



DISTRIBUTION SYSTEM BACKGROUND

The City of St. Charles maintains roughly 221 miles of water main and approximately 2,840 fire hydrants. Currently the City's distribution system is divided into inner and outer pressure zones. The City is able to transfer water between zones through the use of the seven pressure reducing valves.

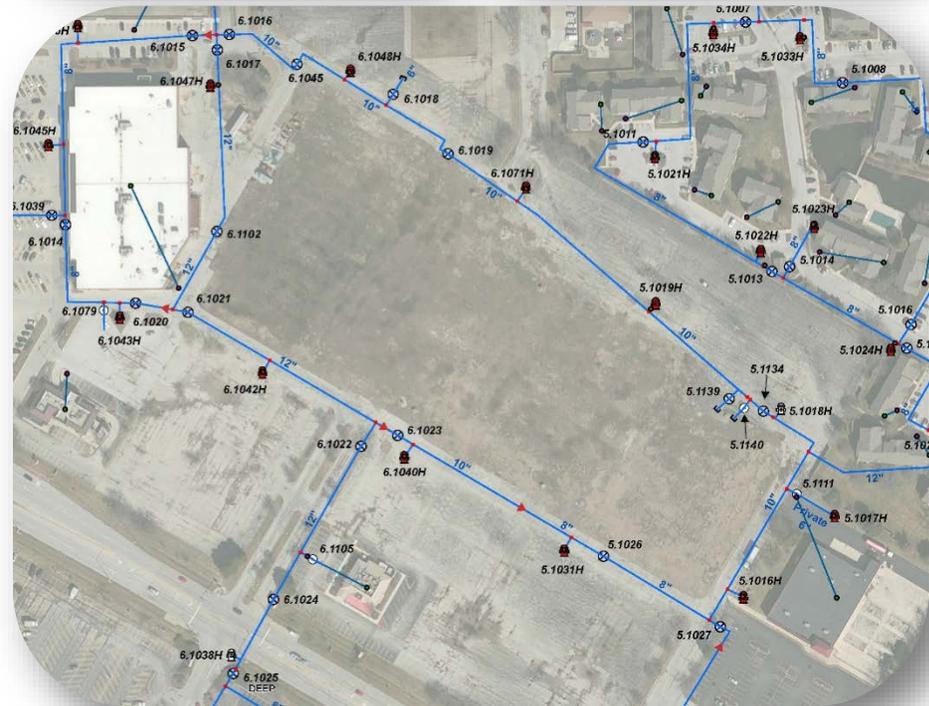
The City Water Department has adopted proactive water main maintenance, flushing, and rehabilitation programs to sustain the level of service provided to the community. The water main rehabilitation program is often coordinated with the City's Capital Improvement's Program for street rehabilitation and reconstruction to minimize costs. As a result, the City of St. Charles has a strong water distribution system.



EXISTING CONDITIONS

The exhibit below illustrates the existing water system layout with system pressure and fire flow capacity for the surrounding area. The area in consideration is along Illinois Route 38 (Roosevelt Road), generally bound between Prairie Street to the North, South 14th Street to the East, Illinois Route 38 (Roosevelt Road) to the South, and Randall Road to the West.

The existing water main in the area consists of 10 and 12-inch water main, with minor portions of 8-inch. This property is located in an area of town with a large amount of water main looping and does not have a significant number of dead end mains. The daily demands in the area consist of both residential and commercial water usage.





WATERCAD® DISTRIBUTION SYSTEM MODEL

General Background

The City maintains a Bentley WaterCAD® V8i distribution system model, hosted by Trotter and Associates, Inc. The model is a valuable tool for evaluating the impact of potential development, as well as to measure the benefits received from capital improvement and rehabilitation projects. In 2007, the WaterCAD® model was updated from its 2001 version to reflect the distribution system's capabilities under Maximum Day Demand (MDD) and Fire Flow conditions.

Through a concerted effort by the City's GIS department the water system data is now managed electronically through GIS. In an effort to create a more accurate WaterCAD® distribution system, in 2014 the City elected to rebuild the model from the existing GIS data incorporating all of the improvements that have occurred since 2007. The new water model has been modified to also include data for all hydrants throughout the service area. In an effort to continue maintaining this goal, the City has asked TAI to provide information in regards to the proposed Prairie Center development and the available fire flows and pressures at this location.

Assumptions and Limitations

The following assumptions were utilized to most accurately analyze the water system at the Prairie Center Development. The existing model used a water velocity constraint of 15 feet per second, which ensures system stability during flushing and fire flow events. In addition, the study area did not consist of the entire system. The study area consisted of the area surrounding the proposed site improvements (Route 38 and South 14th Street). The available fire flows and pressures reported represent instantaneously available capacities at the water main adjacent to the proposed buildings and fire hydrants listed within the data tables provided within this memo.

The improvements that were modeled consisted of that which was described on the proposed plans and exhibits, appended to this report for reference. TAI identified several discrepancies in the plans for the existing water main. In the locations where the development did not call for removal and replacement of the existing water mains, TAI used the sizing provided by STC's GIS Department. As a result, a small section of the water main did remain as 8-inch. TAI also assumed that the 10-inch water main located along the back of the existing site was removed from service, and a new 10 and 12-inch water main was installed per the proposed plans.

Assumptions made in regards to future water usage/daily demands at the proposed development are listed in Tables 1 and 2. It was assumed that each of the residential buildings had a 50/50 split of single bedroom and 2-3 bedroom units. A single bedroom apartment equated to a population equivalent of 1.5, while a 2-3 bedroom apartment equated to three PE. Per City data, 75 gallons/PE was used for the average usage. Table 1 outlines the anticipated water consumption per each residential building.





Table 1: Residential PE & Demands

Residential Building	Single Bedroom	Two/Three Bedroom	Total Units	Total PE/Unit	Gallons/Day
Residential B1	18	18	36	81	6,075
Residential B2	18	18	36	81	6,075
Residential B3	18	18	36	81	6,075
Residential C1	18	18	36	81	6,075
Residential D1	19	20	36	88.5	6,638
Residential D2	19	20	36	88.5	6,638
Residential D3	19	20	36	88.5	6,638
Residential D4	19	20	39	88.5	6,638
Residential D5	19	20	39	88.5	6,638
Residential E1	22	23	39	102	7,650
Mixed Use B1	18	18	39	81	6,075
Mixed Use B2	18	18	39	81	6,075
Mixed Use B3	18	18	45	81	6,075
Mixed Use D1	19	20	39	88.5	6,638
Mixed Use D2	19	20	39	88.5	6,638
Mixed Use D3	19	20	39	88.5	6,638
Total	300	309	609	1,377	103,275

The commercial properties were assumed to be restaurant locations. In order to quantify the water consumption for each building, TAI utilized the square footage of each building to estimate the water demand. It was estimated that each building would use approximately 0.85 gallons/day/square foot of building space. Table 2 outlines each building and the anticipated daily water use.

Table 2: Commercial Demands

Commercial Building	Square Feet	Gallons/Day
Retail/Rest/A	9,000	7,397
Retail/Rest/B1	5,000	4,110
Retail/Rest/B2	5,000	4,110
Retail/Rest/C1	3,475	2,856
Retail/Rest/C2	3,475	2,856
Retail/Rest/D	7,200	5,918
Mixed Use B1 - Retail	12,160	9,995
Mixed Use B2 - Retail	12,160	9,995
Mixed Use B3 - Retail	12,160	9,995
Mixed Use D1 - Retail	15,615	12,834
Mixed Use D2 - Retail	15,615	12,834
Mixed Use D3 - Retail	15,615	12,834
Total	116,475	95,733





Fire Flow Requirements

Per the adopted 2015 International Fire Code, the fire-flow duration for commercial properties is two hours for Needed Fire Flows (NFF_i) up to 3,000 gpm and three hours for needed Fire Flows up to 4,000 gpm. Properties requiring greater than 4,000 gpm fire flows require a flow duration of four hours. The needed fire-flow duration for 1-and 2-family dwellings with an effective area of 3,600 square feet or less is one hour, and dwellings larger than 3,600 square feet is two hours. Buildings other than one and two-family dwellings require fire flows per table B105.1 (minimum required fire-flow and flow durations for buildings) within Appendix B of the IFC.

TABLE B105.1(2)
 REFERENCE TABLE FOR TABLES B105.1(1) AND B105.2

FIRE-FLOW CALCULATION AREA (square feet)					FIRE-FLOW (gallons per minute) ^b	FLOW DURATION (hours)
Type IA and IB ^a	Type IIA and IIIA ^a	Type IV and V-A ^a	Type IIB and IIIB ^a	Type V-B ^a		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	4
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-51,500	6,000	
—	—	115,801-125,500	83,701-90,600	51,501-55,700	6,250	
—	—	125,501-135,500	90,601-97,900	55,701-60,200	6,500	
—	—	135,501-145,800	97,901-106,800	60,201-64,800	6,750	
—	—	145,801-156,700	106,801-113,200	64,801-69,600	7,000	
—	—	156,701-167,900	113,201-121,300	69,601-74,600	7,250	
—	—	167,901-179,400	121,301-129,600	74,601-79,800	7,500	
—	—	179,401-191,400	129,601-138,300	79,801-85,100	7,750	
—	—	191,401-Greater	138,301-Greater	85,101-Greater	8,000	

For SI: 1 square foot = 0.0929 m², 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.
 a. Types of construction are based on the *International Building Code*.
 b. Measured at 20 psi residual pressure.

PRAIRIE CENTER DEVELOPMENT WATER MODEL EVALUATION

Trotter and Associates, Inc. has performed the requested evaluation of the hydraulic model for the City of St. Charles in regards to the Prairie Center Development. Below are the results of the proposed site development from the hydraulic analysis for both average daily demands, and maximum day demands.

Prairie Center Development – Proposed Water Main Layout

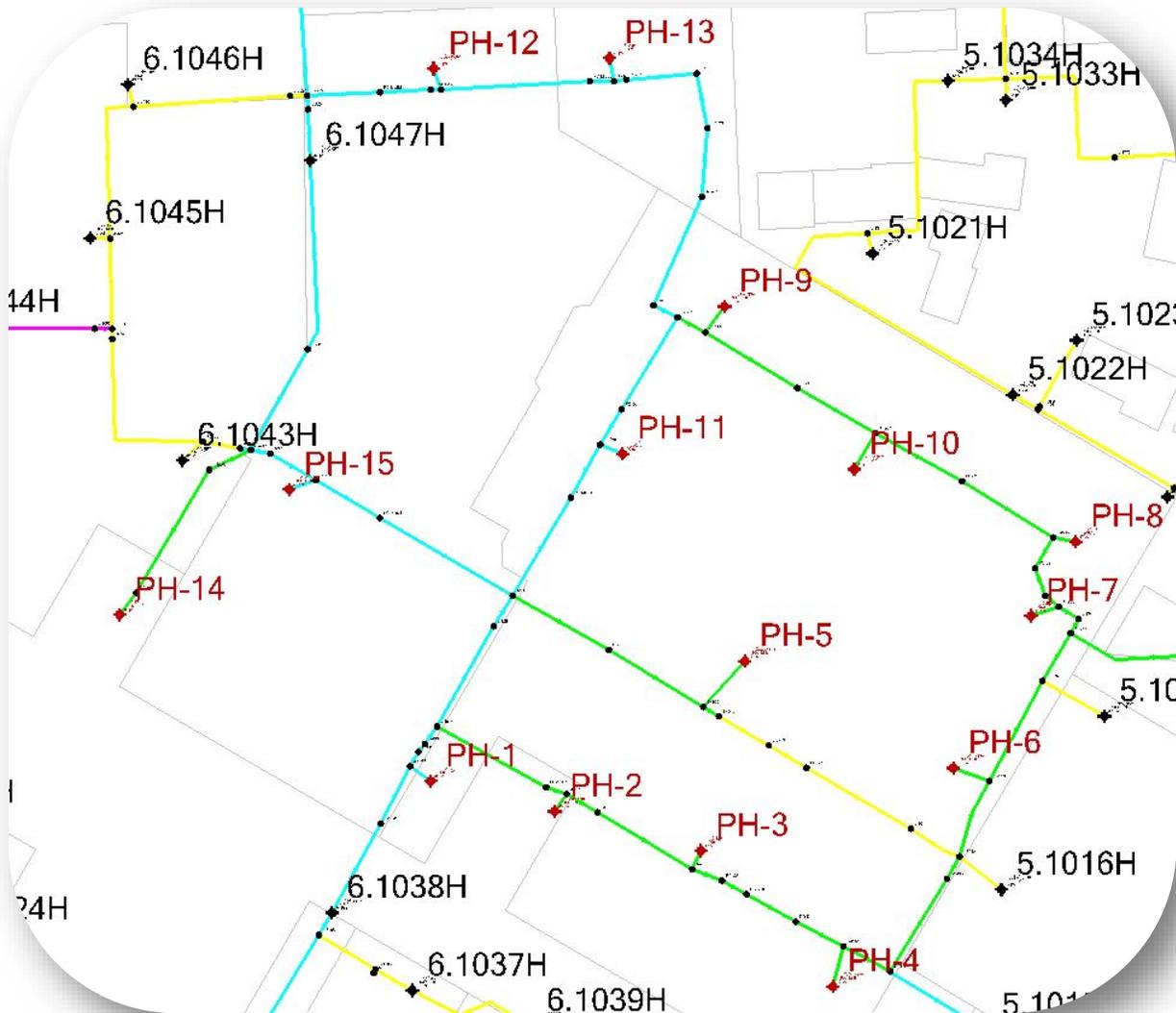
As stated previously, this development has 13 multi-unit residential buildings, six commercial buildings, and three mixed-use commercial/residential buildings. There is approximately a total of 609 residential units, and 80,000 square feet of retail/commercial properties. The proposed water main layout for the Prairie Center Development project is made up mostly 10-inch and 12-inch water main.

This layout includes approximately 1,300 lf of new 12-inch water main, and 1,700 lf of new 10-inch water main. Shown on the following page is the proposed water main layout for the development. Water main in blue represents 12-inch, green is 10-inch, and yellow is 8-inch. The site includes 15 additional hydrants (shown in red) that are to be tied into both the new 10-inch and 12-inch water mains running throughout the site. These new hydrants are to serve the twenty two buildings.



Fire Flow Analysis

The WaterCAD computer modelling software was used to identify the available fire flow capacity throughout the Prairie Center proposed site development during both average daily and maximum day demands. The available fire flow capacity is defined as the maximum deliverable flow from a single building service and hydrant while maintaining residual pressures of no less than 20 psi at any point in the system.





Average Day Demand

The model was first run under representative conditions that the City of St. Charles routinely sees throughout its distribution system, referred to as the Average Daily Demand (ADD). This scenario includes roughly 2,950 gallons per minute of water usage throughout the city following residential and commercial demand patterns. The Campton Hills water tower Red Gate water tower serving the high pressure, and the 10th Street water tower serving the low pressure system, and all were run under nearly full conditions. Additionally, the Ohio Avenue water treatment plant and Wells No. 9 & 11 were available to run during the analysis. These wells typically run under average demand conditions.

The results of this modeling are shown in the table below are for the fire hydrants and connection points to each building in the proposed Prairie Center Development.

Building	Pressure (psi) - ADD	Fire Flow Capacity (gpm) - ADD	Hydrant No.	Pressure (psi) - ADD	Fire Flow Capacity (gpm) - ADD*
Residential B1	54	6,030	PH-1	53	4,122
Residential B2	55	5,809	PH-2	53	3,955
Residential B3	54	6,085	PH-3	53	3,960
Residential C1	54	6,284	PH-4	53	3,910
Residential D1	54	6,185	PH-5	53	3,699
Residential D2	54	4,782	PH-6	53	3,864
Residential D3	54	6,224	PH-7	54	4,017
Residential D4	55	5,879	PH-8	54	3,985
Residential D5	55	5,675	PH-9	53	4,055
Residential E1	54	5,806	PH-10	53	3,860
Mixed Use B1	54	6,255	PH-11	53	4,148
Mixed Use B2	54	6,327	PH-12	53	4,179
Mixed Use B3	54	6,130	PH-13	53	4,104
Mixed Use D1	54	6,128	PH-14	53	3,501
Mixed Use D2	54	5,806	PH-15	53	4,094
Mixed Use D3	55	5,733			
Retail/Rest/A	54	4,660			
Retail/Rest/B1	54	6,214			
Retail/Rest/B2	54	6,232			
Retail/Rest/C1	54	5,769			
Retail/Rest/C2	55	5,717			
Retail/Rest/D	55	5,782			

**Note: The proposed fire hydrants have available fire flows above 3,000 gpm; this is the instantaneous flow and more than one hydrant in the area may be required to achieve this flow rate. It is anticipated that the maximum flow rate from of a single fire hydrant 4.5-inch outlet is approximately 3,000 gpm.*



Maximum Day Demand – Scenario 1 (Towers Full)

The model was then run under the highest demand conditions that the City of St. Charles has seen in the past three years, referred to as the Maximum Day Demand. This scenario includes roughly 6,600 gallons per minute of water usage throughout the City. The Campton Hills water tower, Red Gate water tower, and the 10th Street water tower were run under nearly full conditions for scenario one. Additionally, the Ohio Avenue water treatment plant and Wells No. 9 & 11 were available to run during the analysis.

The results of this modeling are shown in the table below are for the fire hydrants and building services and connection points to each building in the proposed Prairie Center Development.

Building	Pressure (psi) - MDD	Fire Flow Capacity (gpm) - MDD
Residential B1	52	5,566
Residential B2	53	5,375
Residential B3	52	5,606
Residential C1	52	5,787
Residential D1	52	5,698
Residential D2	52	4,465
Residential D3	52	5,728
Residential D4	53	5,439
Residential D5	53	5,256
Residential E1	52	5,368
Mixed Use B1	52	5,752
Mixed Use B2	52	5,821
Mixed Use B3	52	5,649
Mixed Use D1	53	5,650
Mixed Use D2	52	5,358
Mixed Use D3	53	5,304
Retail/Rest/A	52	4,351
Retail/Rest/B1	52	5,719
Retail/Rest/B2	52	5,733
Retail/Rest/C1	52	5,334
Retail/Rest/C2	53	5,289
Retail/Rest/D	53	5,346

Hydrant No.	Pressure (psi) - MDD	Fire Flow Capacity (gpm) - MDD
PH-1	51	3,869
PH-2	51	3,715
PH-3	51	3,725
PH-4	51	3,676
PH-5	51	3,486
PH-6	51	3,636
PH-7	52	3,779
PH-8	52	3,751
PH-9	51	3,811
PH-10	51	3,632
PH-11	51	3,892
PH-12	51	3,925
PH-13	51	3,853
PH-14	51	3,305
PH-15	51	3,845



Maximum Day Demand – Scenario 2 (Campton Hills Tower Empty)

The model was then run again under Maximum Day Demand; however the Campton Hills water tower was taken offline to simulate out-of-service situations such as those during painting or rehabilitation.

The results of this modeling are shown in the table below are for the fire hydrants and connection points to each building in the proposed Prairie Center Development.

Building	Pressure (psi) - MDD	Fire Flow Capacity (gpm) - MDD	Hydrant No.	Pressure (psi) - MDD	Fire Flow Capacity (gpm) - MDD
Residential B1	48	2,365	PH-1	46	2,070
Residential B2	48	2,366	PH-2	46	2,042
Residential B3	47	2,355	PH-3	47	2,066
Residential C1	48	2,387	PH-4	46	2,039
Residential D1	48	2,380	PH-5	46	1,993
Residential D2	48	2,229	PH-6	46	2,031
Residential D3	47	2,374	PH-7	47	2,091
Residential D4	48	2,379	PH-8	47	2,084
Residential D5	48	2,348	PH-9	47	2,081
Residential E1	48	2,350	PH-10	46	2,033
Mixed Use B1	47	2,370	PH-11	46	2,084
Mixed Use B2	47	2,378	PH-12	46	2,101
Mixed Use B3	48	2,370	PH-13	46	2,075
Mixed Use D1	48	2,379	PH-14	46	1,946
Mixed Use D2	47	2,324	PH-15	46	2,080
Mixed Use D3	48	2,350			
Retail/Rest/A	47	2,188			
Retail/Rest/B1	47	2,359			
Retail/Rest/B2	47	2,360			
Retail/Rest/C1	48	2,345			
Retail/Rest/C2	48	2,347			
Retail/Rest/D	48	2,353			



SUMMARY OF FINDINGS

The results of the WaterCAD modeling for the Prairie Center development indicate that during maximum day demand conditions, fire flows in excess of 3,000 gpm are expected to be available at the proposed hydrants and building junctions, with operating pressure of approximately 50 psi. This modeling was performed utilizing a lower residual pressure limit of 20 psi and performed per NFPA recommendations.

As stated previously, the City of St. Charles has adopted the 2015 International Fire Code, which sets requirements for available fire flows and durations for various construction types. Within Appendix B, Fire Code Table B105.1(2) (Reference Table for Tables B105.1(1) and B105.2) states the specific requirements for fire flow capacities of different building types. In order to evaluate the adequacy of fire flow for each building, additional information would be required including building type, construction techniques, building separation, etc. It is recommended that building department evaluate the available fire flows of the proposed development relative to the required fire flow for each building to determine the acceptability of the layout as proposed.





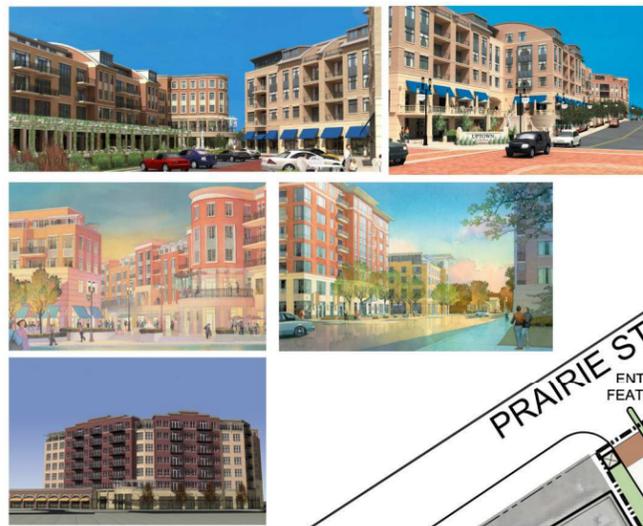
APPENDIX A



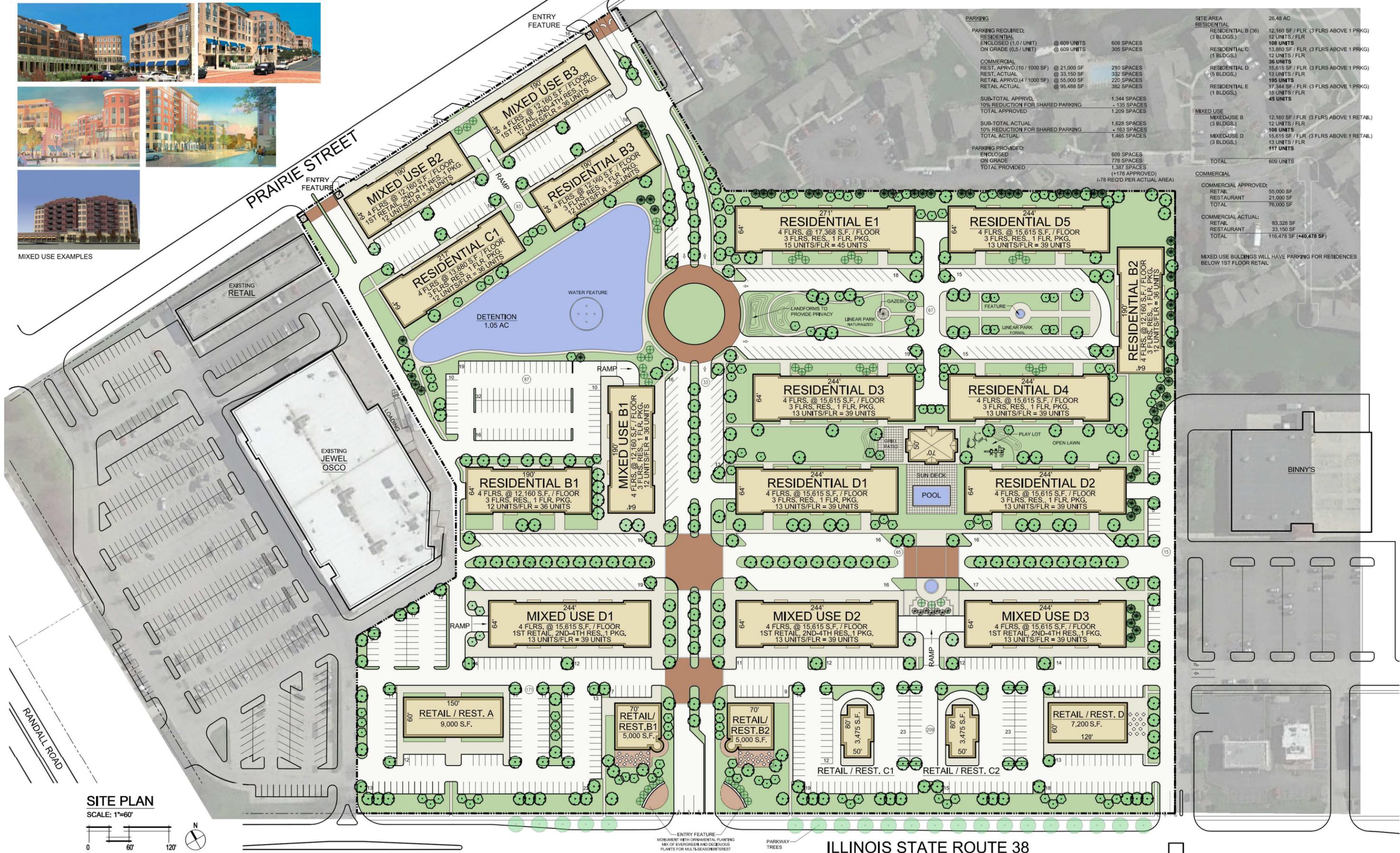


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MIXED USE EXAMPLES



PARKING

PARKING REQUIRED:		
RESIDENTIAL ENCLOSED (1.0 / UNIT)	@ 609 UNITS	609 SPACES
ON GRADE (0.5 / UNIT)	@ 609 UNITS	305 SPACES
COMMERCIAL		
REST. APRVD.(10 / 1000 SF)	@ 21,000 SF	210 SPACES
REST. ACTUAL	@ 33,150 SF	332 SPACES
RETAIL APRVD.(4 / 1000 SF)	@ 55,000 SF	220 SPACES
RETAIL ACTUAL	@ 95,488 SF	382 SPACES
SUB-TOTAL APRVD.		
		1,344 SPACES
10% REDUCTION FOR SHARED PARKING		- 135 SPACES
TOTAL APPROVED		1,209 SPACES
SUB-TOTAL ACTUAL		
		1,628 SPACES
10% REDUCTION FOR SHARED PARKING		- 163 SPACES
TOTAL ACTUAL		1,465 SPACES
PARKING PROVIDED:		
ENCLOSED ON GRADE		609 SPACES
TOTAL PROVIDED		778 SPACES
		1,387 SPACES
		(+178 APPROVED)
		(-78 REQ'D PER ACTUAL AREA)

SITE AREA 26.48 AC

RESIDENTIAL	
RESIDENTIAL B (36 BLDGS.)	12,160 SF / FLR (3 FLRS ABOVE 1 PRKG) 12 UNITS / FLR
108 UNITS	
RESIDENTIAL C (1 BLDGS.)	13,880 SF / FLR (3 FLRS ABOVE 1 PRKG) 12 UNITS / FLR
36 UNITS	
RESIDENTIAL D (5 BLDGS.)	15,615 SF / FLR (3 FLRS ABOVE 1 PRKG) 13 UNITS / FLR
195 UNITS	
RESIDENTIAL E (1 BLDGS.)	17,344 SF / FLR (3 FLRS ABOVE 1 PRKG) 15 UNITS / FLR
45 UNITS	
MIXED USE	
MIXED-USE B (3 BLDGS.)	12,160 SF / FLR (3 FLRS ABOVE 1 RETAIL) 12 UNITS / FLR
108 UNITS	
MIXED-USE D (3 BLDGS.)	15,615 SF / FLR (3 FLRS ABOVE 1 RETAIL) 13 UNITS / FLR
117 UNITS	
TOTAL	609 UNITS
COMMERCIAL	
COMMERCIAL APPROVED:	
RETAIL	55,000 SF
RESTAURANT	21,000 SF
TOTAL	76,000 SF
COMMERCIAL ACTUAL:	
RETAIL	83,328 SF
RESTAURANT	33,150 SF
TOTAL	116,478 SF (+40,478 SF)

MIXED USE BUILDINGS WILL HAVE PARKING FOR RESIDENCES BELOW 1ST FLOOR RETAIL.

SITE PLAN
SCALE: 1"=60'

PRAIRIE CENTRE
ST. CHARLES, ILLINOIS

SHODEEN

ILLINOIS STATE ROUTE 38



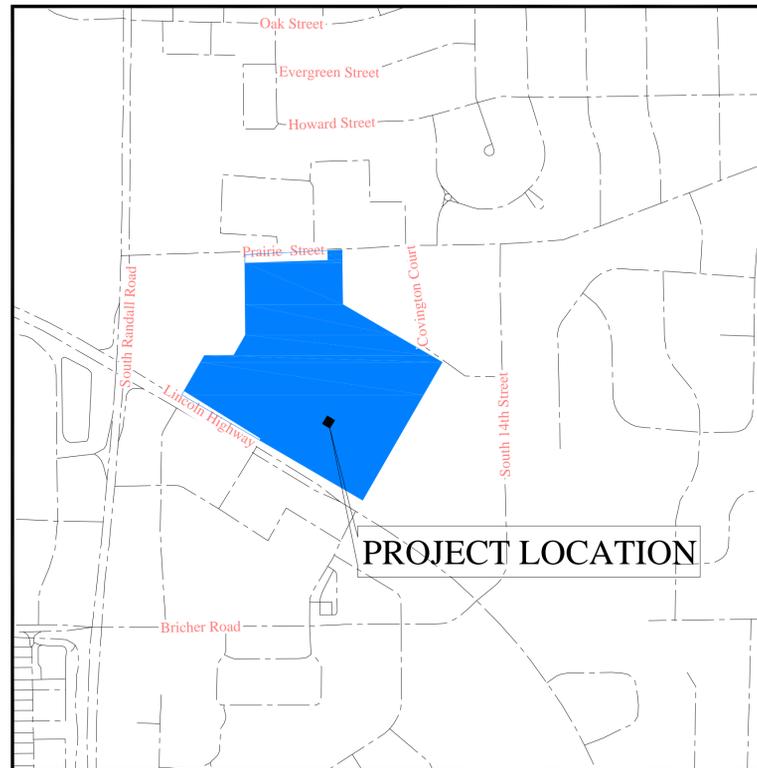
OKW Architects

DATE: APRIL 18, 2016

PROJECT NUMBER: 06090

PRELIMINARY ENGINEERING PLANS FOR **PRAIRIE CENTRE** IL ROUTE 38 & EAST OF RANDALL ROAD ST CHARLES, ILLINOIS

Sheet Number	Sheet Title
1	Cover Sheet
2	OVERALL SITE PLAN
3	EXISTING CONDITIONS 1
4	EXISTING CONDITIONS 2
5	EXISTING CONDITIONS 3
6	EXISTING CONDITIONS 4
7	GEOMETRIC DESIGN 1
8	GEOMETRIC DESIGN 2
9	GEOMETRIC DESIGN 3
10	GEOMETRIC DESIGN 4
11	GEOMETRIC DESIGN 5
12	UTILITY DESIGN 1
13	UTILITY DESIGN 2
14	UTILITY DESIGN 3
15	UTILITY DESIGN 4
16	UTILITY DESIGN 5
17	GRADING 1
18	GRADING 2
19	GRADING 3
20	GRADING 4
21	GRADING 5
22	DETAIL 1



VICINITY MAP
NO SCALE

NOTES:

1. THE TOPOGRAPHY SURVEY FOR THIS PROJECT IS BASED ON A FIELD SURVEY CONDUCTED BY OTHERS. THE CONTRACTOR SHALL VERIFY THE EXISTING CONDITIONS PRIOR TO CONSTRUCTION AND SHALL IMMEDIATELY NOTIFY ESM CIVIL SOLUTIONS AND THE CLIENT IN WRITING OF ANY DIFFERING CONDITIONS.
2. ESM CIVIL SOLUTIONS MAKES NO CLAIMS AS TO THE ACCURACY OF THE EXISTING CONDITIONS REPRESENTED BY THE TOPOGRAPHIC DATA PREPARED BY OTHERS.

ESM CIVIL SOLUTIONS LLC. IS NOT RESPONSIBLE FOR THE SAFETY OF ANY PARTY AT OR ON THE CONSTRUCTION SITE. SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND ANY OTHER PERSON OR ENTITY PERFORMING WORK OR SERVICES. NEITHER THE OWNER NOR ENGINEER ASSUMES ANY RESPONSIBILITY FOR THE JOB SITE SAFETY OF PERSONS ENGAGED IN THE WORK OR THE MEANS OR METHODS OF CONSTRUCTION.

LEGEND

<ul style="list-style-type: none"> ● FOUND 7/8" O.D.I.P. UNLESS OTHERWISE NOTED (HOLD LOCATION) (CONTROL POINT) ■ CONCRETE MONUMENT + CROSS IN CONCRETE ⊙ MANHOLE ⊙ STORM STRUCTURE ⊙ SANITARY MANHOLE ⊙ VALVE VAULT ⊙ FIRE HYDRANT ⊙ FLARED END SECTION ⊙ UTILITY POLE ⊙ GUY POLE ⊙ OVERHEAD TRAFFIC SIGNAL ⊙ TRAFFIC SIGNAL MANHOLE OHW OVERHEAD WIRES ⊙ GAS METER ⊙ ELECTRIC METER ⊙ TRANSFORMER PAD ⊙ TELEPHONE PEDESTAL ⊙ ELECTRIC PEDESTAL ⊙ TELEPHONE MANHOLE ⊙ CABLE TELEVISION PEDESTAL ⊙ ELECTRIC MANHOLE ⊙ VALVE BOX ⊙ B/BOX ⊙ SIGN ⊙ BOLLARD POLE ⊙ LIGHT ⊙ LIGHT POLE ⊙ HAND HOLE ⊙ MAILBOX ⊙ GAS MARKER ⊙ ELECTRIC MARKER 	<ul style="list-style-type: none"> ⊙ TELEPHONE MARKER ⊙ WATER MARKER ⊙ GAS VALVE — SANITARY SEWER — STORM SEWER — WATER MAIN — GAS MAIN — ELECTRIC LINE — TELEPHONE LINE ⊙ CONIFEROUS TREE W/APPROX. DIAMETER ⊙ DECIDUOUS TREE W/APPROX. DIAMETER MS-MULTI-STEM (DRIP LINE SHOWN IS APPROXIMATE) + ELEVATION ■ BITUMINOUS PAVEMENT ■ CONCRETE SURFACE ■ GRAVEL SURFACE ■ LANDSCAPE AREA ■ STONE SURFACE ■ DETECTABLE TACTILE WARNING SURFACE — WOOD FENCE — CHAIN LINK FENCE — METAL GUARDRAIL ⊙ OVERHEAD TRAFFIC SIGNAL 	<p>ABBREVIATIONS</p> <ul style="list-style-type: none"> O.D.I.P. = OUTSIDE DIAMETER IRON PIPE TF = TOP OF FOUNDATION FF = FINISHED FLOOR FES = FLARED END SECTION VCP = VITRIFIED CLAY PIPE DIP = DUCTILE IRON PIPE PVC = POLYVINYL CHLORIDE RCP = REINFORCED CONCRETE PIPE CMP = CORRUGATED METAL PIPE (R) = RECORD BEARING OR DISTANCE (M) = MEASURED BEARING OR DISTANCE (C) = CALCULATED BEARING OR DISTANCE (D) = DEED BEARING OR DISTANCE A = ARC LENGTH R = RADIUS CH = CHORD CB = CHORD BEARING B.S.L. = BUILDING SETBACK LINE U.E. = UTILITY EASEMENT D.E. = DRAINAGE EASEMENT P.U.E. = PUBLIC UTILITY EASEMENT P.O.C. = POINT OF COMMENCEMENT P.O.B. = POINT OF BEGINNING P.U. & D.E. = PUBLIC UTILITY AND DRAINAGE EASEMENT BC = BACK OF CURB BDC = BACK OF DEPRESSED FL = FLOW LINE C = CONCRETE P = PAVEMENT G = GRAVEL EW = EDGE OF WALK TW = TOP OF WALL TP = TOP OF PIPE IE = INVERT ELEVATION PL = PROPERTY LINE DS = DOWN SPOUT S.F. = SQUARE FEET
---	--	--



LINE LEGEND

- LIMITS OF LAND PER LEGAL DESCRIPTION
- ADJACENT LAND
- PARCEL LINE
- EASEMENT LINE
- CENTERLINE
- BUILDING SETBACK LINE
- SECTION LINE
- 400' RADIUS FROM HYDRANT

BENCHMARKS:

1. CUT SQUARE ON TRANSFORMER PAD, NORTH SIDE OF BRICHER ROAD, CORNER OF BRICHER AND AMACO STATION (WEST SIDE)
ELEV = 784.38 (DATUM = NAVD 88)
2. PIN IN CONCRETE MOMUMENT AT MOST NORTHERLY CORNER OF ST. CHARLES COMMERCIAL CENTER UNIT NO.9
ELEV = 786.56

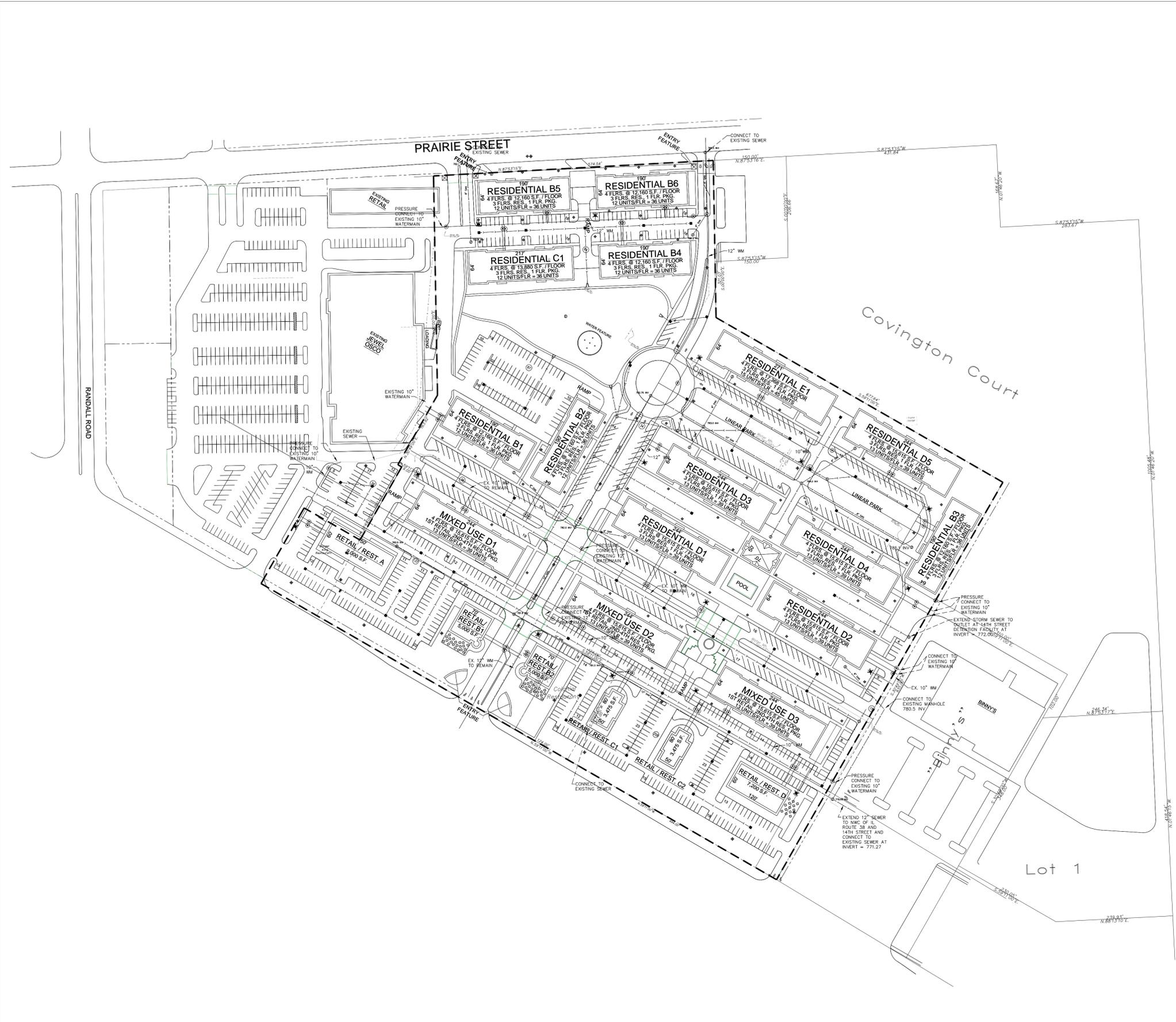


PREPARED FOR:
SHODEEN, INC.
77 NORTH FIRST STREET
GENEVA, IL 60134

PREPARED BY:
ESM CIVIL SOLUTIONS, LLC
Civil Engineering – Land Entitlement – Project Feasibility
1315 Macom Drive – Suite 205 Naperville Illinois 60564
o: 630-300-0933 c: 630-624-0520

NO.		DATE		DESCRIPTION	
3	7-08-16	REVISED PER CITY PLANNING & ENG REVIEW			

COVER SHEET					
PRAIRIE CENTRE					
FILE NAME:	DSGN. BY: ESM	JOB NO: 16033	FLD. BK: ----	SHEET NO.	
DISC NUM: ----	DRN BY: MCA	DATE: 5-13-16	SCALE: NA	1 of 22	



PARKING

PARKING REQUIRED:		
RESIDENTIAL		
ENCLOSED (1.0 / UNIT)	@ 609 UNITS	609 SPACES
ON GRADE (0.5 / UNIT)	@ 609 UNITS	305 SPACES
COMMERCIAL		
REST. APRVD.(10 / 1000 SF)	@ 21,000 SF	210 SPACES
REST. ACTUAL	@ 33,150 SF	332 SPACES
RETAIL APRVD.(4 / 1000 SF)	@ 55,000 SF	220 SPACES
RETAIL ACTUAL	@ 95,488 SF	382 SPACES
SUB-TOTAL APRVD.		1,344 SPACES
10% REDUCTION FOR SHARED PARKING		- 135 SPACES
TOTAL APPROVED		1,209 SPACES
SUB-TOTAL ACTUAL		1,628 SPACES
10% REDUCTION FOR SHARED PARKING		- 163 SPACES
TOTAL ACTUAL		1,465 SPACES
PARKING PROVIDED:		
ENCLOSED		609 SPACES
ON GRADE		778 SPACES
TOTAL PROVIDED		1,387 SPACES
		(+178 APPROVED)
		(-78 REQ'D PER ACTUAL AREA)

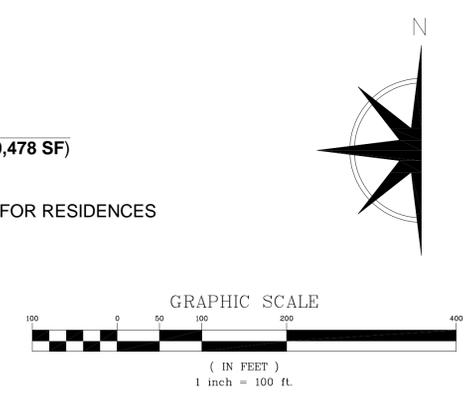
SITE AREA	26.48 AC
RESIDENTIAL	
RESIDENTIAL B (36)	12,160 SF / FLR (3 FLRS ABOVE 1 PRKG)
(3 BLDGS.)	12 UNITS / FLR
	108 UNITS
RESIDENTIAL C	13,880 SF / FLR (3 FLRS ABOVE 1 PRKG)
(1 BLDGS.)	12 UNITS / FLR
	36 UNITS
RESIDENTIAL D	15,615 SF / FLR (3 FLRS ABOVE 1 PRKG)
(5 BLDGS.)	13 UNITS / FLR
	195 UNITS
RESIDENTIAL E	17,344 SF / FLR (3 FLRS ABOVE 1 PRKG)
(1 BLDGS.)	15 UNITS / FLR
	45 UNITS
MIXED USE	
MIXED-USE B	12,160 SF / FLR (3 FLRS ABOVE 1 RETAIL)
(3 BLDGS.)	12 UNITS / FLR
	108 UNITS
MIXED-USE D	15,615 SF / FLR (3 FLRS ABOVE 1 RETAIL)
(3 BLDGS.)	13 UNITS / FLR
	117 UNITS
TOTAL	609 UNITS

COMMERCIAL

COMMERCIAL APPROVED:		
RETAIL	55,000 SF	
RESTAURANT	21,000 SF	
TOTAL	76,000 SF	

COMMERCIAL ACTUAL:		
RETAIL	83,328 SF	
RESTAURANT	33,150 SF	
TOTAL	116,478 SF (+40,478 SF)	

MIXED USE BLDINGS WILL HAVE PARKING FOR RESIDENCES BELOW 1ST FLOOR RETAIL

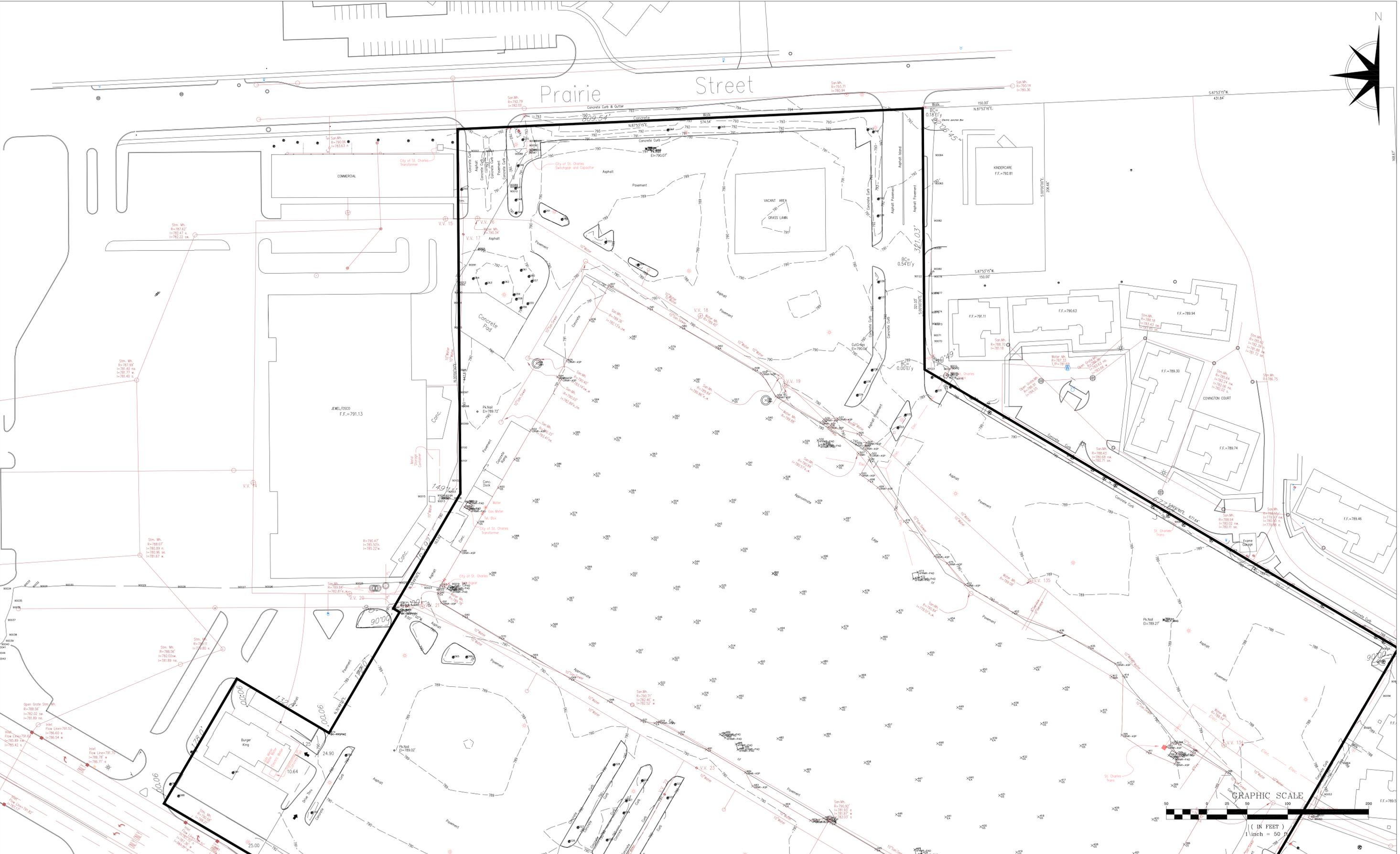


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		REVISIONS			
NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
1	6-29-16	ADDED HYDRANTS & RELOCATED VALVE VAULT PER CITY			
2	07-05-16	REVISED SIDEWALK AND ADDED STREET LIGHTS			
3	7-08-16	REVISED PER CITY PLANNING & ENG REVIEW			

OVERALL SITE PLAN				
PRAIRIE CENTRE				
FILE NAME:	DSGN. BY: ESM	JOB NO: 16033	FLD. BK: ----	SHEET NO. 2 of 22
DISC NUM: ----	DRN BY: MCA	DATE: 5-13-16	SCALE: 1"=100'	



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REVISIONS					
NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
3	7-08-16	REVISED PER CITY PLANNING & ENG REVIEW LETTERS			

EXISTING CONDITIONS 1
PRAIRIE CENTRE

FILE NAME:	DSGN. BY: ESM	JOB NO: 16033	FLD. BK: ----	SHEET NO. 3 of 22
DISC NUM: ----	DRN BY: MCA	DATE: 5-13-16	SCALE: 1"=50'	



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 77 NORTH FIRST STREET
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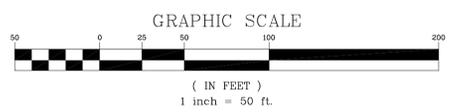


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NO.		DATE		DESCRIPTION		REVISIONS	
3	7-08-16	REVISED PER CITY PLANNING & ENG REVIEW LETTERS					

EXISTING CONDITIONS 2
PRAIRIE CENTRE

FILE NAME: _____ DSGN. BY: ESM JOB NO: 16033 FLD. BK: ---- SHEET NO. 4 of 22
 DISC NUM: ---- DRN BY: MCA DATE: 5-13-16 SCALE: 1"=50'



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77 NORTH FIRST STREET
GENEVA, IL 60134



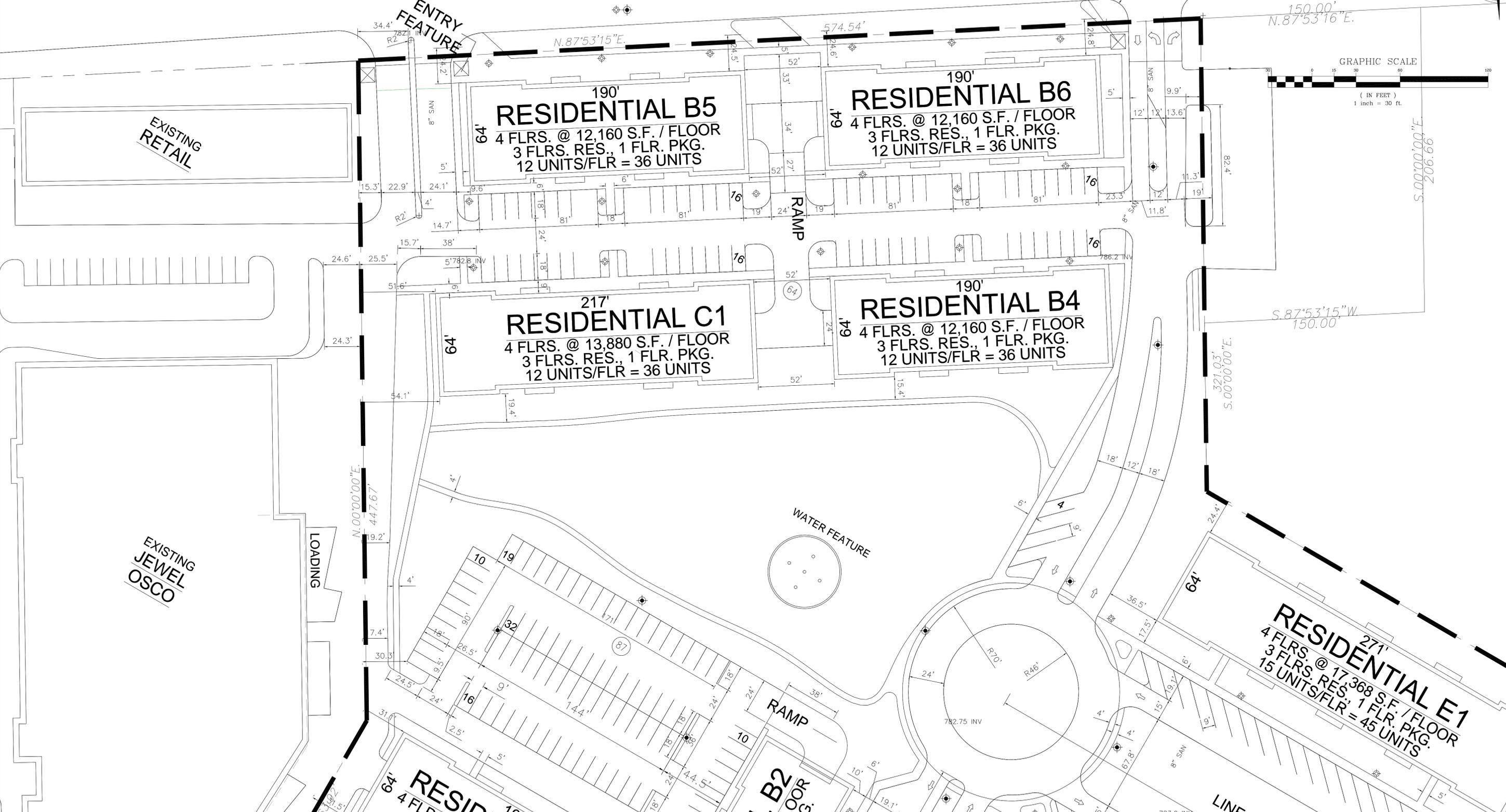
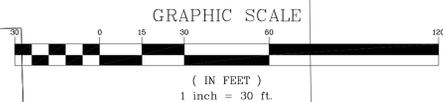
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REVISIONS					
NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
3	7-08-16	REVISED PER CITY PLANNING & ENG REVIEW LETTERS			

EXISTING CONDITIONS 4
PRAIRIE CENTRE

FILE NAME:	DSGN. BY: ESM	JOB NO: 16033	FLD. BK: ----	SHEET NO. 6 of 22
DISC NUM: ----	DRN BY: MCA	DATE: 5-13-16	SCALE: 1"=50'	

PRAIRIE STREET



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77 NORTH FIRST STREET
GENEVA, IL 60134

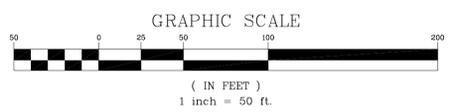
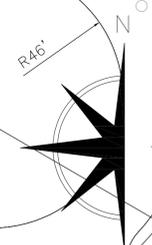


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NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
3	7-08-16	REVISED PER CITY PLANNING & ENG REVIEW			

GEOMETRIC DESIGN 1
PRAIRIE CENTRE

FILE NAME:	DSGN. BY: ESM	JOB NO: 16033	FLD. BK: ----	SHEET NO. 7 of 22
DISC NUM: ----	DRN BY: MCA	DATE: 5-13-16	SCALE: 1"=30'	



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 77 NORTH FIRST STREET
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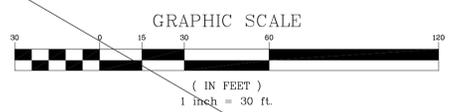
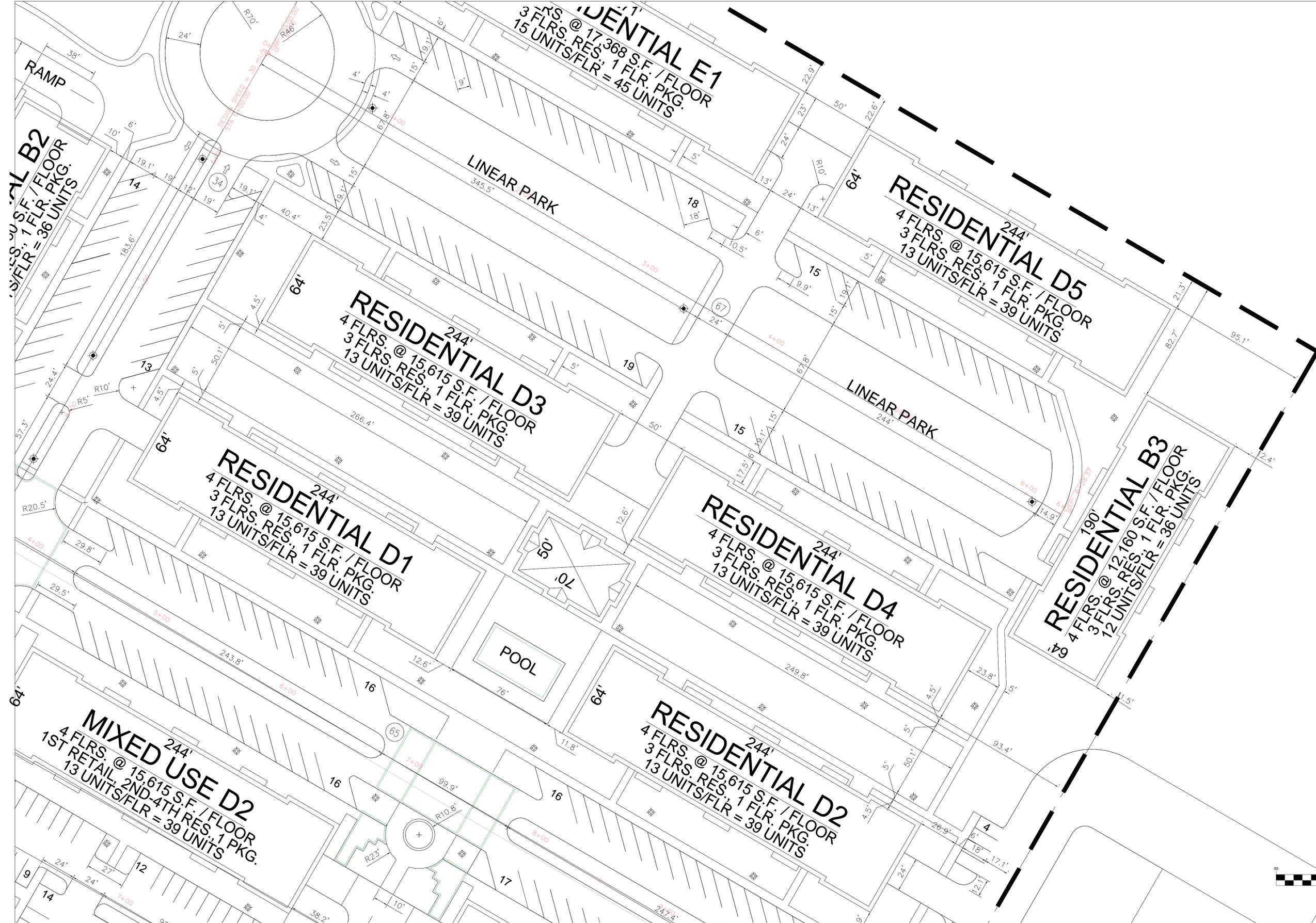


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3		7-08-16		REVISED PER CITY PLANNING & ENG REVIEW LETTERS							

GEOMETRIC DESIGN 2
 PRAIRIE CENTRE

FILE NAME:	DSGN. BY: ESM	JOB NO: 16033	FLD. BK: ----	SHEET NO. 8 of 22
DISC NUM: ----	DRN BY: MCA	DATE: 5-13-16	SCALE: 1"=30'	



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 77 NORTH FIRST STREET
 GENEVA, IL 60134

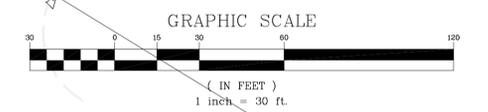
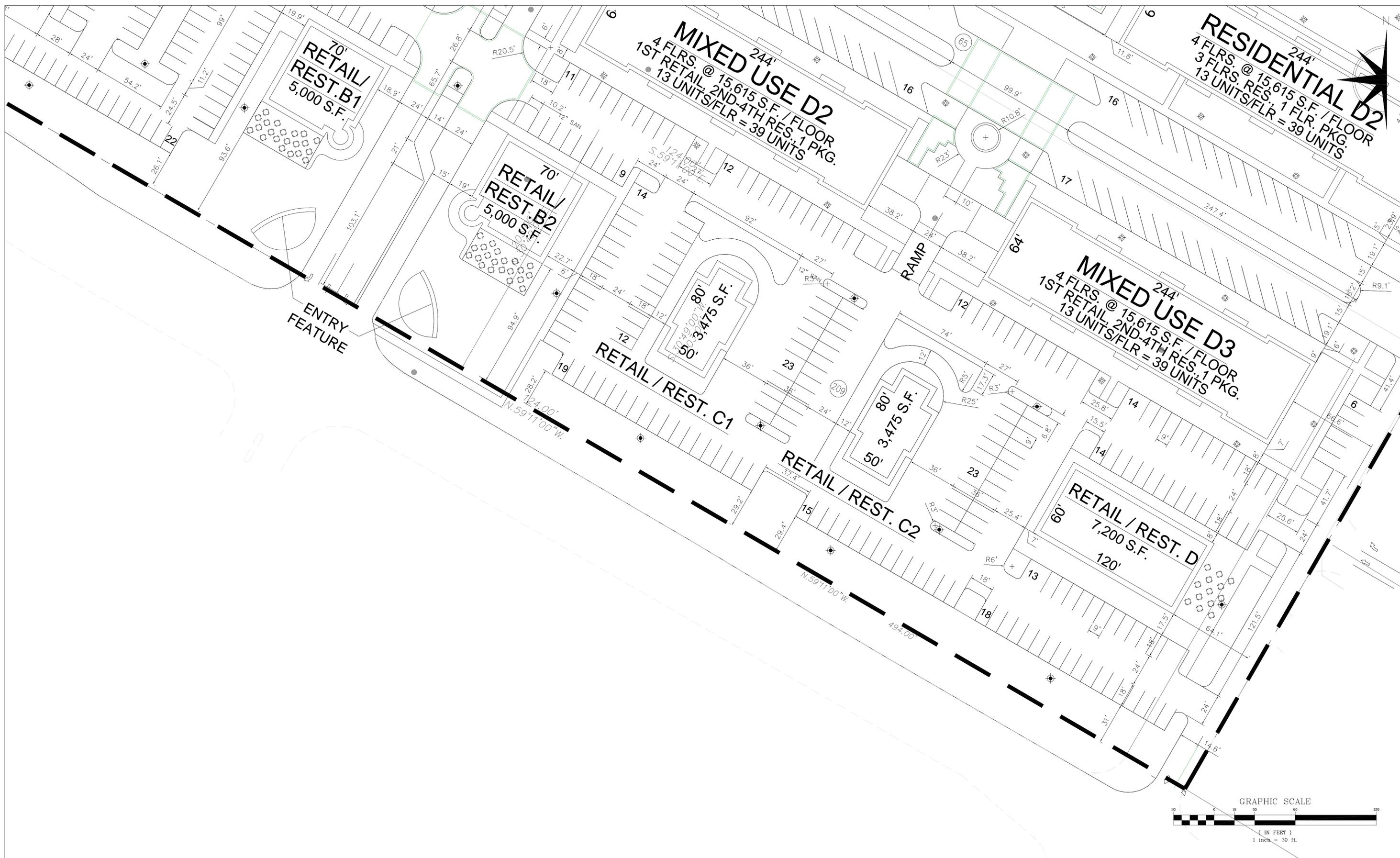
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NO.		DATE		DESCRIPTION		REVISIONS	
3	7-08-16	REVISED PER CITY PLANNING & ENF REVIEW LETTERS					

GEOMETRIC DESIGN 3
 PRAIRIE CENTRE

FILE NAME:	DSGN. BY: ESM	JOB NO: 16033	FLD. BK: ----	SHEET NO. 9 of 22
DISC NUM: ----	DRN BY: MCA	DATE: 5-13-16	SCALE: 1"=40'	



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 77 NORTH FIRST STREET
 GENEVA, IL 60134

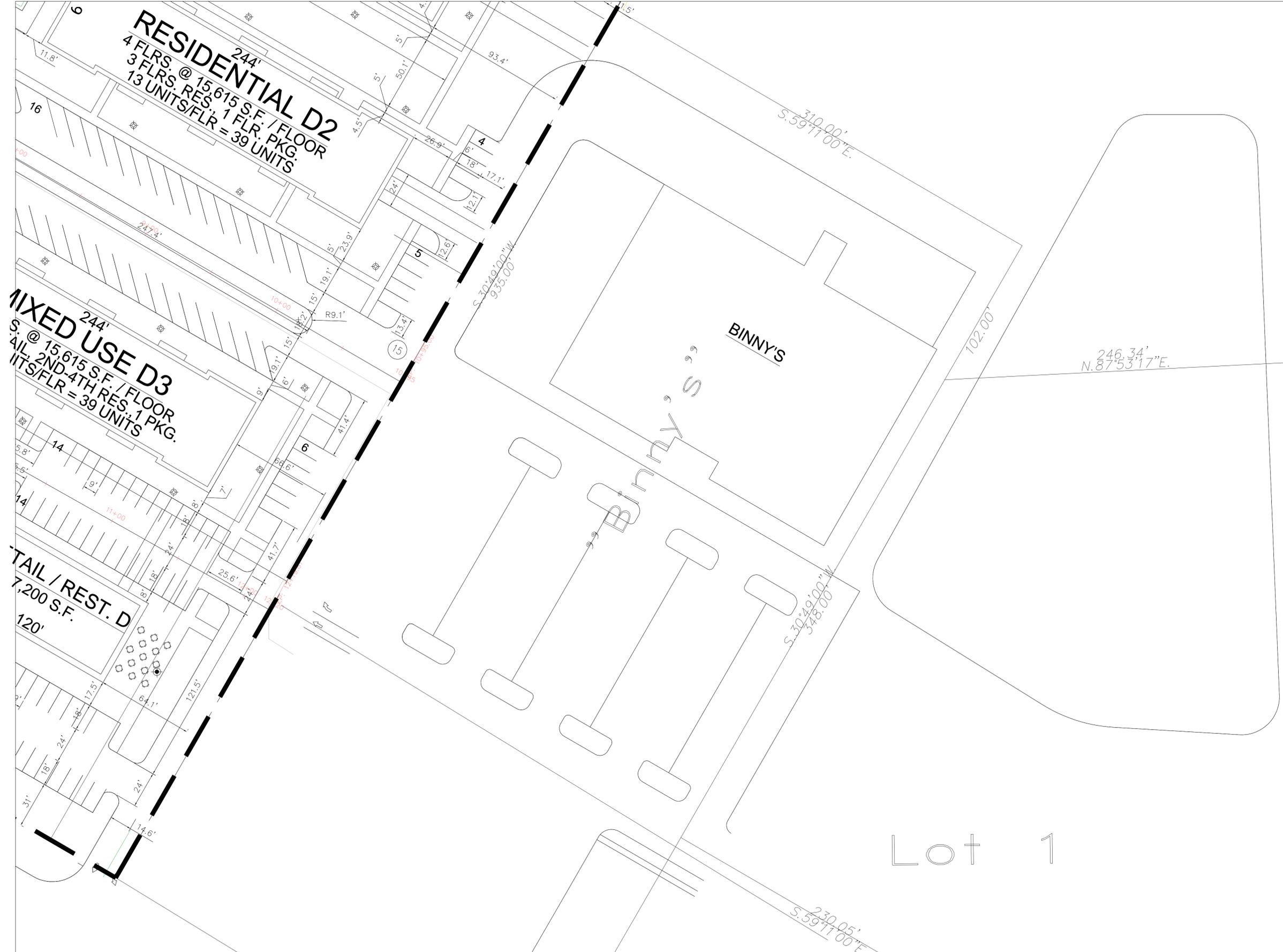


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NO.		DATE		DESCRIPTION		REVISIONS	
NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION	NO.	DATE
3	7-08-16	REVISED PER CITY PLANNING & ENF REVIEW LETTERS					

GEOMETRIC DESIGN 4
 PRAIRIE CENTRE

FILE NAME:	DSGN. BY: ESM	JOB NO: 16033	FLD. BK: ----	SHEET NO. 10 of 22
DISC NUM: ----	DRN BY: MCA	DATE: 5-13-16	SCALE: 1"=40'	



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77 NORTH FIRST STREET
GENEVA, IL 60134

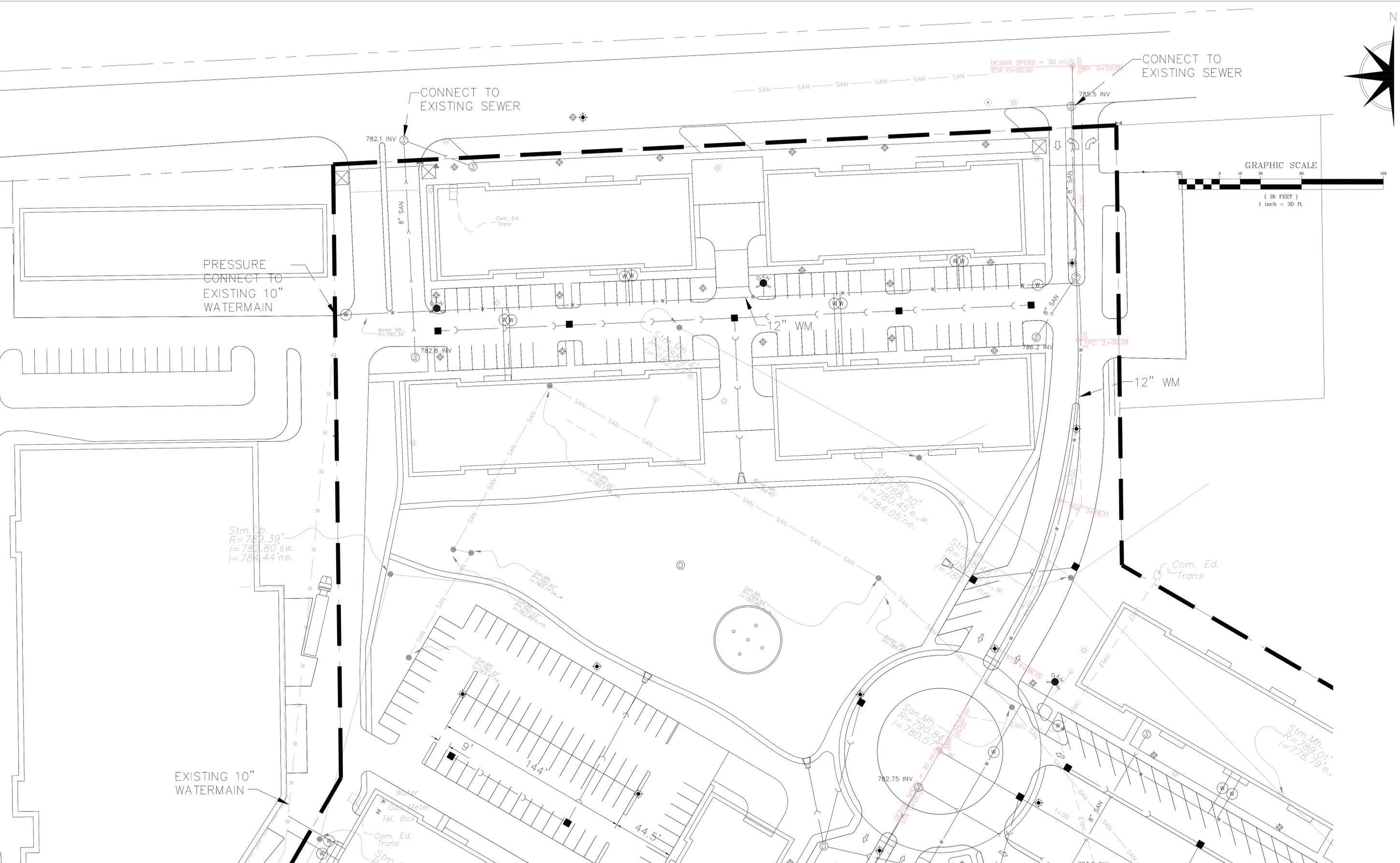
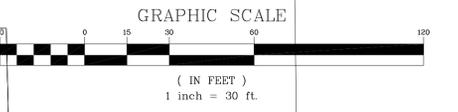


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REVISIONS					
NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
3	7-08-16	REVISED PER CITY PLANNING & ENF REVIEW LETTERS			

GEOMETRIC DESIGN 5
PRAIRIE CENTRE

FILE NAME:	DSGN. BY: CAD	JOB NO: 16033	FLD. BK: ----	SHEET NO. 11 of 22
DISC NUM: ----	DRN BY: MCA	DATE: 5-13-16	SCALE: 1"=40'	



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SHODEEN, INC.
 77 NORTH FIRST STREET
 GENEVA, IL 60134

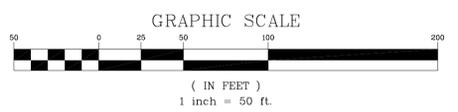
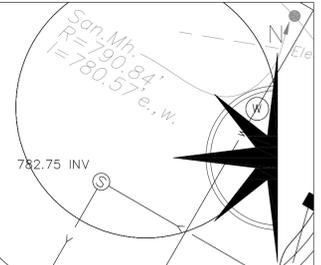


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NO.		DATE	DESCRIPTION	REVISIONS	
3	7-08-16	REVISED PER CITY PLANNING & ENG REVIEW			

UTILITY DESIGN 1
PRAIRIE CENTRE

FILE NAME: _____	DSGN. BY: CAD	JOB NO: 16033	FLD. BK: ----	SHEET NO. 12 of 22
DISC NUM: ----	DRN BY: MCA	DATE: 5-13-16	SCALE: 1"=30'	



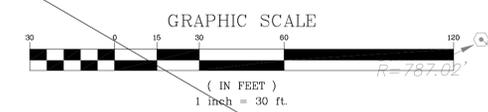
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NO.			DATE			DESCRIPTION			REVISIONS		
3	7-08-16	REVISED PER CITY PLANNING & ENG REVIEW	NO.	DATE	DESCRIPTION						

UTILITY DESIGN 2			
PRAIRIE CENTRE			
FILE NAME: -----	DSGN. BY: CAD	JOB NO: 16033	FLD. BK: -----
DISC NUM: -----	DRN BY: MCA	DATE: 5-13-16	SCALE: 1"=30'
			SHEET NO. 13 of 22



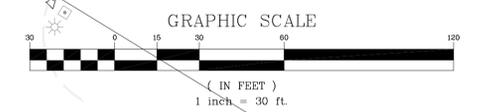
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 77 NORTH FIRST STREET
 GENEVA, IL 60134

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3	7-08-16	REVISED PER CITY PLANNING & ENG REVIEW			

UTILITY DESIGN 3
PRAIRIE CENTRE

FILE NAME: -----	DSGN. BY: CAD	JOB NO: 16033	FLD. BK: -----	SHEET NO. 14 of 22
DISC NUM: -----	DRN BY: MCA	DATE: 5-13-16	SCALE: 1"=40'	



PREPARED FOR:
SHODEEN, INC
 77 NORTH FIRST STREET
 GENEVA, IL 60134

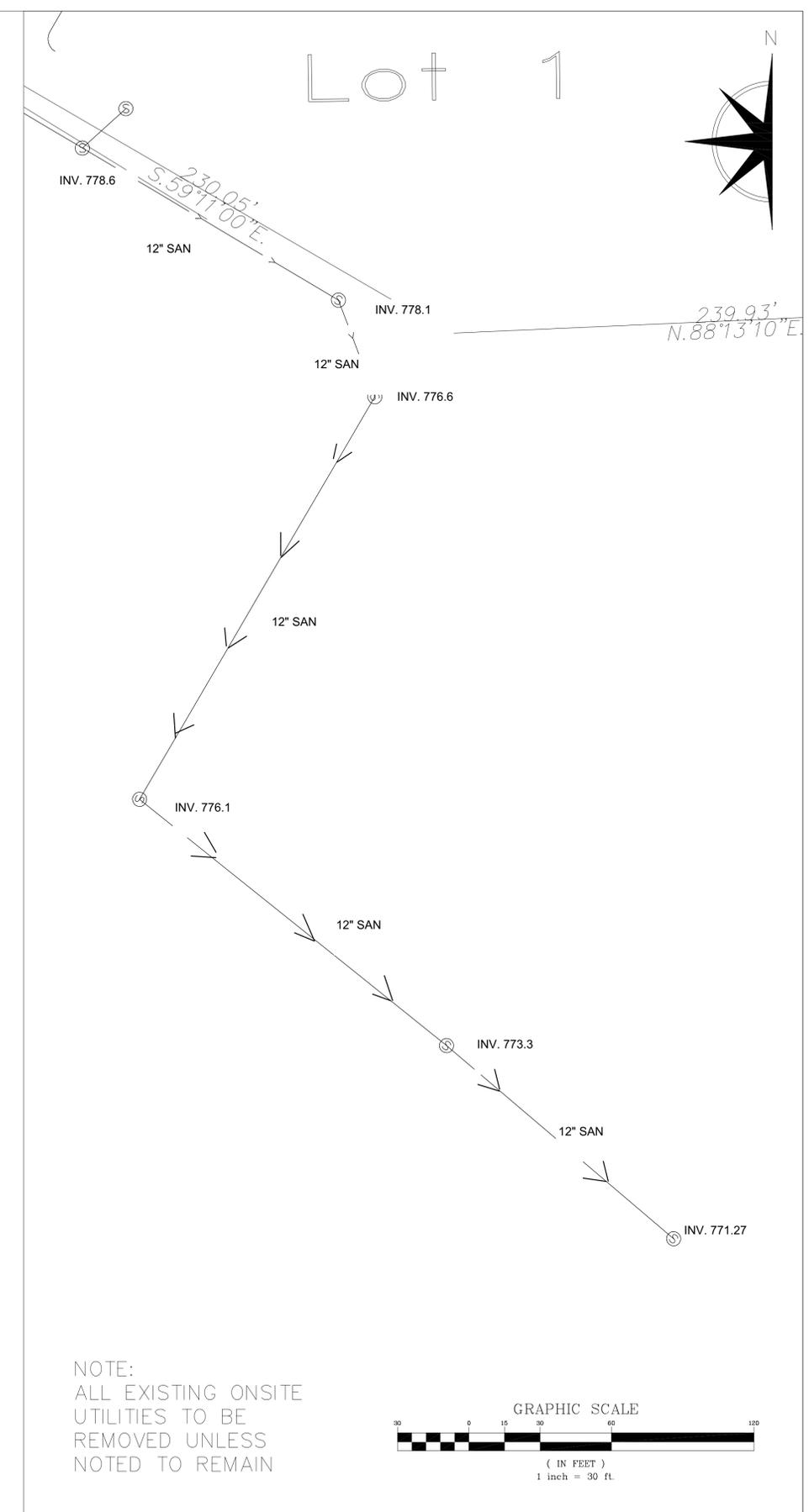
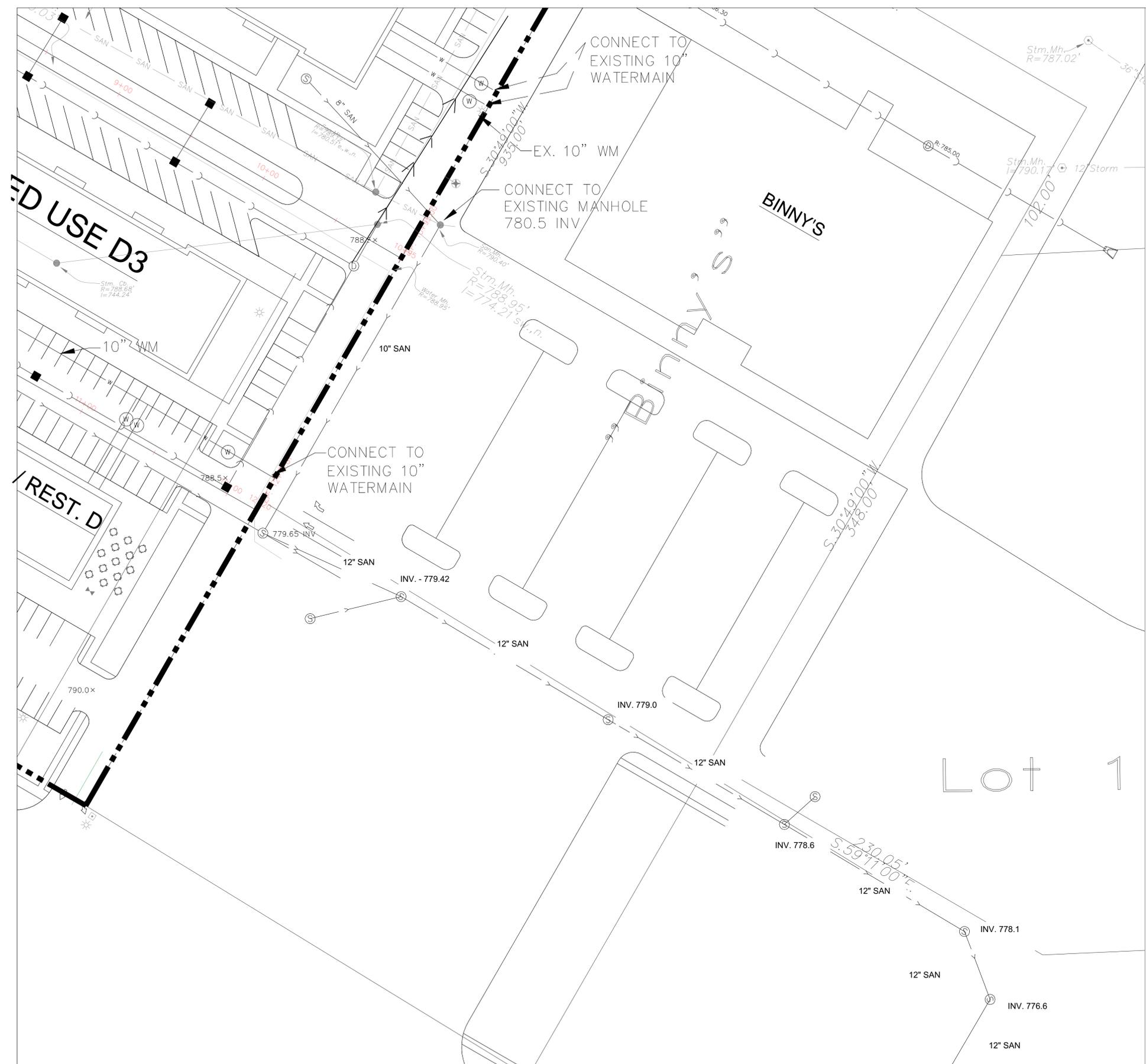


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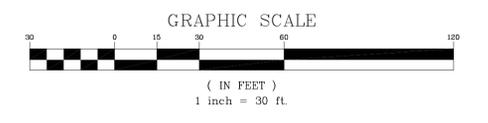
NO.			DATE			DESCRIPTION			REVISIONS		
NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
3	7-08-16	REVISED PER CITY PLANNING & ENG REVIEW									

UTILITY DESIGN 4
PRAIRIE CENTRE

FILE NAME: -----	DSGN. BY: CAD	JOB NO: 16033	FLD. BK: -----	SHEET NO. 15 of 22
DISC NUM: -----	DRN BY: MCA	DATE: 5-13-16	SCALE: 1"=40'	



NOTE:
ALL EXISTING ONSITE
UTILITIES TO BE
REMOVED UNLESS
NOTED TO REMAIN



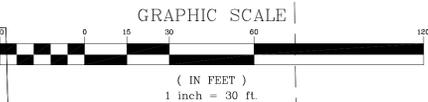
PREPARED FOR:
SHODEEN, INC
77 NORTH FIRST STREET
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PREPARED BY:
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Civil Engineering - Land Entitlement - Project Feasibility
1315 Macom Drive - Suite 205 Naperville Illinois 60564
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NO.		DATE	DESCRIPTION	REVISIONS		NO.	DATE	DESCRIPTION

UTILITY DESIGN 5
PRAIRIE CENTRE

FILE NAME:	DSGN. BY: ESM	JOB NO: 16033	FLD. BK: ----	SHEET NO.
DISC NUM: ----	DRN BY: MCA	DATE: 5-13-16	SCALE: 1"=30'	16 of 22



PREPARED FOR:
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77 NORTH FIRST STREET
GENEVA, IL 60134

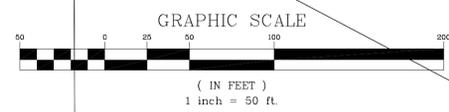
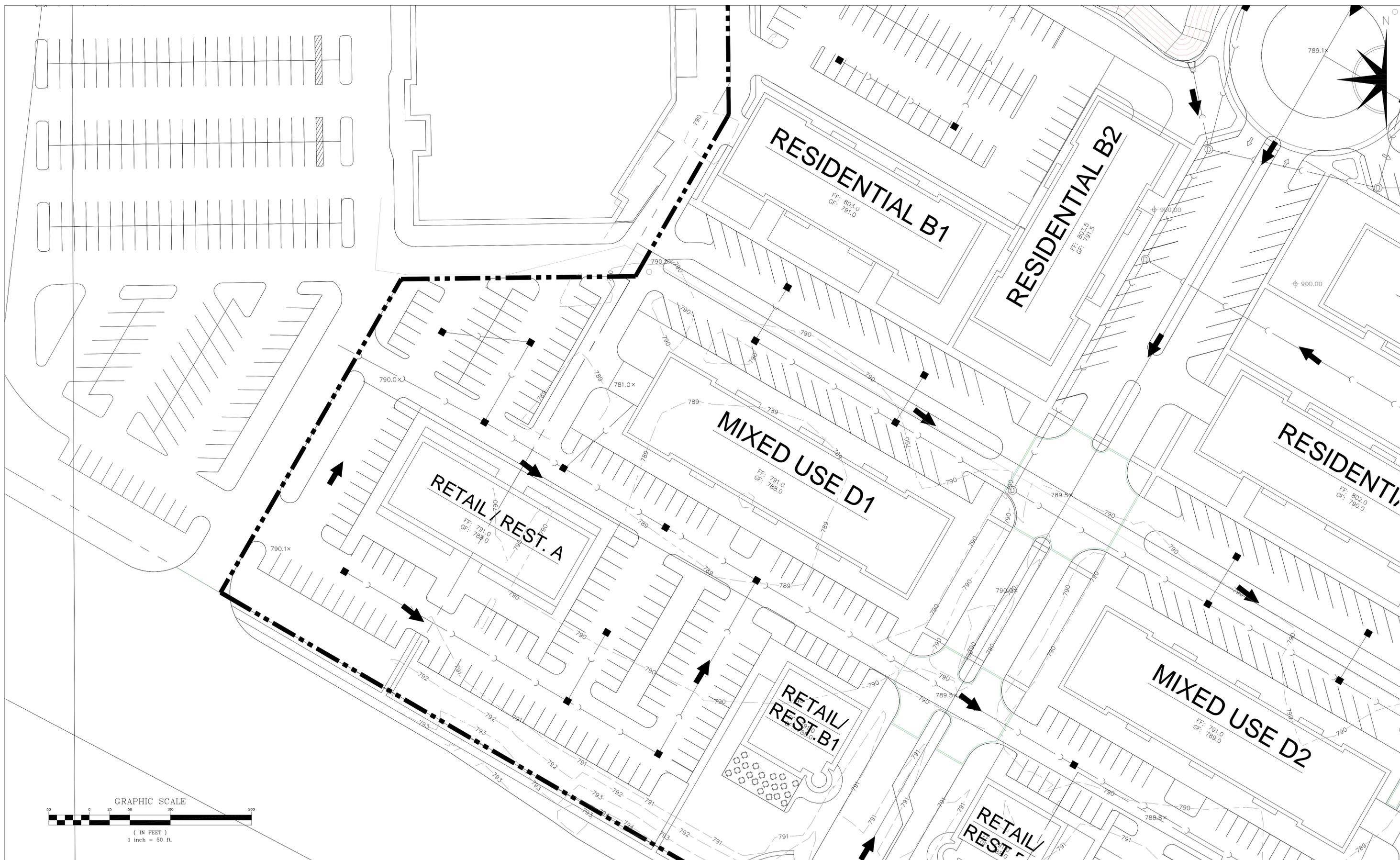


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NO.			DATE			DESCRIPTION		

GRADING 1
PRAIRIE CENTRE

FILE NAME:	DSGN. BY: ESM	JOB NO: 16033	FLD. BK: ----	SHEET NO. 17 of 22
DISC NUM: ----	DRN BY: MCA	DATE: 5-13-16	SCALE: 1"=30'	



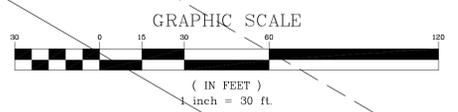
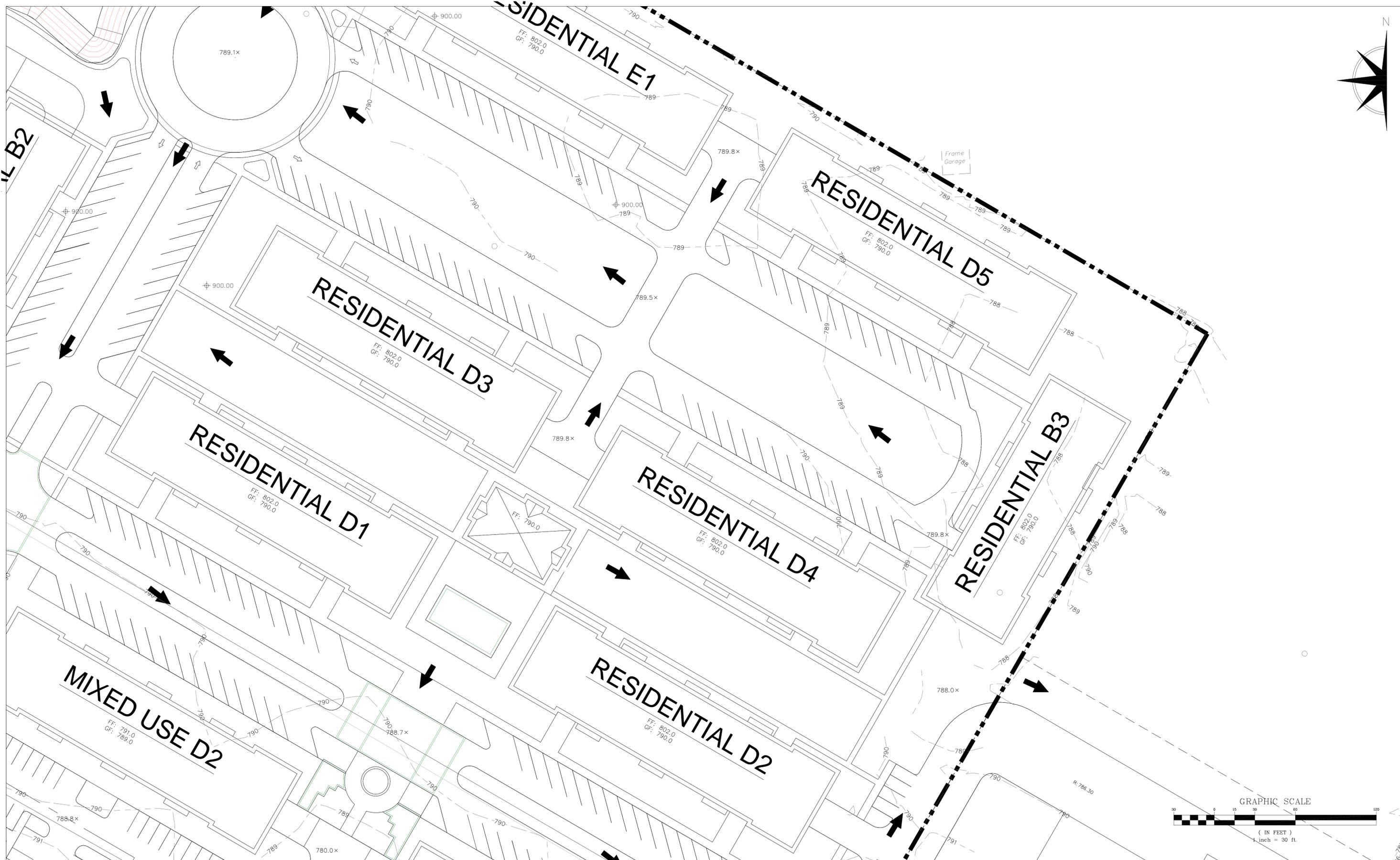
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NO.			DATE			DESCRIPTION		

GRADING 2				
PRAIRIE CENTRE				
FILE NAME:	DSGN. BY: ESM	JOB NO: 16033	FLD. BK: ----	SHEET NO. 18 of 22
DISC NUM: ----	DRN BY: MCA	DATE: 5-13-16	SCALE: 1"=30'	



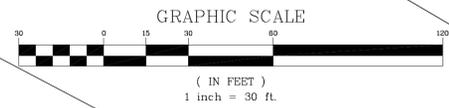
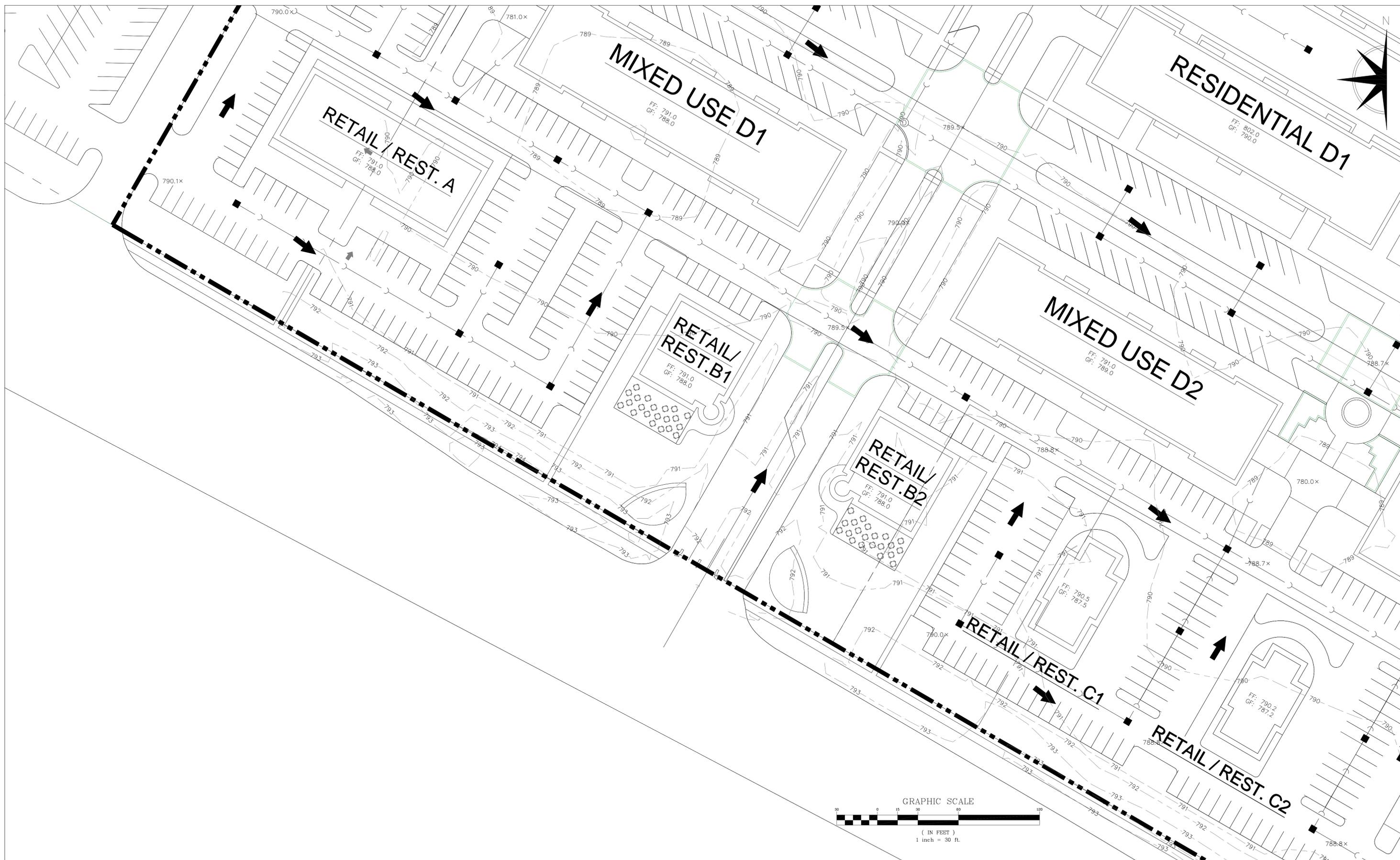
PREPARED FOR:
SHODEEN, INC
 77 NORTH FIRST STREET
 GENEVA, IL 60134

PREPARED BY:
ESM CIVIL SOLUTIONS, LLC
 Civil Engineering - Land Entitlement - Project Feasibility
 1315 Macom Drive - Suite 205 Naperville Illinois 60564
 o: 630-300-0933 c: 630-624-0520

REVISIONS			REVISIONS		
NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION

GRADING 3
PRAIRIE CENTRE

FILE NAME: _____	DSGN. BY: ESM	JOB NO: 16033	FLD. BK: ----	SHEET NO. 19 of 22
DISC NUM: ----	DRN BY: MCA	DATE: 5-13-16	SCALE: 1"=30'	



PREPARED FOR:
 SHODEEN, INC
 77 NORTH FIRST STREET
 GENEVA, IL 60134

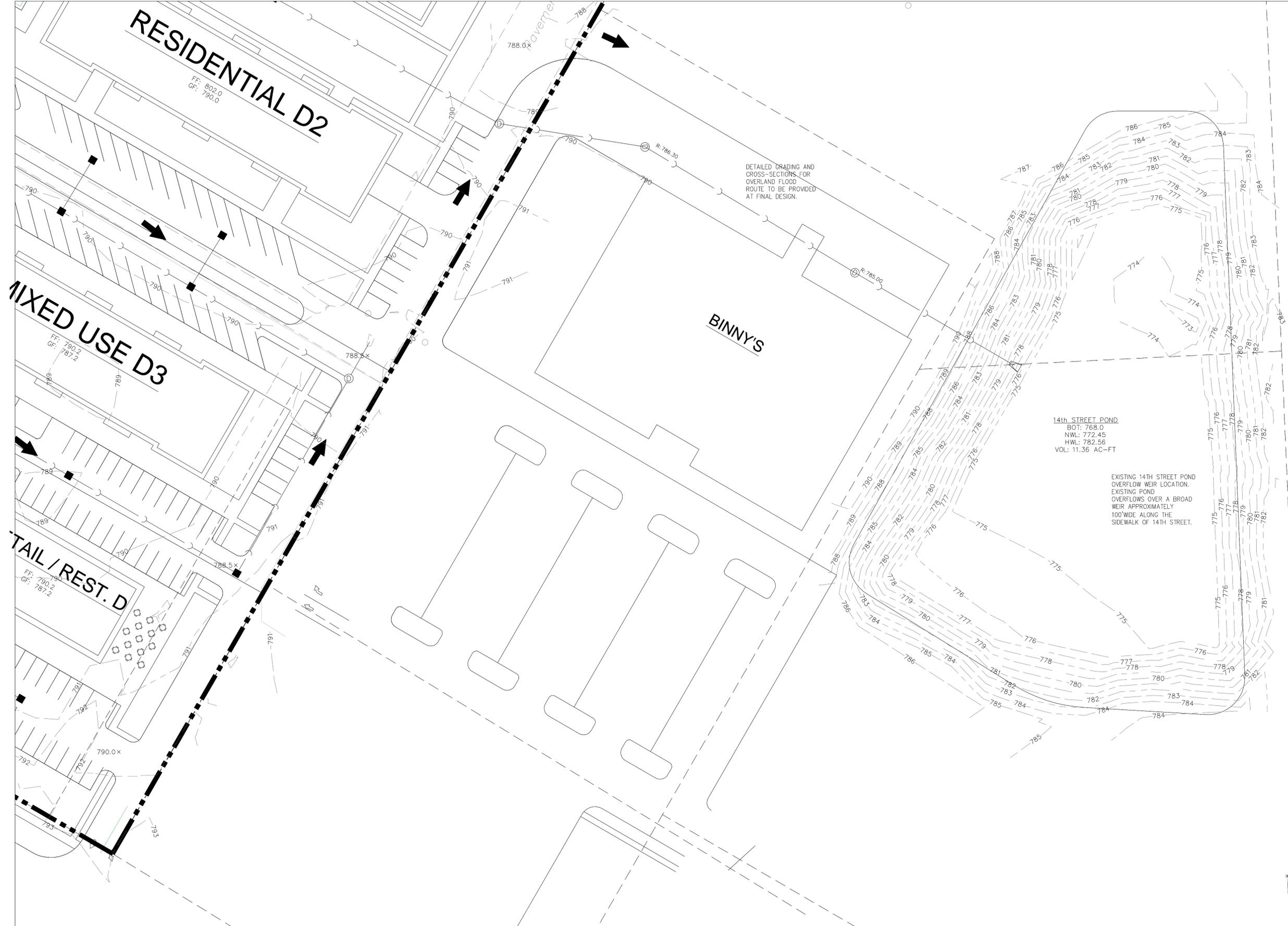


PREPARED BY:
 ESM CIVIL SOLUTIONS, LLC
 Civil Engineering - Land Entitlement - Project Feasibility
 1315 Macom Drive - Suite 205 Naperville Illinois 60564
 o: 630-300-0933 c: 630-624-0520

REVISIONS			REVISIONS		
NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION

GRADING 4
 PRAIRIE CENTRE

FILE NAME:	DSGN. BY: ESM	JOB NO: 16033	FLD. BK: ----	SHEET NO. 20 of 22
DISC NUM: ----	DRN BY: MCA	DATE: 5-13-16	SCALE: 1"=30'	



14th STREET POND
 BOT: 768.0
 NWL: 772.45
 HWL: 782.56
 VOL: 11.36 AC-FT

EXISTING 14TH STREET POND
 OVERFLOW WEIR LOCATION.
 EXISTING POND
 OVERFLOWS OVER A BROAD
 WEIR APPROXIMATELY
 100' WIDE ALONG THE
 SIDEWALK OF 14TH STREET.



PREPARED FOR:
 SHODEEN, INC
 77 NORTH FIRST STREET
 GENEVA, IL 60134

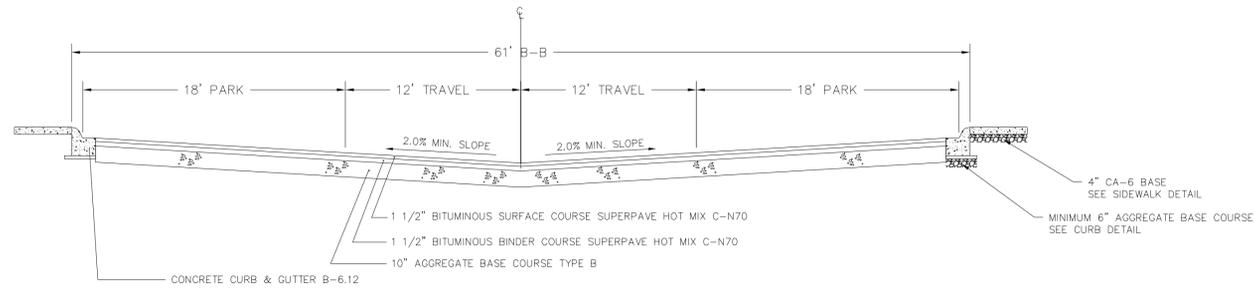


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 Civil Engineering - Land Entitlement - Project Feasibility
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 o: 630-300-0933 c: 630-624-0520

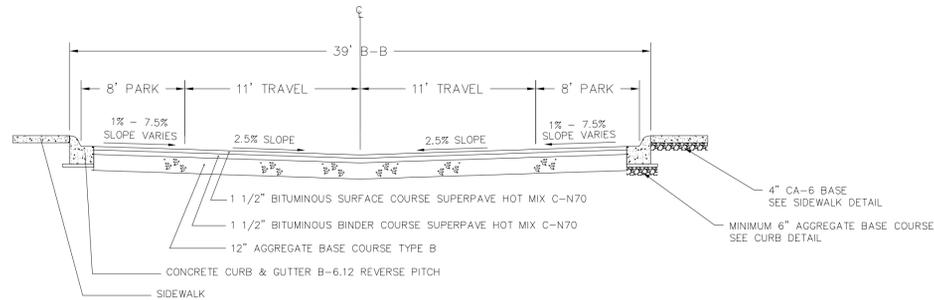
NO.		DATE	DESCRIPTION	REVISIONS		NO.	DATE	DESCRIPTION

GRADING 5
PRAIRIE CENTRE

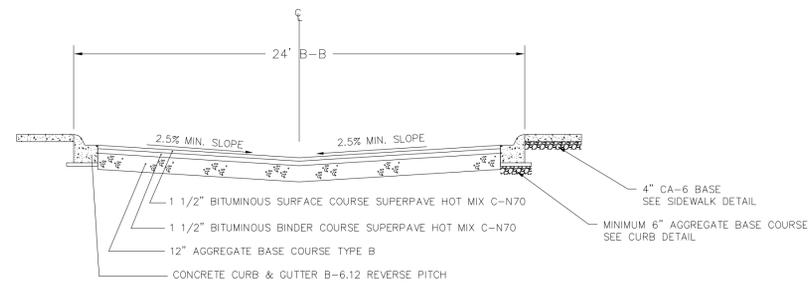
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DISC NUM: ----	DRN BY: MCA	DATE: 5-13-16	SCALE: 1"=30'	



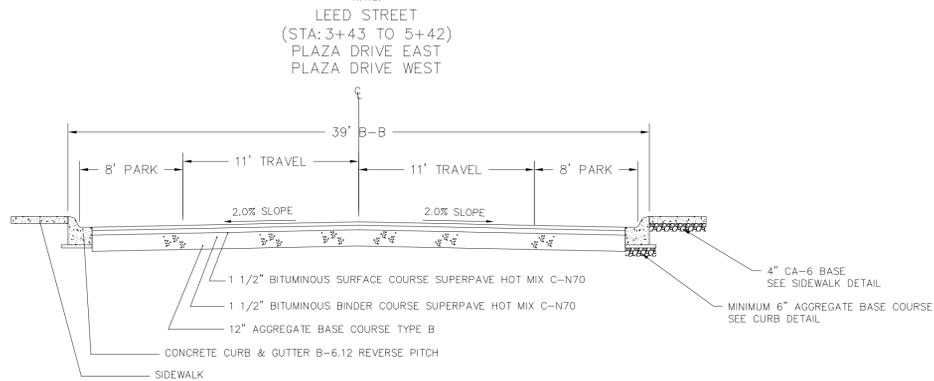
PARKING LOT WITH PERPENDICULAR PARKING
N.T.S.



PRIVATE DRIVE WITH PARALLEL PARKING
N.T.S.

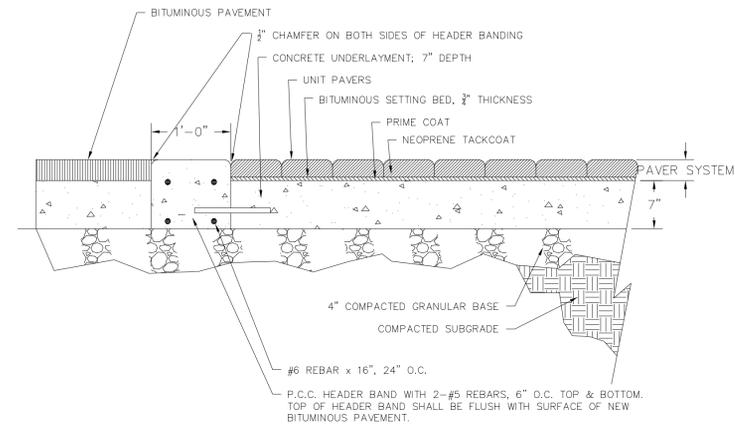


PRIVATE DRIVE WITHOUT PARKING
N.T.S.

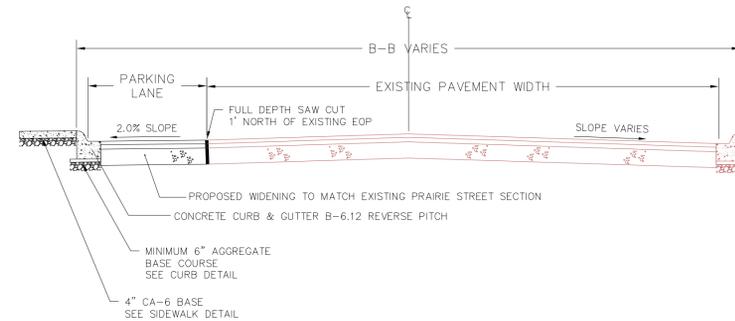


PRIVATE DRIVE WITH PARALLEL PARKING
N.T.S.

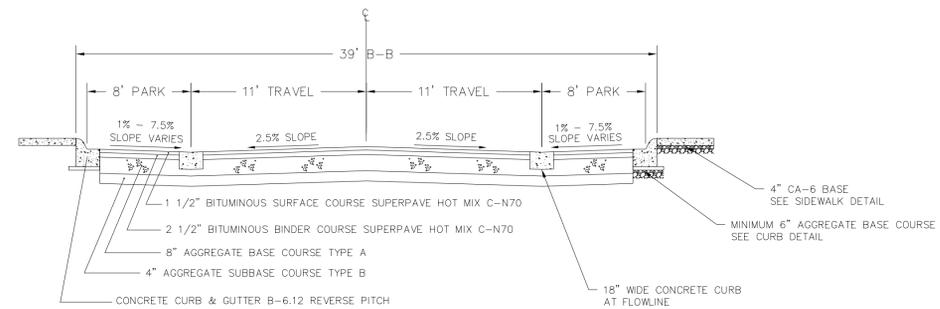
GREEN STREET
(STA: 1+50 TO END)
LEED STREET
(STA: 0+00 TO 3+43)



CROSSWALK SECTION
N.T.S.



PRAIRIE STREET
N.T.S.



PUBLIC ROADS SECTION
N.T.S.

LEED STREET (STA: 6+00 TO END)
TOWNE CENTRE BOULEVARD (NORTH OF MARKET STREET)

PREPARED FOR:
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GENEVA, IL 60134



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o: 630-300-0933 c: 630-624-0520

NO.		DATE	DESCRIPTION	REVISIONS		NO.	DATE	DESCRIPTION

DETAIL 1			
PRAIRIE CENTRE			
FILE NAME:	DSGN. BY: ESM	JOB NO: 16033	FLD. BK: ----
DISC NUM: ----	DRN BY: MCA	DATE: 5-13-16	SCALE: NA
			SHEET NO. 22 of 22