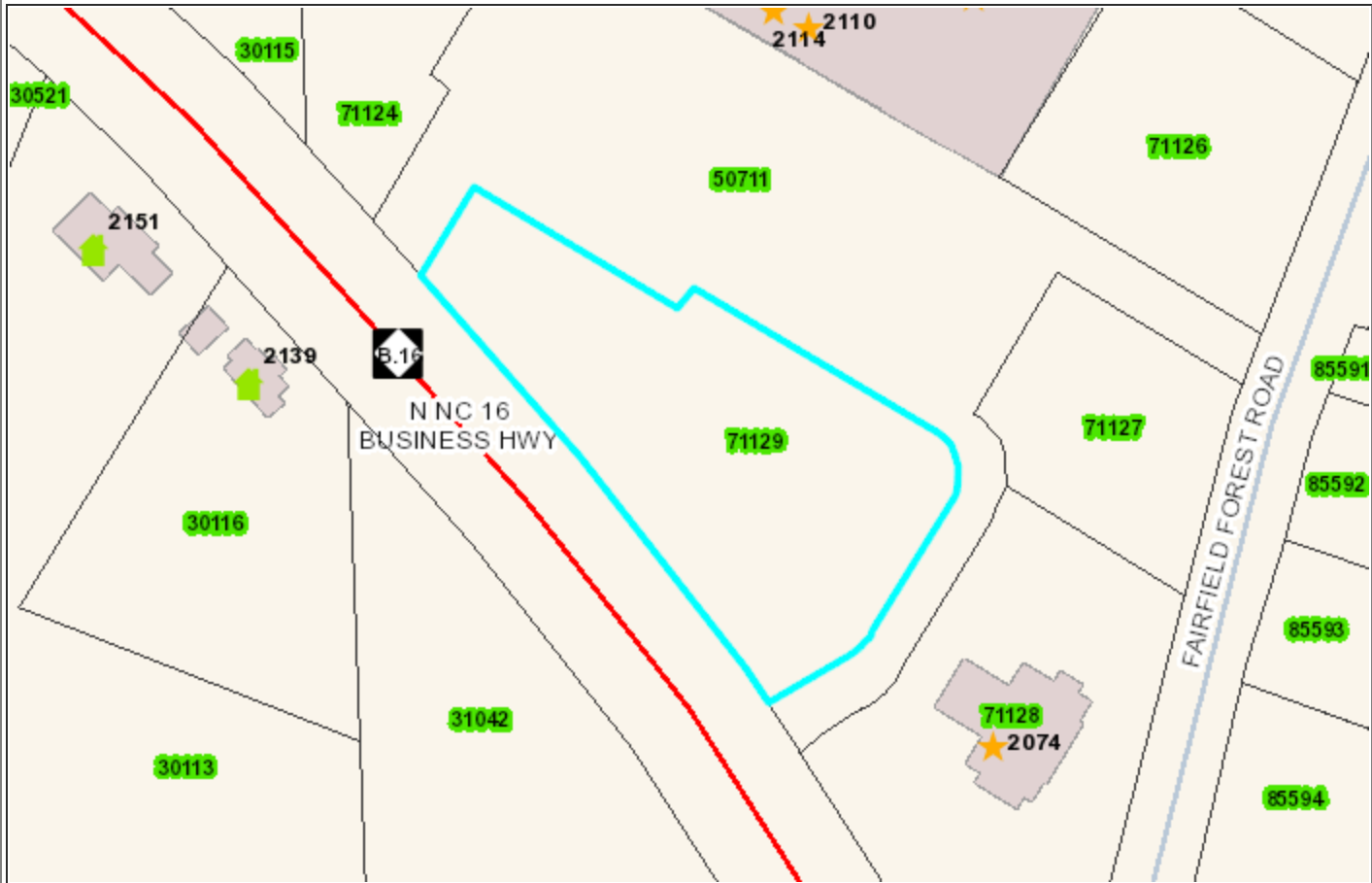
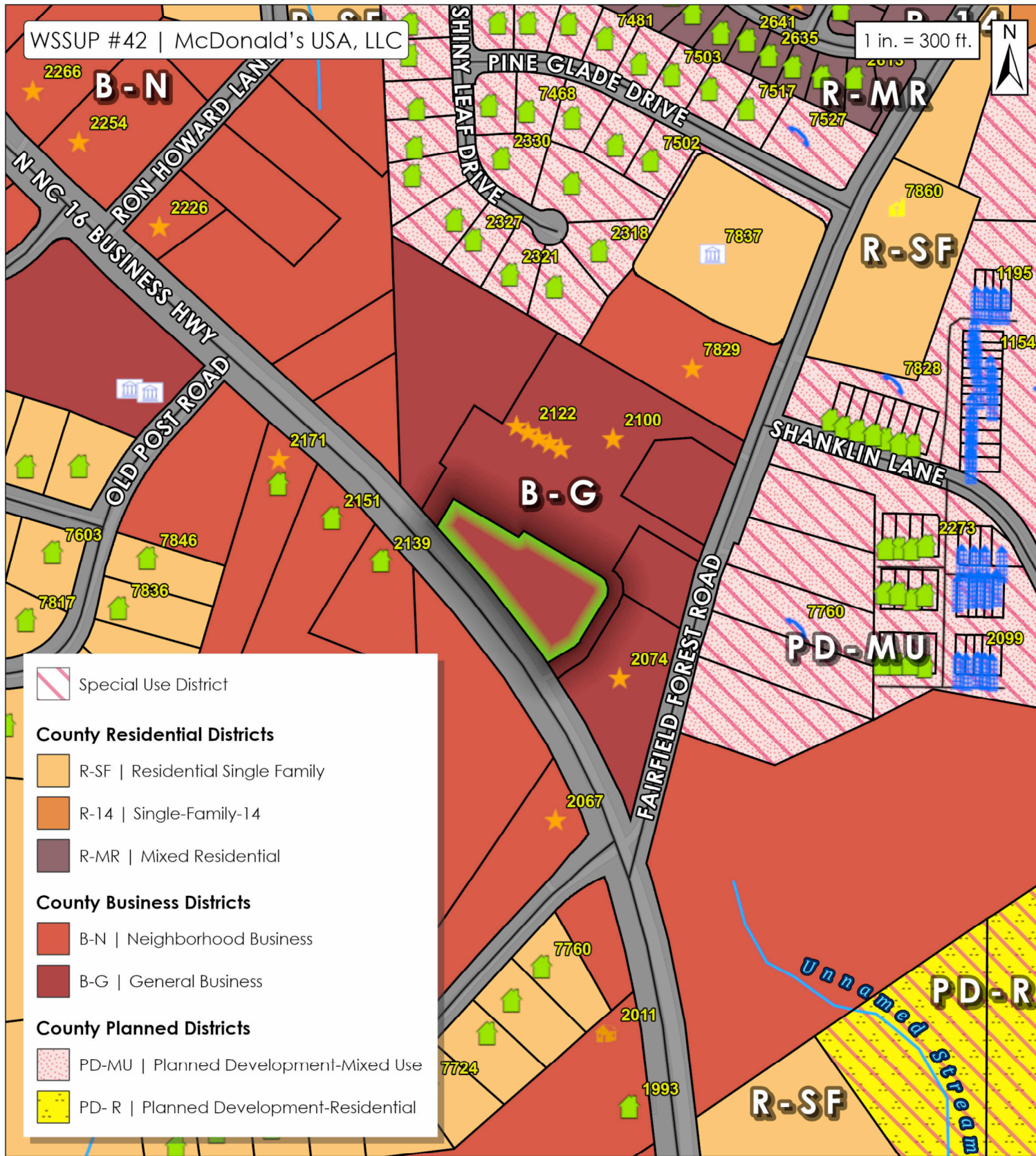


Photo Not Available

Parcel ID	71129	Owner	WESTPORT MARKET LIMITED PARTNERSHIP		
Map	4604	Mailing	2800 ONE FIRST UNION CENTER 301 SOUTH COLLEGE ST		
Account	0085603	Address	CHARLOTTE, NC 28202-6021		
Deed	849 611	Last Transaction Date	11/22/1993	Sale Price	\$0
Plat	G 429	Subdivision	WESTPORT MARKET RETAIL CENTER	Lot	4
Land Value	\$402,502	Improvement Value	\$0	Total Value	\$402,502
Previous Parcel	50711				
-----All values for Tax Year 2025 -----					
Description	#4 PARCEL HWY 16			Deed Acres	1.366
Address	N NC 16 BUSINESS HWY			Tax Acres	1.431
Township	CATAWBA SPRINGS			Tax/Fire District	DENVER
Main Improvement				Value	
Main Sq Feet	Stories			Year Built	
Zoning District	Conditional Use	Calc Acres	Voting Precinct Calc Acres		
		0.01	WP32 1.43		
B-G		1.43			
Watershed				Sewer District	
	1.36		SEWER	1.43	
	0.08				
Census County	Tract		Block		
109	071203		1057	1.43	
Flood	Zone Description			Panel	

WSSUP #42 | McDonald's USA, LLC

1 in. = 300 ft.



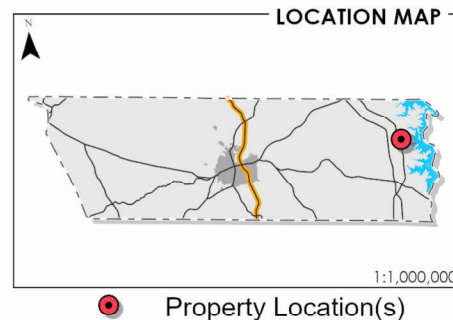
Parcel ID # 71129

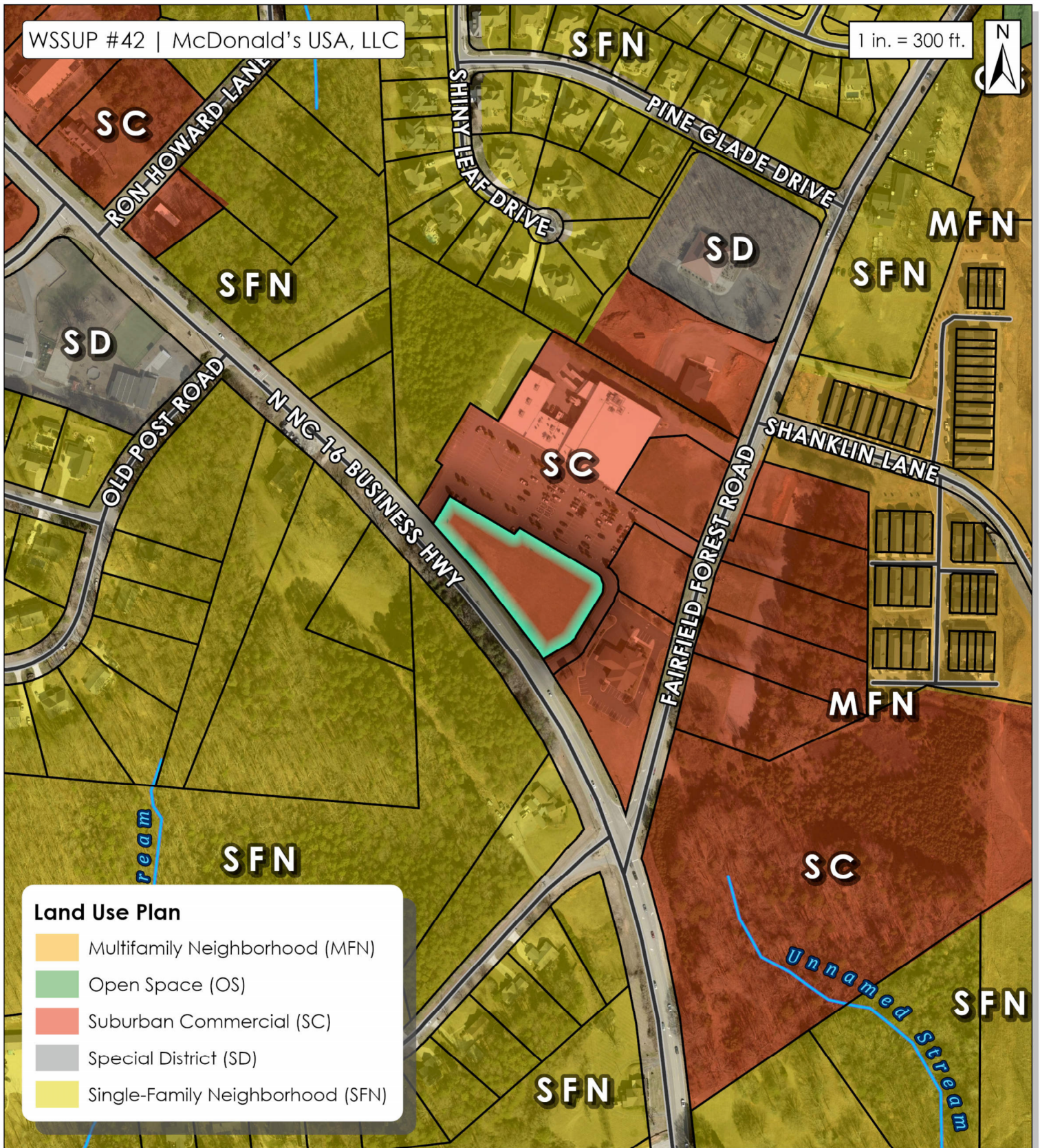
 - Property Location(s)

See Attached Application for Parcel Information



Lincoln County  
Planning & Inspections  
115 W. Main St  
3rd Floor  
Lincolnton, NC 28092





### Land Use Plan

- Multifamily Neighborhood (MFN)
- Open Space (OS)
- Suburban Commercial (SC)
- Special District (SD)
- Single-Family Neighborhood (SFN)

Parcel ID # 71129

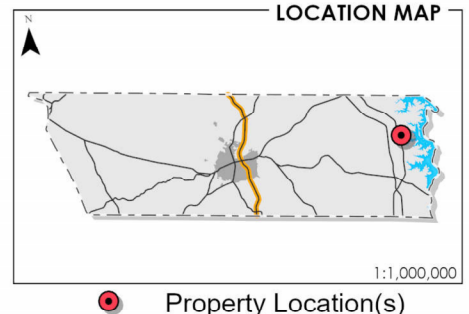
- Property Location(s)

See Attached Application for Parcel Information



Lincoln County  
Planning & Inspections  
115 W. Main St  
3rd Floor  
Lincolnton, NC 28092

### LOCATION MAP



Property Location(s)

2025

# STORMWATER AND EROSION & SEDIMENT CONTROL NARRATIVE

## 32-1752 DENVER, NC MCDONALD'S

Adjacent to 2074 N NC-16 Business  
Denver, NC 28037  
Lincoln County

**Bohler Project #: NCB240100.00**

1 <sup>st</sup> Submittal	March 7, 2025
2nd Submittal	May 21, 2025



---

Oliver Kaija, PE

**BOHLER** //

**BOHLER ENGINEERING NC, PLLC**

4130 Parklake Avenue, Suite 200, Raleigh, NC 27612  
NCBELS # P-1132 | P: 919-578-9000 | F: 919-703-2665  
[www.bohlerengineering.com](http://www.bohlerengineering.com)

# 1. PROJECT DESCRIPTION

## 1.1 PROJECT NARRATIVE

The following stormwater management report is for a proposed commercial development to the northeast of 2074 N NC-16 Business, Denver, NC. The site is an outparcel to a Food Lion shopping center, PIN #71129. The project includes but is not limited to, one 3,859 SF building, parking, 2 entrances, utilities, underground stormwater control measures, and grading activities. The outparcel for the McDonald's development is  $\pm 1.365$  acres. Site access will be provided through an existing drive aisle for the Food Lion shopping center, off of N NC-16 Business.



Figure 1: Aerial View of Site

## 2. STORMWATER

### 2.1 STORMWATER SUMMARY

The site is subject to the analysis of pre and post-development drainage areas to demonstrate at a minimum, control of the pre to post flows for the 2-year and 10-year, 24-hour storms. This project has been designed in accordance with the Lincoln County Unified Development Ordinance. The proposed site is  $\pm 1.365$  acres, and lies within Lincoln County's Eastern Lincoln Development District and the WS-IVP Protected Area. The maximum impervious value permitted for high density projects is 70%. The pre- and post-drainage maps can be found in Appendix B. In the existing condition, the site and adjacent site are nearly  $\pm 100\%$  pervious with primary land covers comprising of grass.

### 2.2 PRE-DEVELOPMENT CONDITION

In the pre-development condition, the site is relatively flat, undeveloped, and is grassed or wooded. The existing site is delineated as one pre-development drainage area, which eventually discharges into the existing storm system within the Food Lion shopping center. "Drainage Area 1" consists of approximately  $\pm 1.36$  acres of area that will primarily drain from the south to the north side of the property towards the shopping center. There is an existing inlet to the north within the site that connects to a 15" CPP pipe within the shopping center.

### 2.3 POST-DEVELOPMENT CONDITION

In the post-development condition, the site is broken up into one drainage area that drains to underground detention. In total,  $\pm 0.93$  acres of impervious area and  $\pm 0.44$  acres of pervious area will be directed to the ADS underground detention system. Due to the increase in impervious area from the existing to proposed conditions, an underground detention system is to be constructed to meet Lincoln County stormwater requirements. In the final condition, the site will be approximately 67.9% impervious, which is below the allowable 70%. However, the BMP was designed to accommodate a 70% impervious drainage area.

### 2.4 BMP SUMMARY

In order to utilize underground detention in Lincoln County, the 1" inch of stormwater needs to be treated. The discharge rate following a 1" rainfall shall drawdown the temporary storage volume between 48 and 120 hours. There are no peak discharge requirements. The system must also be

designed to achieve a minimum of 85% average annual removal for Total Suspended Solids (TSS).

To meet Lincoln County's requirements, an ADS underground system with ground infiltration will be used. Per the page 8 of the geotechnical report dated 8/2/2024, the site has a stabilized infiltration rate of 1.83 in/hr, allowing proper conditions to utilize infiltration for water quality purposes. The device has been sized to accomplish 85% TSS removal, per Lincoln County requirements. For rate control, the system was sized to meet the 2-year 24-hour requirements of Lincoln County, and the 10-year storm to ensure the downstream system will not be overrun with stormwater. See the table below (Underground Detention Design Summary) for pre and post flows for both storm events. These values can also be found in Appendix C. The underground detention system discharges into an existing 15" CPP pipe within the Food Lion shopping center.

The hydrographs seen in Appendix C, for Pond 2P: Underground Detention display that at 120 hours, there is no activity, demonstrating that the detention system within the appropriate timeframe.

Underground Detention Design Summary		
Description	Pre-Development	Post-Development
Drainage Area (AC)	1.365	1.37
Composite Curve Number	69	86
Time of Concentration (min)	11.3	5
2-year, 24-hour Peak Flow Rate (CFS)	1.66	0.16
10-year, 24-hour Peak Flow Rate (CFS)	3.79	3.58

As indicated in the tables above, the proposed development does not result in any increase to the design storms specified in the Lincoln County and NCDEQ Stormwater Regulations.

## 3. EROSION CONTROL

### 3.1 EXISTING CONDITIONS

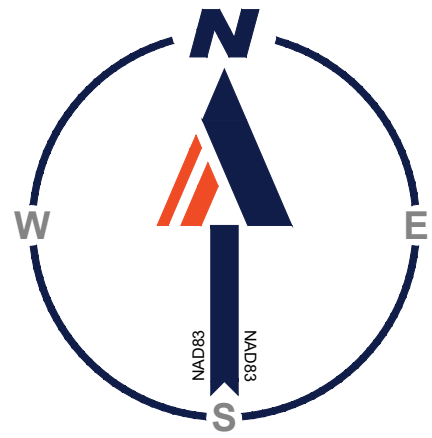
The subject site is a ±1.36 acre site located adjacent to 2074 N NC-16 in Denver, NC, and falls within the jurisdiction of Lincoln County. The site lies within an existing shopping center and is undeveloped and grassed.

### 3.2 PHASE I EROSION CONTROL

Stage 1 will commence with the staking of the limits of disturbance, installation of the construction entrance, perimeter construction fence, and perimeter best management practices (BMPs). The site is subject to BMPs including silt fence outlets, construction entrance, and a concrete washout pit. The majority of stormwater present on site will be controlled by silt fence outlets, silt fence, and inlet protections as seen in sheet C-801 in Appendix A. Once the site is inspected by the Lincoln County inspector, phase II can begin.

### 3.3 PHASE II EROSION CONTROL

Stage 2 will continue adjusting BMPs as necessary and depicted by sheet C-802 in Appendix A. Throughout construction, temporary stabilization for any disturbed areas that are likely to remain inactive shall be installed. Once these measures are in place, sanitary sewer and remaining permanent utilities as seen on the site development plans will be installed. After utilities are placed and buried, the grading and installation of permanent stabilization over all areas shall be completed. Inlet protection will be installed for any inlets on site. Pending Lincoln County inspection and approval to continue, the site may be paved. Concurrence must be obtained from the owner that the site has been fully stabilized, sediment has been removed from all storm inlets, and construction has been completed. Before demobilizing, the contractor must have all remaining temporary erosion and sediment control BMPs removed and stockpiles and any disturbed areas must be stabilized. Contractor may only demobilize once the site has been fully stabilized according to Lincoln County requirement



LEGEND	
NOTE: REFER TO SURVEY FOR EXISTING CONDITIONS SYMBOLS LEGEND.	
	EXISTING CONTOUR LINE
	NEW CONTOUR LINE
	NEW SPOT ELEVATION
	RIDGE LINE

STORM STRUCTURE SCHEDULE				
STRUCTURE #	CATEGORY	GRT/RIM	INV IN	INV OUT
A-10	PROP CURB INLET	868.08		INV OUT = 865.00 (15')
A-20	PROP OUTFALL TO ADS UNDERGROUND DETENTION	865.58	INV IN = 864.06' (15')	
A-30	PROP CURB INLET	867.49		INV OUT = 863.89 (15')
A-40	PROP CURB INLET	868.09	INV IN = 863.32' (15')	INV OUT = 863.12 (15')
A-50	PROP OUTFALL TO ADS UNDERGROUND DETENTION	869.60	INV IN = 862.69' (15')	
A-60	PROP CURB INLET	868.14		INV OUT = 864.36 (15')
A-70	PROP OUTFALL TO ADS UNDERGROUND DETENTION	868.22	INV IN = 864.12' (15')	
A-80	PROP UNDERGROUND DETENTION OUTLET	869.90		INV OUT = 862.00 (15')
EX-10	EX GRATE INLET	867.50	INV IN = 859.85' (15')	INV OUT = 859.65 (15')

STORM SEWER PIPE SCHEDULE							
FROM	FROM INV	TO	TO INV	PIPE LENGTH	SLOPE (%)	DIAMETER (IN.)	MATERIAL
A-20	864.06'	A-10	865.00'	94'	1.00%	15"	RCP
A-40	863.32'	A-30	863.89'	115'	0.50%	15"	HDPE
A-50	862.69'	A-40	863.12'	62'	0.69%	15"	HDPE
A-70	864.12'	A-60	864.36'	11'	2.12%	15"	HDPE
EX-10	859.85'	A-80	862.00'	48'	4.53%	15"	HDPE

#### IMPERVIOUS COVERAGE CALCULATIONS

MAX IMPERVIOUS COVERAGE PERMITTED PER HIGH DENSITY OPTION: 70%

PROPOSED IMPERVIOUS AREA: 0.93 AC/1.37 AC OR 67.9%

PROPOSED PERVIOUS AREA: 0.44 AC/1.37 AC OR 32.1%

BOHLER

BOHLER ENGINEERING NC, PLLC

SITE CIVIL AND CONSULTING ENGINEERING

PROGRAM MANAGEMENT

LANDSCAPE ARCHITECTURE

SUSTAINABLE DESIGN

PERMITTING SERVICES

TRANSPORTATION SERVICES

#### REVISIONS

REV	DATE	COMMENT	DRAWN BY
1	05/21/2025	LINCOLN COUNTY COMMENTS	ZS/CC OAK



ALWAYS CALL 811  
It's fast. It's free. It's the law.

#### ISSUED FOR MUNICIPAL & AGENCY REVIEW & APPROVAL

THIS DRAWING IS INTENDED FOR MUNICIPAL AND/OR AGENCY REVIEW AND APPROVAL. IT IS NOT INTENDED AS A CONSTRUCTION DOCUMENT UNLESS INDICATED OTHERWISE.

PROJECT No.: NCB240100.00-0A  
DRAWN BY: VL/ZMS  
CHECKED BY: OAK  
DATE: 3/17/2025  
CAD I.D.: P-CIVIL-GRAD

PROJECT:

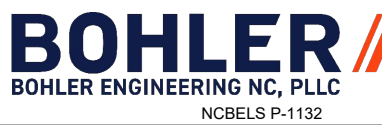
#### PROP. SITE PLAN DOCUMENTS



#### PROPOSED DEVELOPMENT

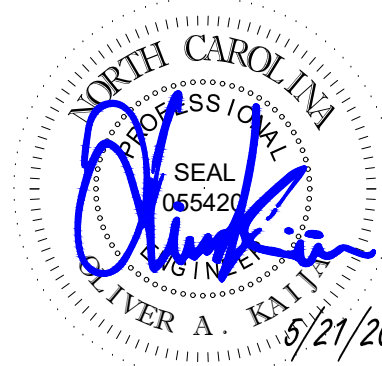
N NC 16 BUSINESS HWY  
LINCOLN COUNTY  
DENVER, NORTH CAROLINA

LC#32-1752



4130 PARKLAKE AVENUE, SUITE 200  
RALEIGH, NC 27612  
Phone: (919) 578-9000

NC@BohlerEng.com



SHEET TITLE:

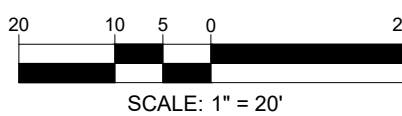
#### GRADING PLAN

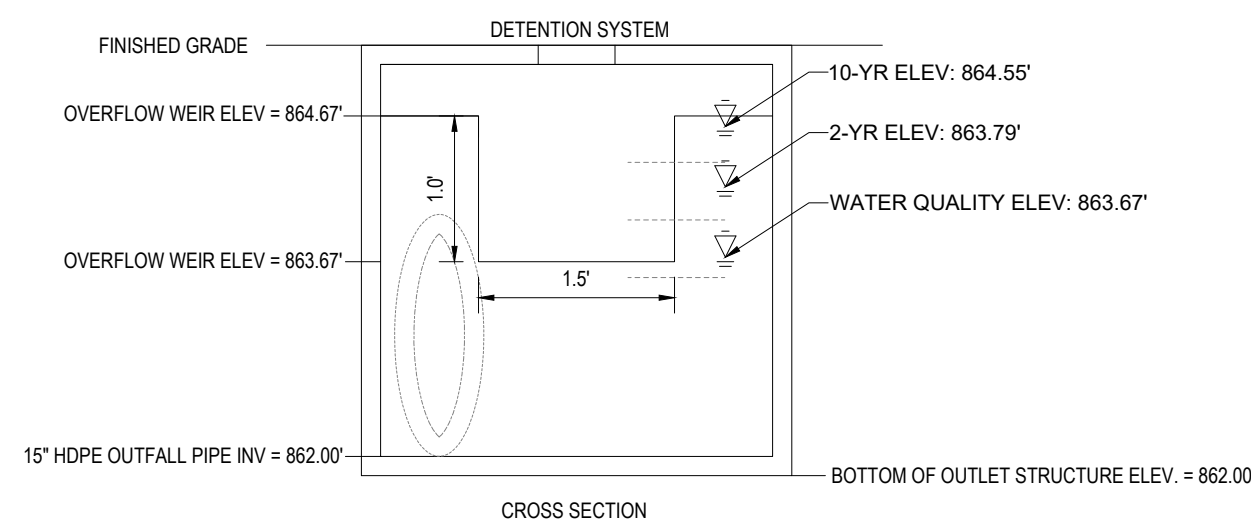
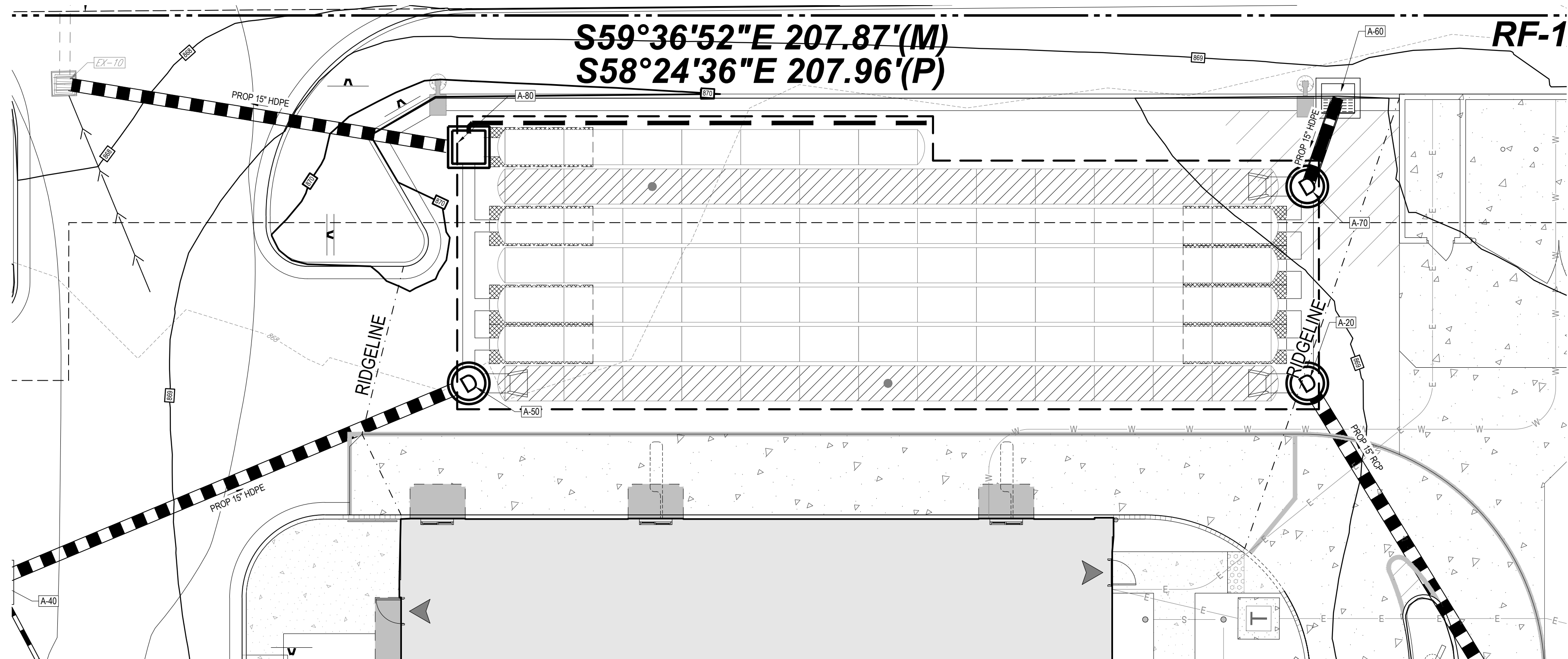
SHEET NUMBER:

C-401

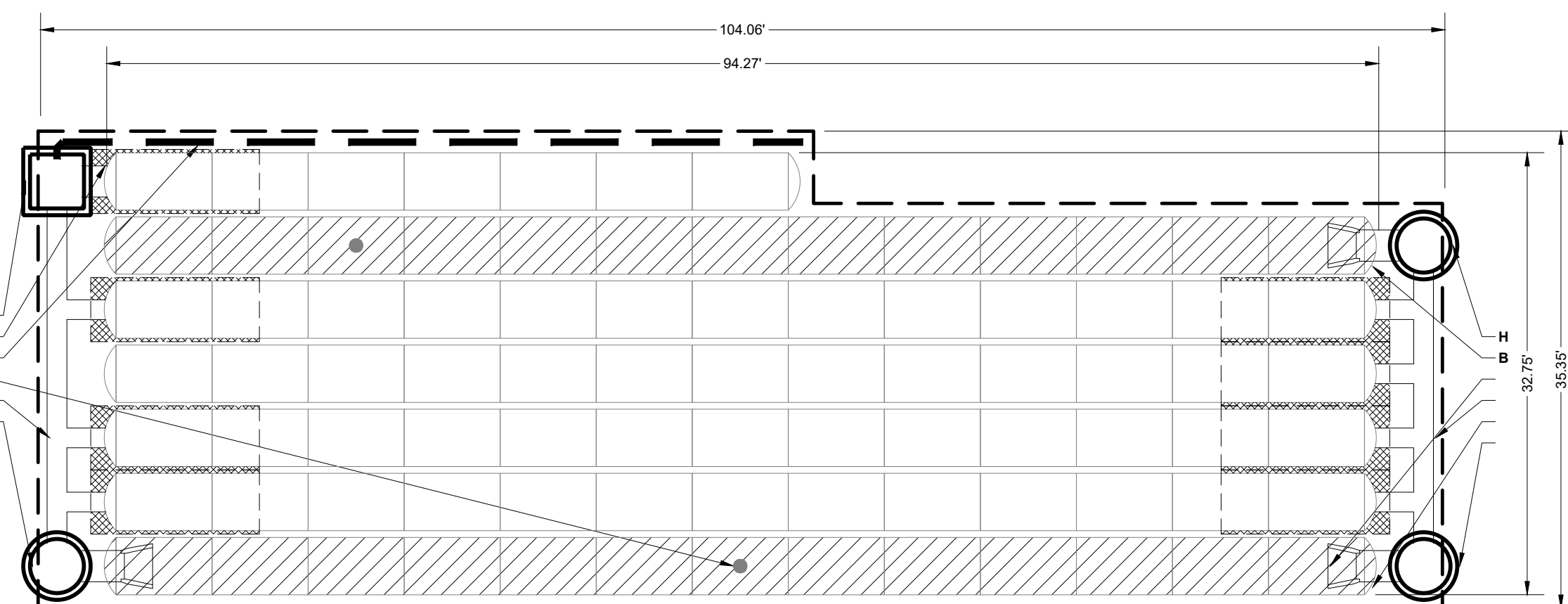
REVISION 1 - 05/21/2025

THIS PLAN TO BE UTILIZED FOR SITE GRADING PURPOSES ONLY







**A-80 - DETENTION OUTLET**  
NOT TO SCALE



PROPOSED LAYOUT		PROPOSED ELEVATIONS:		*INVERT ABOVE BASE OF CHAMBER				
				PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT'	MAX FLOW
85	STORMWATER SC-40 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT UNPAVED):	873.25					
14	STORMWATER SC-800 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	887.00					
6	STONE ABOVE (IN)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	869.50		PRE-CORED END CAP	A 24" BOTTOM PRE-CORED END CAP, PART# SC800E1PE24BC/P TYP OF ALL 24" BOTTOM CONNECTIONS AND ISOLATOR PLUS INVERTS	2.30'	
1	STONE BELOW (IN)	MINIMUM ALLOWABLE GRADE (TOP OF REGIO CONCRETE PAVEMENT):	887.00		PRE-CORED END CAP	B 15" TOP PRE-CORED END CAP, PART# SC800E1STPC TYP OF ALL 15" TOP CONNECTIONS	11.30'	
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	865.75			C INSTALL FLAMP ON 24" ACCESS PIPE (PART# SC14024AMP OF ALL 24" PLACES)	11.30'	
	INSTALLED SYSTEM VOLUME (CF)	TOP OF STONE	865.75			D 15" x 15" TOP MANIFOLD, ADS N-12	11.30'	
7755	CIRCUETER STONE INCLUDED (COVER STONE INCLUDED)	TOP OF STONE	865.75		15" x 15" TOP MANIFOLD	E 15" x 15" TOP MANIFOLD, ADS N-12	11.30'	
	(BASE STONE INCLUDED)	15" x 15" TOP MANIFOLD INVERT:	863.44		MANIFOLD	F 24" BOTTOM CONNECTION	2.30'	
3429	SYSTEM AREA (SF)	15" x 15" TOP MANIFOLD INVERT:	863.44		PIPE CONNECTION	G (DESIGN BY ENGINEER / PROVIDED BY OTHERS)		9.6 CFS IN
278.8	SYSTEM PERIMETER (ft)	24" ISOLATOR ROW PLUS INVERT:	862.69		CONCRETE STRUCTURE	H (DESIGN BY ENGINEER / PROVIDED BY OTHERS)		9.6 CFS IN
		24" ISOLATOR ROW PLUS INVERT:	862.69		CONCRETE STRUCTURE	I (DESIGN BY ENGINEER / PROVIDED BY OTHERS)		9.6 CFS IN
		24" ISOLATOR ROW PLUS INVERT:	862.69		CONCRETE STRUCTURE	J (DESIGN BY ENGINEER / PROVIDED BY OTHERS)		7.0 CFS OUT
		24" ISOLATOR ROW PLUS INVERT:	862.69		CONCRETE STRUCTURE	K (DESIGN BY ENGINEER / PROVIDED BY OTHERS)		
		24" ISOLATOR ROW PLUS INVERT:	862.00		UNDERDRAIN	L 6" ADS N-12 DUAL WALL PERFORATED HDPE UNDERDRAIN		
		UNDERDRAIN INVERT:	862.00		INSPECTION PORT	M 10" SEE DETAIL (TYP 2 PLACES)		
		BOTTOM OF STONE	862.00					

	ISOLATOR ROW PLUS (SEE DETAIL)
	PLACE MINIMUM 12.50' OF ADSPLUS625 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

**DETAIL A - ADS SC-800 CHAMBER SYSTEM**  
NOT TO SCALE

1. CHAMBERS SHALL BE STORMTECH SC-800.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPERE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS TO THE URBAN BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75+ YEAR) ALLOWABLE COVER WITH PARKED (1 WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
  - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
  - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
  - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 550 LB/FT<sup>2</sup>. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° / 173° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
  - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
  - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
  - THE DESIGN COVER REQUIRED SHALL BE AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.
10. MANHOLE SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER, SEE TECH NOTE #6.32 FOR MANHOLE SIZING GUIDANCE. DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONDITIONS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANHOLE COMPONENTS IN THE FIELD.
11. ADS DOES NOT DESIGN OR PROVIDE MEMBRANE LINER SYSTEMS, TO MINIMIZE THE LEAKAGE POTENTIAL OF LINER SYSTEMS, THE MEMBRANE LINER SYSTEM SHOULD BE DESIGNED BY A KNOWLEDGEABLE GEOTECHNICAL PROFESSIONAL AND INSTALLED BY A QUALIFIED CONTRACTOR.

1. STORMTECH SC-800 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-800 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-800/DC-780 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
  - STONEHOOTER LOCATED OFF THE CHAMBER BED.
  - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
  - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE: AASHTO M43 #3, 357, 4, 467, 5, 56, OR 57.
8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
9. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

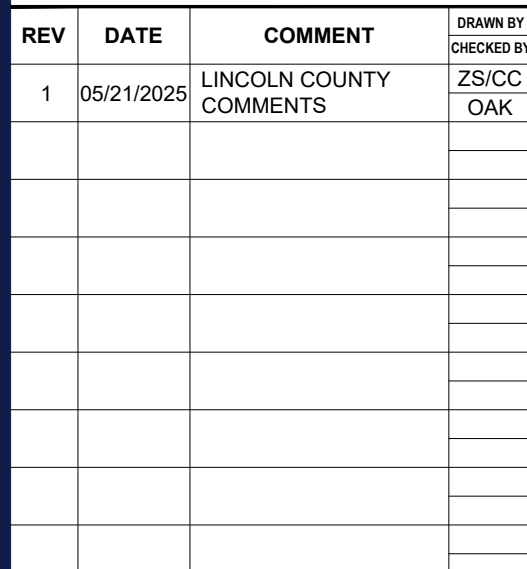
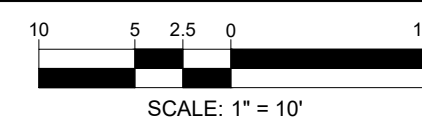
1. STORMTECH SC-800 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-800/DC-780 CONSTRUCTION GUIDE".
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-800 CHAMBERS IS LIMITED:
  - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
  - NO RUBBER TIED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-800/DC-780 CONSTRUCTION GUIDE".
  - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/SC-800/DC-780 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDED STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-800-821-6710 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

<div> <div>UNDERGROUND DETENTION DESIGN</div> <div>SUMMARY</div> </div>		
DESCRIPTION	PRE-DEVELOPMENT	POST DEVELOPMENT (TO UNDERGROUND DETENTION)
DRAINAGE AREA (AC)	1.365	1.37
COMPOSITE CURVE NUMBER	69	86
TIME OF CONCENTRATION (MIN)	11.3	5
2-YEAR, 24-HOUR PEAK FLOW RATE (CFS)	1.66	0.16
10-YEAR, 24-HOUR PEAK FLOW RATE (CFS)	3.79	3.58

**THIS PLAN TO BE UTILIZED  
FOR SITE GRADING  
PURPOSES ONLY**



THIS DRAWING IS INTENDED FOR MUNICIPAL AND/OR AGENCY  
REVIEW AND APPROVAL. IT IS NOT INTENDED AS A CONSTRUCTION  
DOCUMENT UNLESS INDICATED OTHERWISE.

PROJECT No.:	NCB240100.00-0A
DRAWN BY:	VL/ZMS
CHECKED BY:	OAK
DATE:	3/7/2025
CAD I.D.:	P-CIVL-GRAD

PROJECT:

— FOR

McDonald's.

**PROPOSED  
DEVELOPMENT**

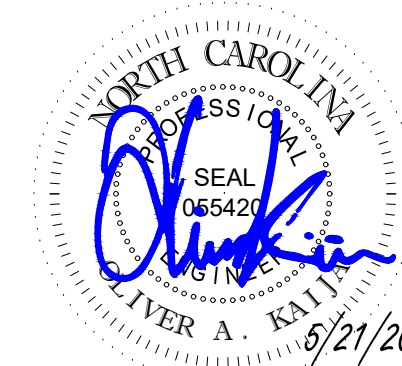
N NC 16 BUSINESS HWY  
LINCOLN COUNTY  
DENVER, NORTH CAROLINA

LC#32-1752

**BOHLER**   
BOHLER ENGINEERING NC, PLLC  
NCBELS P-1132

**4130 PARKLAKE AVENUE, SUITE 200  
RALEIGH, NC 27612  
Phone: (919) 578-9000**

**NC@BohlerEng.com**



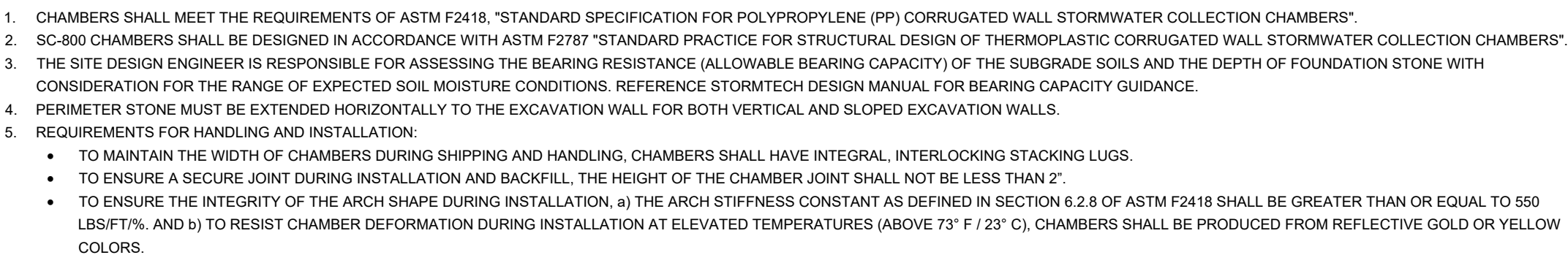
**SHEET TITLE:**

## SHEET NUMBER

**C-402**

REVISION 1 - 05/21/2025

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	<b>FINAL FILL:</b> FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEERS PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	<b>INITIAL FILL:</b> FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE (B' LAYER) TO 15" (375 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE.  MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145 <sup>1</sup> A-1, A-2.4, A-3  OR AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	<b>EMBEDMENT STONE:</b> FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE <sup>2</sup>	AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	<b>FOUNDATION STONE:</b> FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE OR RECYCLED CONCRETE <sup>2</sup>	AASHTO M43 <sup>1</sup> 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. <sup>2,3</sup>

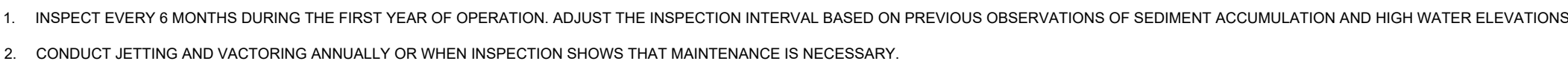
[illegible]

<b>NOMINAL CHAMBER SPECIFICATIONS</b>	
SIZE (W X H X INSTALLED LENGTH)	51.0" X 33.0" X 85.4" (1295 mm X 838 mm X 2169 mm)
CHAMBER STORAGE	50.0 CUBIC FEET (1.43 m <sup>3</sup> )
MINIMUM INSTALLED STORAGE*	81.0 CUBIC FEET (2.29 m <sup>3</sup> )
WEIGHT	58.0 lbs. (26.7 kg)
<b>NOMINAL END CAP SPECIFICATIONS</b>	
SIZE (W X H X INSTALLED LENGTH)	46.5" X 32.6" X 10.5" (1181 mm X 828 mm X 267 mm)
END CAP STORAGE	3.4 CUBIC FEET (0.09 m <sup>3</sup> )
MINIMUM INSTALLED STORAGE*	15.4 CUBIC FEET (0.43 m <sup>3</sup> )
WEIGHT	15.7 lbs. (7.1 kg)

\*\*ASSUMES 6" (152 mm) STONE ABOVE AND BELOW END CAPS, 6" (152 mm) BETWEEN ROWS, 12" (305 mm) BEYOND END CAPS

NOTE: ALL DIMENSIONS ARE NOMINAL

NOT TO SCALE



NOT TO SCALE

