

16.004999 11/19/2021
\$52,055.00 RB

 <p>City of Fitchburg Planning/Zoning Department 5520 Lacy Road Fitchburg, WI 53711 (608-270-4200)</p>	<h2>LAND DIVISION APPLICATION</h2>
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The undersigned owner, or owner's authorized agent, of property herein described hereby submits ten (10) copies of the attached maps, one (1) copy no larger than 11" x 17", and one (1) pdf document of the complete submittal (planning@fitchburgwi.gov) for approval under the rules and requirements of the Fitchburg Land Division Ordinance.

1. Type of Action Requested:
- Certified Survey Map Approval
 - Preliminary Plat Approval
 - Final Plat Approval
 - Replat
 - Comprehensive Development Plan Approval

2. Proposed Land Use (Check all that Apply):
- Single Family Residential
 - Two-Family Residential
 - Multi-Family Residential
 - Commercial/Industrial

3. No. of Parcels Proposed: 286

4. No. of Buildable Lots Proposed: 271

5. Zoning District: Existing: A-S & A-X; Proposed: PDD and RL

6. Current Owner of Property: Fahey Land, LLC

Address: 5376 Irish Lane Phone No: 608-658-0174

7. Contact Person: Dan Day, D'Onofrio, Kottke & Associates, Inc.

Email: dday@donofrio.cc

Address: 7530 Westward Way, Madison, WI Phone No: 608-833-7530

8. Submission of legal description in electronic format (MS Word or plain text) by email to: planning@fitchburgwi.gov

Pursuant to Section 24-2 (4) of the Fitchburg Land Division Ordinance, all Land Divisions shall be consistent with the currently adopted City of Fitchburg Comprehensive Plan.

Respectfully Submitted By: *David Fahey* David Fahey
 Owner's or Authorized Agent's Signature Print Owner's or Authorized Agent's Name

PLEASE NOTE - Applicants shall be responsible for legal or outside consultant costs incurred by the City. Submissions shall be made at least four (4) weeks prior to desired plan commission meeting.

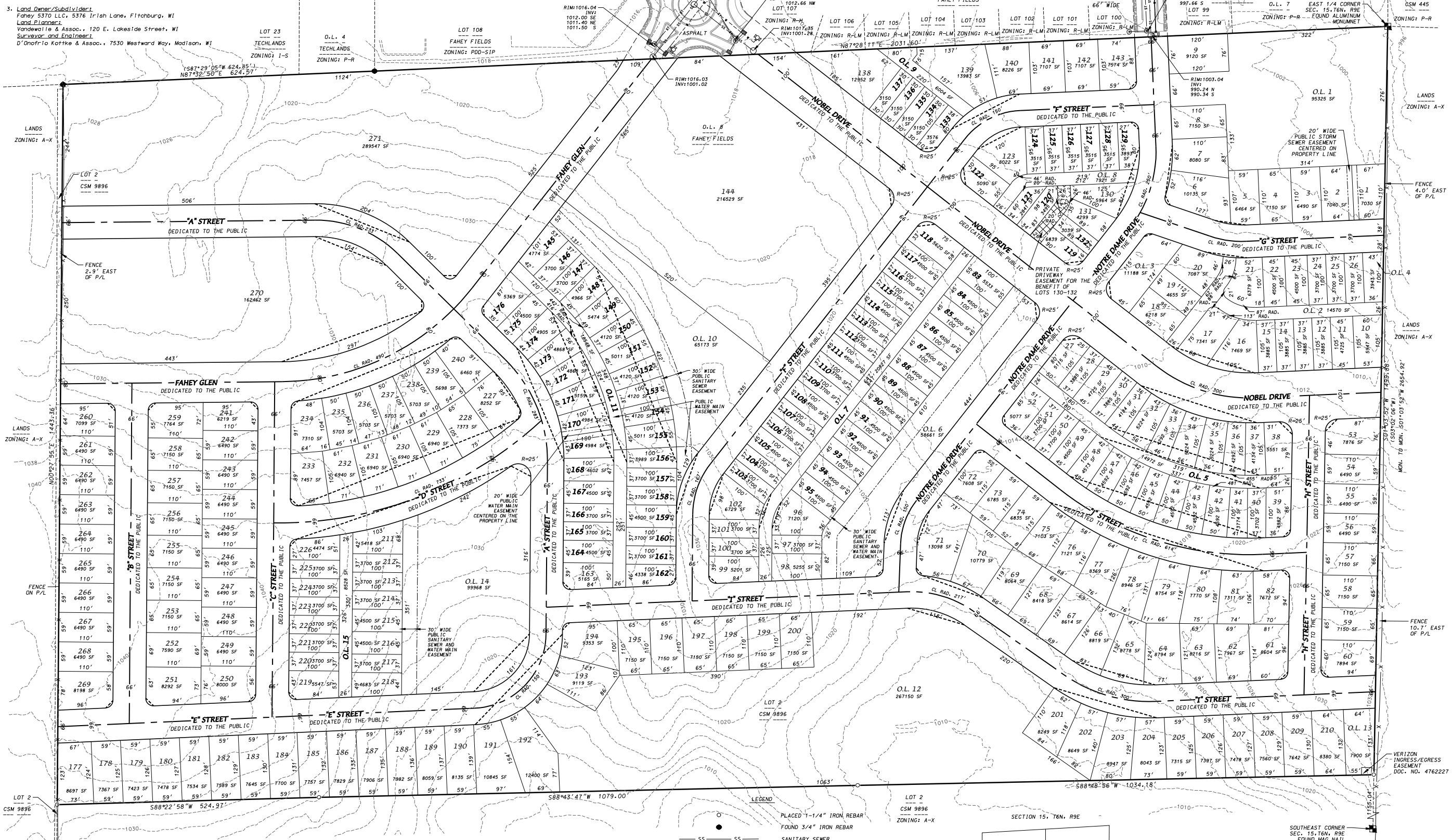
For City Use Only: Date Received: 11/17/21

Ordinance Section No. _____ Fee Paid: \$52,055

Permit Request No. PP-2415-21

NOTES

- All intersection right-of-way radii are 15', unless noted.
- Existing Zoning: A-S, A-X
Proposed Zoning: Lots 1-143 and 145-269,
Outlots 1-15: PDD
Lot 144 - RL
- Land Owner/Subdivider:
Fahey 5370 LLC, 5376 Irish Lane, Fitchburg, WI
Land Planner:
Vandewalle & Assoc., 120 E. Lakeside Street, WI
Surveyor and Engineer:
D'Onofrio Kottke & Assoc., 7530 Westward Way, Madison, WI



- OUTLOT DESIGNATIONS**
- OL 1 Dedicated to the Public for Stormwater Management and Pedestrian Path Purposes
 - OL 2 Private Alley and Public Utility Easement
 - OL 3 Dedicated to the Public for Park Purposes
 - OL 4 Reserved for Future Development
 - OL 5 Private Alley and Public Utility Easement
 - OL 6 Dedicated to the Public for Park Purposes
 - OL 7 Private Alley and Public Utility Easement
 - OL 8 Private Alley and Public Utility Easement
 - OL 9 Private Alley and Public Utility Easement
 - OL 10 Dedicated to the Public for Park Purposes
 - OL 11 Private Alley and Public Utility Easement
 - OL 12 Dedicated to the Public for Stormwater Management and Pedestrian Path Purposes
 - OL 13 Reserved for Future Development
 - OL 14 Dedicated to the Public for Park Purposes
 - OL 15 Private Alley and Public Utility Easement

SURVEYOR'S CERTIFICATE

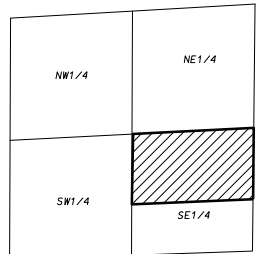
I, Brett T. Stoffregan, Professional Land Surveyor, S-2742, hereby certify that this preliminary plat is a true and correct representation of all the adjacent existing land divisions and of the boundary of the preliminary plat and features and that I have fully complied with the City of Fitchburg Subdivision Ordinance.

Dated this 17th day of November 2021.

Brett T. Stoffregan
Brett T. Stoffregan, Professional Land Surveyor, S-2742

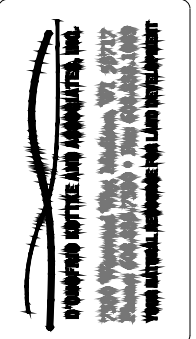


- LEGEND**
- PLACED 1-1/4" IRON REBAR
 - FOUND 3/4" IRON REBAR
 - SS — SS — SANITARY SEWER
 - W — WATER MAIN
 - ST — ST — STORM SEWER
 - MANHOLE
 - ⊗ CATCH BASIN/INLET
 - ⊕ VALVE
 - ⊙ HYDRANT
 - CONCRETE CURB AND GUTTER
 - - - 918 - - - EXISTING CONTOUR
 - () "RECORDED AS" INFORMATION



LEGAL DESCRIPTION

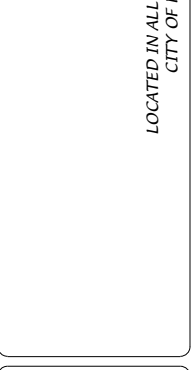
Outlot 8, Fahey Fields, recorded in Volume 60-079A of Plats on pages 429-434 as Document Number 5349708 and Part of Lot 2, Certified Survey Map No. 9896, recorded in Volume 57 of Certified Survey Maps on pages 237-238 as Document Number 3271318, Dane County Registry, located in all 1/4's of the SE 1/4 of Section 15, T6N, R9E, City of Fitchburg, Dane County, Wisconsin to-wit: Beginning at the East 1/4 corner of said Section 15, thence S01°03'52"W, 1499.88 feet along the East line of said SE 1/4; thence S88°48'56"W, 1034.18 feet; thence S88°43'47"W, 1079.00 feet; thence S88°22'58"W, 524.97 feet; thence N00°27'55"E, 1443.36 feet to a point on the South line of Lot 23, Techlands; thence N87°32'50"E, 624.57 feet along the said line of said Lot 23 and Outlot 4, Techlands to the Southeast corner of said Outlot 4; thence N87°28'11"E, 2031.60 feet to the point of beginning, Containing 89,201 acres.



PRELIMINARY PLAT

HIGHFIELD RESERVE

LOCATED IN ALL 1/4'S OF THE SE 1/4 OF SECTION 15, T6N, R9E,
CITY OF FITCHBURG, DANE COUNTY, WISCONSIN



THE EAST LINE OF THE SE 1/4 OF SECTION 15, T6N, R9E IS ASSUMED TO BEAR S01°03'52"W

SCALE: 1" = 100'

DATE: 11-17-21
REVISED:
X

FN: 21-07-105

Sheet Number:
1 of 1

HIGHFIELD RESERVE PRELIMINARY ENGINEERING PLANS

CITY OF FITCHBURG DANE COUNTY, WISCONSIN

CONTACTS:

CONSTRUCTION PROJECT MANAGER - TBD

PLAN DESIGNER - D'ONOFRIO, KOTTKE & ASSOCIATES INC.
NATE OSWALD, P.E.
608-833-7530

CITY OF FITCHBURG DIRECTOR OF PUBLIC WORKS
BILL BALKE, P.E.
608-270-4260

CITY OF FITCHBURG ENVIRONMENTAL ENGINEER
CLAUDIA GUY, P.E.
608-270-4262

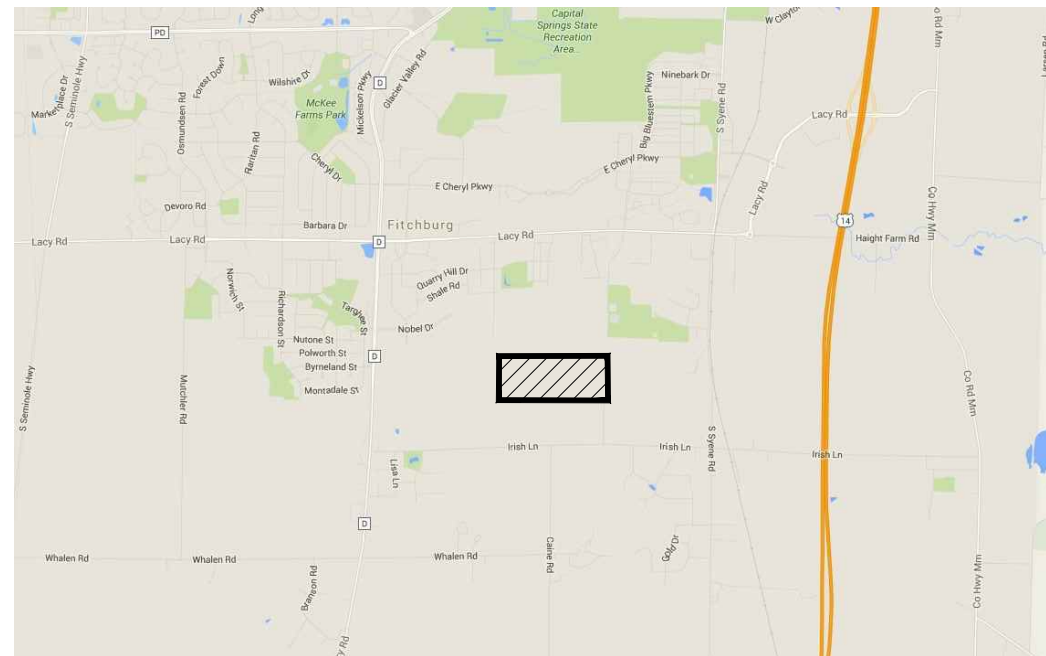
CITY OF FITCHBURG URBAN FORESTER
ANNA HEALY
608-270-4289

GAS - MADISON GAS & ELECTRIC
HOLLY POWELL
608-252-7224

ELECTRIC - MADISON GAS & ELECTRIC
MARK GAUGER
608-252-1570

TELEPHONE - AT&T
CAROL ANASON
608-252-2385

CABLE TV - CHARTER COMMUNICATIONS
ROBERT TENUTA
414-758-5688



PROJECT LOCATION

D'ONOFRIO KOTTKE AND ASSOCIATES, INC.
7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

SHEET LIST TABLE	
SHEET NUMBER	SHEET TITLE
1 of 41	COVER
2 of 41	OVERALL GRADING PLAN
3 of 41	PROPOSED GRADING PLAN
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5 of 41	PROPOSED GRADING PLAN
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15 of 41	A STREET
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17 of 41	B STREET
18 of 41	B STREET
19 of 41	C STREET
20 of 41	C STREET
21 of 41	D STREET
22 of 41	F STREET
23 of 41	F STREET
24 of 41	F STREET
25 of 41	FAHEY GLEN
26 of 41	FAHEY GLEN
27 of 41	FAHEY GLEN
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29 of 41	H STREET
30 of 41	H STREET
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33 of 41	I STREET
34 of 41	J STREET
35 of 41	J STREET
36 of 41	NOBEL DRIVE
37 of 41	NOBEL DRIVE
38 of 41	NOBEL DRIVE
39 of 41	NOTRE DAME DRIVE
40 of 41	NOTRE DAME DRIVE
41 of 41	NOTRE DAME DRIVE

COVER
HIGHFIELD RESERVE
CITY OF FITCHBURG, DANE COUNTY, WISCONSIN

DATE: 11-17-21
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1 of 41

FN: 21-04-107

ISSUE DATE: 11-17-21

SHEET 1 of 41



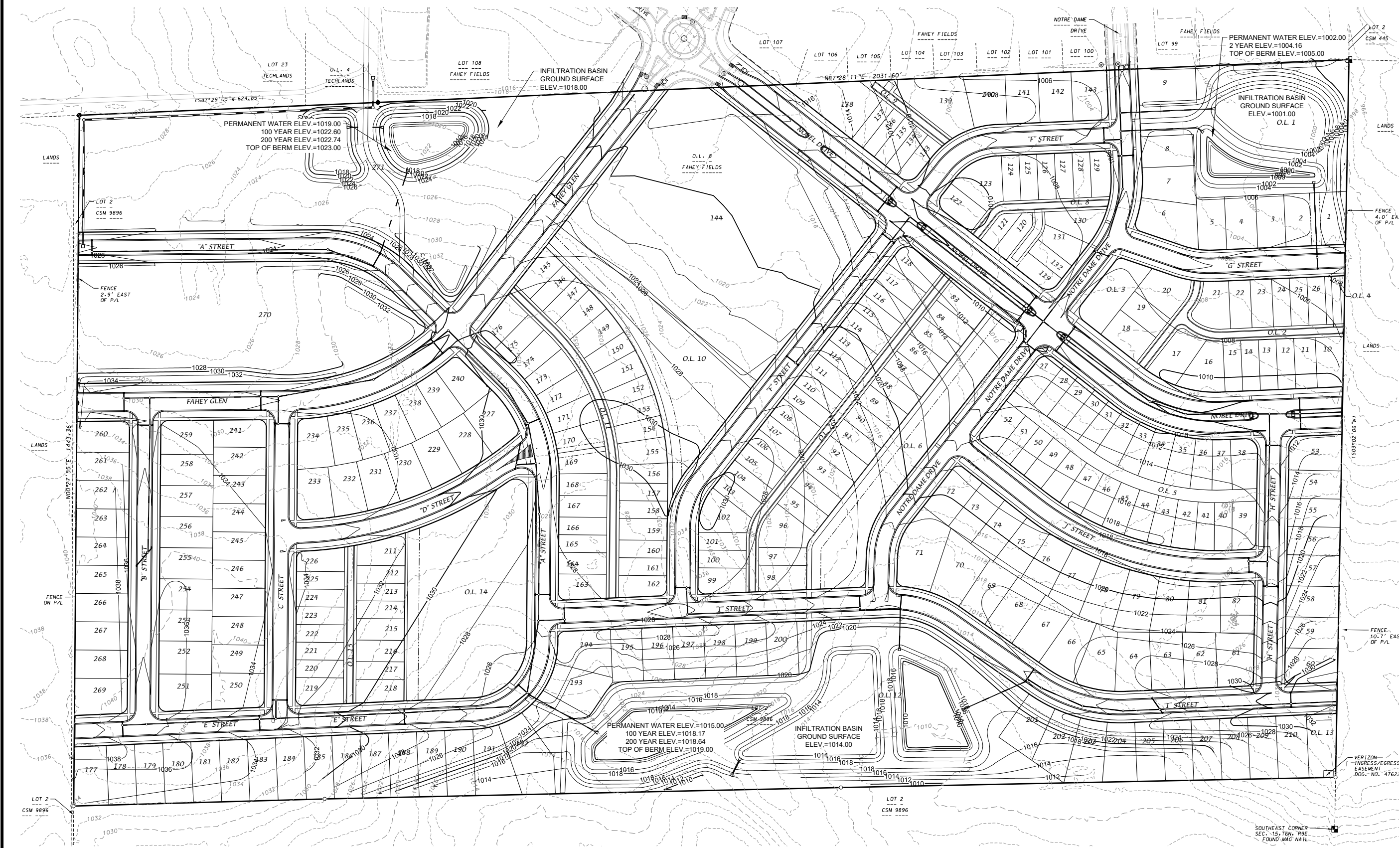
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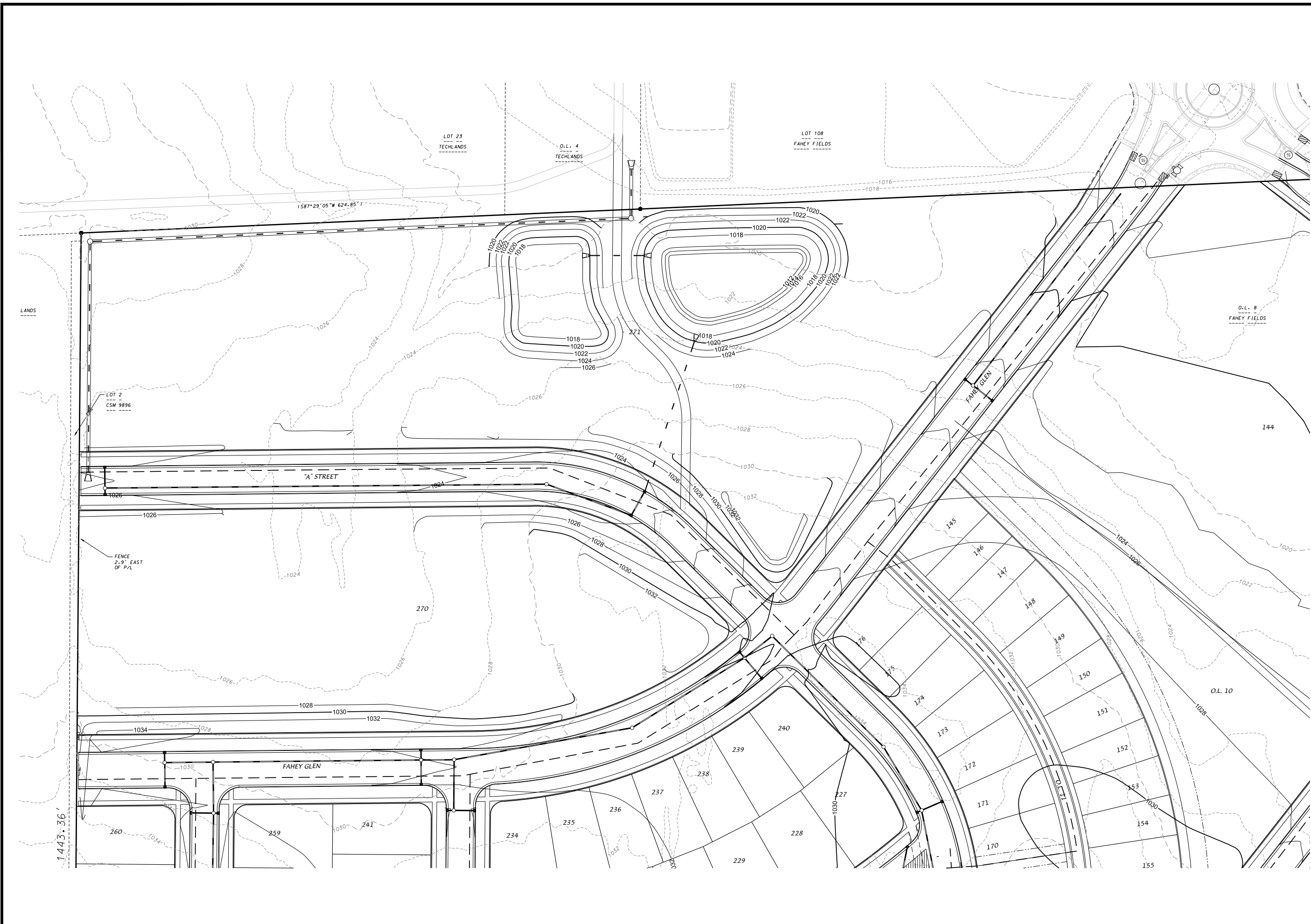
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 7530 Westwood Way, Madison, WI 53717
 Phone: 608.833.7530 • Fax: 608.833.1089
 YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

PROPOSED GRADING PLAN
HIGHFIELD RESERVE
 CITY OF FITCHBURG, DANE COUNTY, WISCONSIN


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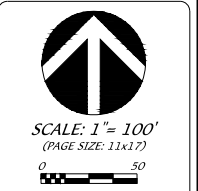
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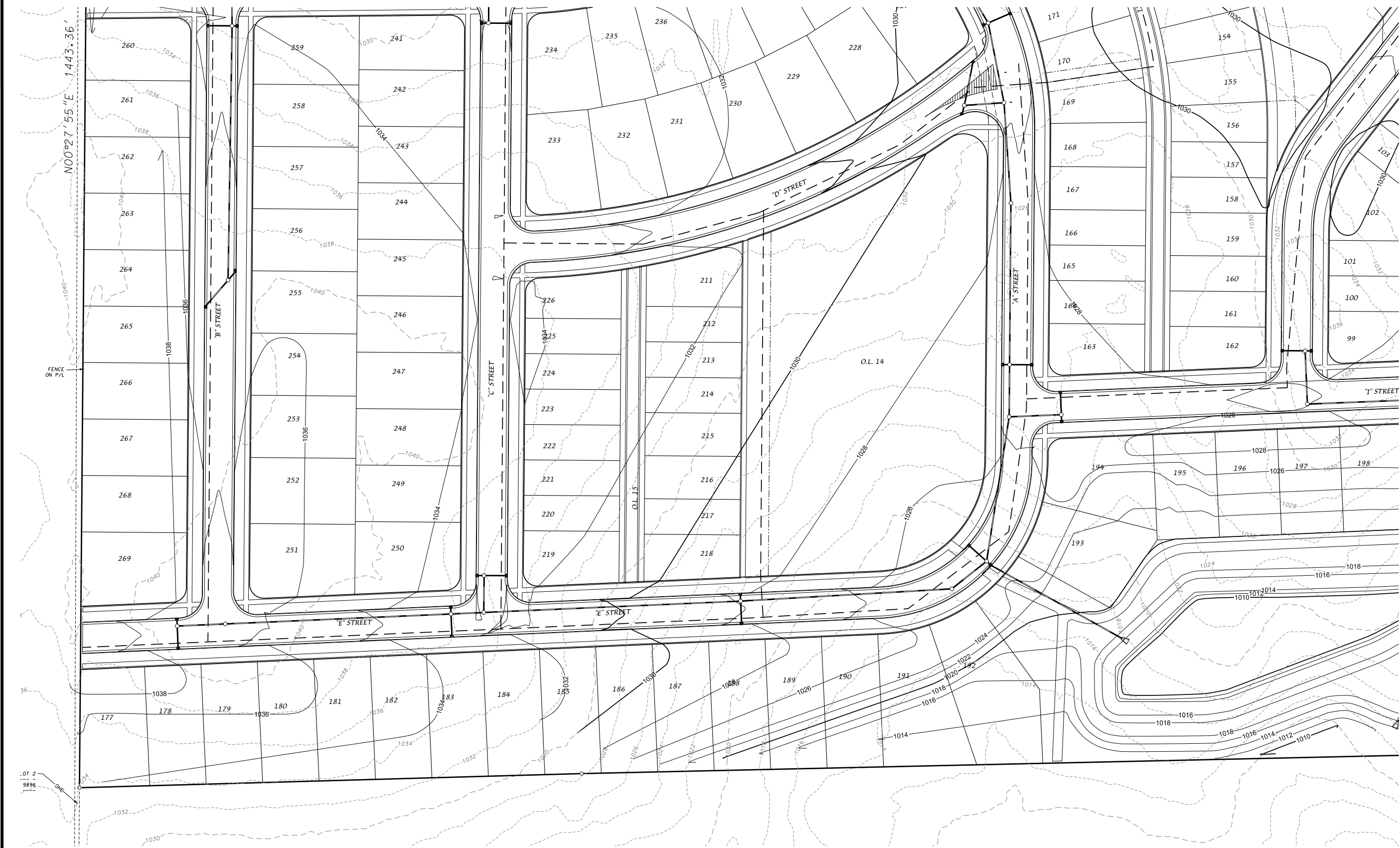
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HIGHFIELD RESERVE
 CITY OF FITCHBURG, DANE COUNTY, WISCONSIN



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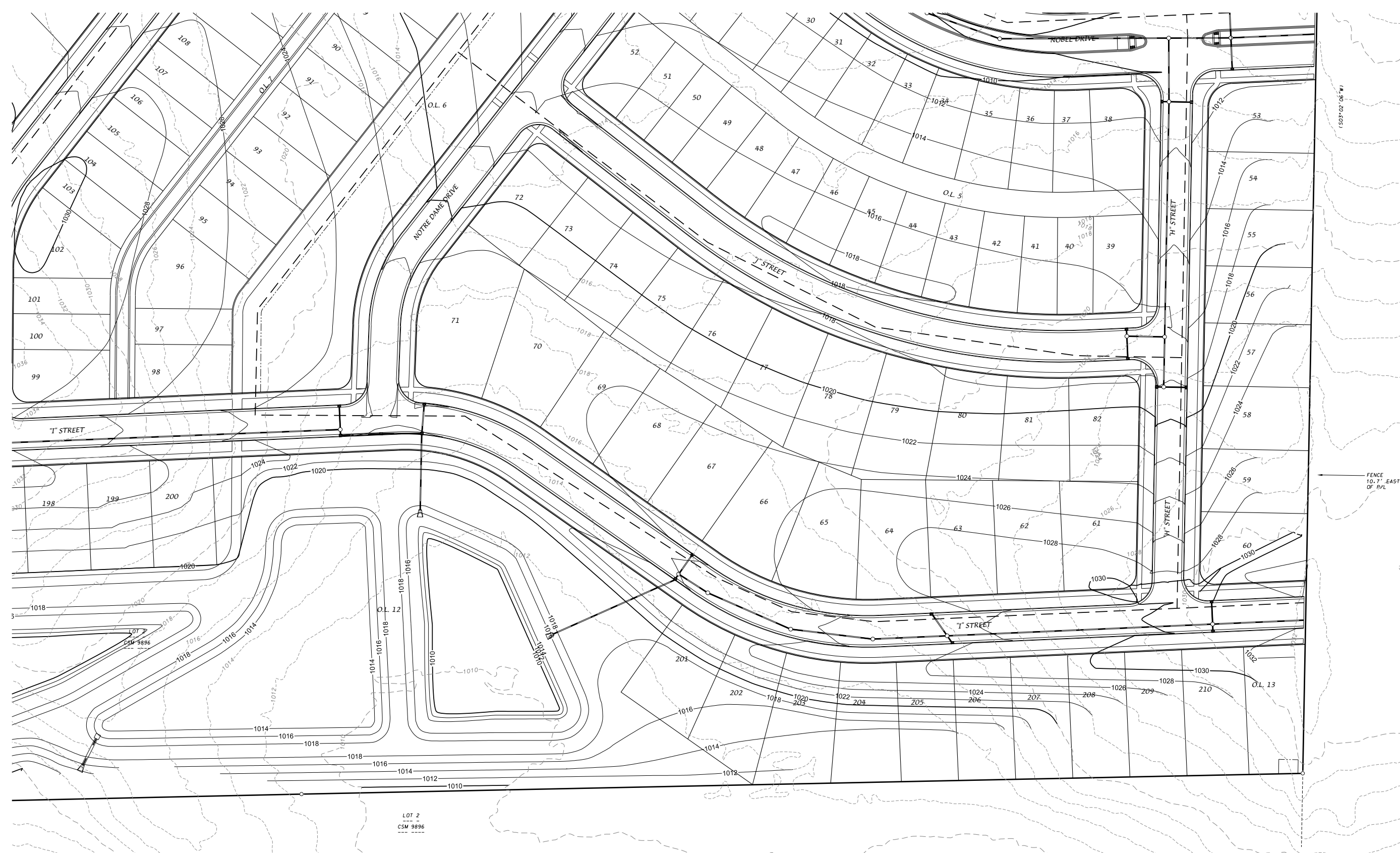
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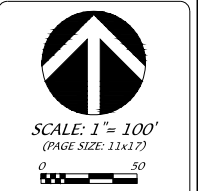
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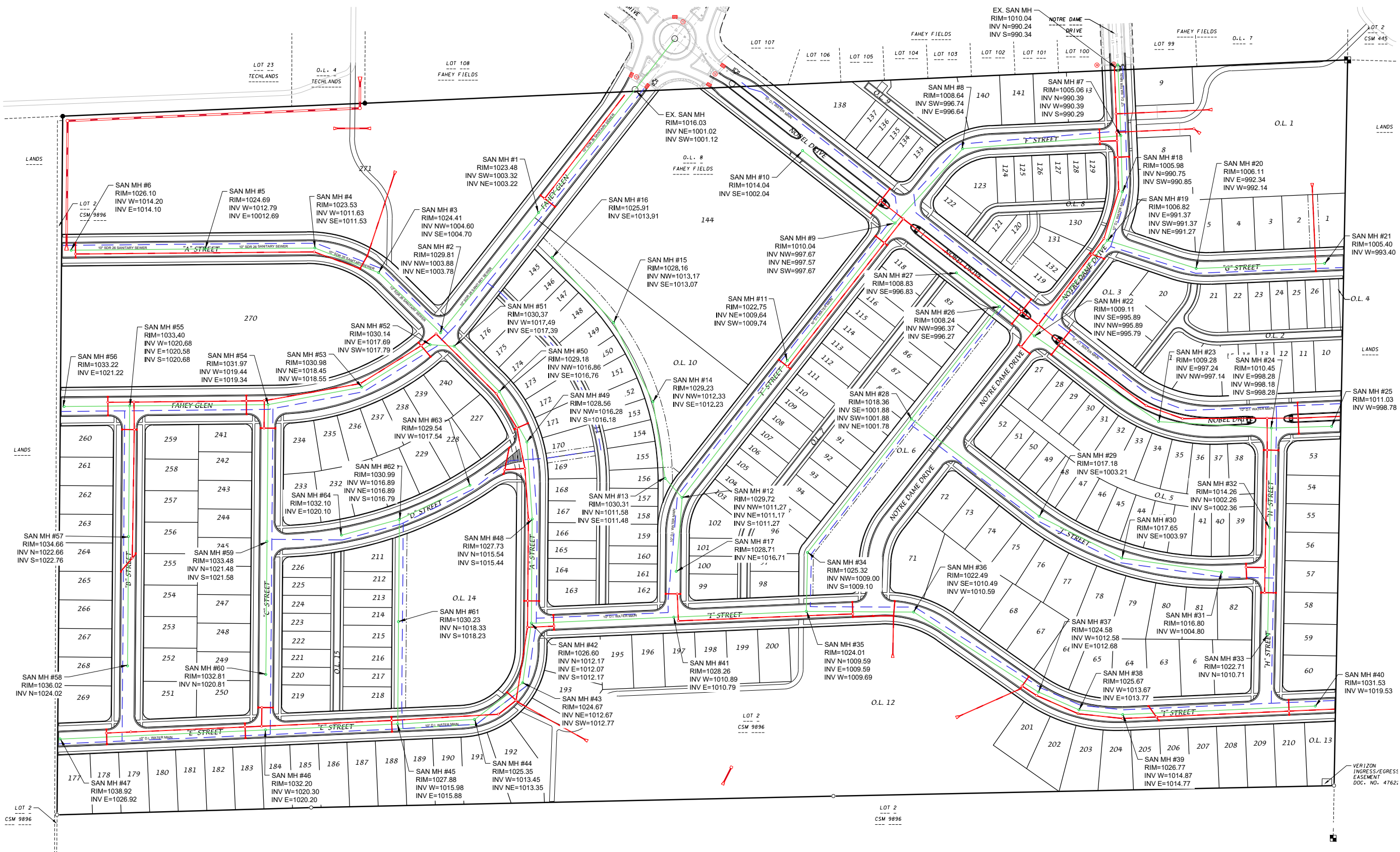
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 CITY OF FITCHBURG, DANE COUNTY, WISCONSIN



DATE: 11-17-21
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NOTES:
 - ALL SANITARY SEWER SHALL BE 8" DIAMETER UNLESS NOTED.
 - ALL WATER MAIN SHALL BE 8" DIAMETER UNLESS NOTED.



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 7590 Westwood Way, Madison, WI 53717
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PROPOSED OVERALL UTILITY SCHEMATIC

HIGHFIELD RESERVE

CITY OF FITCHBURG, DANE COUNTY, WISCONSIN



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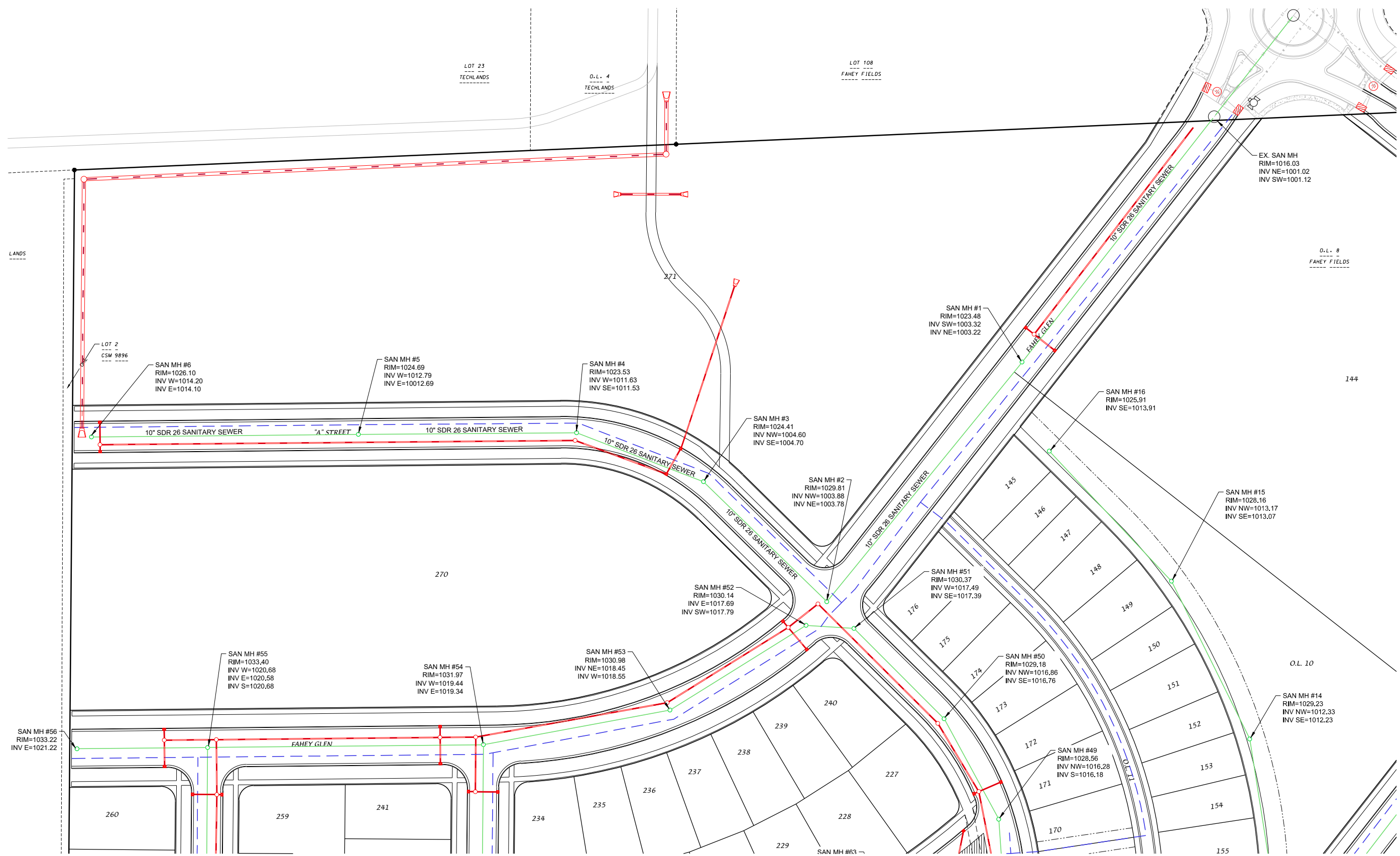
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 7590 Westwood Way, Madison, WI 53717
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 YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

PROPOSED UTILITY SCHEMATIC
HIGHFIELD RESERVE
 CITY OF FITCHBURG, DANE COUNTY, WISCONSIN



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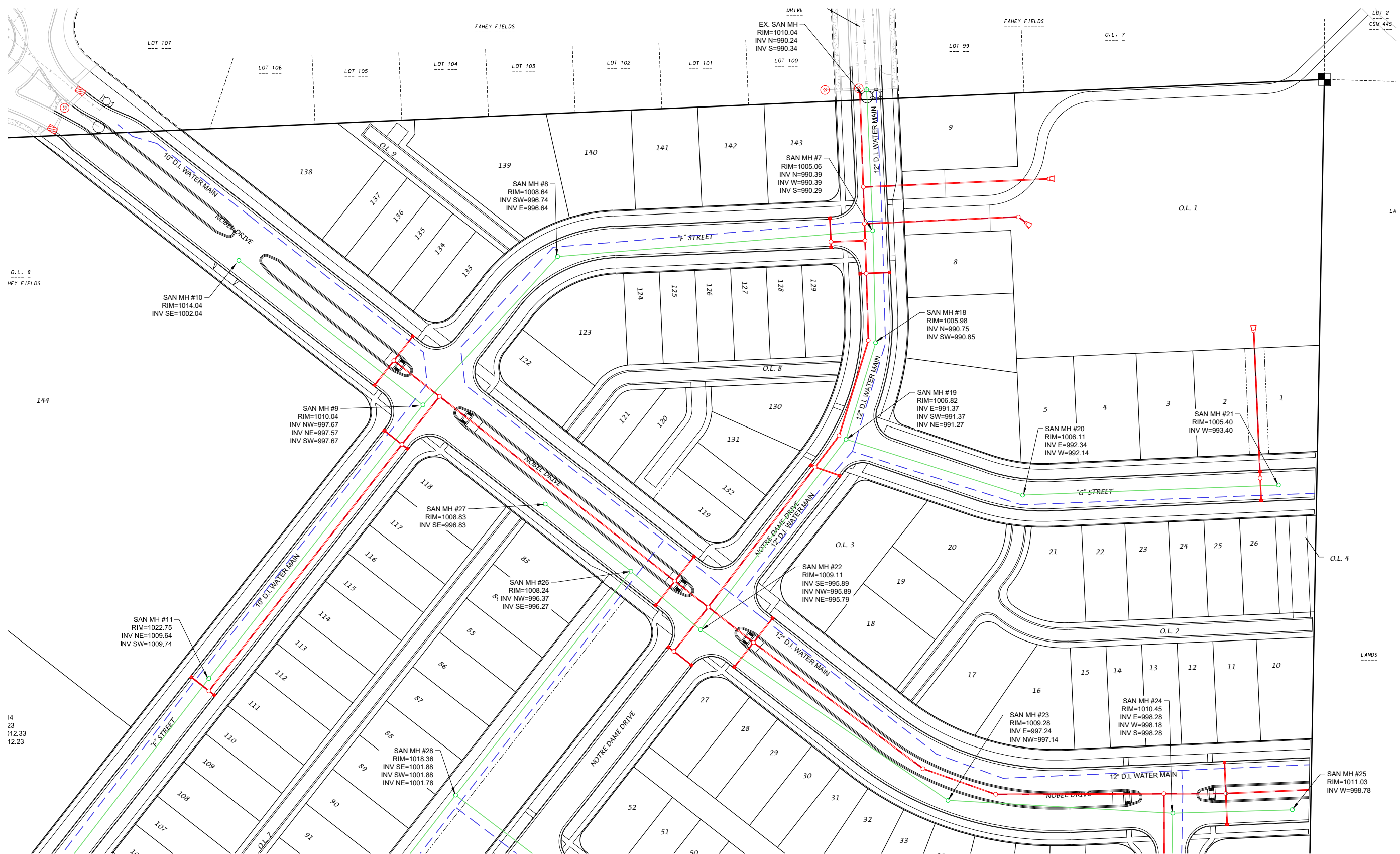
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PROPOSED UTILITY SCHEMATIC
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 CITY OF FITCHBURG, DANE COUNTY, WISCONSIN



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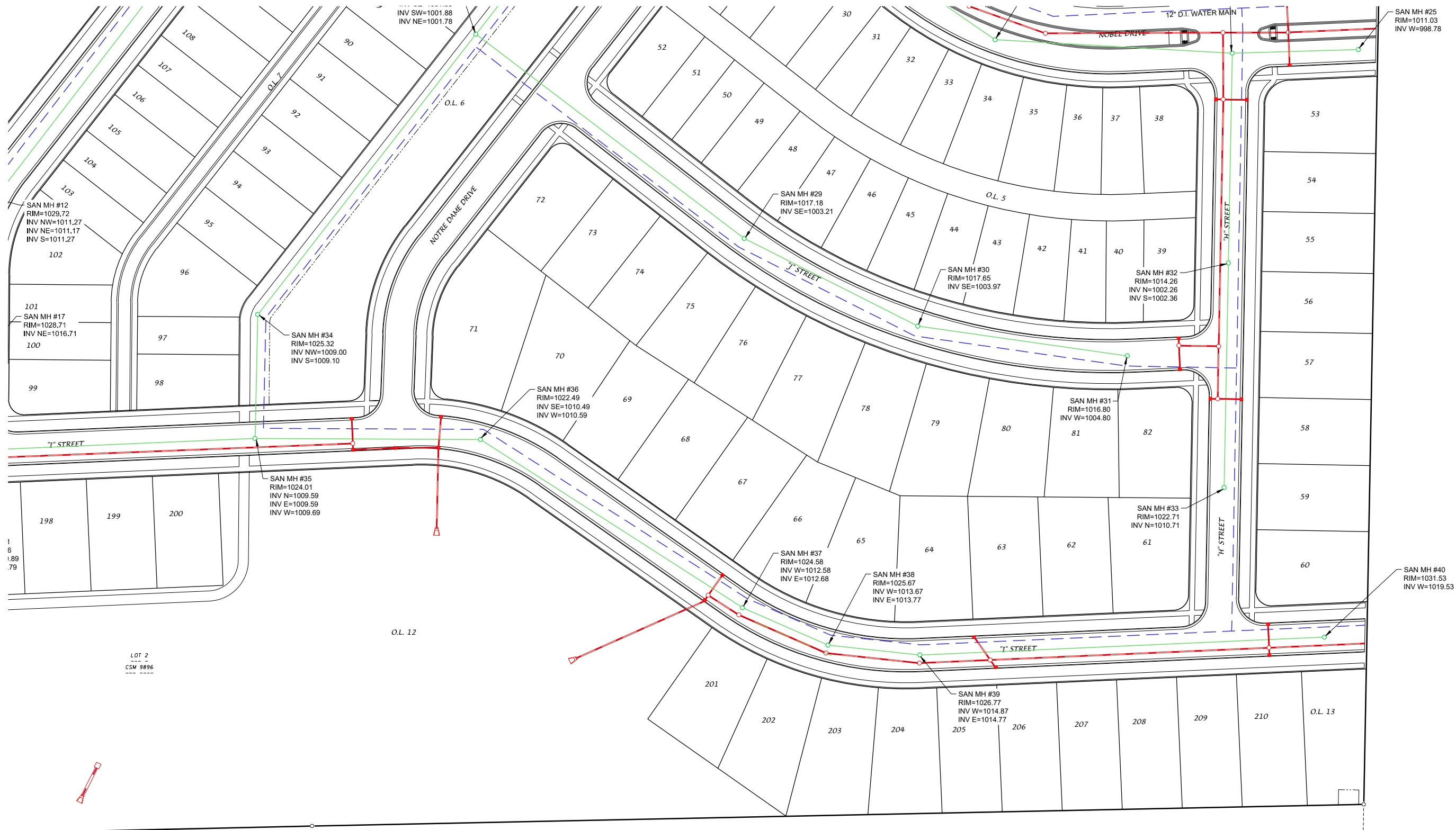
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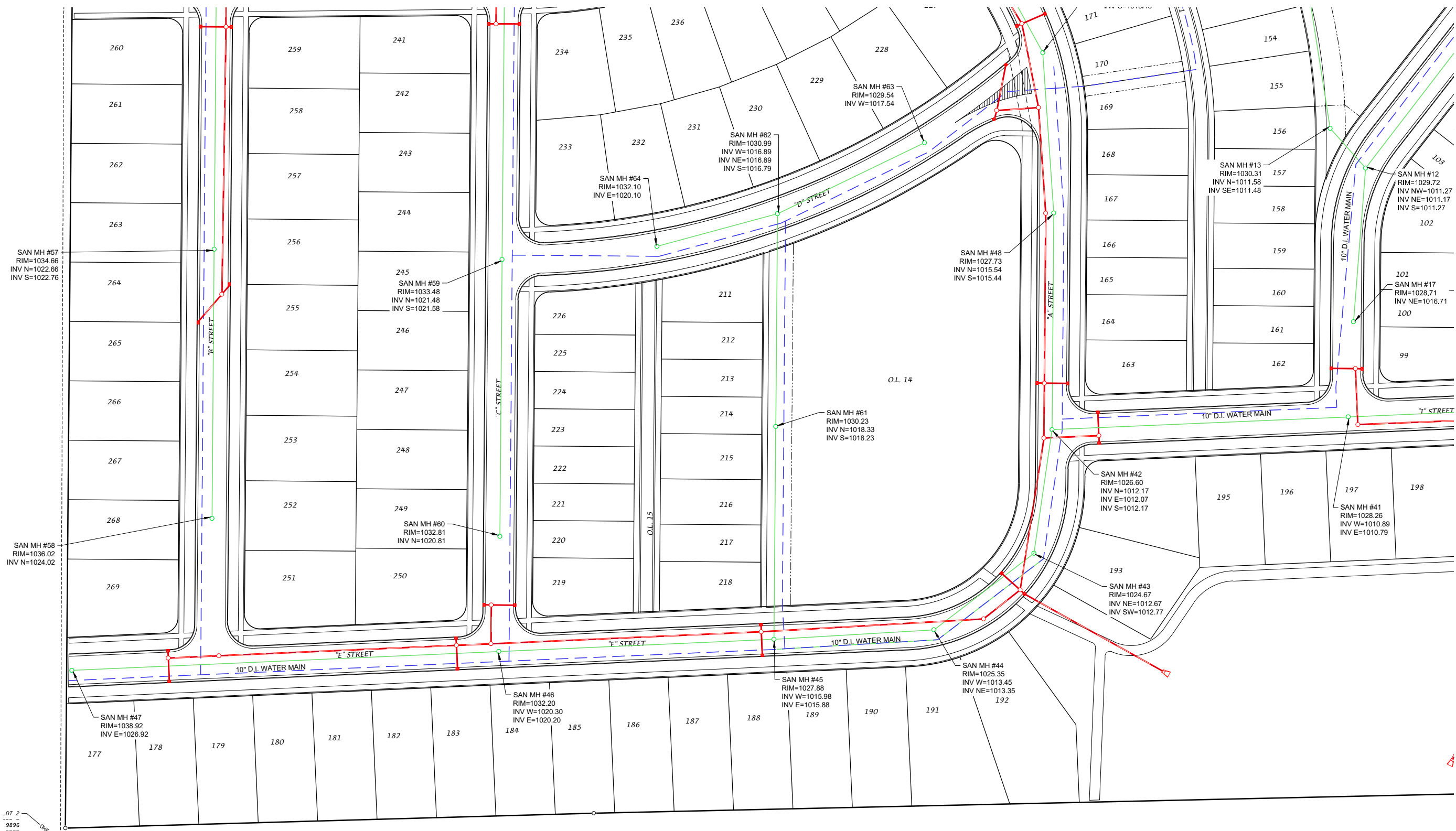
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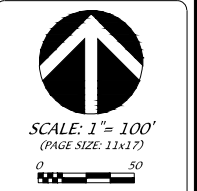
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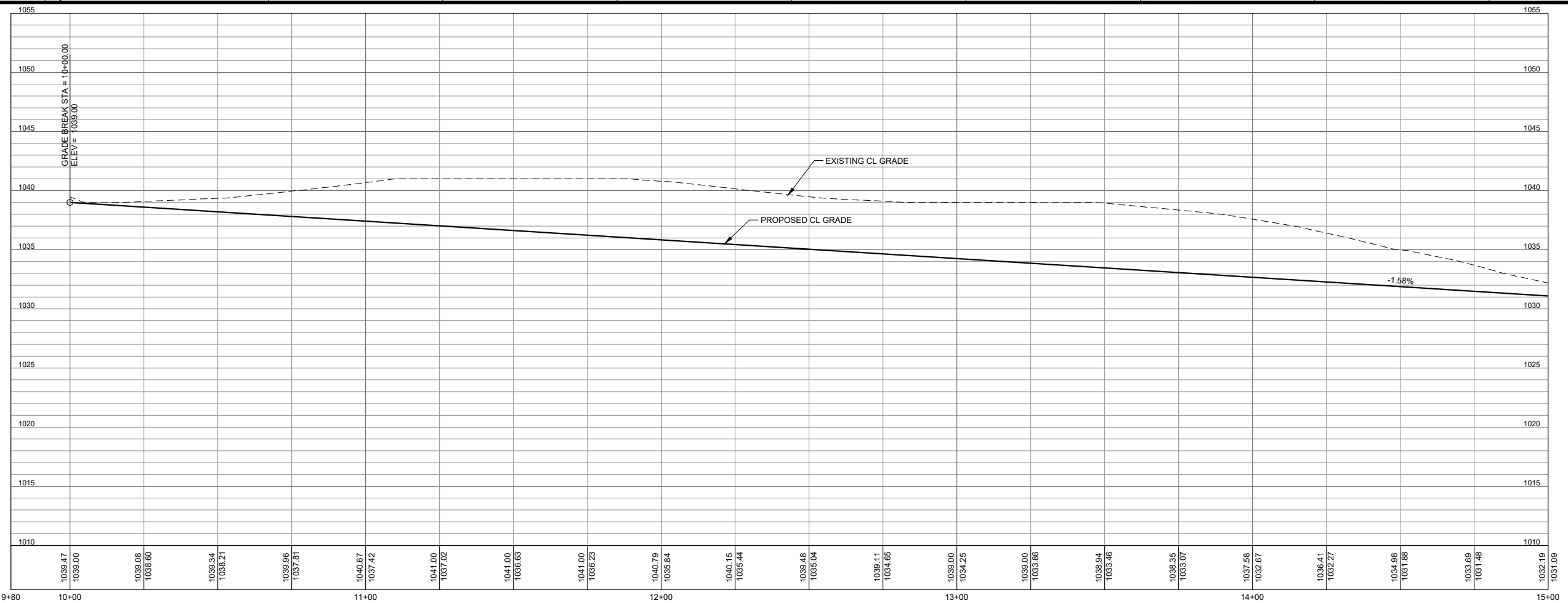
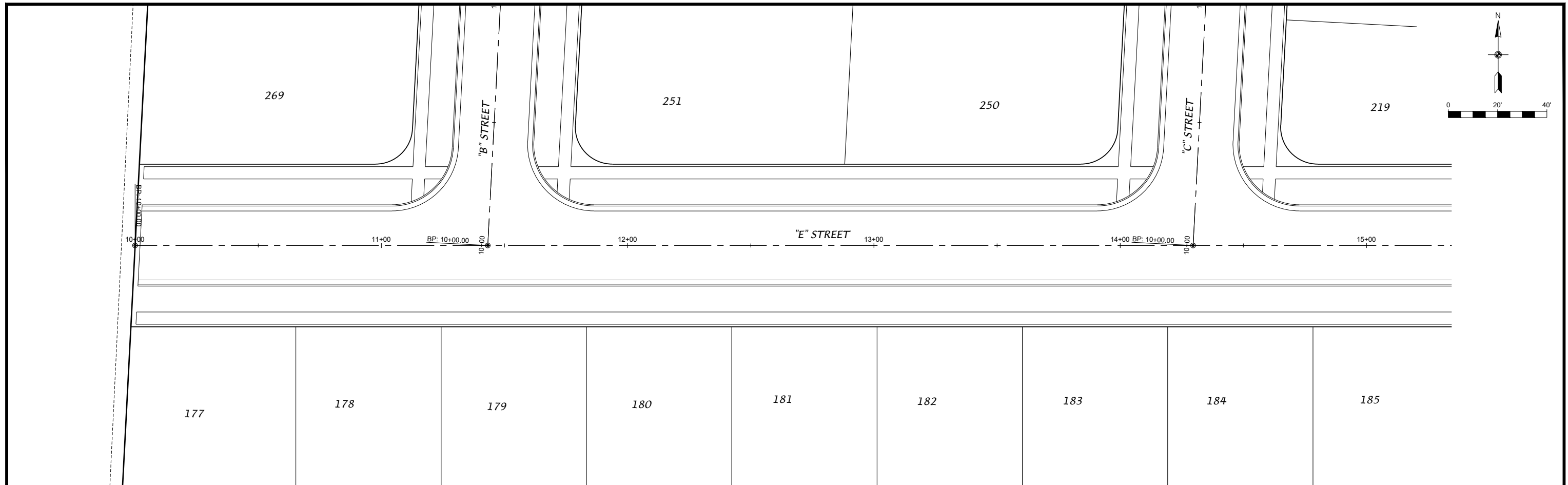
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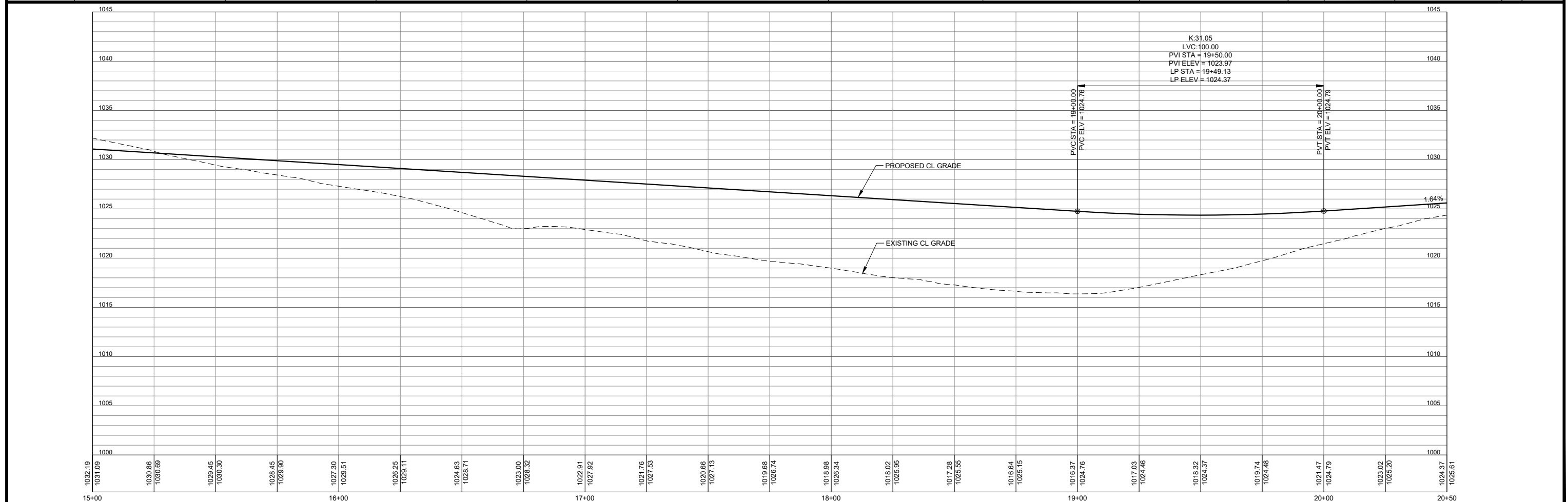
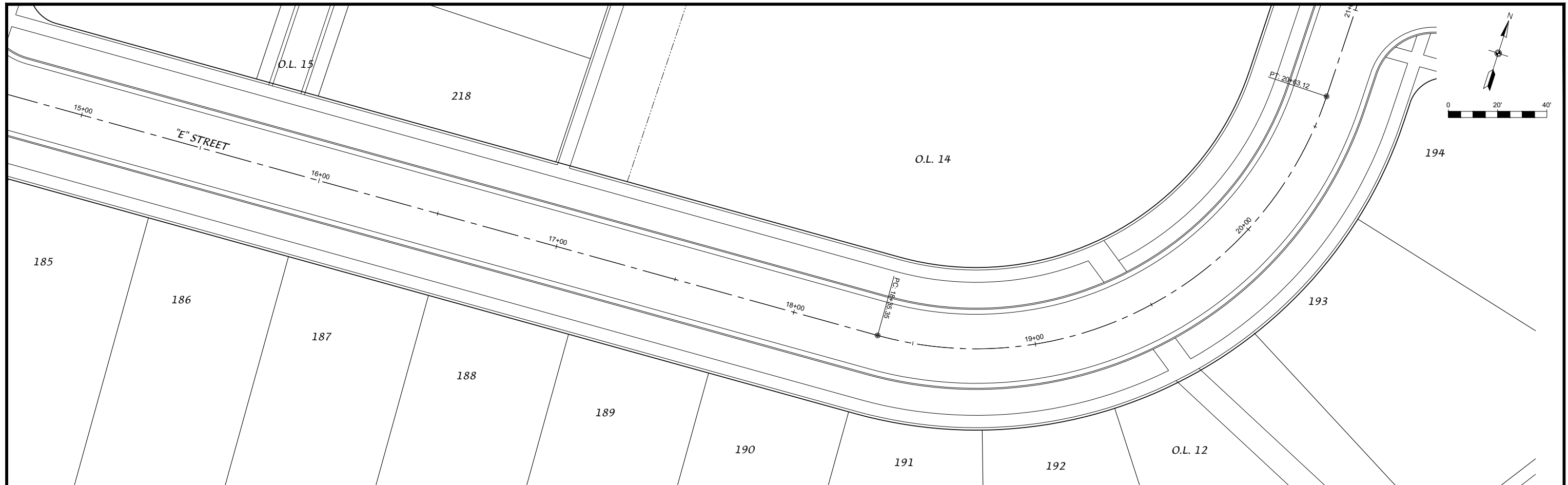
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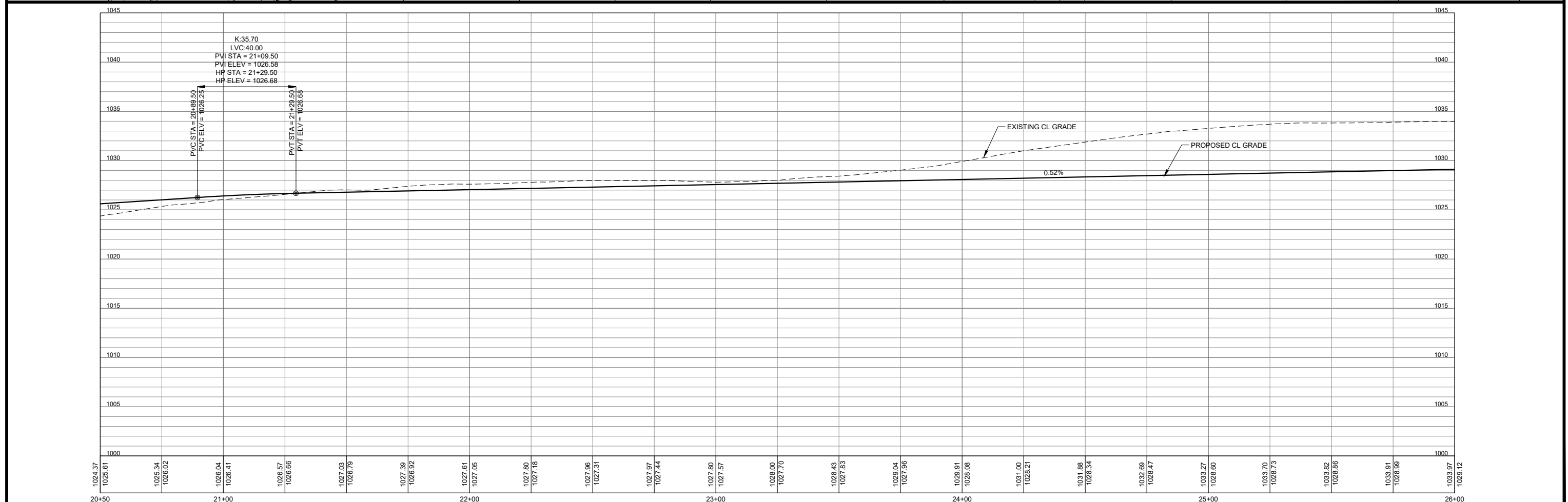
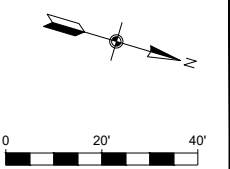
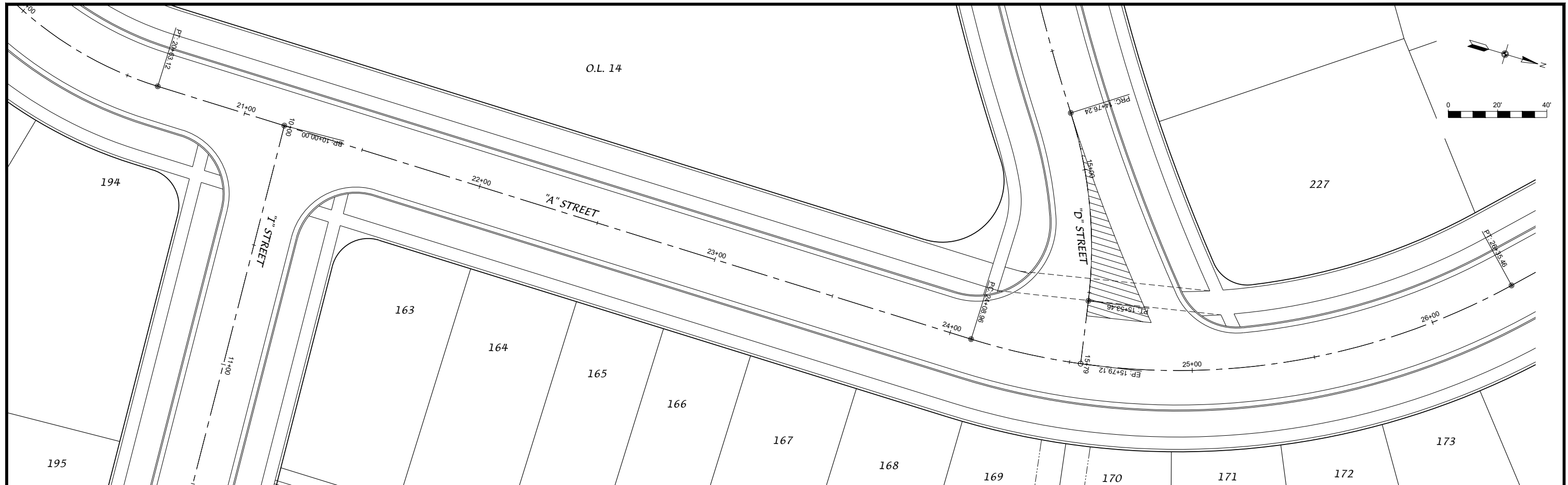


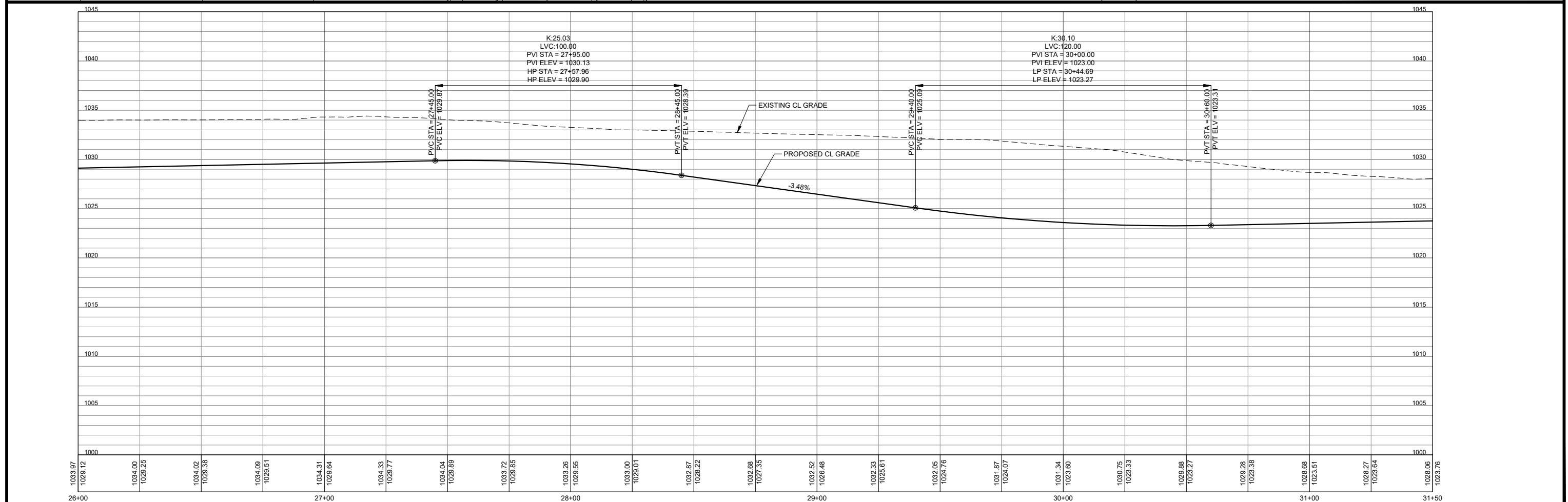
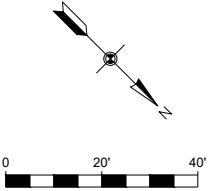
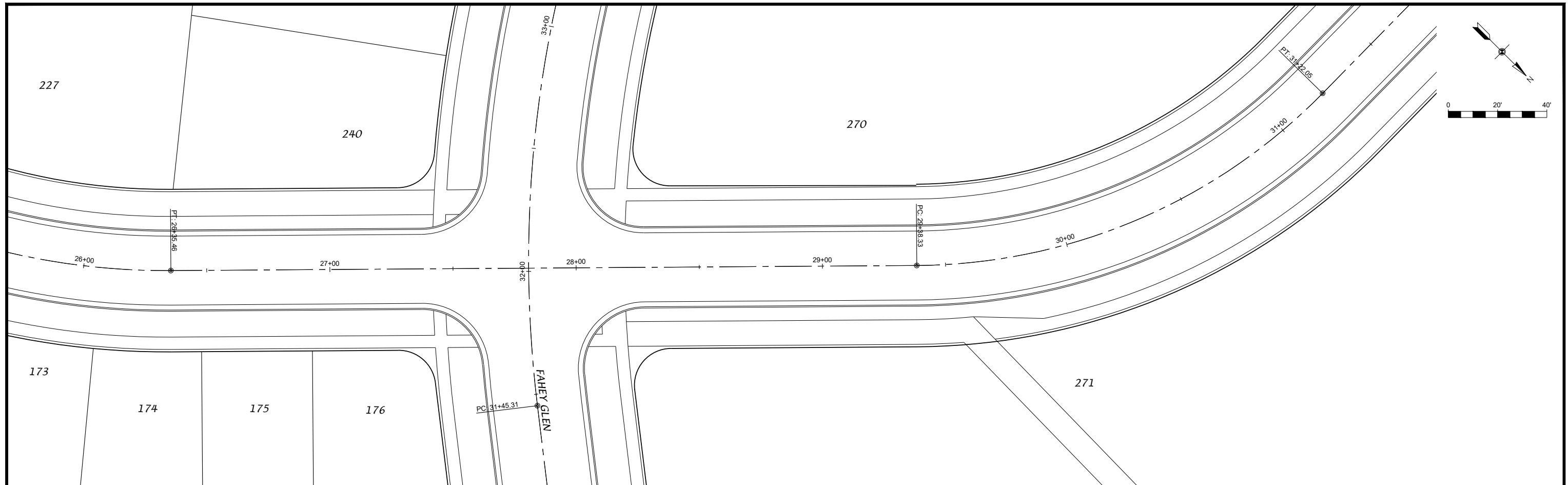
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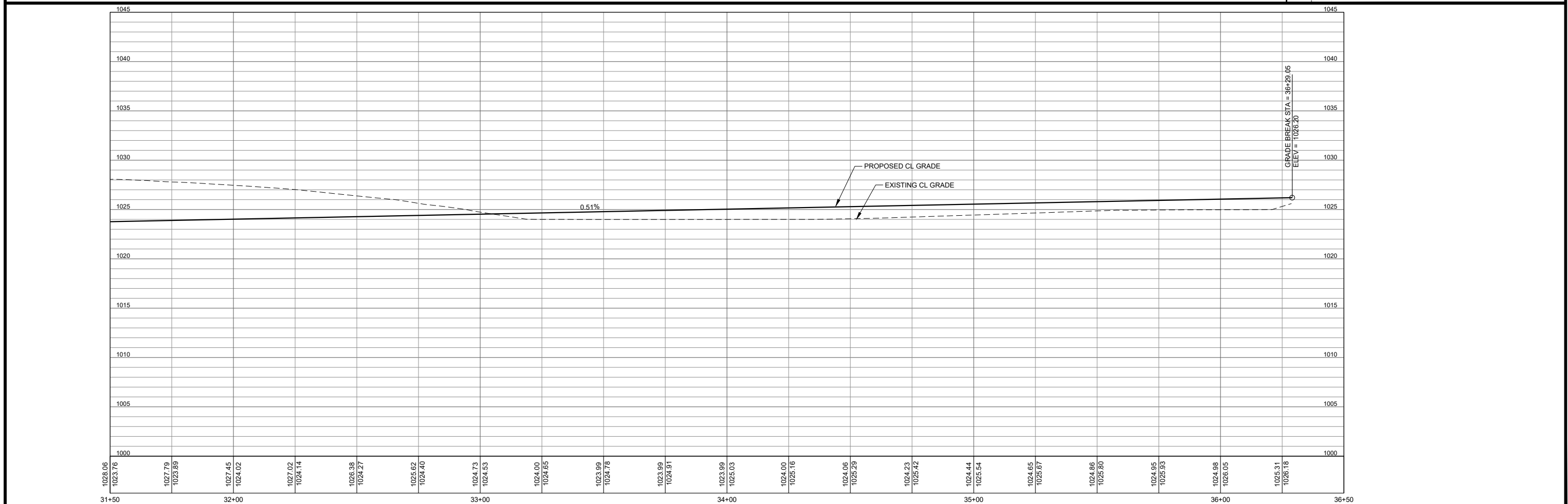
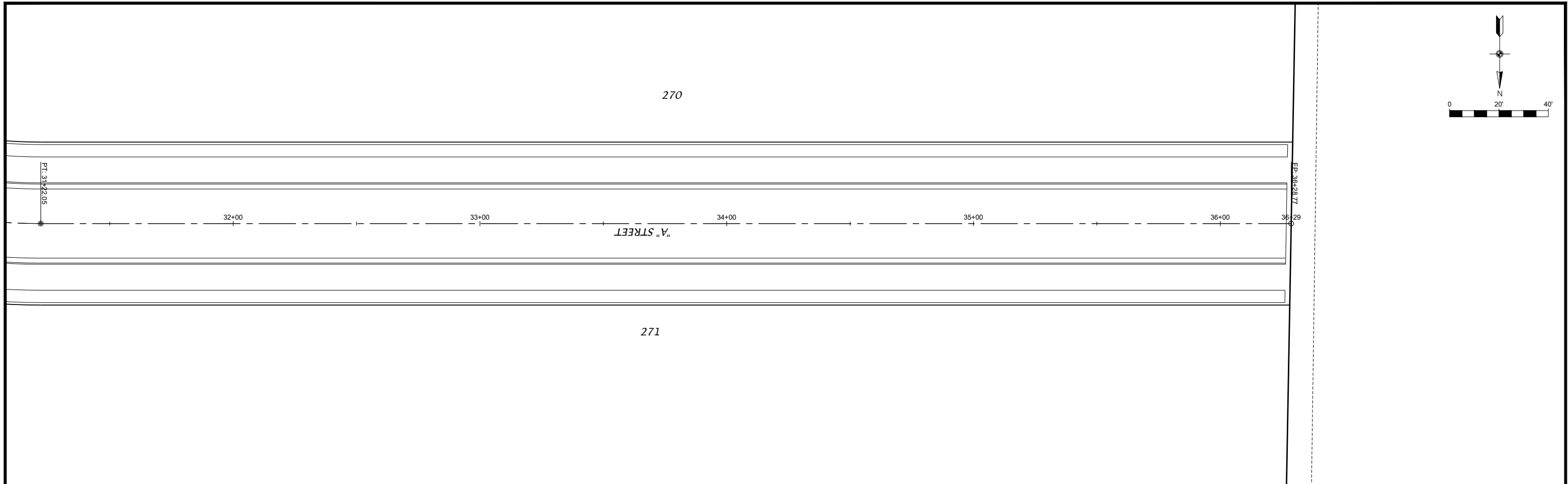
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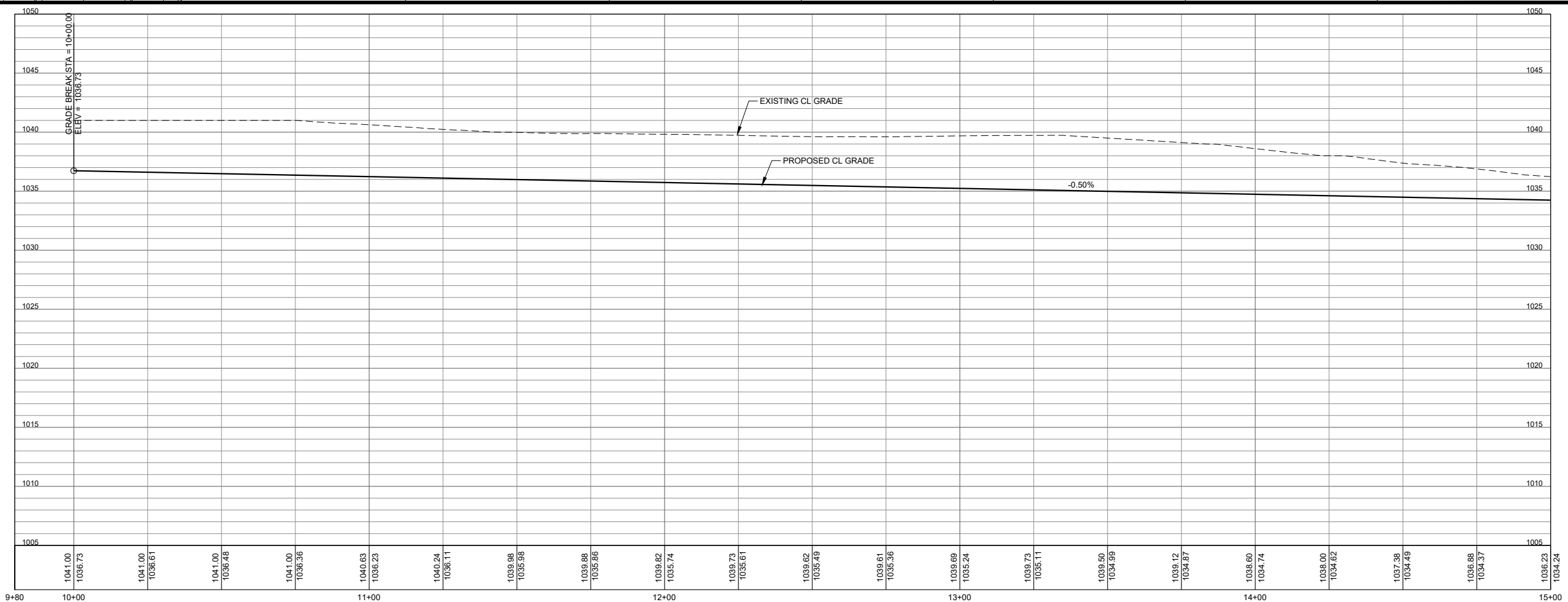
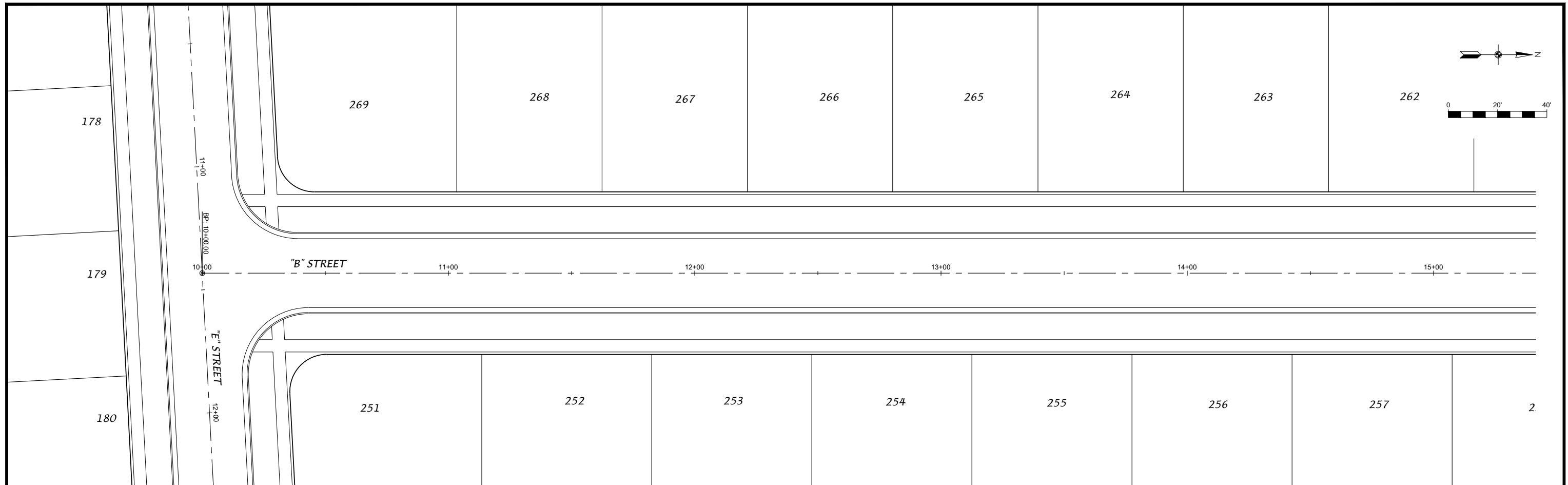


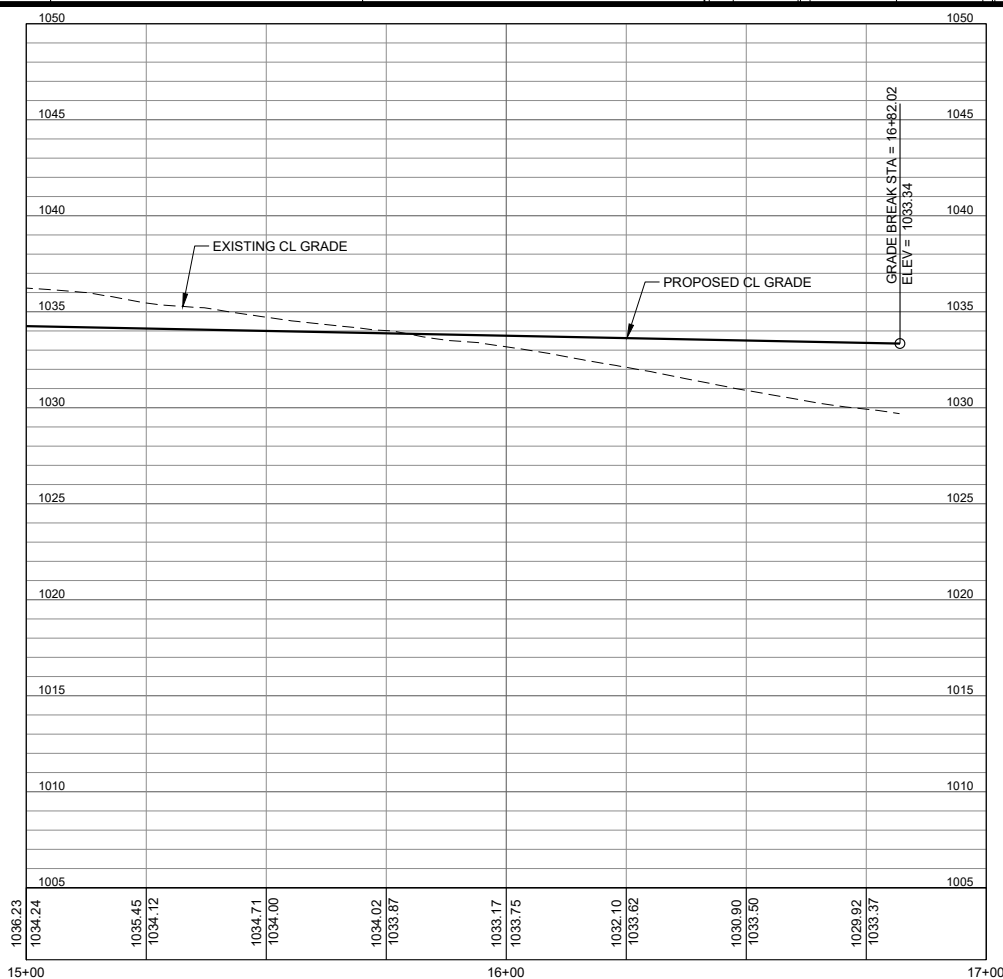
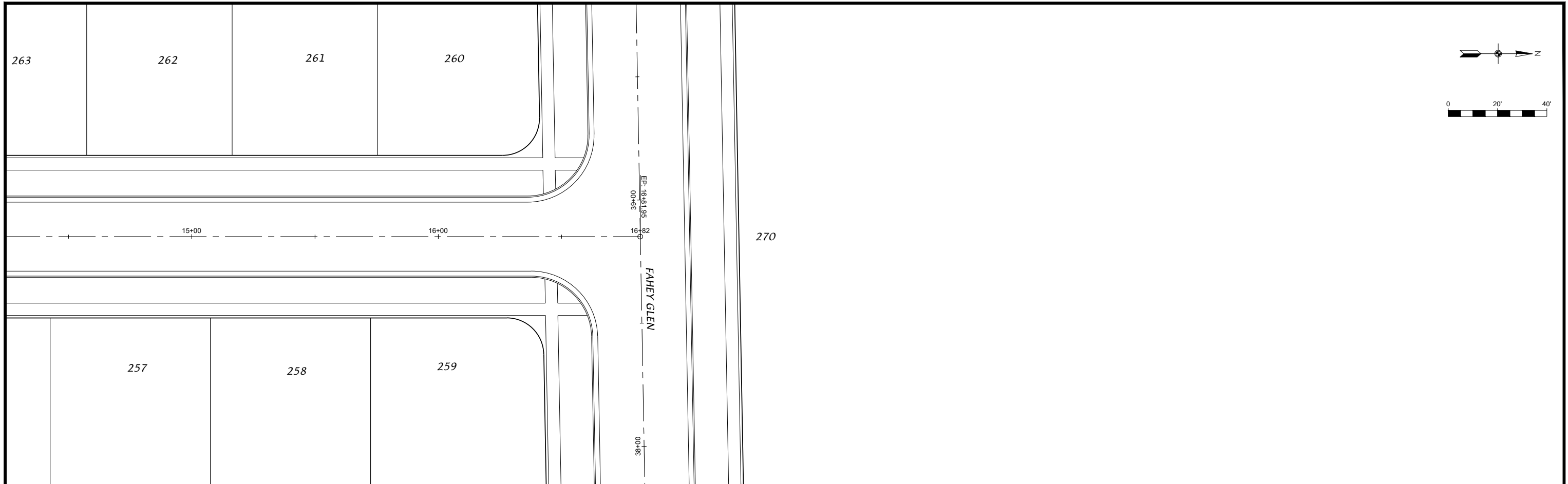


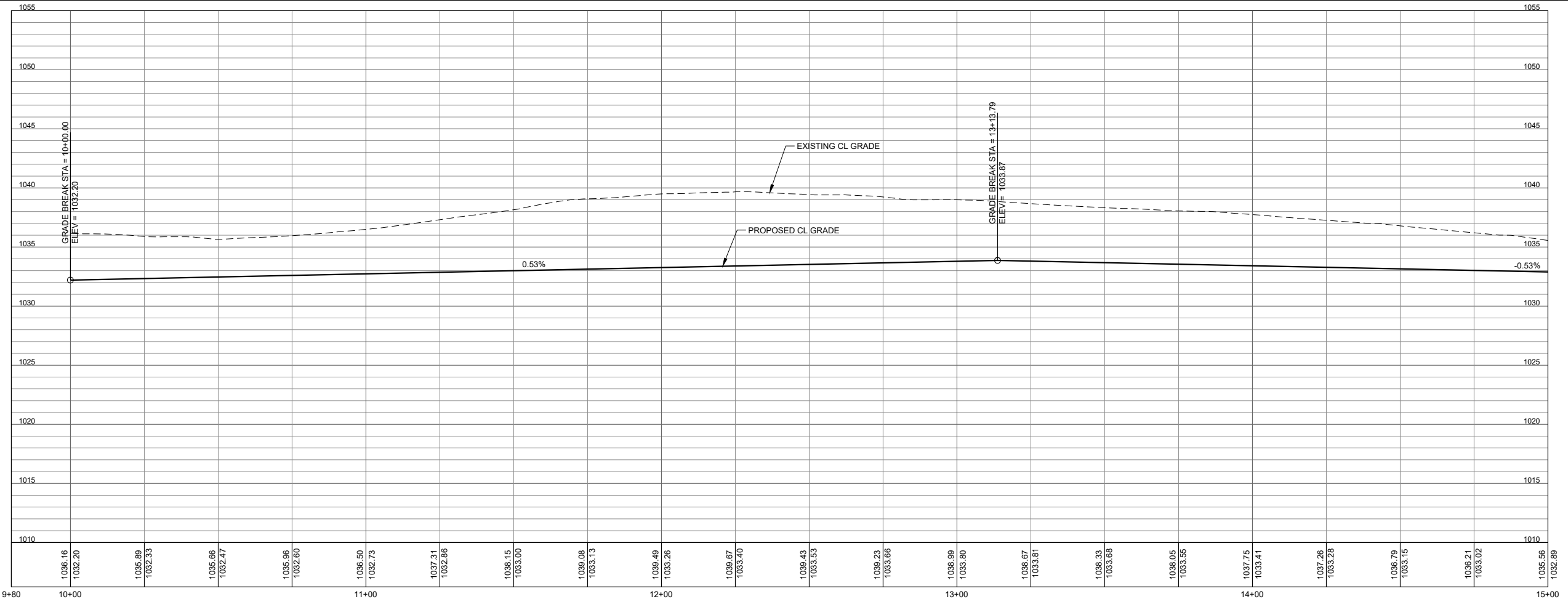
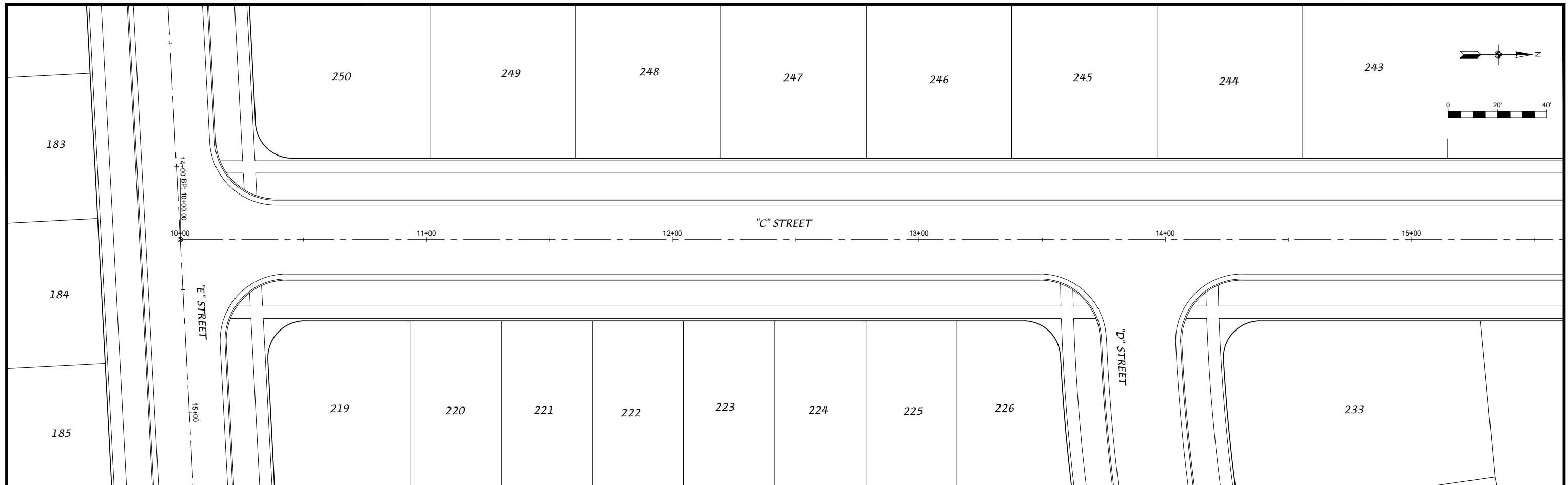


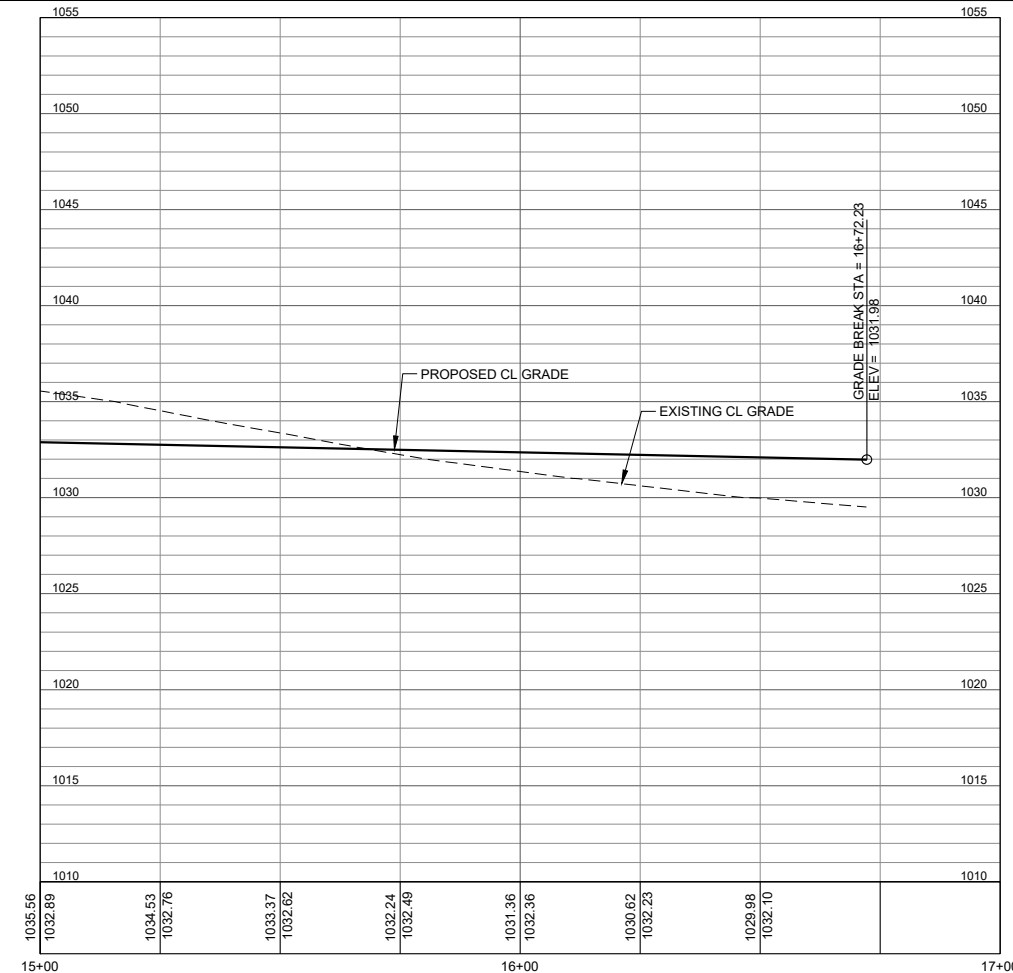
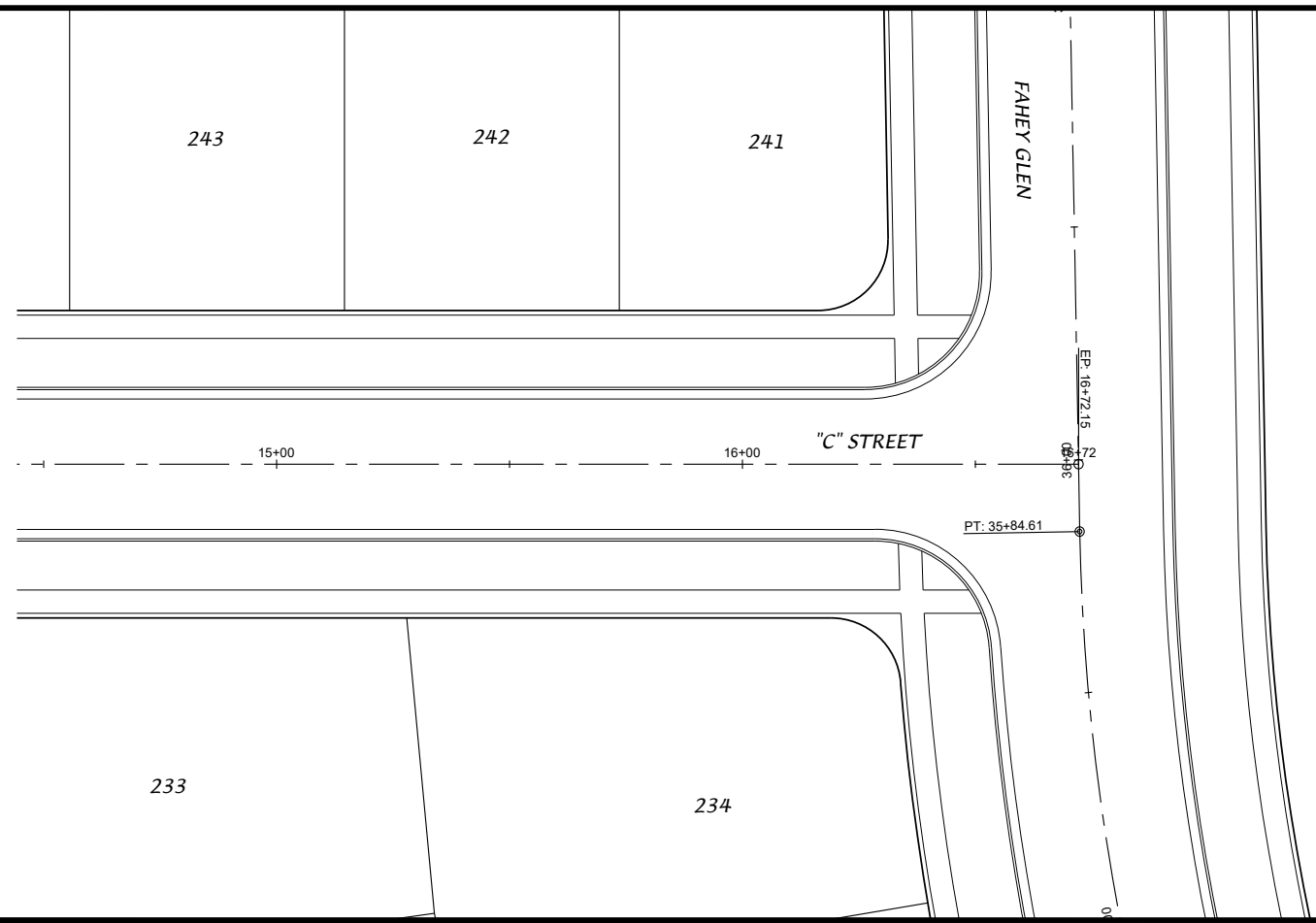
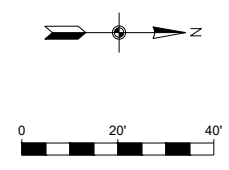


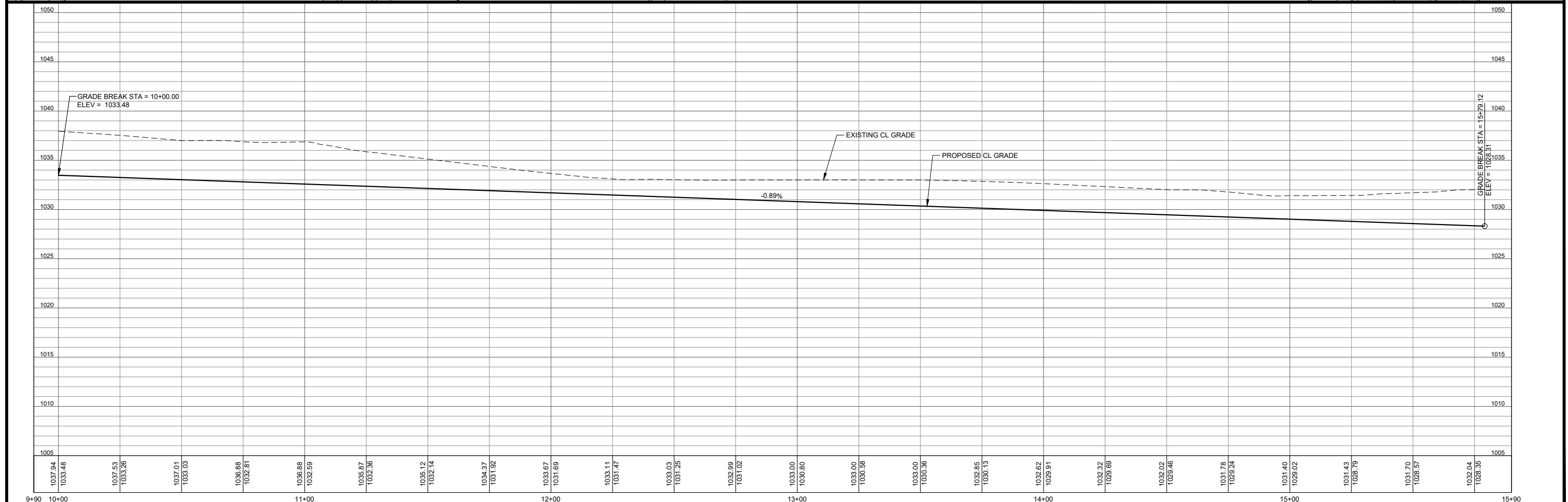
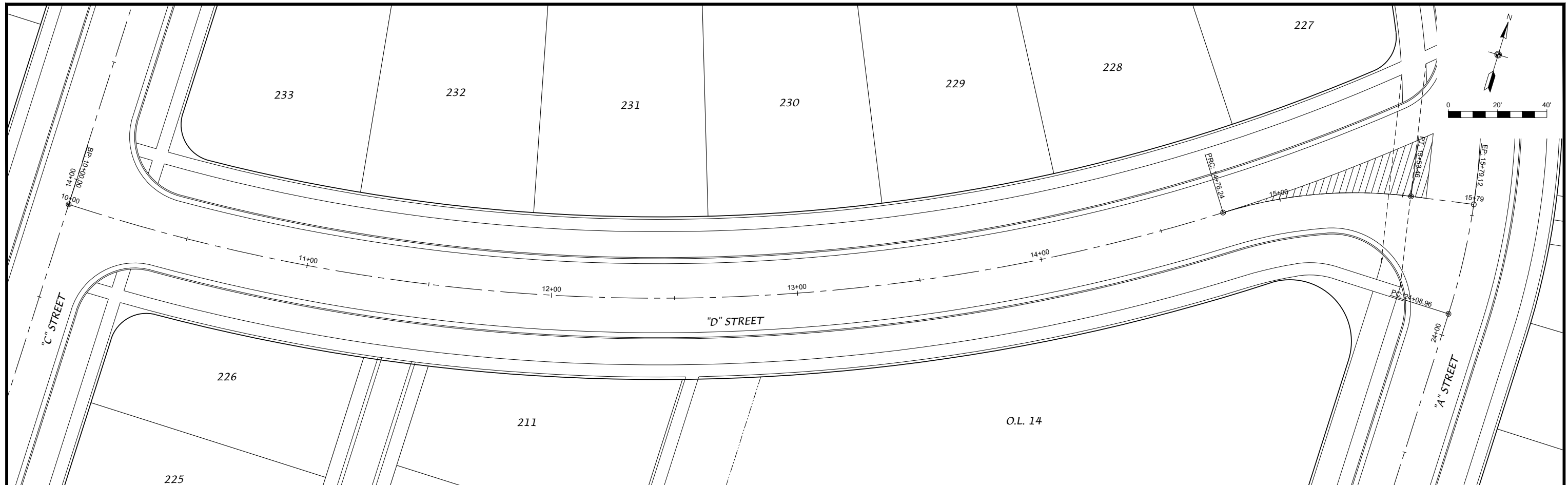


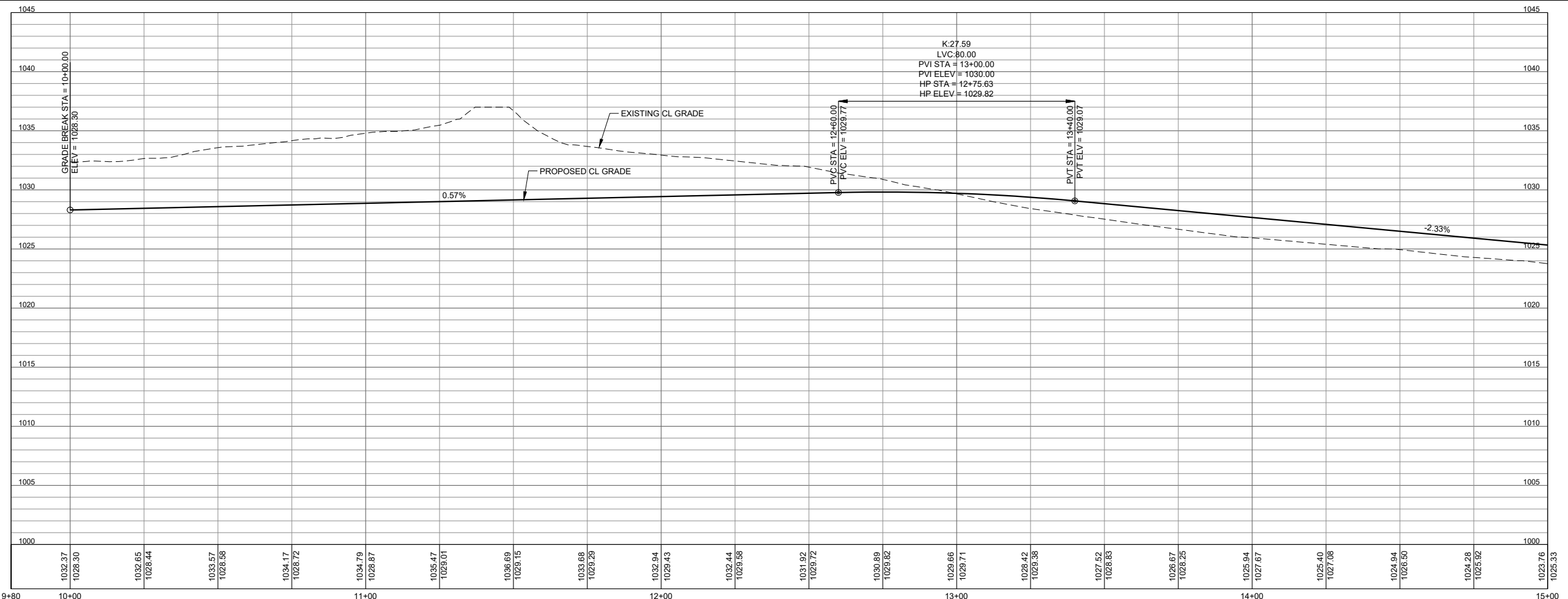
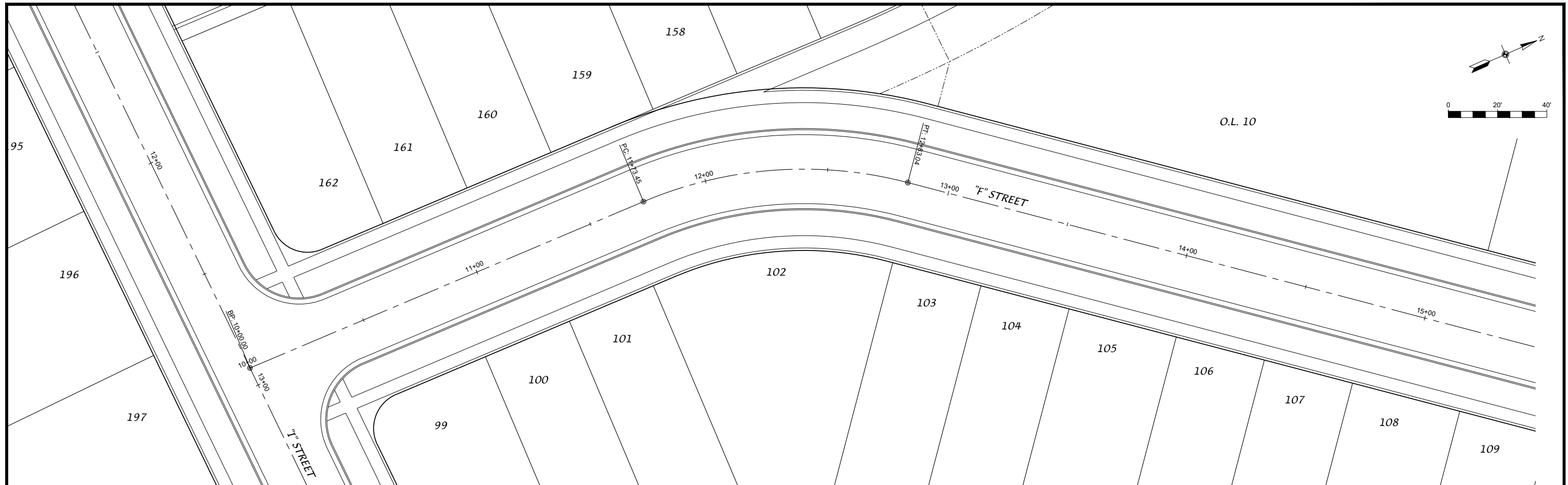


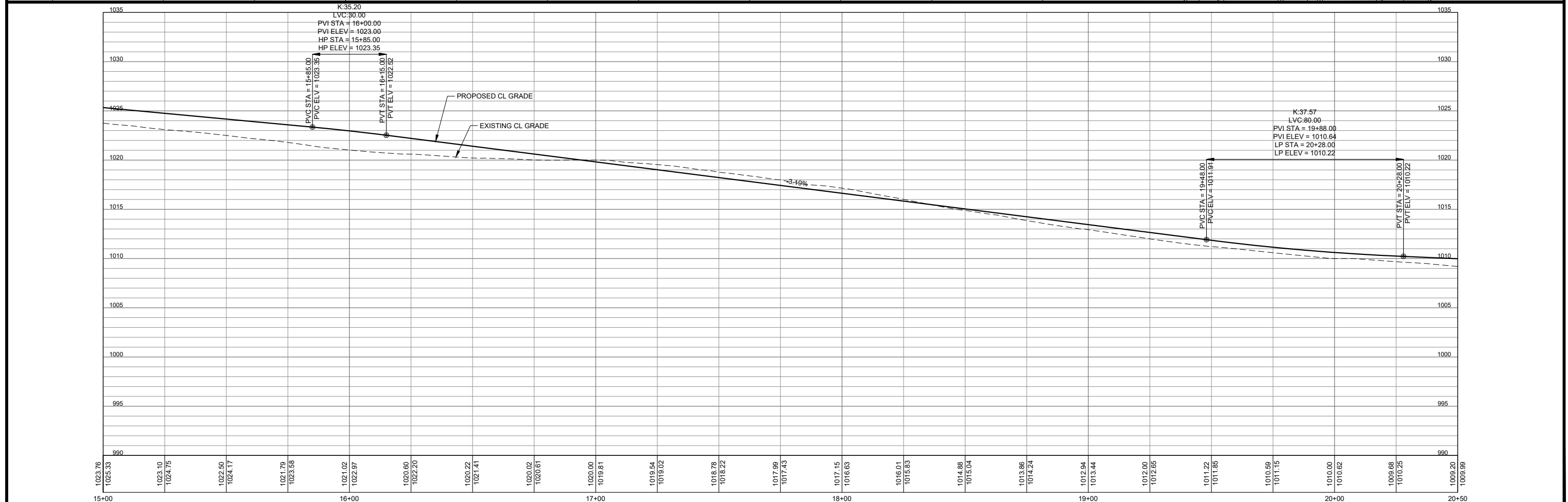
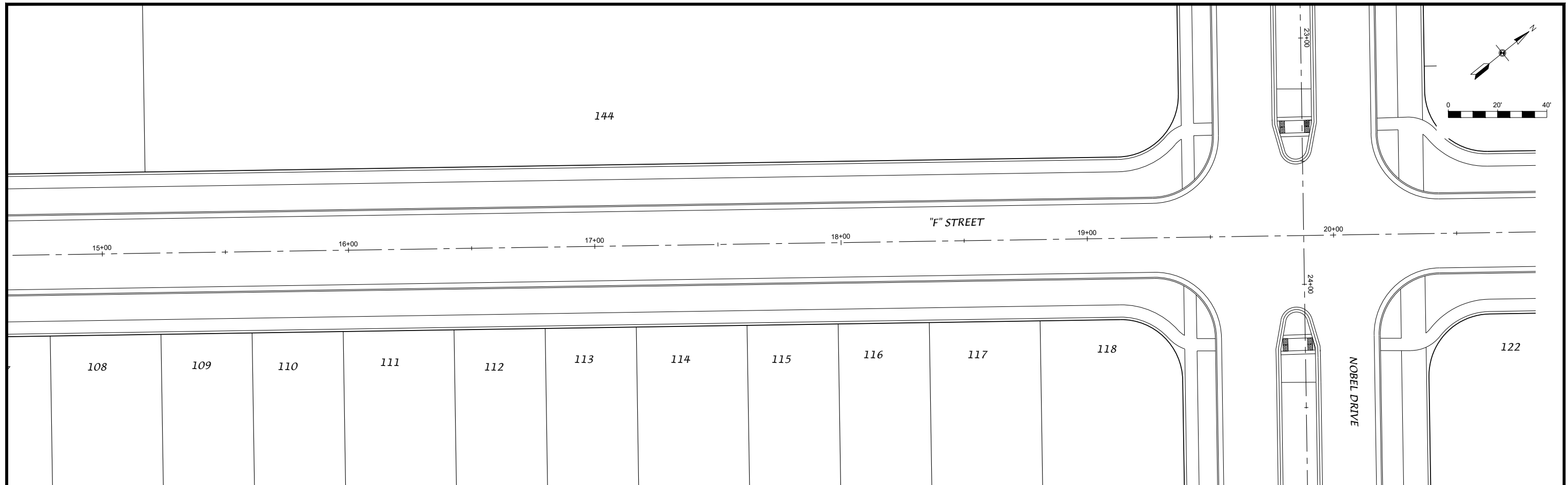


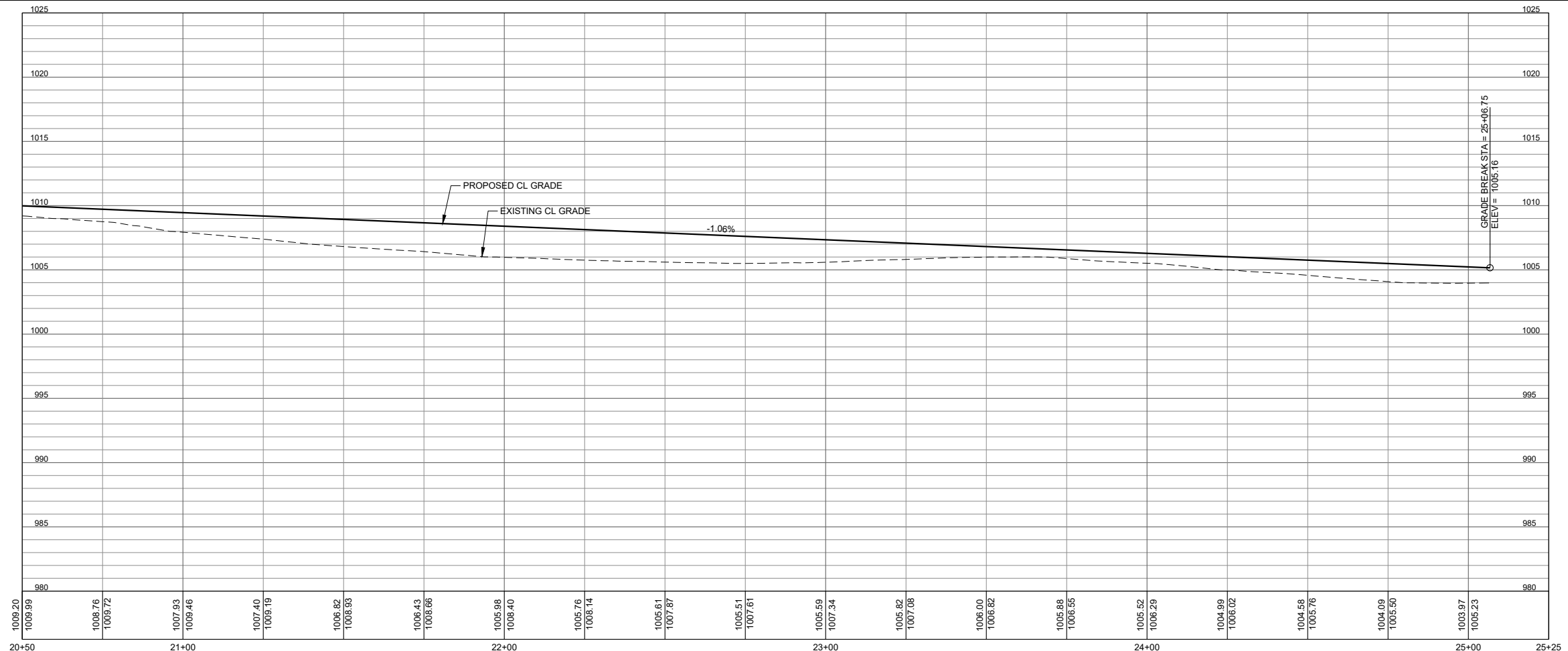
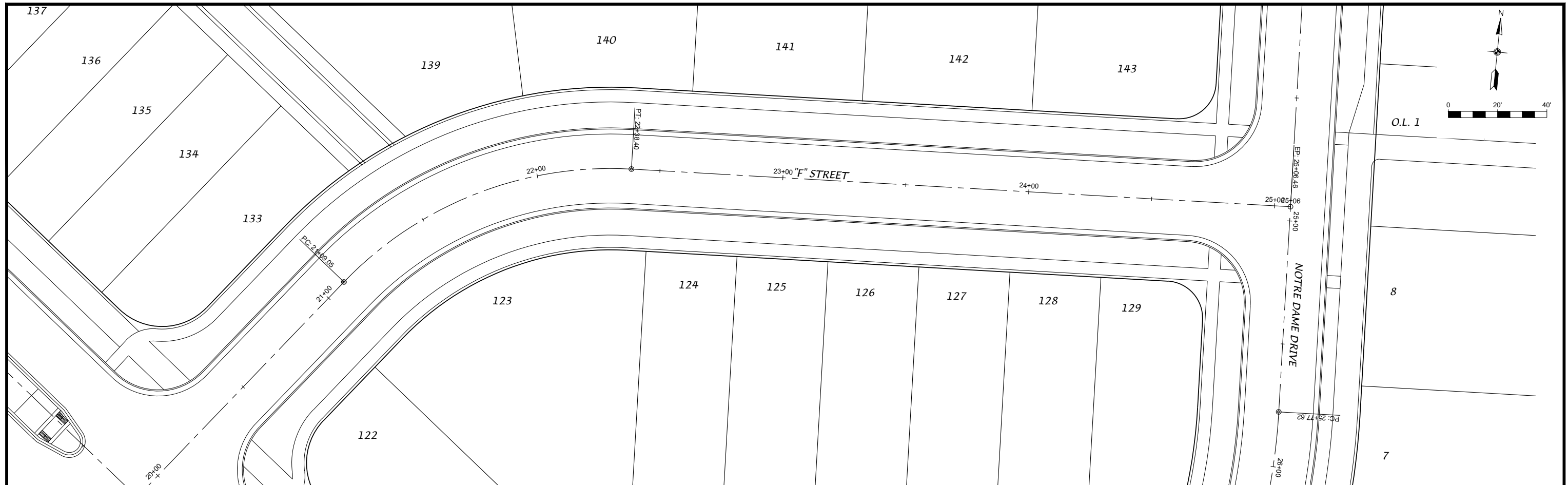


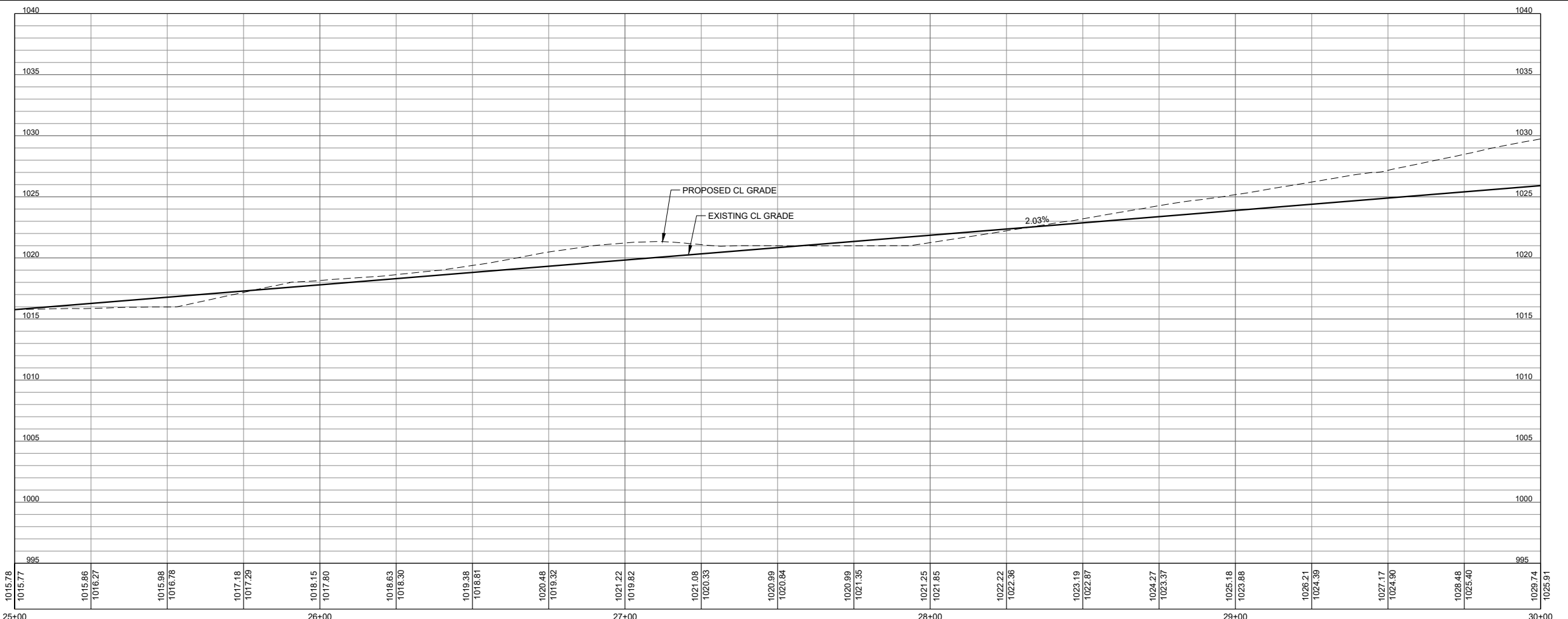
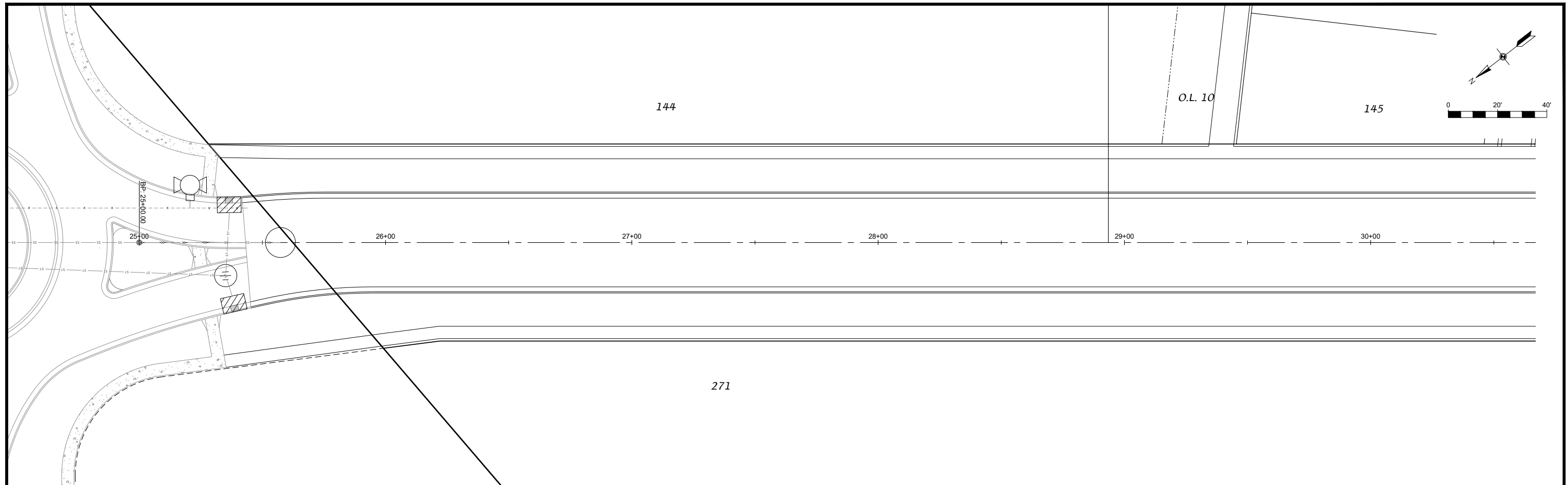


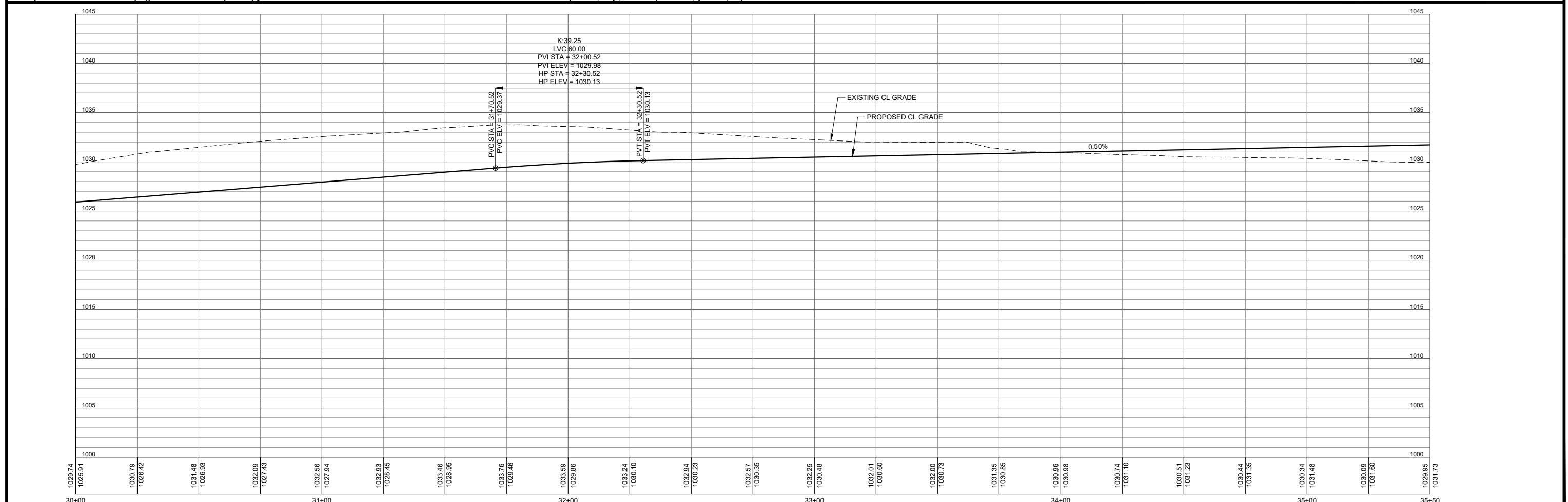
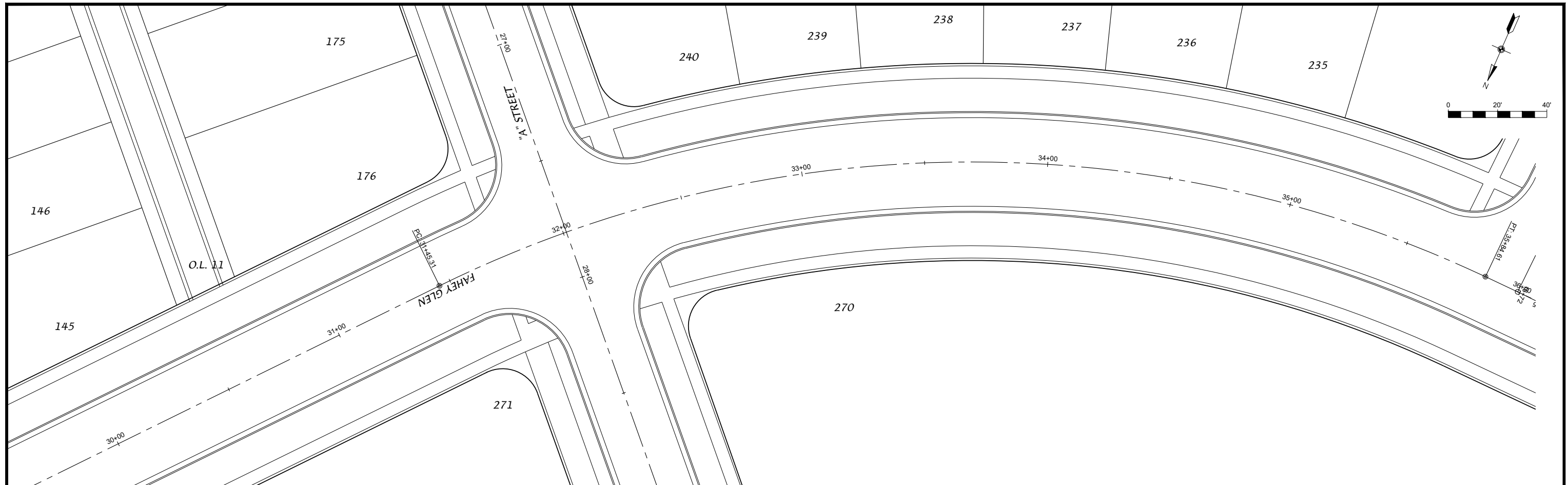


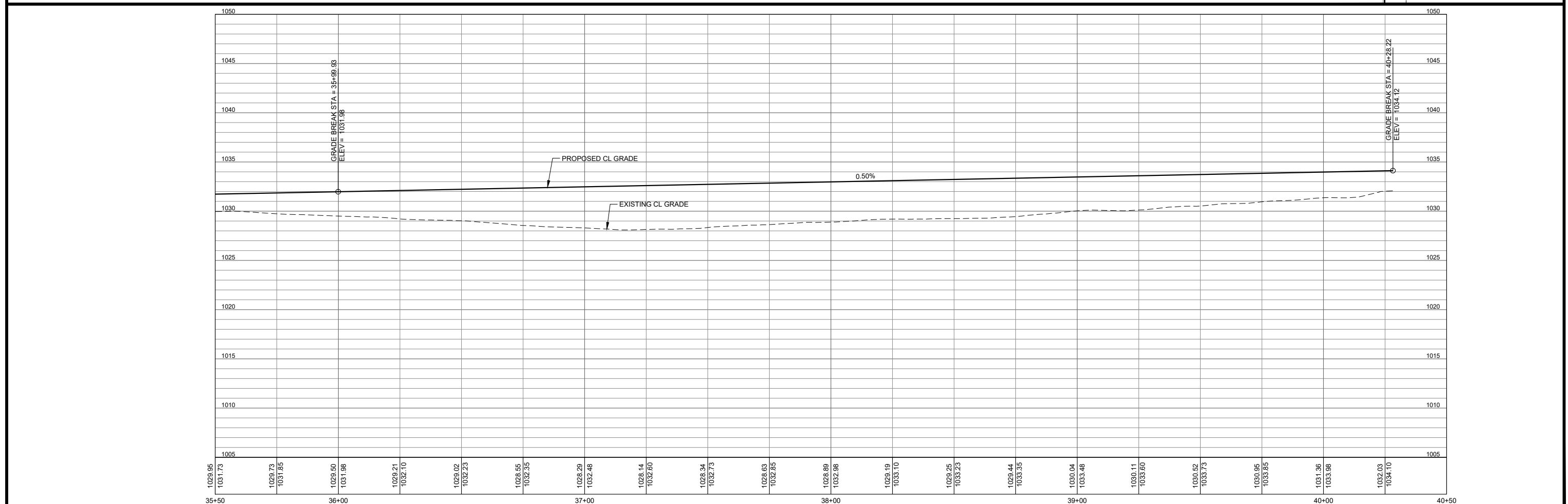
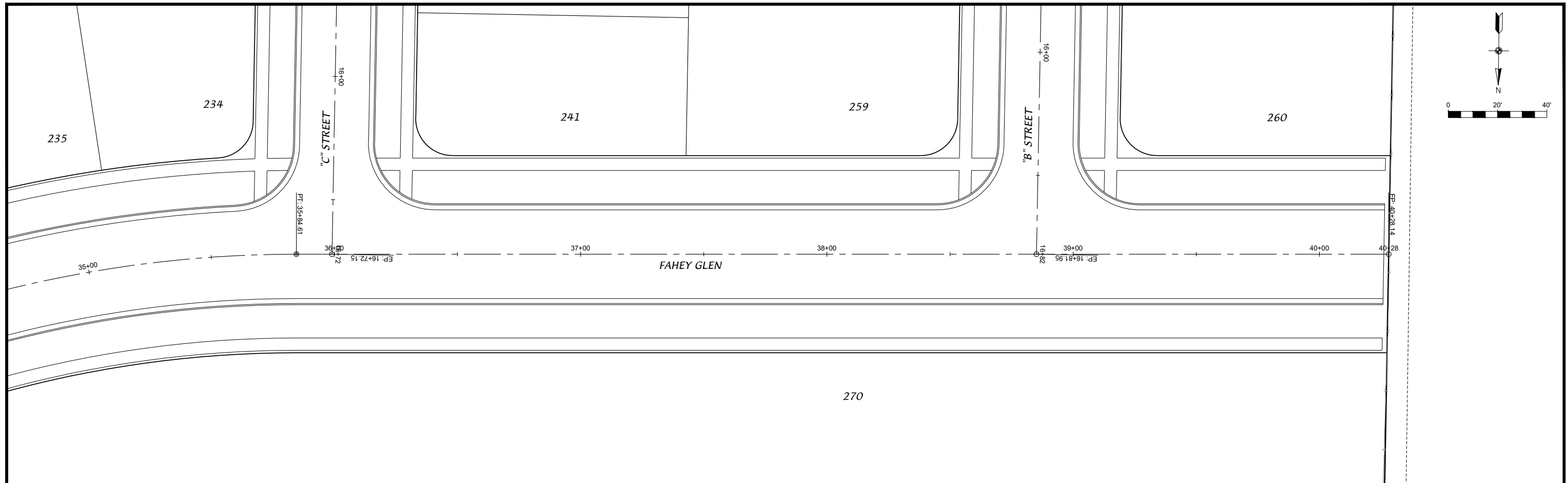


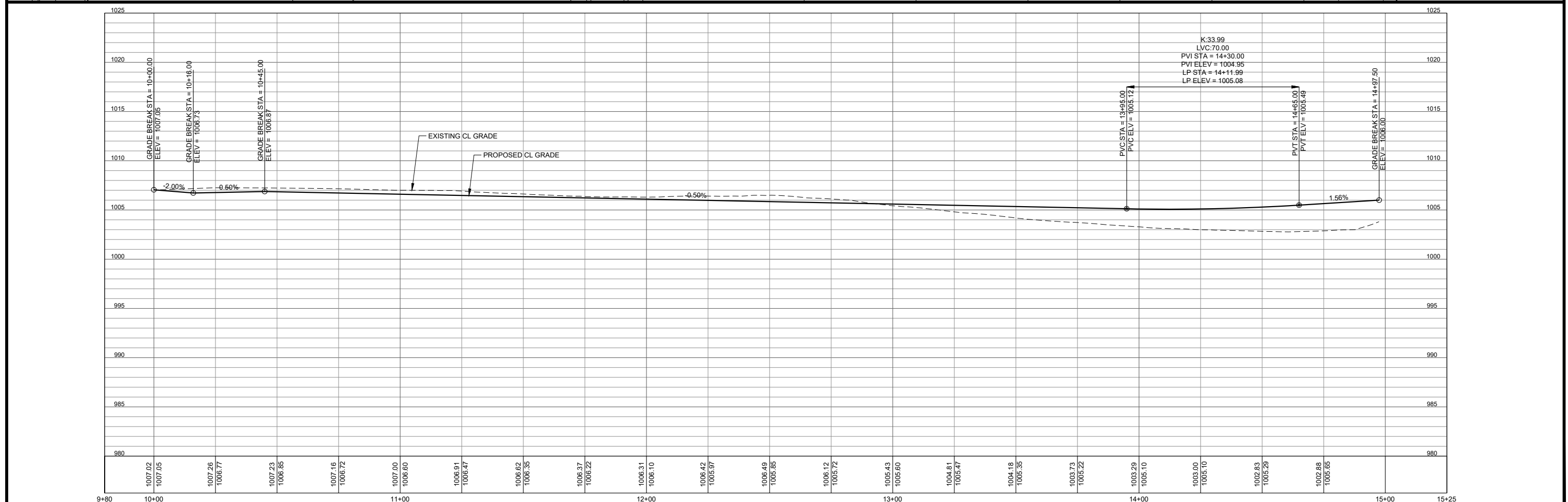
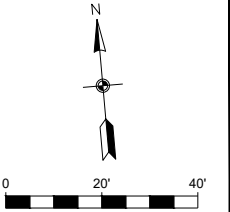
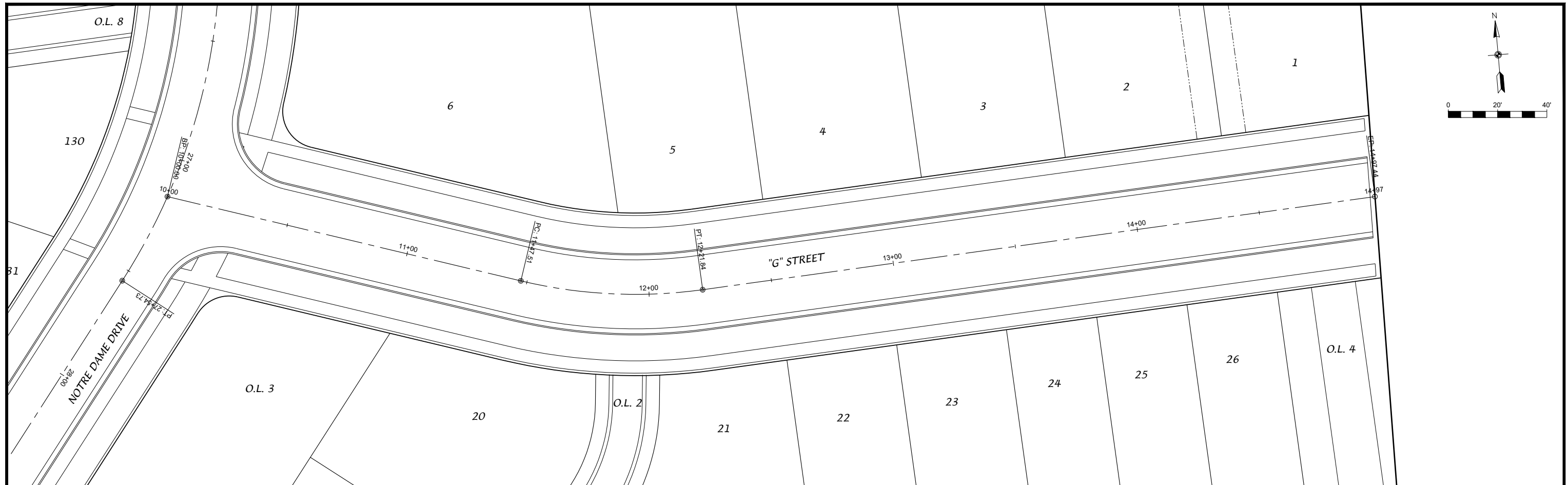


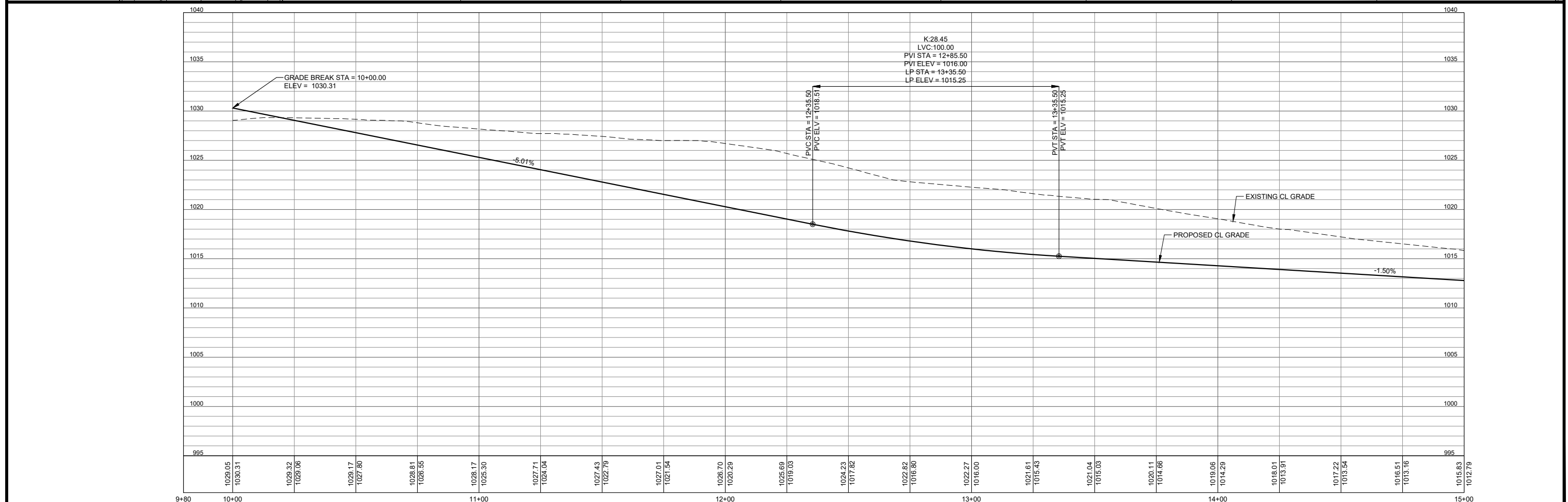
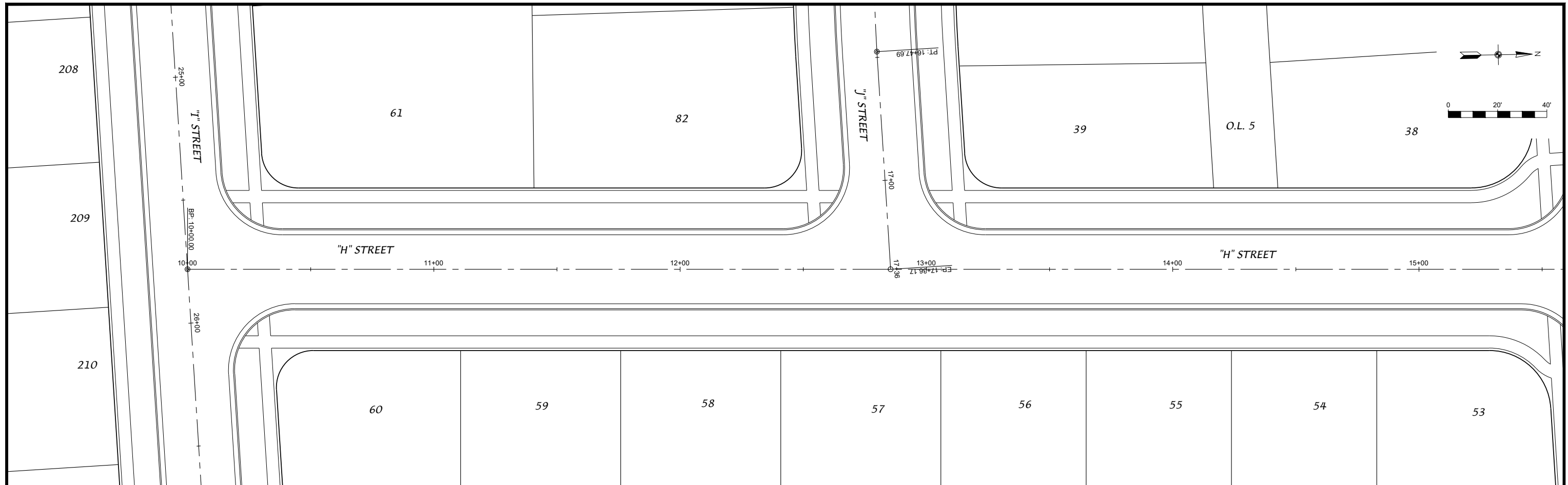


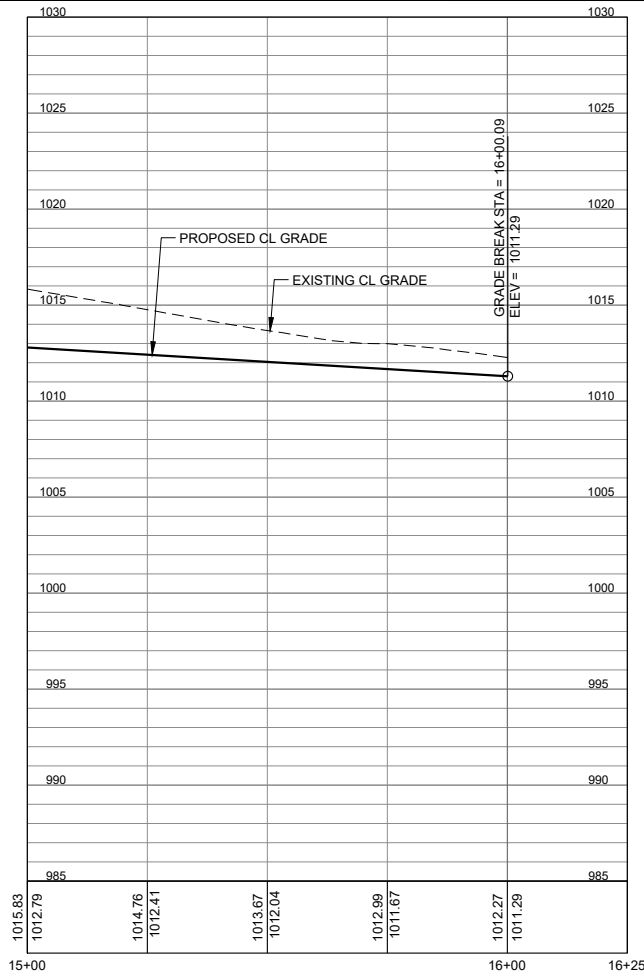
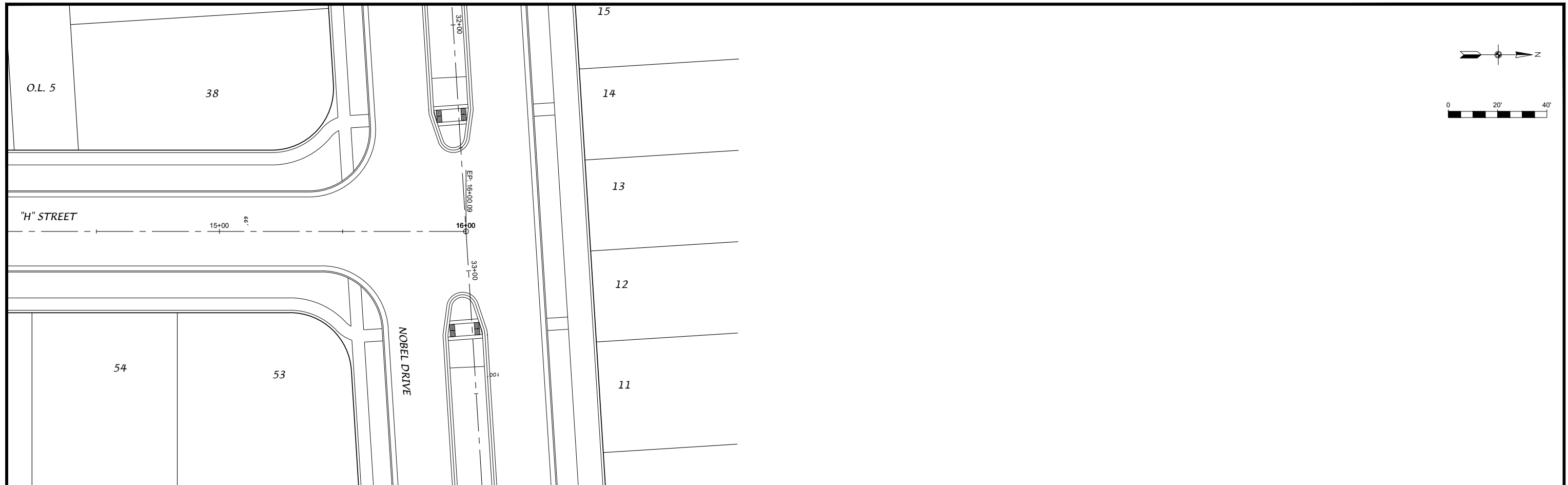


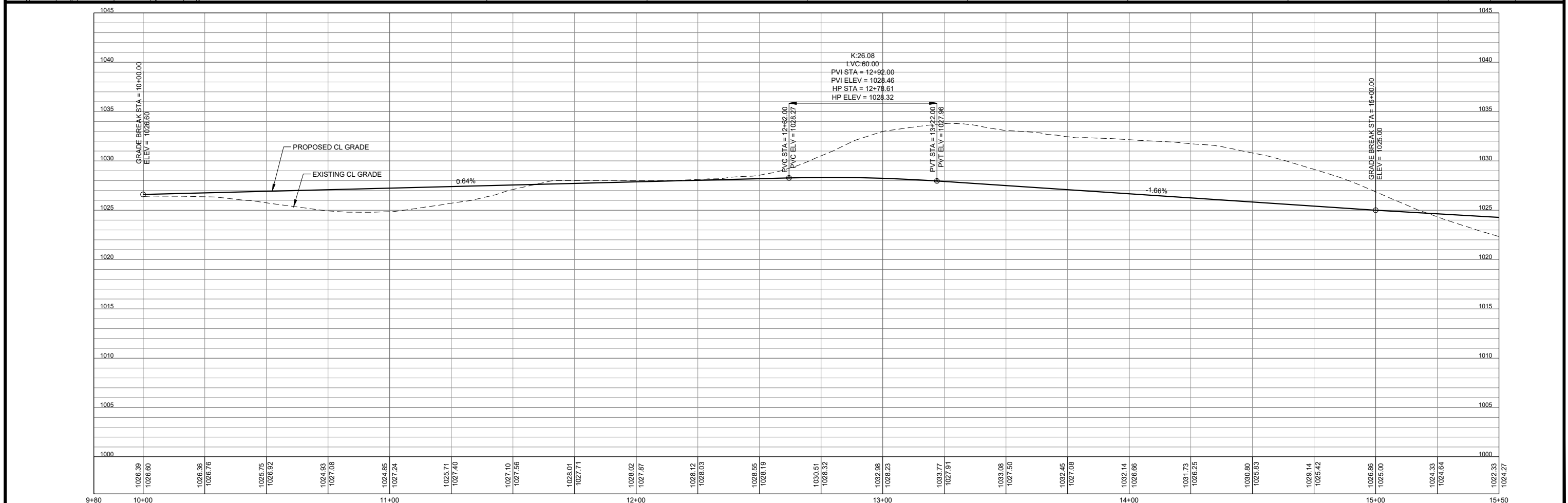
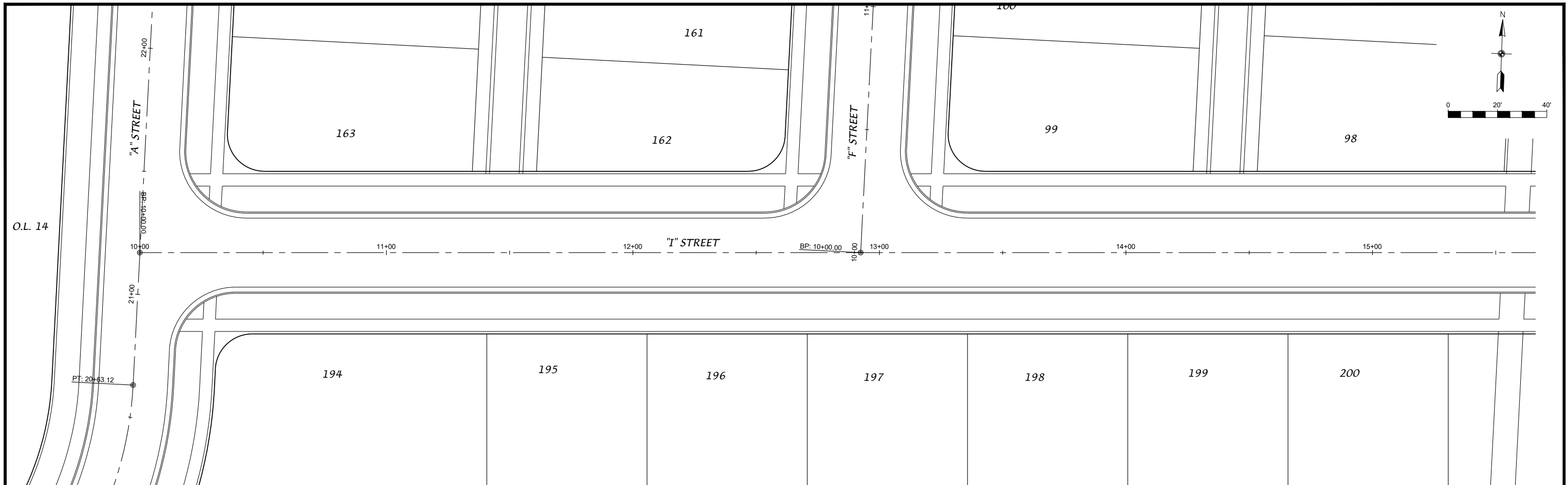


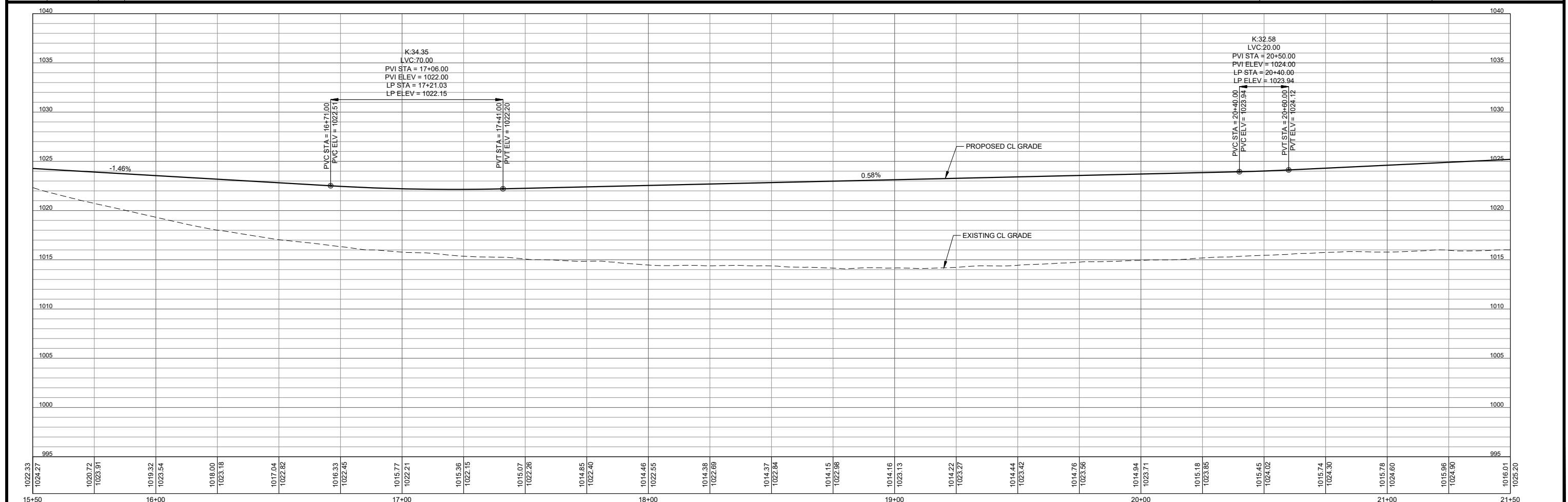
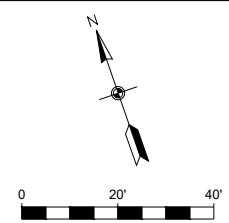
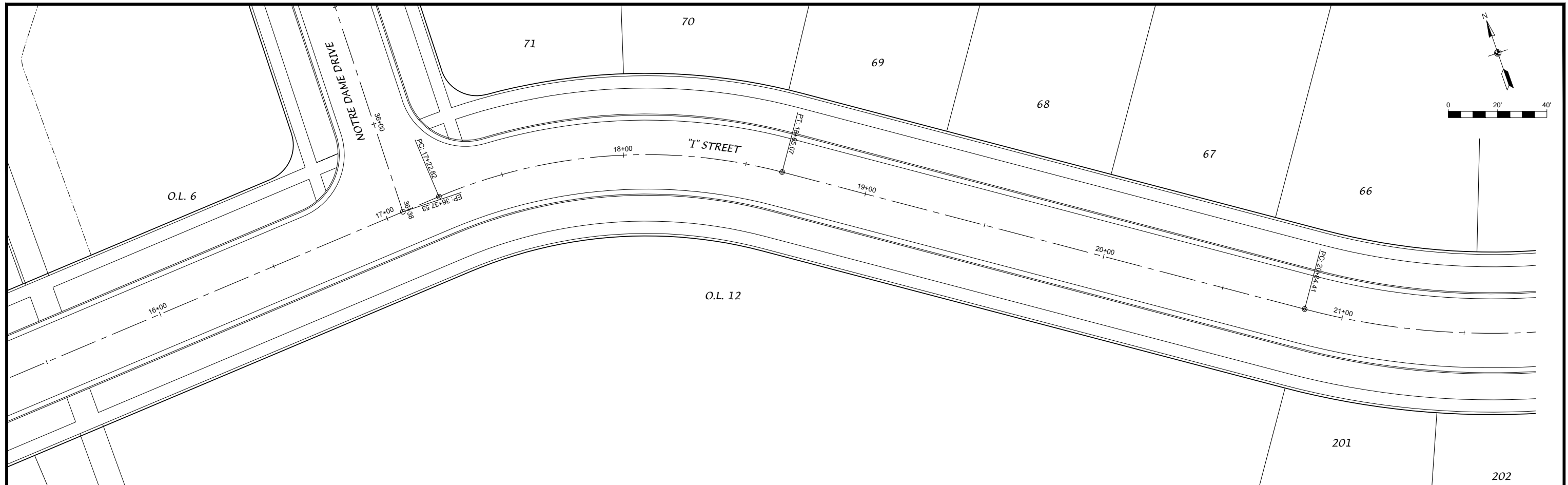


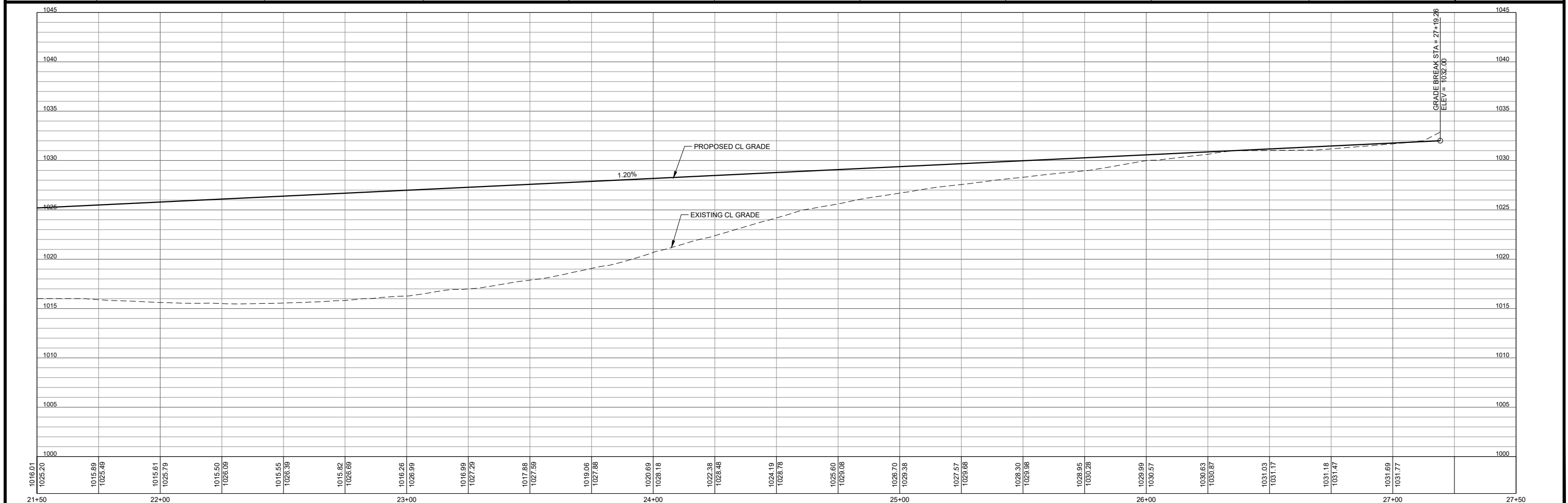
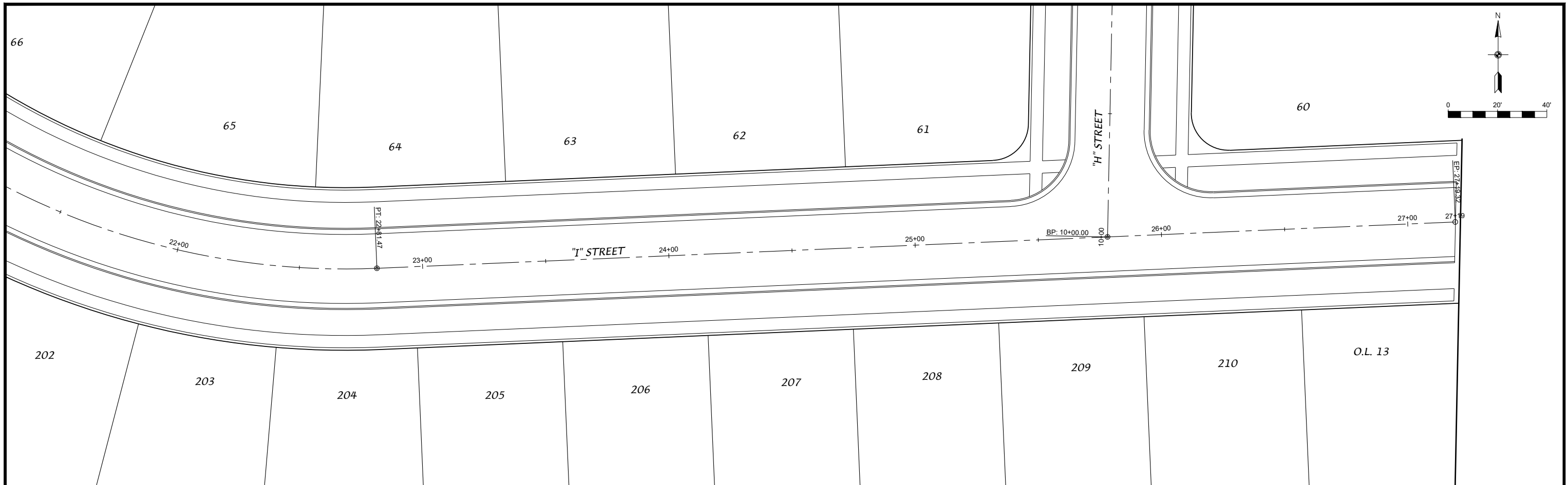


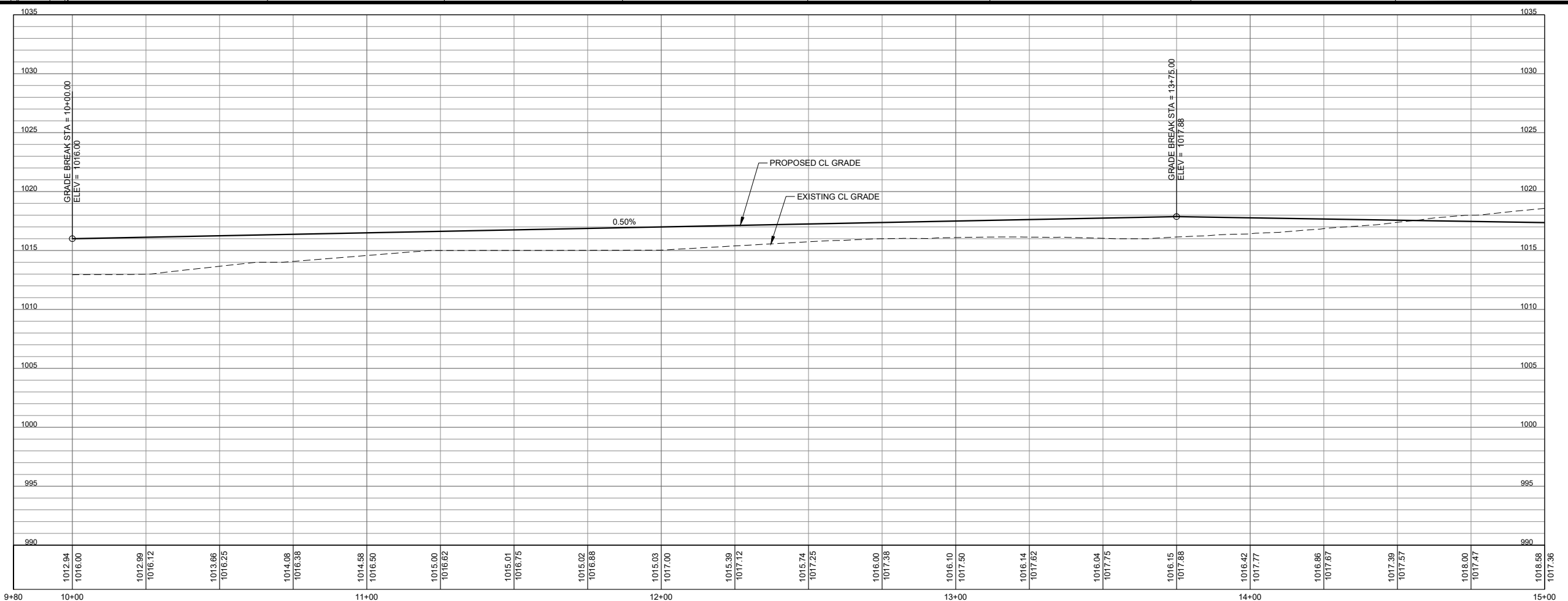
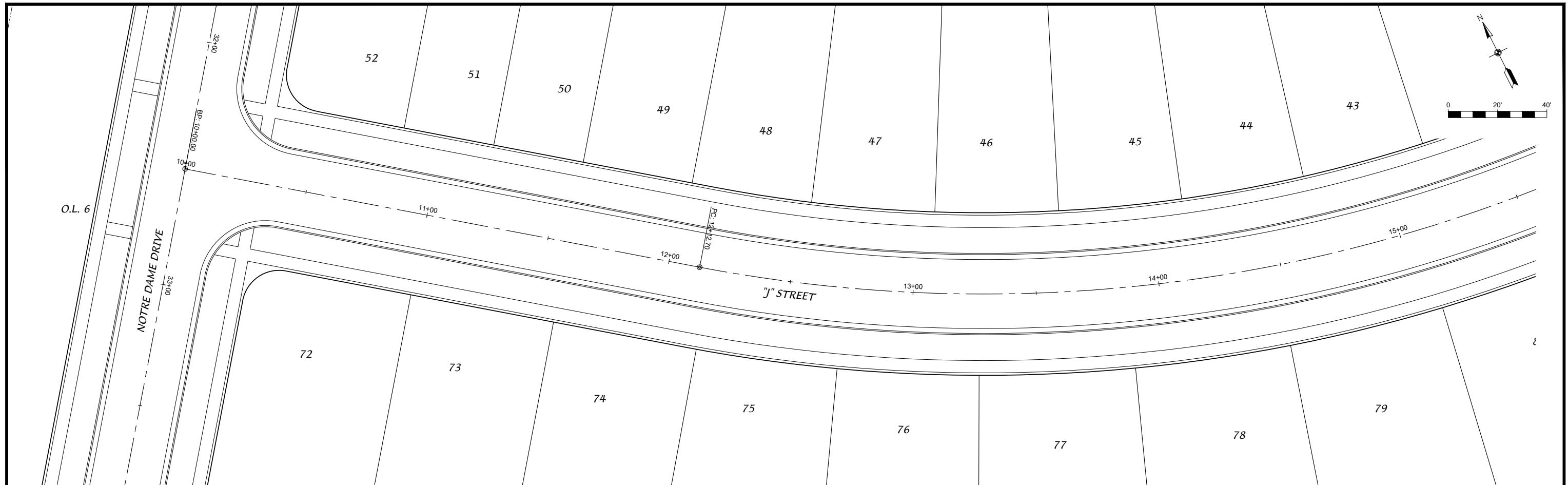


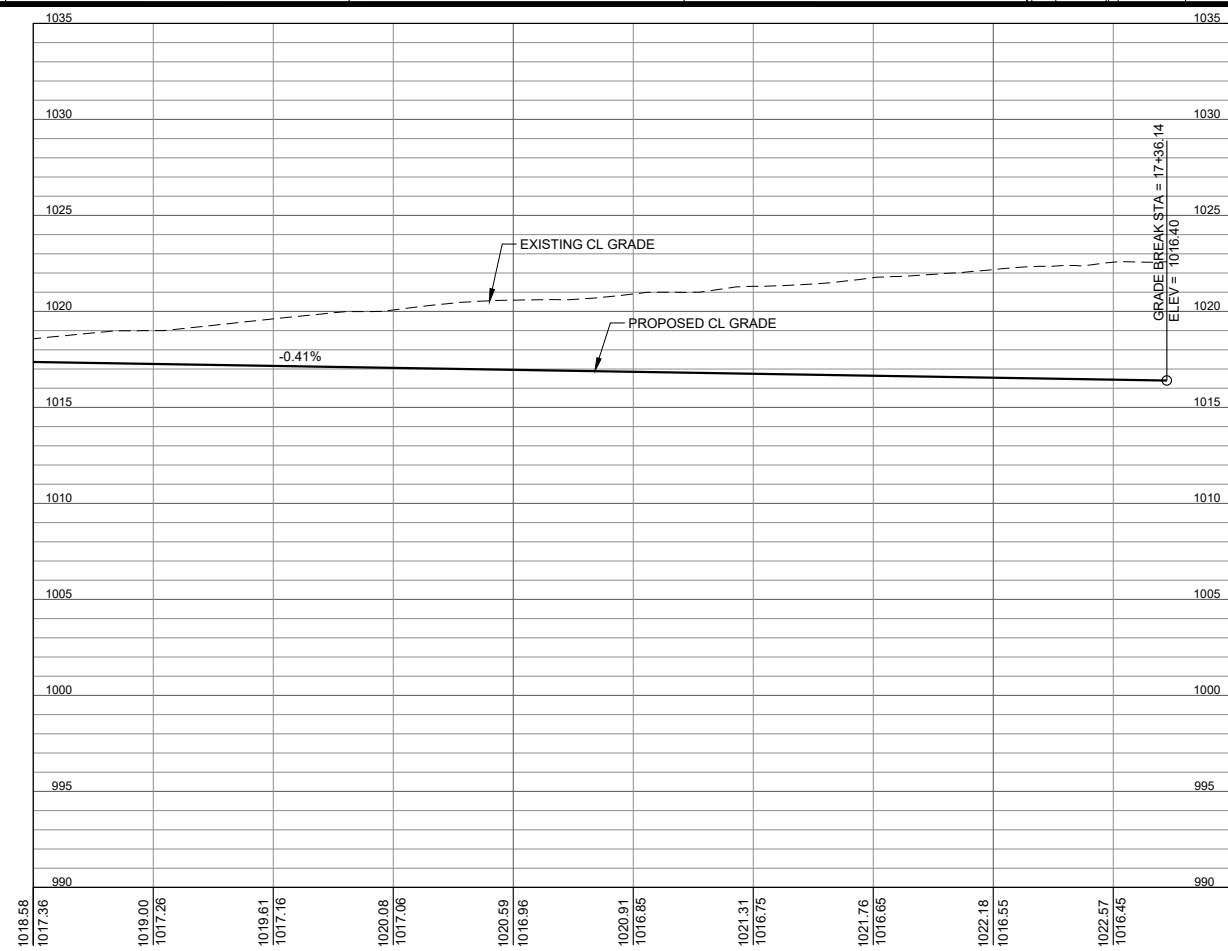
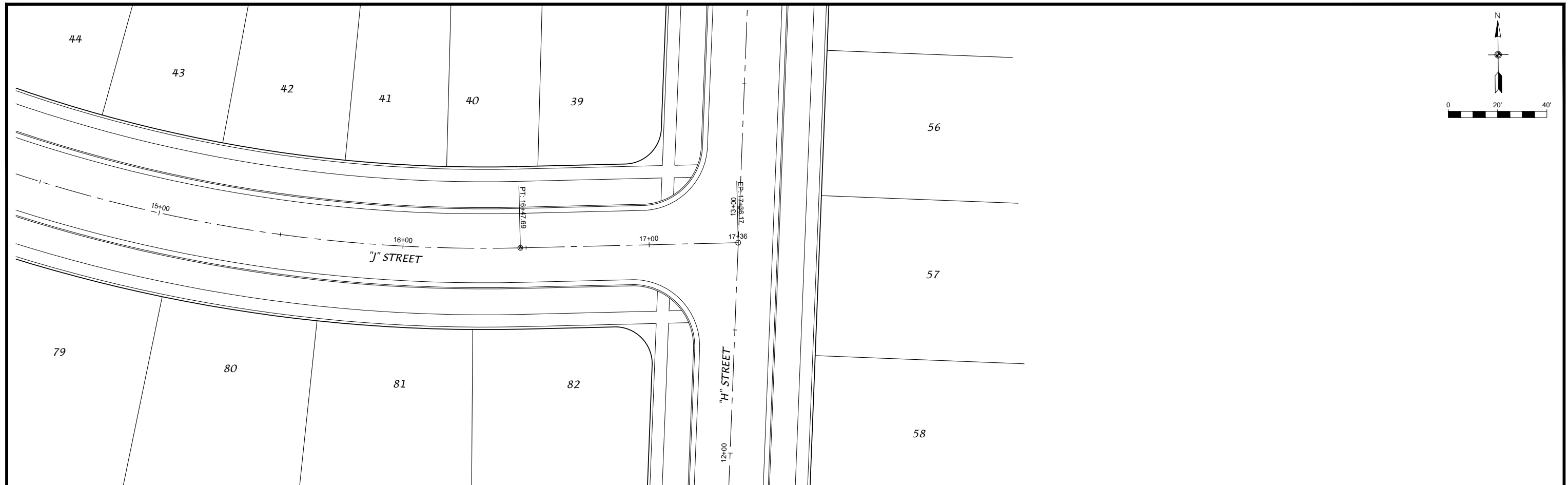


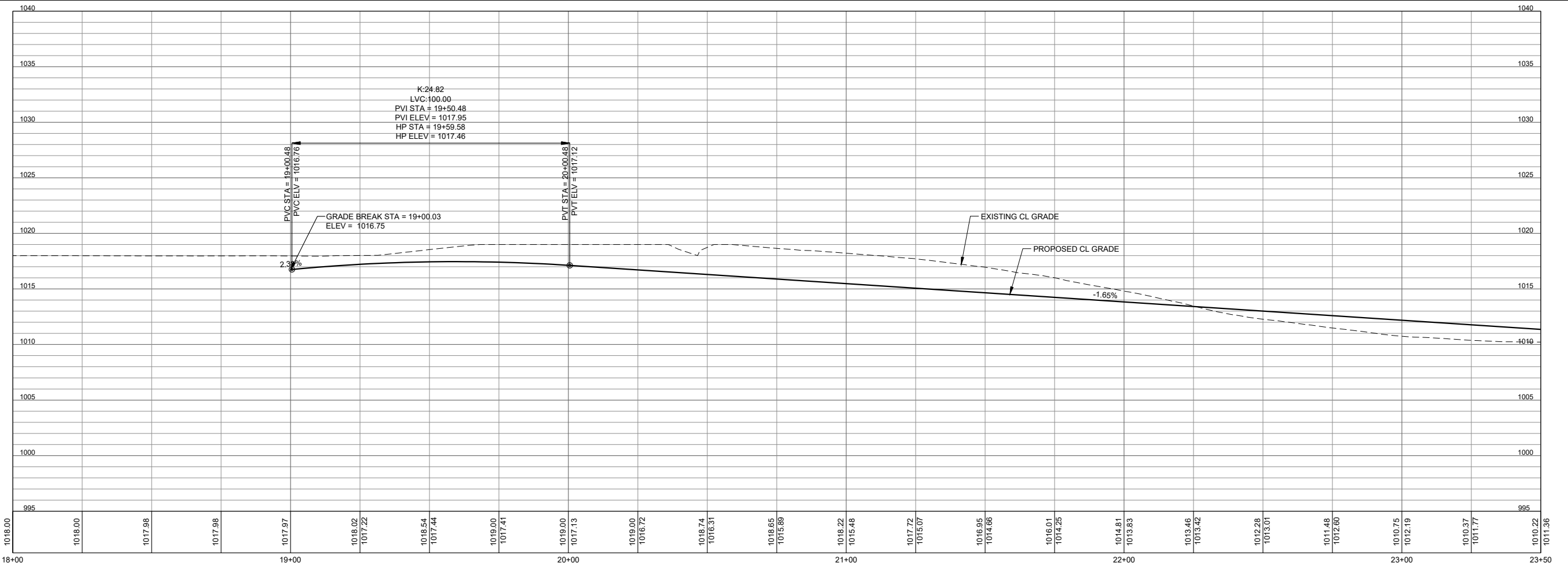
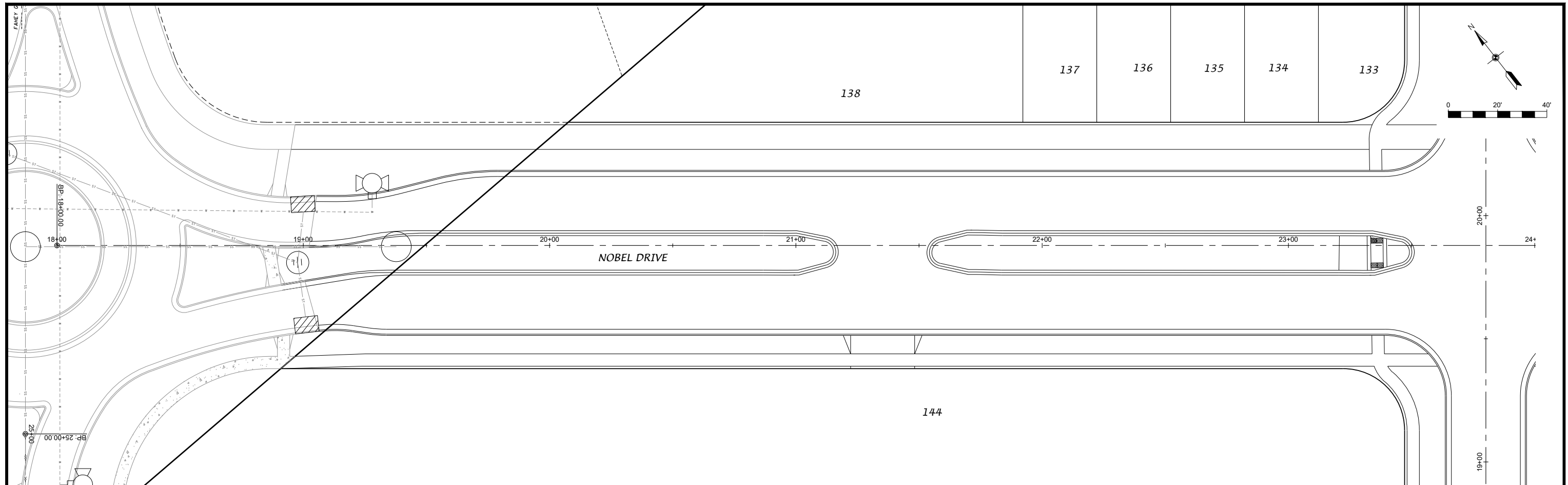


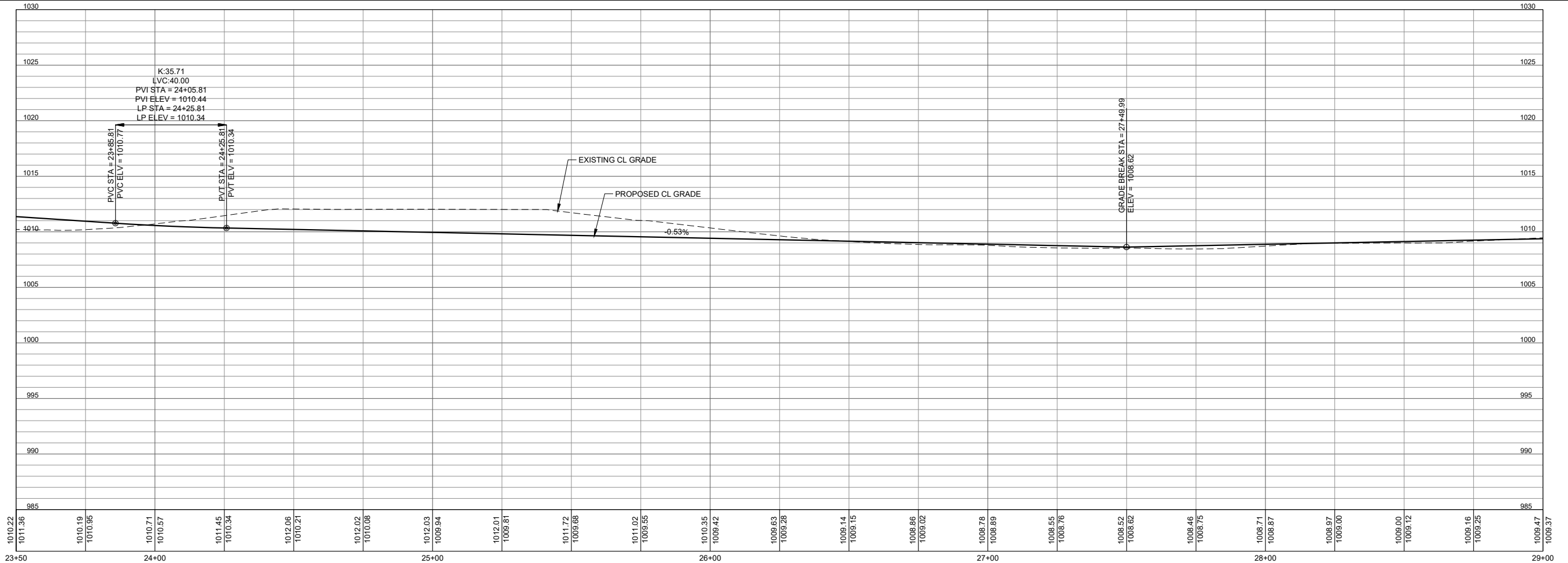
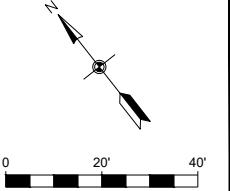
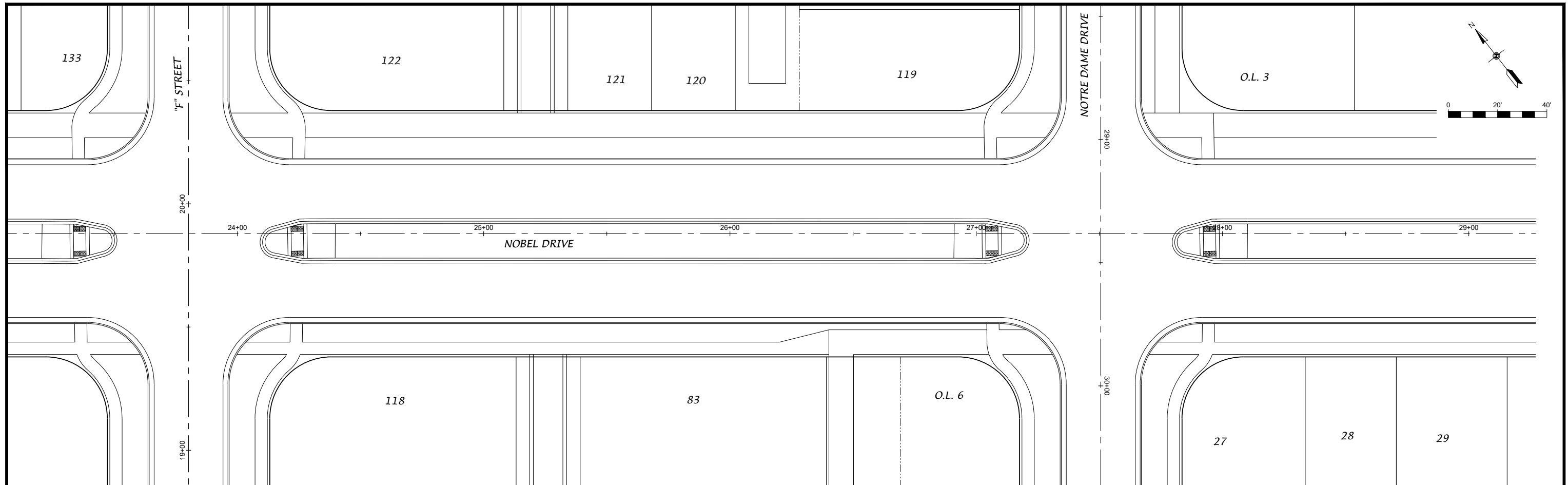


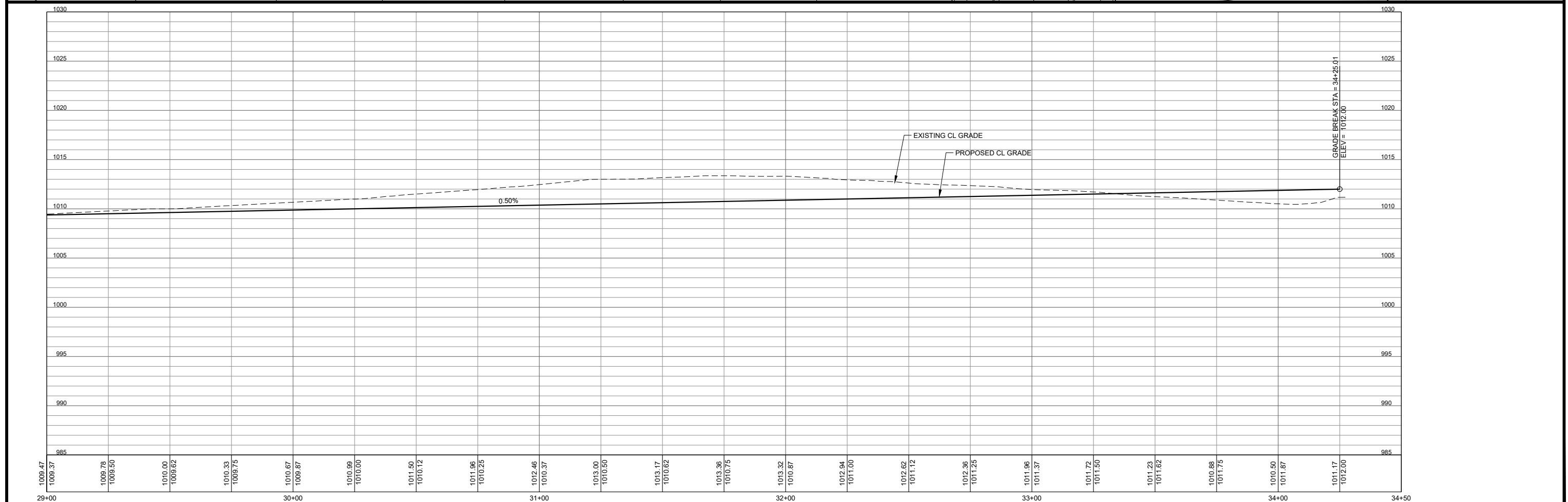
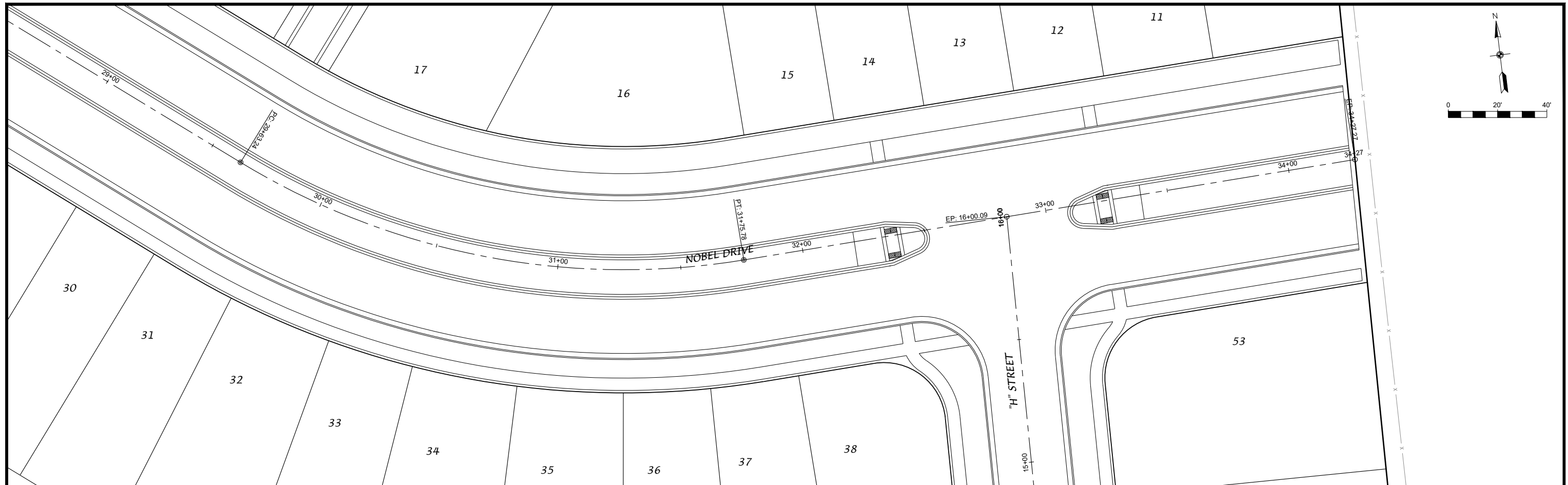


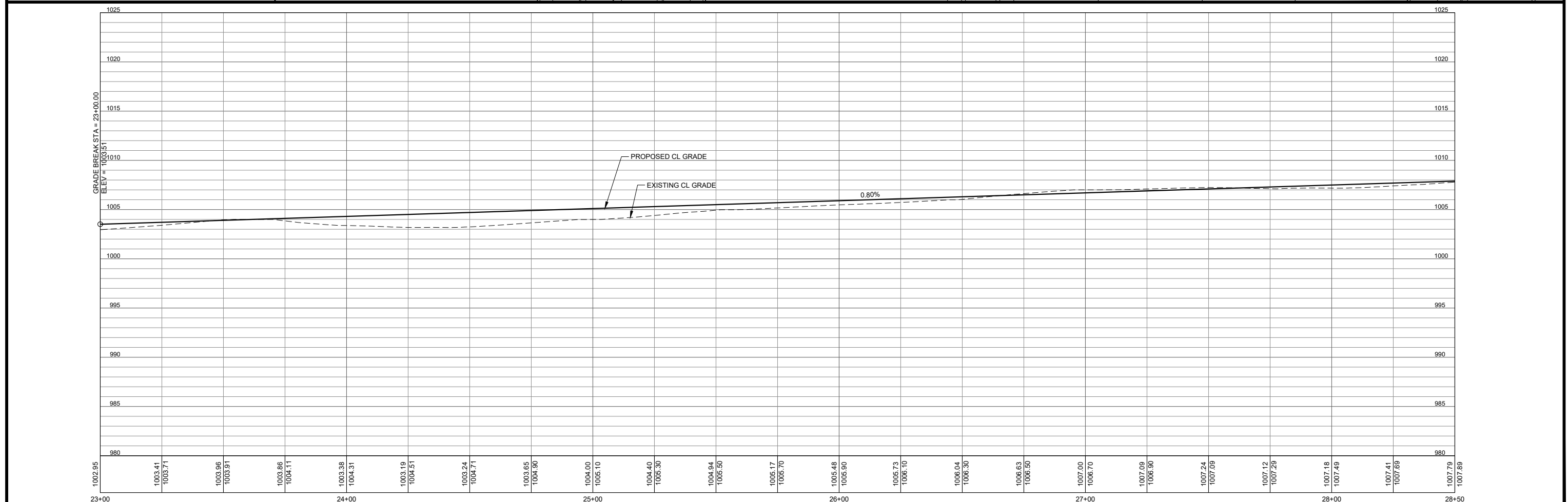
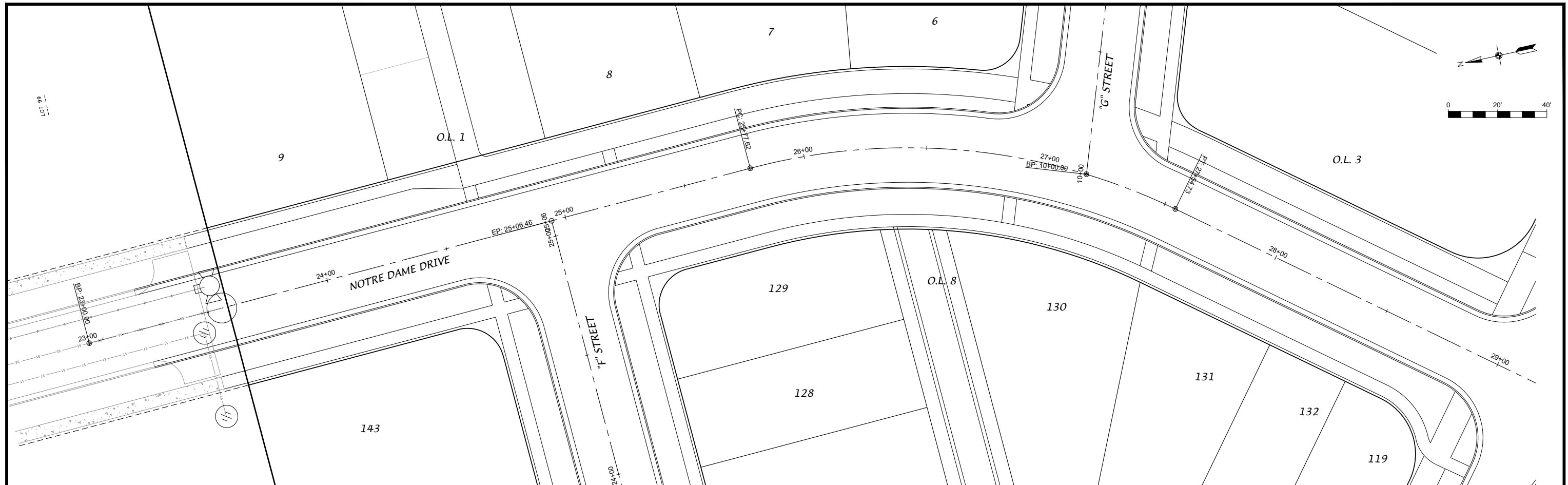


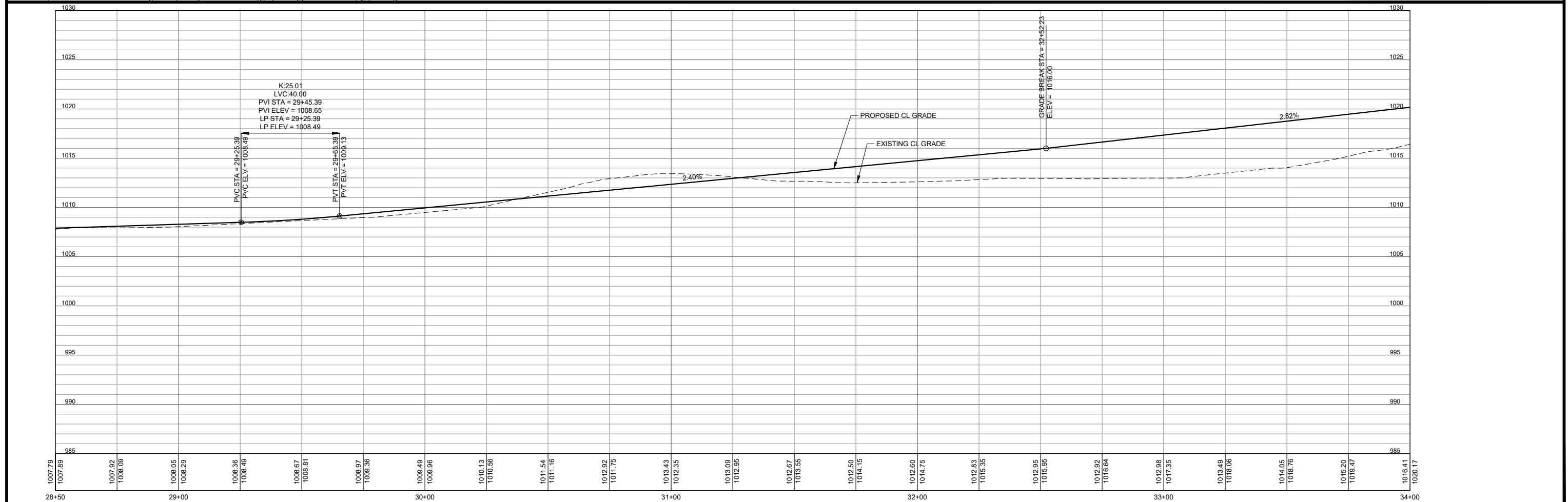
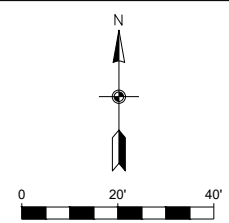
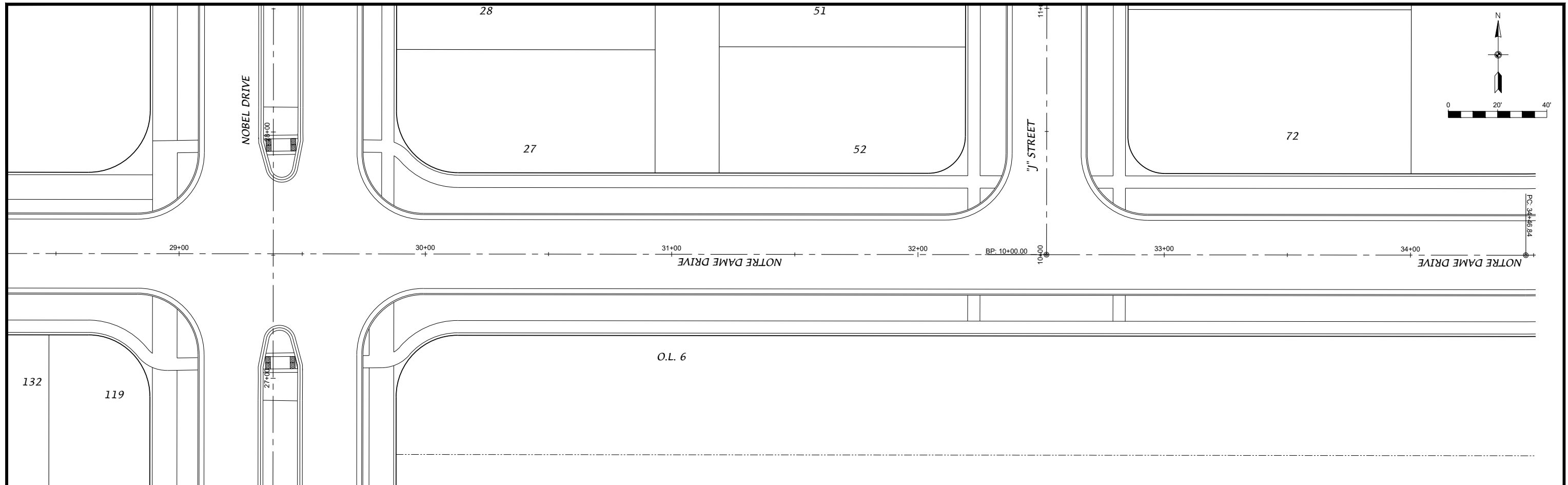


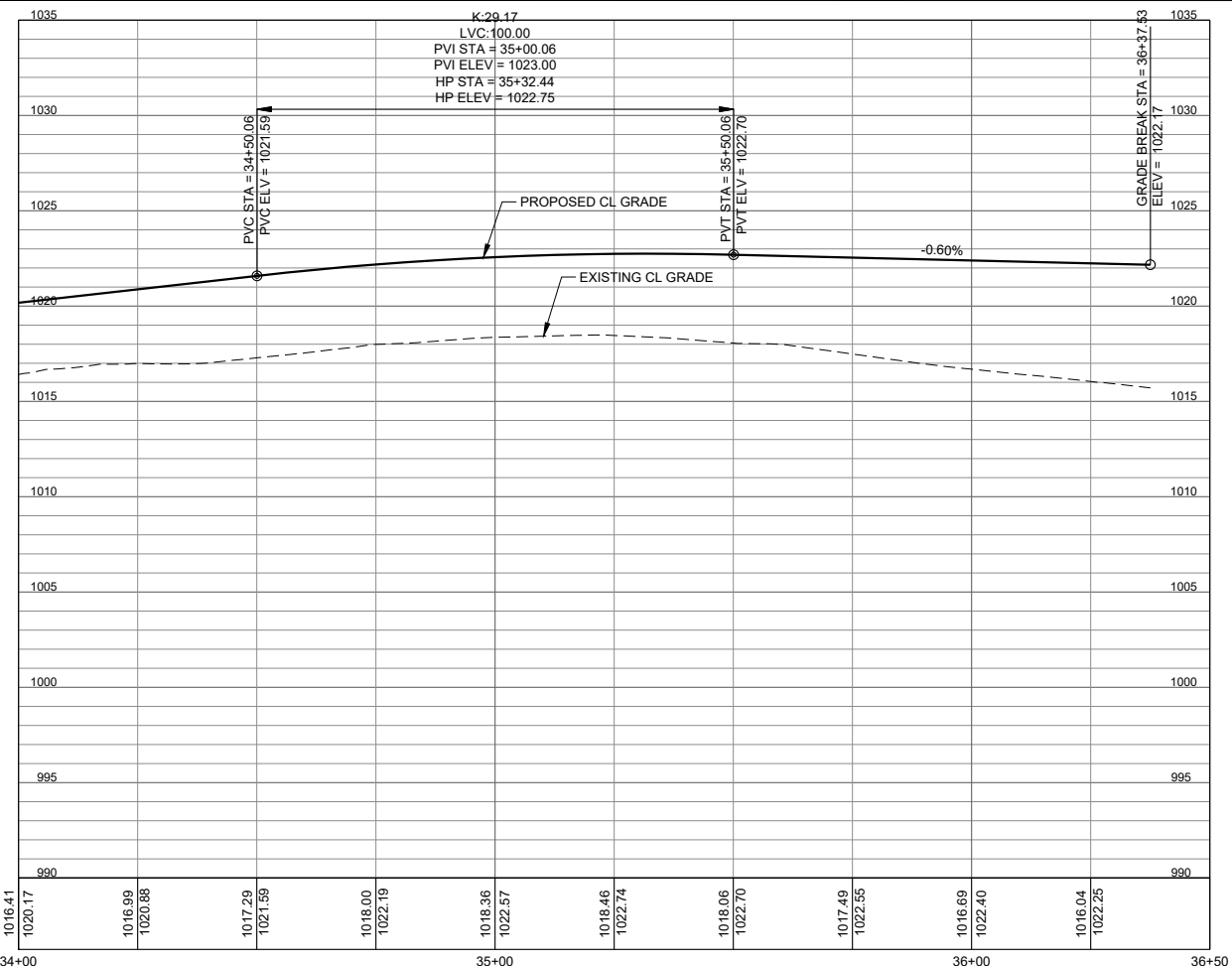
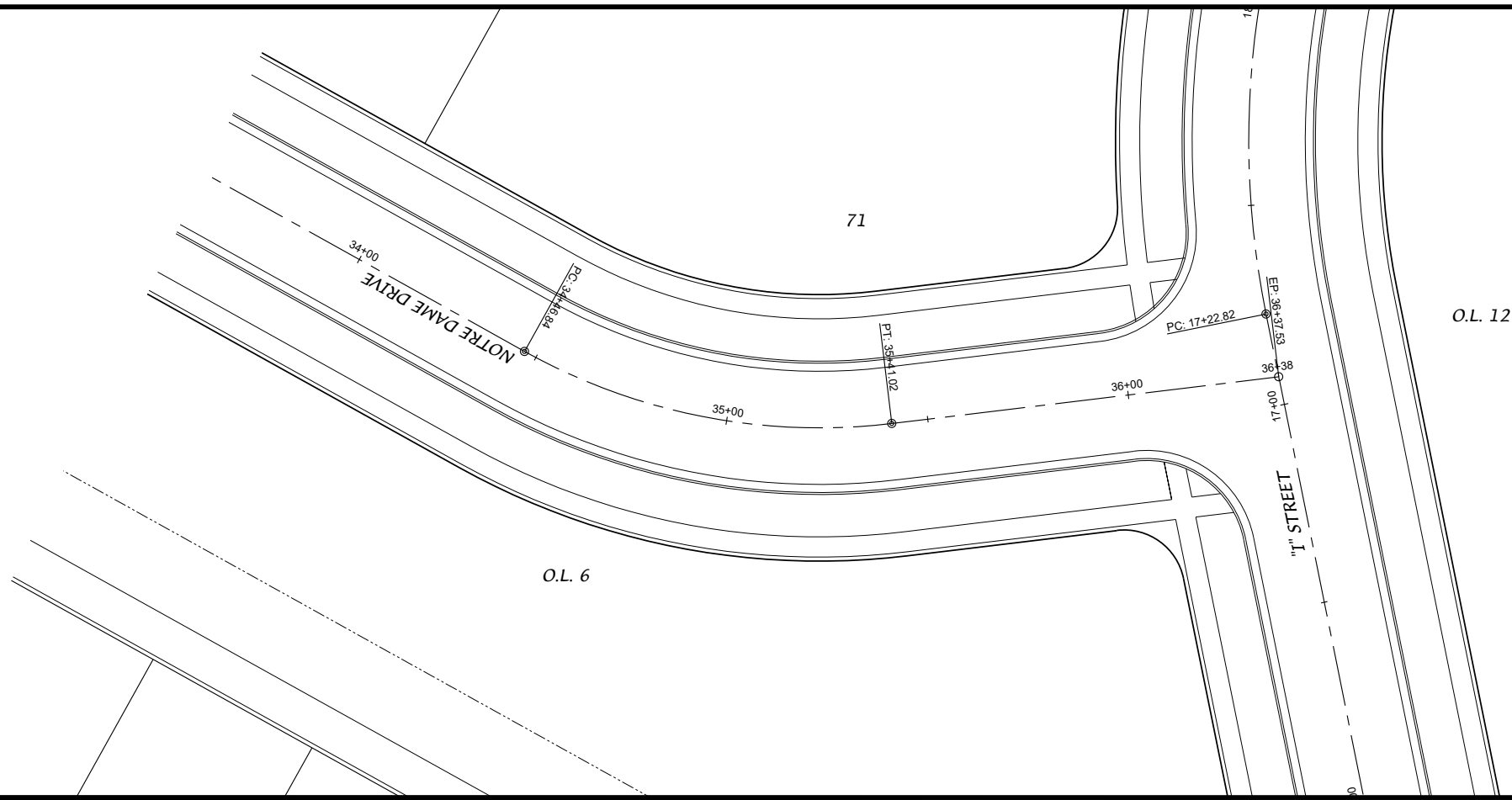
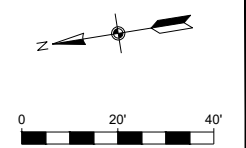












**HIGHFIELD RESERVE
CITY OF FITCHBURG
DANE COUNTY, WISCONSIN**

DRAFT STORM WATER MANAGEMENT REPORT

PREPARED FOR

**Fahey Land, LLC
5376 Irish Lane
Fitchburg, WI 53711**

**VH Acquisitions, LLC
6801 South Towne Drive
Madison, WI 53713**

November 24, 2021

PREPARED BY

**D'Onofrio, Kottke & Associates, Inc.
7530 Westward Way
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FN: 21-04-107

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3. Existing Drainage Plan
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- B. Hydrocad Output
- C. Pipe Sizing

INTRODUCTION

The intent of this report is to provide details on how the proposed “Highfield Reserve” plat will be developed so that it is constructed in accordance with applicable storm water management standards.

The proposed development is an approximately 87 acre plat located in the City of Fitchburg. The site is located to the south of the existing Fahey Fields development. A project location map can be found in Exhibit #1.

The existing layout of the site consists mostly of agricultural tilled land with surface water generally draining to the south and north sides of the site and eventually out of the plat. The drainage is split by a ridge running through the middle of the site from the east to west.

In developed conditions the plat will create single family lots, 2 multi-family lots, a lot for a proposed school, 2-stormwater outlots and open space/parkland. The site consists of 4 different proposed drainage areas for stormwater treatment purposes. The south half of the single family lots will need full stormwater management and will be treated with a wet pond / infiltration system. The mutli-family lots will be required to provide full stormwater management on-site and will not be treated at a plat level. The north portion of the single family, as well as the school lot, will be treated for TSS and Runoff Rate Control at a regional basin and will be treated only for infiltration on-site. This will be accomplished with a wet pond for pretreatment and an infiltration basin at a plat level for the single family lots. The school lot will not be treated by these basins and will be required to meet infiltration requirements on site. The soil conditions on site consist of hydrologic soil group type B soils. A site soils map can be found in Exhibit #2.

The land to the west of the proposed plat that flows through the northwest corner of the plat will be collected and pipe around the edge of the plat to the existing swale to the north. Calculations for this pipe sizing can be found in Appendix C.

The proposed future improvements for this plat require land disturbing activity in excess of one acre and the future cumulative addition of 20,000 square feet of impervious surface area. Therefore, according to the City of Fitchburg and State of Wisconsin ordinances, the site requires storm water management approvals and permits.

STANDARDS & RESULTS

The proposed development requires the following storm water management performance standards.

Sediment Control

Standard: Reduce, to the maximum extent practical, total suspended solids load leaving the site by eighty percent (80%) based on the average annual rainfall.

Design Results: Sediment from the site will be reduced by 80% by routing the site runoff through a combination wet detention basin/infiltration basin system prior to leaving the site for the south portion of the single family lots. A separate wet detention / infiltration system will be used at the multifamily lots to achieve 80% TSS reduction. For the north portion of the single family lots, only infiltration is required but this will necessitate 60% TSS removal for pretreatment. A combination wet detention / infiltration will treat this area. The school lot will also require pretreatment prior to infiltration and this will be taken care of on the school lot in a separate design. See appendix A for sediment reduction calculations.

Temperature Control

Standard: For development of sites within thermally sensitive areas, provisions and practices to reduce the temperature of the storm water runoff shall be included.

Design Results: The proposed site does not fall within a defined thermally sensitive area.

Runoff Rate Control

Standard: For new developments, storm water management practices shall be designed and implemented to maintain post-development peak runoff discharge rates at predevelopment rates for the 1, 2, 10, 25, 100 and 200 year-24 hour design storm events.

Design Results: The proposed detention basin system was designed to maintain the development's existing peak runoff rates for the 1, 2, 10, 25, 100 and 200 year- 24 hour storm events. This requirement will only apply and be met by the south single family lot portion and the multi-family lots. The north single family lots and the school lot will be treated for peak flow by the existing regional basins. The peak flow comparison chart for the site can be found in the stormwater management measures section of this report and the HydroCAD output can be found within Appendix B. The soil curve number for the post development lawn areas has been dropped by a soil class to 71.

The existing and proposed runoff curve numbers used for this development are as follows:

Description	CN
Existing Type B Soil	58
Impervious Area	98
Proposed 50% Impervious Residential	86

Proposed 70% Impervious Residential	92
Proposed Park Area/ Assumed 10% Impervious	77

Infiltration

Standard: For new developments, design practices to infiltrate sufficient runoff volume so the post-development infiltration volume shall be at least 90% of the predevelopment infiltration volume.

Design Results: The proposed development was designed to meet the 90% stayon requirement for the plat through infiltration basins. The infiltration basins were sized using WinSLAMM modeling software. A minimum of 60% sediment reduction will occur in the proposed wet detention basin cells prior to entering the designed infiltration basins. The basin system was sized to compensate for any stormwater that drains directly offsite. The infiltration design calculations can be found in Appendix B.

STORM WATER MANAGEMENT MEASURES

The proposed plat was modeled as 4 drainage areas in developed conditions and as 4 drainage areas in pre-developed conditions. The south single family lots will be treated by routing runoff to a wet detention/infiltration basin system located on the south side of the plat and designed to meet runoff rate control, TSS reduction, and infiltration requirements. The multi-family lots will be treated by routing runoff to a wet detention/infiltration basin system located on the multi-family lots and designed to meet runoff rate control, TSS reduction, and infiltration requirements. The north single family lots will be treated by routing runoff to a wet detention/infiltration basin system located on the northeast corner of the plat that will provide pretreatment and infiltration. Runoff rate control and TSS reduction for this area will be provided by a regional basin. The school lot will be required to provide infiltration on-site, which will be done under a separate design. The school lot will be treated for runoff rate control and TSS reduction by a regional basin.

HydroCAD Stormwater Modeling software has been used to analyze the stormwater runoff characteristics for the development. HydroCAD uses the TR-55 methodology for determining peak discharge rates. The model output shows the runoff leaving the site in existing and proposed conditions. The site was designed to utilize two combination wet detention basin and infiltration basin systems prior to leaving the site in proposed conditions. In these systems, the wet detention chamber in each basin will limit flow into the infiltration basin chamber for the 1yr-24hr storm event to remove sediment before entering the infiltration basin. During larger storms, the two chambers in the basin systems will act as one basin to limit peak flow from the site (see basin details in Appendix A). The detention and infiltration basins were modeled dynamically to better represent the elevations of the two chambers working together. The peak flow results from the stormwater modeling and basin design are shown in the chart on the next page. The detention basin system will maintain the combined existing peak runoff rates leaving the plat on south, east and overall for the 1, 2, 10, 25, 100 and 200 year- 24 hour storm events.

Infiltration modeling for the site was calculated using WinSLAMM software and meets the 90% predevelopment standard per the ordinance. The infiltration basins will be implemented when at a minimum 75% of the plat area draining to the basin is complete. WinSLAMM was also used to perform the sediment reduction calculations for the proposed basin system. Appendix A contains the calculation results. The stormwater management system will provide 80% sediment removal for the plat.

PEAK FLOW COMPARISION CHART

	1-yr	2-yr	10-yr	100-yr	200-yr
South Single Family Existing	1.34	3.22	16.62	63.33	82.25
South Single Family Proposed	1.26	1.42	9.72	40.77	53.44
Multi-Family Existing	2.60	4.10	11.03	29.05	35.78
Multi-Family Proposed	0.67	0.79	4.24	12.79	18.24

CONCLUSIONS

As the results indicate, the storm water management system for the proposed development meets the City of Fitchburg and State of Wisconsin Ordinances. The peak flow, sediment control and infiltration requirements will be met for this site at the time of development.

EXHIBITS



PROJECT LOCATION

LOCATION MAP

HIGHFIELD RESERVE

CITY OF FITCHBURG, WISCONSIN

DRAWN BY: KWB

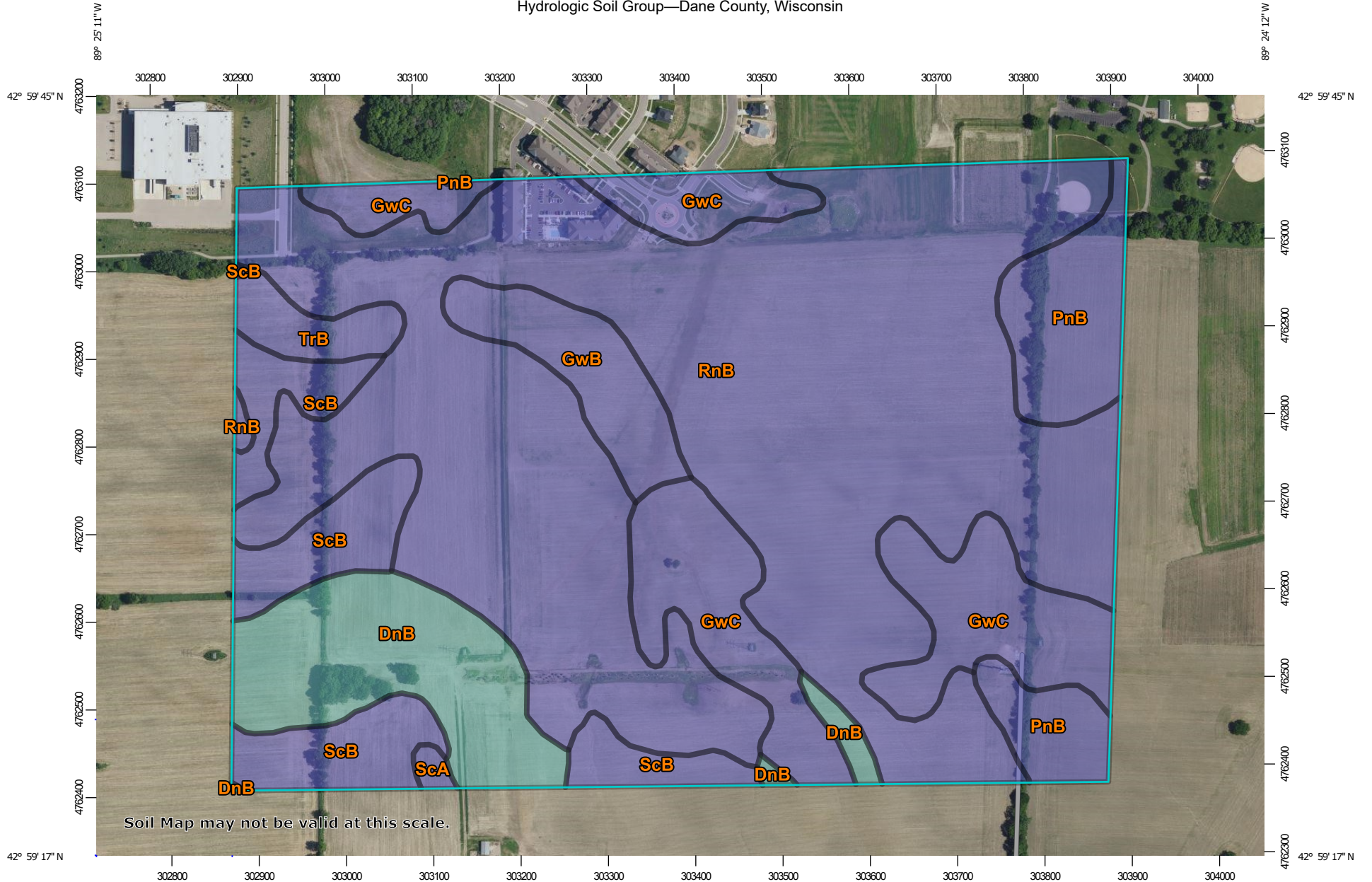
EXHIBIT 1

D'ONOFRIO KOTTKE AND ASSOCIATES, INC.

7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089

YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

Hydrologic Soil Group—Dane County, Wisconsin



Map Scale: 1:6,120 if printed on A landscape (11" x 8.5") sheet.

0 50 100 200 300 Meters


0 250 500 1000 1500 Feet

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



MAP LEGEND

Area of Interest (AOI)









 Area of Interest (AOI)

Soils

Soil Rating Polygons





 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines


 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points






 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available


Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

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: Dane County, Wisconsin
 Survey Area Data: Version 20, Sep 7, 2021

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

Date(s) aerial images were photographed: Jun 13, 2020—Jul 31, 2020

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
DnB	Dodge silt loam, 2 to 6 percent slopes	C	15.1	8.6%
GwB	Griswold loam, 2 to 6 percent slopes	B	6.4	3.7%
GwC	Griswold loam, 6 to 12 percent slopes	B	23.6	13.4%
PnB	Plano silt loam, till substratum, 2 to 6 percent slopes	B	10.6	6.0%
RnB	Ringwood silt loam, 2 to 6 percent slopes	B	101.8	58.0%
ScA	St. Charles silt loam, 0 to 2 percent slopes	B	0.4	0.3%
ScB	St. Charles silt loam, 2 to 6 percent slopes	B	14.8	8.4%
TrB	Troxel silt loam, 0 to 3 percent slopes	B	2.9	1.6%
Totals for Area of Interest			175.7	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

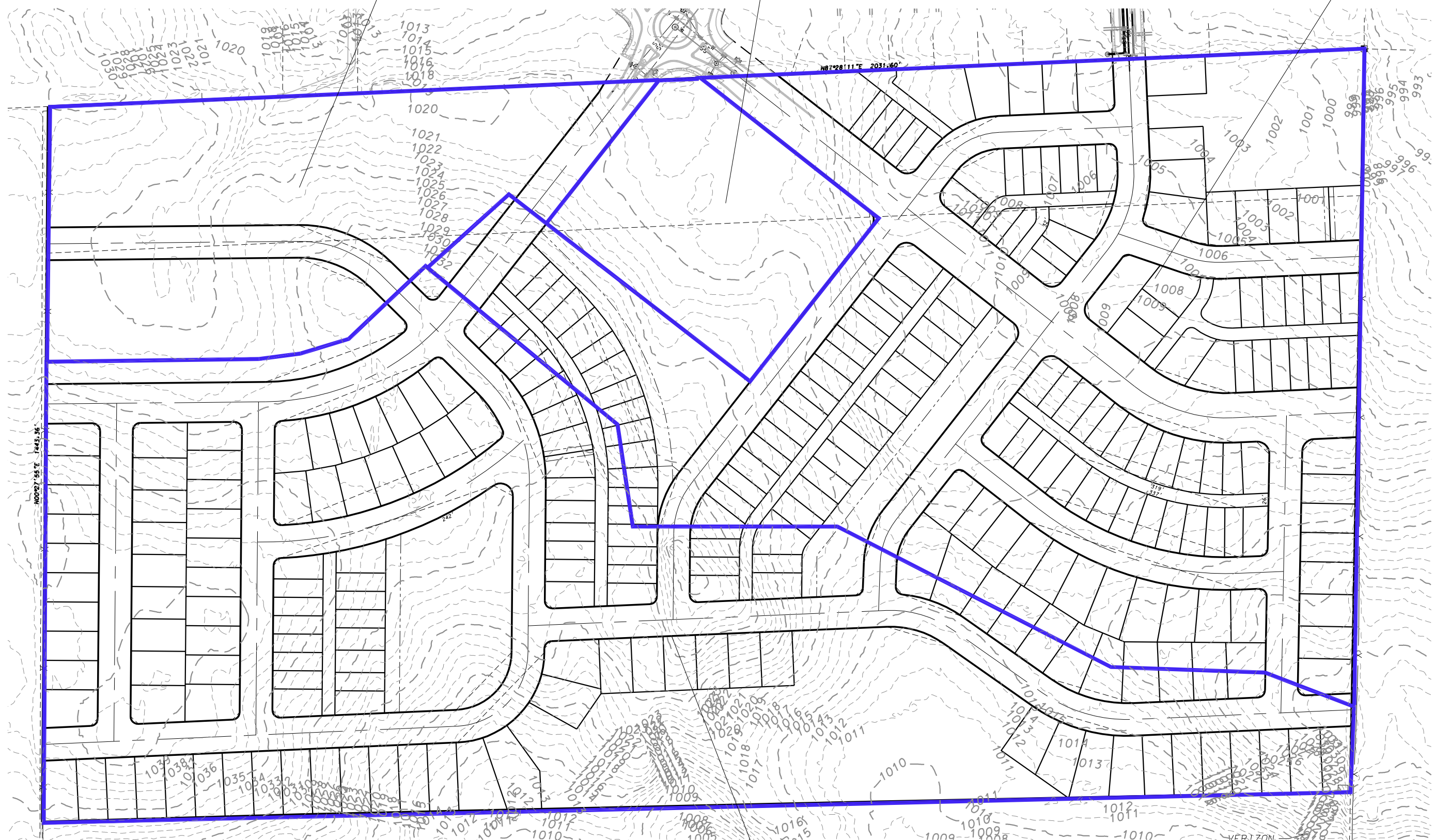
Tie-break Rule: Higher

MULTI FAMILY EXISTING DRAINAGE AREA = 11.5 AC
11.5 AC - EXISTING TYPE B= CN 58

SCHOOL SITE EXISTING DRAINAGE AREA = 5.1 AC
5.1 AC - EXISTING TYPE B= CN 58

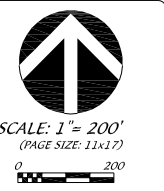
NORTH SINGLE FAMILY EXISTING DRAINAGE AREA = 33.12 AC
33.12 AC - EXISTING TYPE B= CN 58

SOUTH SINGLE FAMILY EXISTING DRAINAGE AREA = 36.78 AC
36.78 AC - EXISTING TYPE B= CN 58



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EXISTING DRAINAGE AREA MAP
HIGHFIELD RESERVE
CITY OF FITCHBURG

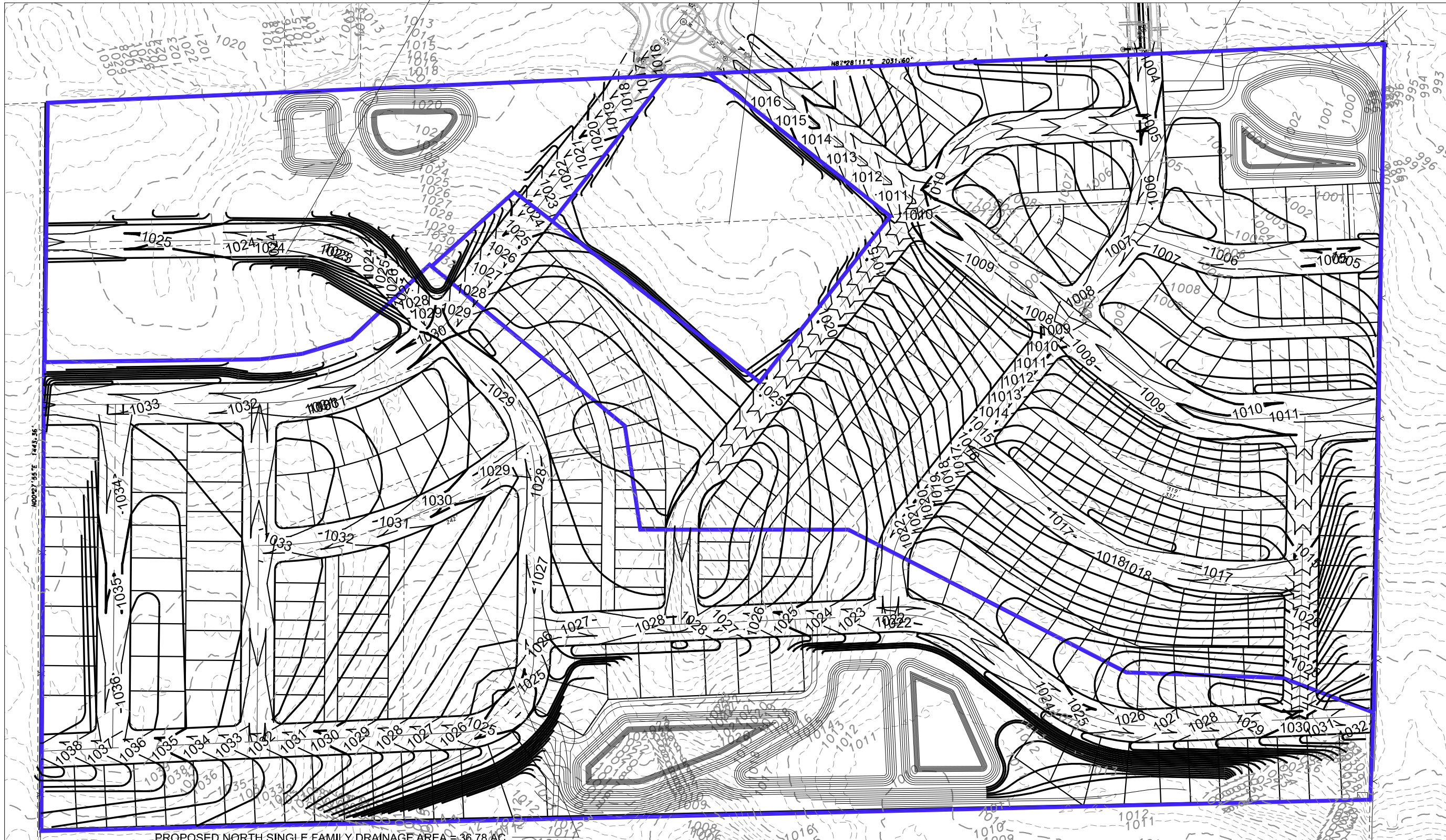


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DRAWN BY: KB
FN: 21-04-107
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EXHIBIT 3

PROPOSED NORTH SINGLE FAMILY DRAINAGE AREA = 11.5 AC
 5.5 AC - IMPERVIOUS = CN 98
 5.5 AC - GRASS AREAS = CN 71
 0.5 AC - WATER BODIES = CN 98

PROPOSED SCHOOL AREA

PROPOSED NORTH SINGLE FAMILY DRAINAGE AREA = 33.12 AC
 10.0 AC - 50% IMPERVIOUS RESIDENTIAL = CN 88
 19.62 AC - 70% IMPERVIOUS RESIDENTIAL = CN 91
 1.5 AC - OUTLOT 10% IMPERVIOUS = CN 77
 2.0 AC - WATER BODIES = CN 98



PROPOSED NORTH SINGLE FAMILY DRAINAGE AREA = 36.78 AC
 20.71 AC - 50% IMPERVIOUS RESIDENTIAL = CN 88
 7.06 AC - 70% IMPERVIOUS RESIDENTIAL = CN 91
 4.33 AC - OUTLOT 10% IMPERVIOUS = CN 77
 4.68 AC - WATER BODIES = CN 98

D'ONOFRIO KOTTHE AND ASSOCIATES, INC.
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 YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

PROPOSED DRAINAGE MAP
HIGHFIELD RESERVE
 FITCHBURG, WI



SCALE: 1" = 200'
 (PAGE SIZE: 11x17)
 DATE: 11-17-21
 REVISED:
 DRAWN BY: KB
 FN: 21-04-107
 Sheet Number:
EXHIBIT 4

HIGHFIELD RESERVE

BASIN LAYOUT MAP

FITCHBURG, WI



SCALE: 1" = 200'
 (PAGE SIZE: 11x17)

DATE: 11-17-21
 REVISED:

DRAWN BY: KB

FN: 21-04-107

Sheet Number:
 EXHIBIT 5

PROPOSED NORTHEAST INFILTRATION BASIN
 TOP OF BASIN BERM - 1005.00, AREA = 30,204 SQFT
 BOTTOM OF BASIN - 1000.00, AREA = 20,419 SQFT

PROPOSED NORTHEAST DETENTION BASIN
 TOP OF POND BERM - 1005.00, AREA = 20,465 SQFT
 TOP OF WET POND/OUTLET - 1001.00, AREA = 12,571 SQFT
 BOTTOM OF WET POND - 995.00

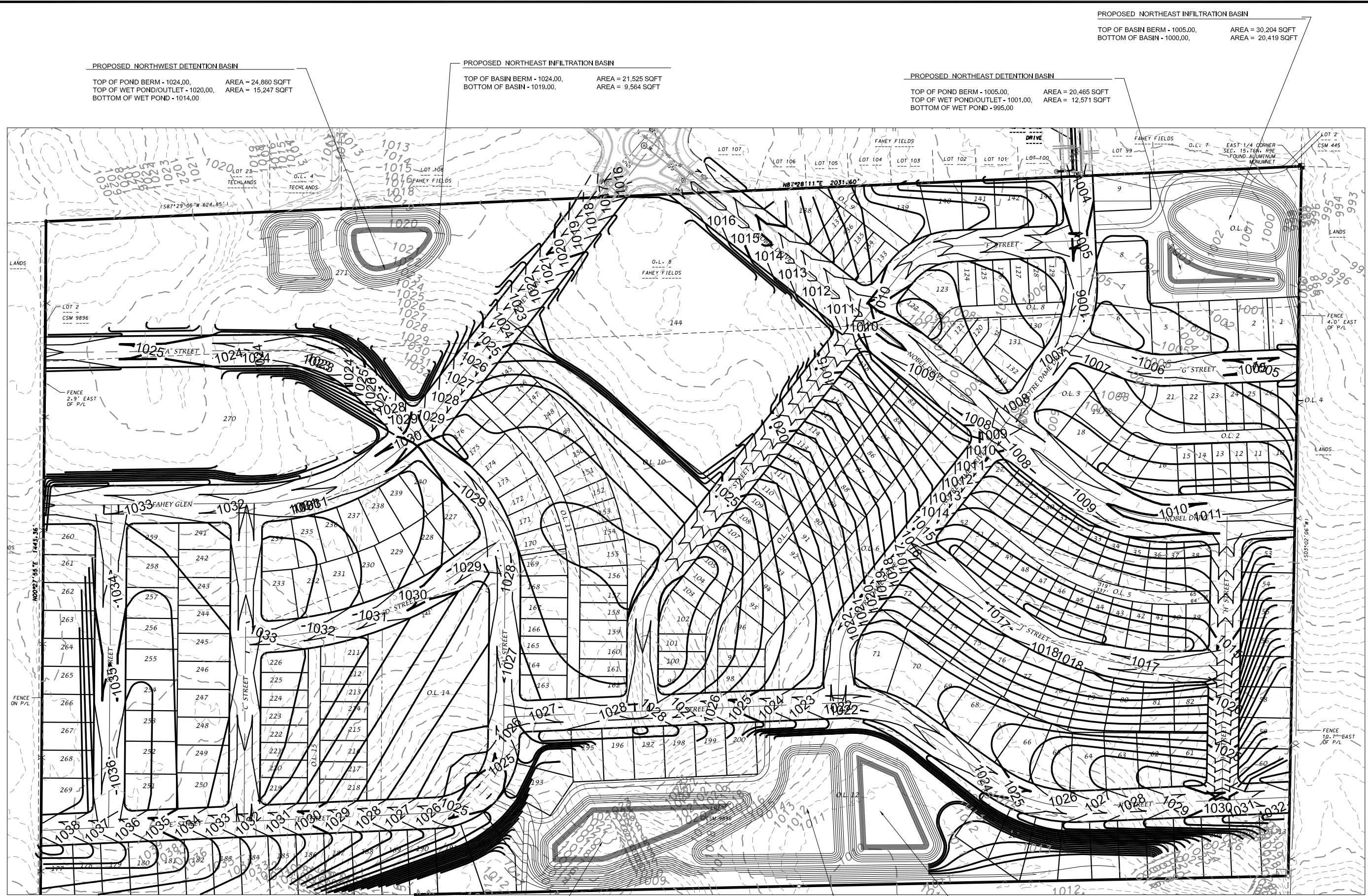
PROPOSED NORTHEAST INFILTRATION BASIN
 TOP OF BASIN BERM - 1024.00, AREA = 21,525 SQFT
 BOTTOM OF BASIN - 1019.00, AREA = 9,564 SQFT

PROPOSED NORTHWEST DETENTION BASIN
 TOP OF POND BERM - 1024.00, AREA = 24,860 SQFT
 TOP OF WET POND/OUTLET - 1020.00, AREA = 15,247 SQFT
 BOTTOM OF WET POND - 1014.00

PROPOSED SOUTHWEST DETENTION BASIN
 TOP OF POND BERM - 1019.00, AREA = 51,013 SQFT
 TOP OF WET POND/OUTLET - 1015.00, AREA = 35,159 SQFT
 BOTTOM OF WET POND - 1009.00

PROPOSED NORTHEAST INFILTRATION BASIN
 TOP OF BASIN BERM - 1019.00, AREA = 50,077 SQFT
 BOTTOM OF BASIN - 1014.00, AREA = 31,423 SQFT

PROPOSED SOUTHEAST DETENTION BASIN
 TOP OF POND BERM - 1019.00, AREA = 20,465 SQFT
 TOP OF WET POND/OUTLET - 1015.00, AREA = 26,636 SQFT
 BOTTOM OF WET POND - 1009.00

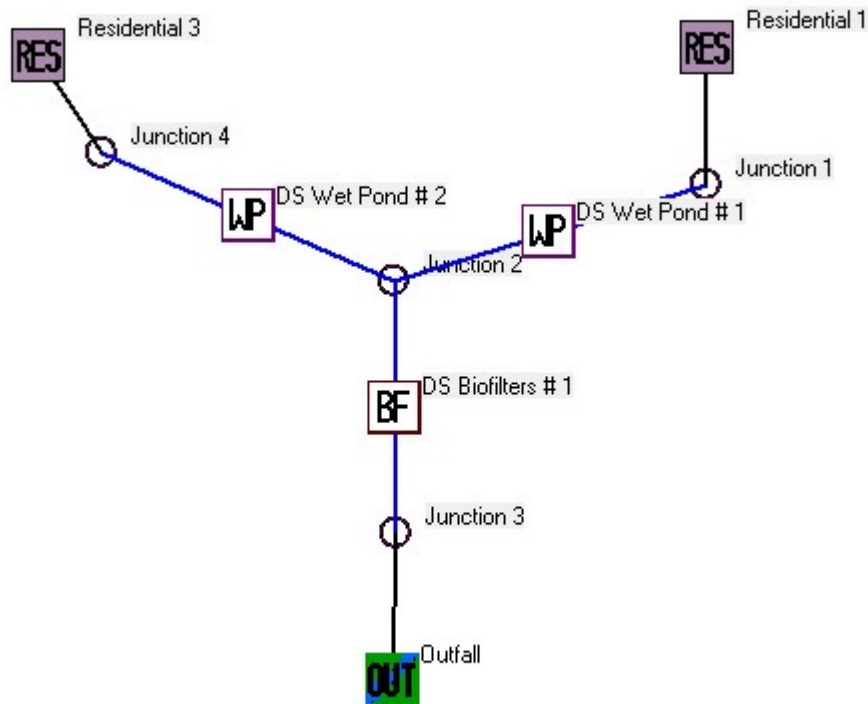


APPENDIX A

SEDIMENT REDUCTION & INFILTRATION CALCULATIONS

South Drainage Area:

Model Schematic:



Model Input Information:

Data file name: U:\User\2104107\Engineering\SWMP\South Drainage 2 ponds.mdb
WinSLAMM Version 10.4.1
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
Seed for random number generator: -42
Study period starting date: 01/01/81 Study period ending date: 12/31/81
Start of Winter Season: 12/02 End of Winter Season: 03/12
Date: 11-17-2021 Time: 09:33:14
Site information:

LU# 1 - Residential: Residential 1 Total area (ac): 11.151
1 - Roofs 1: 0.730 ac. Pitched Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
2 - Roofs 2: 1.480 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
25 - Driveways 1: 0.845 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.576 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

- 37 - Streets 1: 1.410 ac. Intermediate Street Length = 2.4 curb-mi Street Width (assuming two curb-mi per street mile) = 9.693749 ft
Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
- 45 - Large Landscaped Areas 1: 4.290 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
- 70 - Water Body Areas: 1.820 ac. Source Area PSD File:

LU# 2 - Residential: Residential 3 Total area (ac): 25.670

- 1 - Roofs 1: 1.680 ac. Pitched Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
- 2 - Roofs 2: 3.420 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
- 25 - Driveways 1: 1.940 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
- 31 - Sidewalks 1: 1.320 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
- 37 - Streets 1: 3.250 ac. Intermediate Street Length = 2.4 curb-mi Street Width (assuming two curb-mi per street mile) = 22.34375 ft
Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
- 45 - Large Landscaped Areas 1: 9.870 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
- 70 - Water Body Areas: 4.190 ac. Source Area PSD File:

Control Practice 1: Wet Detention Pond CP# 1 (DS) - DS Wet Pond # 1

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 6

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Orifice 1

- 1. Orifice diameter (ft): 2
- 2. Number of orifices: 1
- 3. Invert elevation above datum (ft): 6

Outlet type: Broad Crested Weir

- 1. Weir crest length (ft): 50
- 2. Weir crest width (ft): 6
- 3. Height from datum to bottom of weir opening: 9

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.3350	0.00	0.00
2	1.00	0.3590	0.00	0.00
3	2.00	0.3850	0.00	0.00
4	3.00	0.4110	0.00	0.00
5	4.00	0.4380	0.00	0.00
6	5.00	0.4650	0.00	0.00
7	6.00	0.6110	0.00	0.00
8	7.00	0.6740	0.00	0.00
9	8.00	0.7390	0.00	0.00
10	9.00	0.8060	0.00	0.00
11	10.00	0.8760	0.00	0.00

Control Practice 2: Biofilter CP# 1 (DS) - DS Biofilters # 1

- 1. Top area (square feet) = 50077
- 2. Bottom area (square feet) = 31423
- 3. Depth (ft): 4
- 4. Biofilter width (ft) - for Cost Purposes Only: 10
- 5. Infiltration rate (in/hr) = 0.5
- 6. Random infiltration rate generation? No
- 7. Infiltration rate fraction (side): 0.001
- 8. Infiltration rate fraction (bottom): 1
- 9. Depth of biofilter that is rock filled (ft) 0
- 10. Porosity of rock filled volume = 0
- 11. Engineered soil infiltration rate: 0
- 12. Engineered soil depth (ft) = 0
- 13. Engineered soil porosity = 0
- 14. Percent solids reduction due to flow through engineered soil = 0
- 15. Biofilter peak to average flow ratio = 3.8
- 16. Number of biofiltration control devices = 1
- 17. Particle size distribution file: Not needed - calculated by program
- 18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil

Biofilter Outlet/Discharge Characteristics:

Outlet type: Broad Crested Weir

- 1. Weir crest length (ft): 20
- 2. Weir crest width (ft): 4
- 3. Height of datum to bottom of weir opening: 3

Outlet type: Surface Discharge Pipe

1. Surface discharge pipe outlet diameter (ft): 1
2. Pipe invert elevation above datum (ft): 1
3. Number of surface pipe outlets: 1

Control Practice 3: Wet Detention Pond CP# 2 (DS) - DS Wet Pond # 2

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 6

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Orifice 1

1. Orifice diameter (ft): 2
2. Number of orifices: 1
3. Invert elevation above datum (ft): 6

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 50
2. Weir crest width (ft): 6
3. Height from datum to bottom of weir opening: 9

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.4200	0.00	0.00
2	1.00	0.4540	0.00	0.00
3	2.00	0.4890	0.00	0.00
4	3.00	0.5250	0.00	0.00
5	4.00	0.5620	0.00	0.00
6	5.00	0.6010	0.00	0.00
7	6.00	0.8070	0.00	0.00
8	7.00	0.8950	0.00	0.00
9	8.00	0.9850	0.00	0.00
10	9.00	1.0770	0.00	0.00
11	10.00	1.1710	0.00	0.00

Output Sediment Reduction:

File Name:

Outfall Output Summary

	Runoff Volume (cu. ft.)	Percent Runoff Reduction	Runoff Coefficient (Rv)	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of All Land Uses without Controls	1.740E+06		0.41	123.4	13406	
Outfall Total with Controls	512801	70.53 %	0.12	42.92	1374	89.75 %

Current File Output: Annualized Total After Outfall Controls Years in Model Run:

Total Area Modeled

Receiving Water Impacts Due To Stormwater

(CWP Impervious Cover Model)

	Calculated Rv	Approximate Urban Stream Classification
Without Controls	0.41	Poor
With Controls	0.12	Good

Total Control Practice

Capital Cost	N/A
Land Cost	N/A
Annual Maintenance	N/A
Present Value of All Costs	N/A
Annualized Value of All	N/A

Total site sediment reduction in developed conditions is over 80%

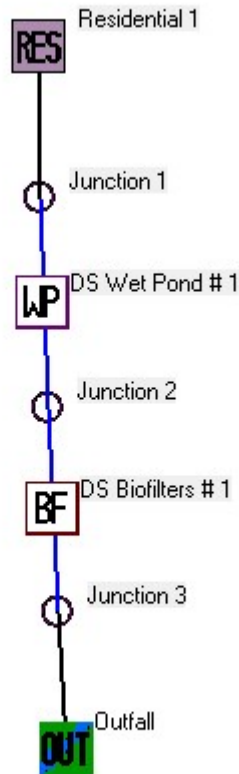
Rain Number	Start Date	Rain Total (in)	Outfall Total (cf)	Rv	Total Losses (in.)	Calculated CN*	Event Peak Flow (cfs)
Minimum:		0.00	0	0.000	0.01	80.9	0.000
Maximum:		2.59	139223	0.402	1.55	90.6	4.572
Average:		0.26	4705	0.023	0.23	83.2	2.862
Total:		28.81	512801		24.98		
* Note: NRCS does not recommend using CN method for rains < 0.5 in.							
See 'PreDevelopment Areas and CN' Help for more info.							

Predevelopment stay-on = 27.09

Post development stay-on = 24.98

24.98/27.09 = 92.1% Stay-On

North Drainage Area:



Data file name: U:\User\2104107\Engineering\SWMP\North Drainage.mdb
WinSLAMM Version 10.4.1
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
Seed for random number generator: -42
Study period starting date: 01/01/81 Study period ending date: 12/31/81
Start of Winter Season: 12/02 End of Winter Season: 03/12
Date: 11-17-2021 Time: 09:46:00
Site information:

LU# 1 - Residential: Residential 1 Total area (ac): 33.140

- 1 - Roofs 1: 2.770 ac. Pitched Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
- 2 - Roofs 2: 5.630 ac. Pitched Disconnected Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
- 25 - Driveways 1: 2.960 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
- 31 - Sidewalks 1: 2.540 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
- 37 - Streets 1: 5.510 ac. Intermediate Street Length = 2.845 curb-mi Street Width (assuming two curb-mi per street mile) = 31.95606 ft
- Default St. Dirt Accum. Annual Winter Load = 2500 lbs Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
- 45 - Large Landscaped Areas 1: 11.770 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
- 70 - Water Body Areas: 1.960 ac. Source Area PSD File:

Control Practice 1: Wet Detention Pond CP# 1 (DS) - DS Wet Pond # 1

Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 6

Peak to Average Flow Ratio: 3.8

Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Orifice 1

- 1. Orifice diameter (ft): 0.83
- 2. Number of orifices: 1
- 3. Invert elevation above datum (ft): 6

Outlet type: Broad Crested Weir

- 1. Weir crest length (ft): 20
- 2. Weir crest width (ft): 4
- 3. Height from datum to bottom of weir opening: 9

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.1680	0.00	0.00
2	1.00	0.1840	0.00	0.00
3	2.00	0.2000	0.00	0.00
4	3.00	0.2170	0.00	0.00
5	4.00	0.2340	0.00	0.00
6	5.00	0.2520	0.00	0.00
7	6.00	0.3590	0.00	0.00
8	7.00	0.4060	0.00	0.00
9	8.00	0.4550	0.00	0.00
10	9.00	0.5060	0.00	0.00
11	10.00	0.5600	0.00	0.00

Control Practice 2: Biofilter CP# 1 (DS) - DS Biofilters # 1

- 1. Top area (square feet) = 29680
- 2. Bottom area (square feet) = 21249
- 3. Depth (ft): 4
- 4. Biofilter width (ft) - for Cost Purposes Only: 10
- 5. Infiltration rate (in/hr) = 0.5
- 6. Random infiltration rate generation? No
- 7. Infiltration rate fraction (side): 0.001
- 8. Infiltration rate fraction (bottom): 1
- 9. Depth of biofilter that is rock filled (ft) 0
- 10. Porosity of rock filled volume = 0
- 11. Engineered soil infiltration rate: 0
- 12. Engineered soil depth (ft) = 0
- 13. Engineered soil porosity = 0
- 14. Percent solids reduction due to flow through engineered soil = 0
- 15. Biofilter peak to average flow ratio = 3.8
- 16. Number of biofiltration control devices = 1
- 17. Particle size distribution file: Not needed - calculated by program
- 18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil

Biofilter Outlet/Discharge Characteristics:

Outlet type: Broad Crested Weir

- 1. Weir crest length (ft): 20
- 2. Weir crest width (ft): 4
- 3. Height of datum to bottom of weir opening: 3

Outlet type: Surface Discharge Pipe

- 1. Surface discharge pipe outlet diameter (ft): 1
- 2. Pipe invert elevation above datum (ft): 1
- 3. Number of surface pipe outlets: 1

Control Practice No.	Control Practice Type	Total Inflow Volume (cf)	Total Outflow Volume (cf)	Percent Volume Reduction	Total Influent Load (lbs)	Total Effluent Load (lbs)	Percent Load Reduction
1	Wet Detention Pond	1.476E+06	1.480E+06	-0.271	10042	3874	61.42

Wet pond provides over 60% sediment reduction for pretreatment

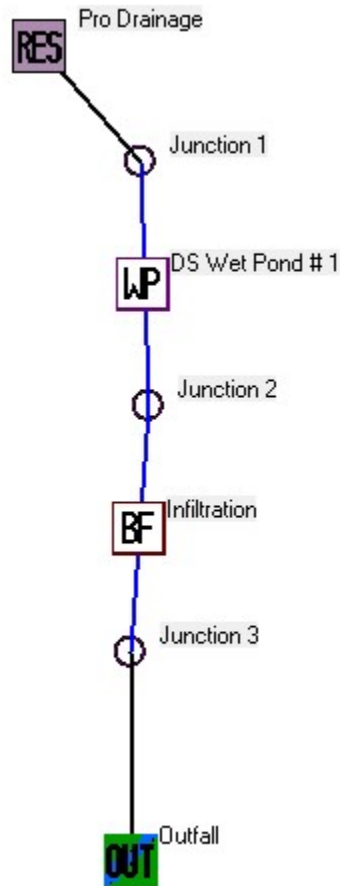
Rain Number	Start Date	Rain Total (in)	Outfall Total (cf)	Rv	Total Losses (in.)	Calculated CN*	Event Peak Flow (cfs)
Minimum:		0.00	0	0.000	0.01	73.1	0.000
Maximum:		2.59	132278	0.425	1.49	91.3	3.714
Average:		0.26	4901	0.028	0.22	84.6	2.203
Total:		28.81	534159		24.37		

Predevelopment stay-on = 27.09

Post development stay-on = 24.37

24.37/27.09 = 90.0% Stay-On

Multi-Family Drainage Area:



Data file name: U:\User\2107105\Engineering\SWMP\preliminary\21.02.25 preliminary\2107105 prelim slamm.mdb
WinSLAMM Version 10.4.1

Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN

Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx

Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx

Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std

Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std

Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std

Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False

Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx

Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv

Cost Data file name:

Seed for random number generator: -42

Study period starting date: 01/01/81 Study period ending date: 12/31/81

Start of Winter Season: 12/02 End of Winter Season: 03/12
 Date: 11-17-2021 Time: 10:03:53
 Site information:

LU# 1 - Residential: Pro Drainage Total area (ac): 11.500
 1 - Roofs 1: 2.400 ac. Pitched Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
 13 - Paved Parking 1: 3.100 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
 45 - Large Landscaped Areas 1: 5.500 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
 70 - Water Body Areas: 0.500 ac. Source Area PSD File:

Control Practice 1: Wet Detention Pond CP# 1 (DS) - DS Wet Pond # 1
 Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 6
 Peak to Average Flow Ratio: 3.8
 Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Orifice 1

1. Orifice diameter (ft): 0.42
2. Number of orifices: 1
3. Invert elevation above datum (ft): 6

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 30
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 9

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 3
2. Stand pipe height above datum (ft): 8.1

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.10	0.1300	0.00	0.00
2	1.00	0.1500	0.00	0.00
3	2.00	0.1700	0.00	0.00
4	3.00	0.1900	0.00	0.00
5	4.00	0.2100	0.00	0.00
6	5.00	0.2300	0.00	0.00
7	6.00	0.3500	0.00	0.00
8	7.00	0.4000	0.00	0.00
9	8.00	0.4600	0.00	0.00
10	9.00	0.5100	0.00	0.00
11	10.00	0.5700	0.00	0.00

Control Practice 2: Biofilter CP# 1 (DS) - Infiltration

1. Top area (square feet) = 21525
2. Bottom area (square feet) = 9564
3. Depth (ft): 5
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0.5
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 0.01
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 0
10. Porosity of rock filled volume = 0
11. Engineered soil infiltration rate: 0
12. Engineered soil depth (ft) = 0
13. Engineered soil porosity = 0
14. Percent solids reduction due to flow through engineered soil = 0
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil

Biofilter Outlet/Discharge Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 5
2. Weir crest width (ft): 10
3. Height of datum to bottom of weir opening: 4

Outlet type: Surface Discharge Pipe

1. Surface discharge pipe outlet diameter (ft): 1.5
2. Pipe invert elevation above datum (ft): 1
3. Number of surface pipe outlets:

File Name:

U:\User\2107105\Engineering\SWMP\preliminary\21.02.25 preliminary\2107105 prelim slamm.mdb

Outfall Output Summary

	Runoff Volume (cu. ft.)	Percent Runoff Reduction	Runoff Coefficient (Rv)	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of All Land Uses without Controls	552172		0.41	85.01	2930	
Outfall Total with Controls	129186	76.60 %	0.10	23.32	188.1	93.58 %
<hr/>						
Current File Output: Annualized Total After Outfall Controls	129541		Years in Model Run:	1.00	188.6	

Print Output Summary to .csv File

Print Output Summary to Text File

Print Output Summary to Printer

Total Area Modeled (ac)

11.500

Total Control Practice Costs

Capital Cost	N/A
Land Cost	N/A
Annual Maintenance Cost	N/A
Present Value of All Costs	N/A
Annualized Value of All Costs	N/A

Perform Outfall
Flow Duration
Curve Calculations

Receiving Water Impacts Due To Stormwater Runoff (CWP Impervious Cover Model)

	Calculated Rv	Approximate Urban Stream Classification
Without Controls	0.41	Poor
With Controls	0.10	Good

Total site sediment reduction in developed conditions is over 80%

Rain Number	Start Date	Rain Total (in)	Outfall Total (cf)	Rv	Total Losses (in.)	Calculated CN*	Event Peak Flow (cfs)
Minimum:		0.00	0	0.000	0.01	78.3	0.000
Maximum:		2.59	40339	0.373	1.62	98.2	1.167
Average:		0.26	1185	0.017	0.24	81.9	0.713
Total:		28.81	129186		25.72		

Predevelopment stay-on = 27.09

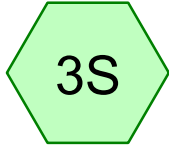
Post development stay-on = 25.72

25.72/27.09 = 94.9% Stay-On

APPENDIX B

HYDROCAD OUTPUT

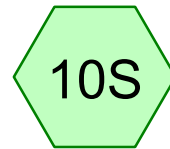
South Drainage Area



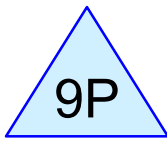
EX South Drainage



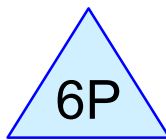
Pro S Center Site



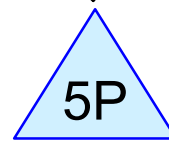
Pro S East Site



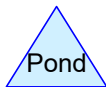
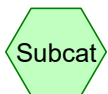
S Center Det Basin



S Center Infiltration



S Center Det Basin



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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1yr 24hr	MSE 24-hr	4	Default	24.00	1	2.49	2
2	2yr 24hr	MSE 24-hr	4	Default	24.00	1	2.84	2
3	10yr 24hr	MSE 24-hr	4	Default	24.00	1	4.09	2
4	100yr 24hr	MSE 24-hr	4	Default	24.00	1	6.66	2
5	200yr 24hr	MSE 24-hr	4	Default	24.00	1	7.53	2

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MSE 24-hr 4 1yr 24hr Rainfall=2.49"

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Summary for Subcatchment 3S: EX South Drainage

Runoff = 1.34 cfs @ 12.80 hrs, Volume= 0.424 af, Depth= 0.13"
 Routed to nonexistent node 1L

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 1yr 24hr Rainfall=2.49"

Area (ac)	CN	Description
* 38.837	58	Type B
38.837		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.0	300	0.0300	0.26		Sheet Flow, Sheet Range n= 0.130 P2= 2.84"
11.9	500	0.0100	0.70		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
30.9	800	Total			

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MSE 24-hr 4 1yr 24hr Rainfall=2.49"

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Summary for Subcatchment 10S: Pro S East Site

Runoff = 18.75 cfs @ 12.21 hrs, Volume= 1.274 af, Depth= 1.37"
 Routed to Pond 5P : S Center Det Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 1yr 24hr Rainfall=2.49"

Area (ac)	CN	Description
* 1.331	77	10% Impervious
* 5.579	86	50% Impervious
* 1.653	91	70% Impervious
* 2.571	98	Wet
11.134	88	Weighted Average
8.563		76.91% Pervious Area
2.571		23.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	150	0.0260	0.22		Sheet Flow, Sheet Range n= 0.130 P2= 2.84"
0.4	100	0.0400	4.06		Shallow Concentrated Flow, Shallow Paved Kv= 20.3 fps
0.7	800	0.0750	19.72	61.95	Pipe Channel, Channel 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
12.7	1,050	Total			

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MSE 24-hr 4 1yr 24hr Rainfall=2.49"

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Summary for Subcatchment 12S: Pro S Center Site

Runoff = 41.05 cfs @ 12.21 hrs, Volume= 2.786 af, Depth= 1.30"
 Routed to Pond 9P : S Center Det Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 1yr 24hr Rainfall=2.49"

Area (sf)	CN	Description
* 131,000	77	10% Impervious
* 659,000	86	50% Impervious
* 236,000	91	70% Impervious
* 92,000	98	Wet
1,118,000	87	Weighted Average
1,026,000		91.77% Pervious Area
92,000		8.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	150	0.0260	0.22		Sheet Flow, Sheet Range n= 0.130 P2= 2.84"
0.4	100	0.0400	4.06		Shallow Concentrated Flow, Shallow Paved Kv= 20.3 fps
0.7	800	0.0750	19.72	61.95	Pipe Channel, Channel 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
12.7	1,050	Total			

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MSE 24-hr 4 1yr 24hr Rainfall=2.49"

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Summary for Pond 5P: S Center Det Basin

Inflow Area = 11.134 ac, 23.09% Impervious, Inflow Depth = 1.37" for 1yr 24hr event
 Inflow = 18.75 cfs @ 12.21 hrs, Volume= 1.274 af
 Outflow = 2.92 cfs @ 12.78 hrs, Volume= 1.131 af, Atten= 84%, Lag= 34.4 min
 Primary = 2.92 cfs @ 12.78 hrs, Volume= 1.131 af
 Routed to Pond 6P : S Center Infiltration
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Pond 6P : S Center Infiltration

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,016.01' @ 12.78 hrs Surf.Area= 29,402 sf Storage= 28,417 cf

Plug-Flow detention time= 592.6 min calculated for 1.129 af (89% of inflow)
 Center-of-Mass det. time= 544.7 min (1,363.7 - 819.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,015.00'	129,057 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,015.00	26,636	0	0
1,016.00	29,362	27,999	27,999
1,017.00	32,189	30,776	58,775
1,018.00	35,116	33,653	92,427
1,019.00	38,143	36,630	129,057

Device	Routing	Invert	Outlet Devices
#1	Primary	1,015.00'	24.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,015.00' / 1,015.00' S= 0.0000 '/ Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Secondary	1,018.00'	50.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=2.92 cfs @ 12.78 hrs HW=1,016.01' TW=1,014.48' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 2.92 cfs @ 2.66 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,015.00' TW=1,014.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 6P: S Center Infiltration

Inflow Area = 36.800 ac, 12.73% Impervious, Inflow Depth > 1.20" for 1yr 24hr event
 Inflow = 9.07 cfs @ 12.81 hrs, Volume= 3.688 af
 Outflow = 1.26 cfs @ 18.53 hrs, Volume= 2.798 af, Atten= 86%, Lag= 343.5 min
 Discarded = 0.45 cfs @ 18.53 hrs, Volume= 1.285 af
 Primary = 0.81 cfs @ 18.53 hrs, Volume= 1.513 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to nonexistent node 2L

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,015.99' @ 18.53 hrs Surf.Area= 38,540 sf Storage= 69,499 cf

Plug-Flow detention time= 722.4 min calculated for 2.795 af (76% of inflow)
 Center-of-Mass det. time= 439.3 min (1,686.2 - 1,246.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,014.00'	202,745 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,014.00	31,423	0	0
1,015.00	34,953	33,188	33,188
1,016.00	38,583	36,768	69,956
1,017.00	42,314	40,449	110,405
1,018.00	46,145	44,230	154,634
1,019.00	50,077	48,111	202,745

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,014.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 0.00'
#2	Primary	1,015.00'	30.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,015.00' / 1,014.00' S= 0.0200 '/ Cc= 0.900 n= 0.013, Flow Area= 4.91 sf
#3	Device 2	1,015.00'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 2	1,016.50'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	1,017.50'	5.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Fahey South Prelim SWMP

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MSE 24-hr 4 1yr 24hr Rainfall=2.49"

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Discarded OutFlow Max=0.45 cfs @ 18.53 hrs HW=1,015.99' (Free Discharge)

↑1=Exfiltration (Controls 0.45 cfs)

Primary OutFlow Max=0.81 cfs @ 18.53 hrs HW=1,015.99' (Free Discharge)

↑2=Culvert (Passes 0.81 cfs of 6.11 cfs potential flow)

↑3=Orifice/Grate (Orifice Controls 0.81 cfs @ 4.14 fps)

↑4=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,014.00' (Free Discharge)

↑5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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MSE 24-hr 4 1yr 24hr Rainfall=2.49"

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Summary for Pond 9P: S Center Det Basin

Inflow Area = 25.666 ac, 8.23% Impervious, Inflow Depth = 1.30" for 1yr 24hr event
 Inflow = 41.05 cfs @ 12.21 hrs, Volume= 2.786 af
 Outflow = 6.15 cfs @ 12.82 hrs, Volume= 2.557 af, Atten= 85%, Lag= 36.9 min
 Primary = 6.15 cfs @ 12.82 hrs, Volume= 2.557 af
 Routed to Pond 6P : S Center Infiltration
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Pond 6P : S Center Infiltration

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,016.49' @ 12.82 hrs Surf.Area= 44,112 sf Storage= 61,387 cf

Plug-Flow detention time= 411.6 min calculated for 2.557 af (92% of inflow)
 Center-of-Mass det. time= 372.7 min (1,195.1 - 822.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,015.00'	184,845 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,015.00	38,293	0	0
1,016.00	42,164	40,229	40,229
1,017.00	46,136	44,150	84,379
1,018.00	50,208	48,172	132,551
1,019.00	54,380	52,294	184,845

Device	Routing	Invert	Outlet Devices
#1	Primary	1,015.00'	24.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,015.00' / 1,015.00' S= 0.0000 '/ Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Secondary	1,018.00'	50.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=6.15 cfs @ 12.82 hrs HW=1,016.49' TW=1,014.52' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 6.15 cfs @ 3.40 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,015.00' TW=1,014.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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MSE 24-hr 4 2yr 24hr Rainfall=2.84"

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Summary for Subcatchment 3S: EX South Drainage

Runoff = 3.22 cfs @ 12.66 hrs, Volume= 0.726 af, Depth= 0.22"
Routed to nonexistent node 1L

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2yr 24hr Rainfall=2.84"

Area (ac)	CN	Description
* 38.837	58	Type B
38.837		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.0	300	0.0300	0.26		Sheet Flow, Sheet Range n= 0.130 P2= 2.84"
11.9	500	0.0100	0.70		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
30.9	800	Total			

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MSE 24-hr 4 2yr 24hr Rainfall=2.84"

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Summary for Subcatchment 10S: Pro S East Site

Runoff = 22.84 cfs @ 12.21 hrs, Volume= 1.556 af, Depth= 1.68"
 Routed to Pond 5P : S Center Det Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 2yr 24hr Rainfall=2.84"

Area (ac)	CN	Description
* 1.331	77	10% Impervious
* 5.579	86	50% Impervious
* 1.653	91	70% Impervious
* 2.571	98	Wet
11.134	88	Weighted Average
8.563		76.91% Pervious Area
2.571		23.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	150	0.0260	0.22		Sheet Flow, Sheet Range n= 0.130 P2= 2.84"
0.4	100	0.0400	4.06		Shallow Concentrated Flow, Shallow Paved Kv= 20.3 fps
0.7	800	0.0750	19.72	61.95	Pipe Channel, Channel 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
12.7	1,050	Total			

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MSE 24-hr 4 2yr 24hr Rainfall=2.84"

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Summary for Subcatchment 12S: Pro S Center Site

Runoff = 50.35 cfs @ 12.21 hrs, Volume= 3.423 af, Depth= 1.60"
 Routed to Pond 9P : S Center Det Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 2yr 24hr Rainfall=2.84"

Area (sf)	CN	Description
* 131,000	77	10% Impervious
* 659,000	86	50% Impervious
* 236,000	91	70% Impervious
* 92,000	98	Wet
1,118,000	87	Weighted Average
1,026,000		91.77% Pervious Area
92,000		8.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	150	0.0260	0.22		Sheet Flow, Sheet Range n= 0.130 P2= 2.84"
0.4	100	0.0400	4.06		Shallow Concentrated Flow, Shallow Paved Kv= 20.3 fps
0.7	800	0.0750	19.72	61.95	Pipe Channel, Channel 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
12.7	1,050	Total			

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MSE 24-hr 4 2yr 24hr Rainfall=2.84"

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Summary for Pond 5P: S Center Det Basin

Inflow Area = 11.134 ac, 23.09% Impervious, Inflow Depth = 1.68" for 2yr 24hr event
 Inflow = 22.84 cfs @ 12.21 hrs, Volume= 1.556 af
 Outflow = 4.13 cfs @ 12.70 hrs, Volume= 1.332 af, Atten= 82%, Lag= 29.6 min
 Primary = 4.13 cfs @ 12.70 hrs, Volume= 1.332 af
 Routed to Pond 6P : S Center Infiltration
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Pond 6P : S Center Infiltration

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,016.29' @ 18.74 hrs Surf.Area= 30,172 sf Storage= 36,527 cf

Plug-Flow detention time= 648.8 min calculated for 1.331 af (86% of inflow)
 Center-of-Mass det. time= 592.3 min (1,406.6 - 814.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,015.00'	129,057 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,015.00	26,636	0	0
1,016.00	29,362	27,999	27,999
1,017.00	32,189	30,776	58,775
1,018.00	35,116	33,653	92,427
1,019.00	38,143	36,630	129,057

Device	Routing	Invert	Outlet Devices
#1	Primary	1,015.00'	24.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,015.00' / 1,015.00' S= 0.0000 '/ Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Secondary	1,018.00'	50.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=4.13 cfs @ 12.70 hrs HW=1,016.21' TW=1,014.61' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 4.13 cfs @ 2.99 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,015.00' TW=1,014.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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MSE 24-hr 4 2yr 24hr Rainfall=2.84"

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Summary for Pond 6P: S Center Infiltration

Inflow Area = 36.800 ac, 12.73% Impervious, Inflow Depth > 1.44" for 2yr 24hr event
 Inflow = 12.60 cfs @ 12.72 hrs, Volume= 4.417 af
 Outflow = 1.42 cfs @ 18.70 hrs, Volume= 3.390 af, Atten= 89%, Lag= 358.8 min
 Discarded = 0.46 cfs @ 18.70 hrs, Volume= 1.325 af
 Primary = 0.96 cfs @ 18.70 hrs, Volume= 2.065 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to nonexistent node 2L

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,016.28' @ 18.70 hrs Surf.Area= 39,642 sf Storage= 81,055 cf

Plug-Flow detention time= 738.8 min calculated for 3.390 af (77% of inflow)
 Center-of-Mass det. time= 445.6 min (1,715.9 - 1,270.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,014.00'	202,745 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,014.00	31,423	0	0
1,015.00	34,953	33,188	33,188
1,016.00	38,583	36,768	69,956
1,017.00	42,314	40,449	110,405
1,018.00	46,145	44,230	154,634
1,019.00	50,077	48,111	202,745

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,014.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 0.00'
#2	Primary	1,015.00'	30.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,015.00' / 1,014.00' S= 0.0200 '/ Cc= 0.900 n= 0.013, Flow Area= 4.91 sf
#3	Device 2	1,015.00'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 2	1,016.50'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	1,017.50'	5.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

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MSE 24-hr 4 2yr 24hr Rainfall=2.84"

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Discarded OutFlow Max=0.46 cfs @ 18.70 hrs HW=1,016.28' (Free Discharge)

↑1=Exfiltration (Controls 0.46 cfs)

Primary OutFlow Max=0.96 cfs @ 18.70 hrs HW=1,016.28' (Free Discharge)

↑2=Culvert (Passes 0.96 cfs of 9.79 cfs potential flow)

↑3=Orifice/Grate (Orifice Controls 0.96 cfs @ 4.90 fps)

↑4=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,014.00' (Free Discharge)

↑5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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MSE 24-hr 4 2yr 24hr Rainfall=2.84"

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Summary for Pond 9P: S Center Det Basin

Inflow Area = 25.666 ac, 8.23% Impervious, Inflow Depth = 1.60" for 2yr 24hr event
 Inflow = 50.35 cfs @ 12.21 hrs, Volume= 3.423 af
 Outflow = 8.48 cfs @ 12.74 hrs, Volume= 3.085 af, Atten= 83%, Lag= 31.7 min
 Primary = 8.48 cfs @ 12.74 hrs, Volume= 3.085 af
 Routed to Pond 6P : S Center Infiltration
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Pond 6P : S Center Infiltration

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,016.79' @ 12.74 hrs Surf.Area= 45,293 sf Storage= 74,675 cf

Plug-Flow detention time= 438.6 min calculated for 3.085 af (90% of inflow)
 Center-of-Mass det. time= 393.9 min (1,211.4 - 817.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,015.00'	184,845 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,015.00	38,293	0	0
1,016.00	42,164	40,229	40,229
1,017.00	46,136	44,150	84,379
1,018.00	50,208	48,172	132,551
1,019.00	54,380	52,294	184,845

Device	Routing	Invert	Outlet Devices
#1	Primary	1,015.00'	24.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,015.00' / 1,015.00' S= 0.0000 '/ Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Secondary	1,018.00'	50.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=8.48 cfs @ 12.74 hrs HW=1,016.79' TW=1,014.65' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 8.48 cfs @ 3.79 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,015.00' TW=1,014.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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MSE 24-hr 4 10yr 24hr Rainfall=4.09"

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Summary for Subcatchment 3S: EX South Drainage

Runoff = 16.62 cfs @ 12.53 hrs, Volume= 2.285 af, Depth= 0.71"
Routed to nonexistent node 1L

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 10yr 24hr Rainfall=4.09"

Area (ac)	CN	Description
* 38.837	58	Type B
38.837		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.0	300	0.0300	0.26		Sheet Flow, Sheet Range n= 0.130 P2= 2.84"
11.9	500	0.0100	0.70		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
30.9	800	Total			

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MSE 24-hr 4 10yr 24hr Rainfall=4.09"

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Summary for Subcatchment 10S: Pro S East Site

Runoff = 37.72 cfs @ 12.20 hrs, Volume= 2.610 af, Depth= 2.81"
 Routed to Pond 5P : S Center Det Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 10yr 24hr Rainfall=4.09"

Area (ac)	CN	Description
* 1.331	77	10% Impervious
* 5.579	86	50% Impervious
* 1.653	91	70% Impervious
* 2.571	98	Wet
11.134	88	Weighted Average
8.563		76.91% Pervious Area
2.571		23.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	150	0.0260	0.22		Sheet Flow, Sheet Range n= 0.130 P2= 2.84"
0.4	100	0.0400	4.06		Shallow Concentrated Flow, Shallow Paved Kv= 20.3 fps
0.7	800	0.0750	19.72	61.95	Pipe Channel, Channel 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
12.7	1,050	Total			

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MSE 24-hr 4 10yr 24hr Rainfall=4.09"

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Summary for Subcatchment 12S: Pro S Center Site

Runoff = 84.47 cfs @ 12.21 hrs, Volume= 5.816 af, Depth= 2.72"
 Routed to Pond 9P : S Center Det Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 10yr 24hr Rainfall=4.09"

Area (sf)	CN	Description
* 131,000	77	10% Impervious
* 659,000	86	50% Impervious
* 236,000	91	70% Impervious
* 92,000	98	Wet
1,118,000	87	Weighted Average
1,026,000		91.77% Pervious Area
92,000		8.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	150	0.0260	0.22		Sheet Flow, Sheet Range n= 0.130 P2= 2.84"
0.4	100	0.0400	4.06		Shallow Concentrated Flow, Shallow Paved Kv= 20.3 fps
0.7	800	0.0750	19.72	61.95	Pipe Channel, Channel 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
12.7	1,050	Total			

Summary for Pond 5P: S Center Det Basin

Inflow Area = 11.134 ac, 23.09% Impervious, Inflow Depth = 2.81" for 10yr 24hr event
 Inflow = 37.72 cfs @ 12.20 hrs, Volume= 2.610 af
 Outflow = 9.13 cfs @ 12.59 hrs, Volume= 2.269 af, Atten= 76%, Lag= 23.0 min
 Primary = 9.13 cfs @ 12.59 hrs, Volume= 2.269 af
 Routed to Pond 6P : S Center Infiltration
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Pond 6P : S Center Infiltration

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,016.90' @ 14.59 hrs Surf.Area= 31,902 sf Storage= 55,520 cf

Plug-Flow detention time= 513.6 min calculated for 2.269 af (87% of inflow)
 Center-of-Mass det. time= 459.7 min (1,261.8 - 802.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,015.00'	129,057 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,015.00	26,636	0	0
1,016.00	29,362	27,999	27,999
1,017.00	32,189	30,776	58,775
1,018.00	35,116	33,653	92,427
1,019.00	38,143	36,630	129,057

Device	Routing	Invert	Outlet Devices
#1	Primary	1,015.00'	24.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,015.00' / 1,015.00' S= 0.0000 ' / Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Secondary	1,018.00'	50.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=9.13 cfs @ 12.59 hrs HW=1,016.87' TW=1,015.17' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 9.13 cfs @ 3.88 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,015.00' TW=1,014.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 6P: S Center Infiltration

Inflow Area = 36.800 ac, 12.73% Impervious, Inflow Depth > 2.47" for 10yr 24hr event
 Inflow = 25.20 cfs @ 12.63 hrs, Volume= 7.584 af
 Outflow = 9.72 cfs @ 13.98 hrs, Volume= 6.388 af, Atten= 61%, Lag= 80.6 min
 Discarded = 0.49 cfs @ 13.98 hrs, Volume= 1.396 af
 Primary = 9.23 cfs @ 13.98 hrs, Volume= 4.992 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to nonexistent node 2L

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,016.91' @ 13.98 hrs Surf.Area= 41,968 sf Storage= 106,499 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 275.0 min (1,432.2 - 1,157.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,014.00'	202,745 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,014.00	31,423	0	0
1,015.00	34,953	33,188	33,188
1,016.00	38,583	36,768	69,956
1,017.00	42,314	40,449	110,405
1,018.00	46,145	44,230	154,634
1,019.00	50,077	48,111	202,745

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,014.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 0.00'
#2	Primary	1,015.00'	30.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,015.00' / 1,014.00' S= 0.0200 '/ Cc= 0.900 n= 0.013, Flow Area= 4.91 sf
#3	Device 2	1,015.00'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 2	1,016.50'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	1,017.50'	5.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

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MSE 24-hr 4 10yr 24hr Rainfall=4.09"

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Discarded OutFlow Max=0.49 cfs @ 13.98 hrs HW=1,016.91' (Free Discharge)

↑1=Exfiltration (Controls 0.49 cfs)

Primary OutFlow Max=9.22 cfs @ 13.98 hrs HW=1,016.91' (Free Discharge)

↑2=Culvert (Passes 9.22 cfs of 18.89 cfs potential flow)

↑3=Orifice/Grate (Orifice Controls 1.22 cfs @ 6.20 fps)

↑4=Orifice/Grate (Weir Controls 8.01 cfs @ 2.09 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,014.00' (Free Discharge)

↑5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 9P: S Center Det Basin

Inflow Area = 25.666 ac, 8.23% Impervious, Inflow Depth = 2.72" for 10yr 24hr event
 Inflow = 84.47 cfs @ 12.21 hrs, Volume= 5.816 af
 Outflow = 16.11 cfs @ 12.67 hrs, Volume= 5.316 af, Atten= 81%, Lag= 27.7 min
 Primary = 16.11 cfs @ 12.67 hrs, Volume= 5.316 af
 Routed to Pond 6P : S Center Infiltration
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Pond 6P : S Center Infiltration

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,017.87' @ 12.67 hrs Surf.Area= 49,668 sf Storage= 125,929 cf

Plug-Flow detention time= 347.8 min calculated for 5.316 af (91% of inflow)
 Center-of-Mass det. time= 307.6 min (1,112.6 - 805.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,015.00'	184,845 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,015.00	38,293	0	0
1,016.00	42,164	40,229	40,229
1,017.00	46,136	44,150	84,379
1,018.00	50,208	48,172	132,551
1,019.00	54,380	52,294	184,845

Device	Routing	Invert	Outlet Devices
#1	Primary	1,015.00'	24.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,015.00' / 1,015.00' S= 0.0000 '/ Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Secondary	1,018.00'	50.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=16.10 cfs @ 12.67 hrs HW=1,017.87' TW=1,015.37' (Dynamic Tailwater)
 ↑1=Culvert (Barrel Controls 16.10 cfs @ 5.13 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,015.00' TW=1,014.00' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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MSE 24-hr 4 100yr 24hr Rainfall=6.66"

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Summary for Subcatchment 3S: EX South Drainage

Runoff = 63.33 cfs @ 12.47 hrs, Volume= 7.059 af, Depth= 2.18"
 Routed to nonexistent node 1L

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 100yr 24hr Rainfall=6.66"

Area (ac)	CN	Description
* 38.837	58	Type B
38.837		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.0	300	0.0300	0.26		Sheet Flow, Sheet
					Range n= 0.130 P2= 2.84"
11.9	500	0.0100	0.70		Shallow Concentrated Flow, Shallow
					Short Grass Pasture Kv= 7.0 fps
30.9	800	Total			

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MSE 24-hr 4 100yr 24hr Rainfall=6.66"

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Summary for Subcatchment 10S: Pro S East Site

Runoff = 68.43 cfs @ 12.20 hrs, Volume= 4.884 af, Depth> 5.26"
 Routed to Pond 5P : S Center Det Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 100yr 24hr Rainfall=6.66"

Area (ac)	CN	Description
* 1.331	77	10% Impervious
* 5.579	86	50% Impervious
* 1.653	91	70% Impervious
* 2.571	98	Wet
11.134	88	Weighted Average
8.563		76.91% Pervious Area
2.571		23.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	150	0.0260	0.22		Sheet Flow, Sheet Range n= 0.130 P2= 2.84"
0.4	100	0.0400	4.06		Shallow Concentrated Flow, Shallow Paved Kv= 20.3 fps
0.7	800	0.0750	19.72	61.95	Pipe Channel, Channel 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
12.7	1,050	Total			

Summary for Subcatchment 12S: Pro S Center Site

Runoff = 155.34 cfs @ 12.20 hrs, Volume= 11.017 af, Depth= 5.15"
 Routed to Pond 9P : S Center Det Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 100yr 24hr Rainfall=6.66"

Area (sf)	CN	Description
* 131,000	77	10% Impervious
* 659,000	86	50% Impervious
* 236,000	91	70% Impervious
* 92,000	98	Wet
1,118,000	87	Weighted Average
1,026,000		91.77% Pervious Area
92,000		8.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	150	0.0260	0.22		Sheet Flow, Sheet Range n= 0.130 P2= 2.84"
0.4	100	0.0400	4.06		Shallow Concentrated Flow, Shallow Paved Kv= 20.3 fps
0.7	800	0.0750	19.72	61.95	Pipe Channel, Channel 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
12.7	1,050	Total			

Summary for Pond 5P: S Center Det Basin

Inflow Area = 11.134 ac, 23.09% Impervious, Inflow Depth > 5.26" for 100yr 24hr event
 Inflow = 68.43 cfs @ 12.20 hrs, Volume= 4.884 af
 Outflow = 17.11 cfs @ 12.41 hrs, Volume= 4.517 af, Atten= 75%, Lag= 12.4 min
 Primary = 16.84 cfs @ 12.36 hrs, Volume= 4.078 af
 Routed to Pond 6P : S Center Infiltration
 Secondary = 7.55 cfs @ 12.60 hrs, Volume= 0.439 af
 Routed to Pond 6P : S Center Infiltration

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,018.20' @ 12.79 hrs Surf.Area= 35,732 sf Storage= 99,636 cf

Plug-Flow detention time= 317.3 min calculated for 4.512 af (92% of inflow)
 Center-of-Mass det. time= 282.7 min (1,070.1 - 787.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,015.00'	129,057 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,015.00	26,636	0	0
1,016.00	29,362	27,999	27,999
1,017.00	32,189	30,776	58,775
1,018.00	35,116	33,653	92,427
1,019.00	38,143	36,630	129,057

Device	Routing	Invert	Outlet Devices
#1	Primary	1,015.00'	24.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,015.00' / 1,015.00' S= 0.0000 ' / Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Secondary	1,018.00'	50.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=15.03 cfs @ 12.36 hrs HW=1,017.96' TW=1,016.98' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 15.03 cfs @ 4.78 fps)

Secondary OutFlow Max=5.84 cfs @ 12.60 hrs HW=1,018.16' TW=1,018.10' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 5.84 cfs @ 0.74 fps)

Summary for Pond 6P: S Center Infiltration

Inflow Area = 36.800 ac, 12.73% Impervious, Inflow Depth > 4.89" for 100yr 24hr event
 Inflow = 126.02 cfs @ 12.32 hrs, Volume= 14.999 af
 Outflow = 40.77 cfs @ 12.70 hrs, Volume= 13.767 af, Atten= 68%, Lag= 22.9 min
 Discarded = 0.54 cfs @ 12.70 hrs, Volume= 1.477 af
 Primary = 32.78 cfs @ 12.70 hrs, Volume= 11.847 af
 Secondary = 7.45 cfs @ 12.70 hrs, Volume= 0.444 af
 Routed to nonexistent node 2L

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,018.17' @ 12.70 hrs Surf.Area= 46,827 sf Storage= 162,697 cf

Plug-Flow detention time= 247.4 min calculated for 13.751 af (92% of inflow)
 Center-of-Mass det. time= 135.2 min (1,141.1 - 1,006.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,014.00'	202,745 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,014.00	31,423	0	0
1,015.00	34,953	33,188	33,188
1,016.00	38,583	36,768	69,956
1,017.00	42,314	40,449	110,405
1,018.00	46,145	44,230	154,634
1,019.00	50,077	48,111	202,745

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,014.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 0.00'
#2	Primary	1,015.00'	30.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,015.00' / 1,014.00' S= 0.0200 '/ Cc= 0.900 n= 0.013, Flow Area= 4.91 sf
#3	Device 2	1,015.00'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 2	1,016.50'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	1,017.50'	5.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Fahey South Prelim SWMP

MSE 24-hr 4 100yr 24hr Rainfall=6.66"

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Discarded OutFlow Max=0.54 cfs @ 12.70 hrs HW=1,018.17' (Free Discharge)

↑1=Exfiltration (Controls 0.54 cfs)

Primary OutFlow Max=32.77 cfs @ 12.70 hrs HW=1,018.17' (Free Discharge)

↑2=Culvert (Inlet Controls 32.77 cfs @ 6.68 fps)

↑3=Orifice/Grate (Passes < 1.62 cfs potential flow)

↑4=Orifice/Grate (Passes < 44.02 cfs potential flow)

Secondary OutFlow Max=7.44 cfs @ 12.70 hrs HW=1,018.17' (Free Discharge)

↑5=Broad-Crested Rectangular Weir (Weir Controls 7.44 cfs @ 2.21 fps)

Summary for Pond 9P: S Center Det Basin

Inflow Area = 25.666 ac, 8.23% Impervious, Inflow Depth = 5.15" for 100yr 24hr event
 Inflow = 155.34 cfs @ 12.20 hrs, Volume= 11.017 af
 Outflow = 110.11 cfs @ 12.32 hrs, Volume= 10.482 af, Atten= 29%, Lag= 6.8 min
 Primary = 22.89 cfs @ 12.32 hrs, Volume= 7.087 af
 Routed to Pond 6P : S Center Infiltration
 Secondary = 87.22 cfs @ 12.32 hrs, Volume= 3.394 af
 Routed to Pond 6P : S Center Infiltration

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,018.75' @ 12.32 hrs Surf.Area= 53,339 sf Storage= 171,401 cf

Plug-Flow detention time= 212.2 min calculated for 10.469 af (95% of inflow)
 Center-of-Mass det. time= 188.3 min (978.3 - 790.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,015.00'	184,845 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,015.00	38,293	0	0
1,016.00	42,164	40,229	40,229
1,017.00	46,136	44,150	84,379
1,018.00	50,208	48,172	132,551
1,019.00	54,380	52,294	184,845

Device	Routing	Invert	Outlet Devices
#1	Primary	1,015.00'	24.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,015.00' / 1,015.00' S= 0.0000 '/ Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Secondary	1,018.00'	50.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=22.49 cfs @ 12.32 hrs HW=1,018.74' TW=1,016.53' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 22.49 cfs @ 7.16 fps)

Secondary OutFlow Max=85.14 cfs @ 12.32 hrs HW=1,018.74' TW=1,016.52' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 85.14 cfs @ 2.31 fps)

Fahey South Prelim SWMP

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MSE 24-hr 4 200yr 24hr Rainfall=7.53"

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Summary for Subcatchment 3S: EX South Drainage

Runoff = 82.25 cfs @ 12.46 hrs, Volume= 8.985 af, Depth= 2.78"
 Routed to nonexistent node 1L

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 200yr 24hr Rainfall=7.53"

Area (ac)	CN	Description
* 38.837	58	Type B
38.837		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.0	300	0.0300	0.26		Sheet Flow, Sheet Range n= 0.130 P2= 2.84"
11.9	500	0.0100	0.70		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
30.9	800	Total			

Summary for Subcatchment 10S: Pro S East Site

Runoff = 78.75 cfs @ 12.20 hrs, Volume= 5.667 af, Depth> 6.11"
 Routed to Pond 5P : S Center Det Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 200yr 24hr Rainfall=7.53"

Area (ac)	CN	Description
* 1.331	77	10% Impervious
* 5.579	86	50% Impervious
* 1.653	91	70% Impervious
* 2.571	98	Wet
11.134	88	Weighted Average
8.563		76.91% Pervious Area
2.571		23.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	150	0.0260	0.22		Sheet Flow, Sheet Range n= 0.130 P2= 2.84"
0.4	100	0.0400	4.06		Shallow Concentrated Flow, Shallow Paved Kv= 20.3 fps
0.7	800	0.0750	19.72	61.95	Pipe Channel, Channel 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
12.7	1,050	Total			

Summary for Subcatchment 12S: Pro S Center Site

Runoff = 179.20 cfs @ 12.20 hrs, Volume= 12.817 af, Depth> 5.99"
 Routed to Pond 9P : S Center Det Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 200yr 24hr Rainfall=7.53"

Area (sf)	CN	Description
* 131,000	77	10% Impervious
* 659,000	86	50% Impervious
* 236,000	91	70% Impervious
* 92,000	98	Wet
1,118,000	87	Weighted Average
1,026,000		91.77% Pervious Area
92,000		8.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	150	0.0260	0.22		Sheet Flow, Sheet Range n= 0.130 P2= 2.84"
0.4	100	0.0400	4.06		Shallow Concentrated Flow, Shallow Paved Kv= 20.3 fps
0.7	800	0.0750	19.72	61.95	Pipe Channel, Channel 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
12.7	1,050	Total			

Summary for Pond 5P: S Center Det Basin

Inflow Area = 11.134 ac, 23.09% Impervious, Inflow Depth > 6.11" for 200yr 24hr event
 Inflow = 78.75 cfs @ 12.20 hrs, Volume= 5.667 af
 Outflow = 32.11 cfs @ 12.38 hrs, Volume= 5.295 af, Atten= 59%, Lag= 10.5 min
 Primary = 18.44 cfs @ 12.29 hrs, Volume= 4.041 af
 Routed to Pond 6P : S Center Infiltration
 Secondary = 24.89 cfs @ 12.65 hrs, Volume= 1.254 af
 Routed to Pond 6P : S Center Infiltration

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,018.62' @ 12.74 hrs Surf.Area= 37,002 sf Storage= 114,891 cf

Plug-Flow detention time= 285.0 min calculated for 5.289 af (93% of inflow)
 Center-of-Mass det. time= 254.0 min (1,038.1 - 784.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,015.00'	129,057 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,015.00	26,636	0	0
1,016.00	29,362	27,999	27,999
1,017.00	32,189	30,776	58,775
1,018.00	35,116	33,653	92,427
1,019.00	38,143	36,630	129,057

Device	Routing	Invert	Outlet Devices
#1	Primary	1,015.00'	24.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,015.00' / 1,015.00' S= 0.0000 '/ Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Secondary	1,018.00'	50.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

Primary OutFlow Max=14.48 cfs @ 12.29 hrs HW=1,018.10' TW=1,017.19' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 14.48 cfs @ 4.61 fps)

Secondary OutFlow Max=12.15 cfs @ 12.65 hrs HW=1,018.62' TW=1,018.61' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 12.15 cfs @ 0.39 fps)

Summary for Pond 6P: S Center Infiltration

Inflow Area = 36.800 ac, 12.73% Impervious, Inflow Depth > 5.73" for 200yr 24hr event
 Inflow = 164.26 cfs @ 12.31 hrs, Volume= 17.568 af
 Outflow = 53.44 cfs @ 12.52 hrs, Volume= 16.329 af, Atten= 67%, Lag= 12.5 min
 Discarded = 0.57 cfs @ 12.52 hrs, Volume= 1.501 af
 Primary = 36.54 cfs @ 12.52 hrs, Volume= 13.510 af
 Secondary = 16.34 cfs @ 12.52 hrs, Volume= 1.318 af
 Routed to nonexistent node 2L

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,018.64' @ 12.52 hrs Surf.Area= 48,660 sf Storage= 184,948 cf

Plug-Flow detention time= 216.2 min calculated for 16.329 af (93% of inflow)
 Center-of-Mass det. time= 118.2 min (1,098.9 - 980.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,014.00'	202,745 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,014.00	31,423	0	0
1,015.00	34,953	33,188	33,188
1,016.00	38,583	36,768	69,956
1,017.00	42,314	40,449	110,405
1,018.00	46,145	44,230	154,634
1,019.00	50,077	48,111	202,745

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,014.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 0.00'
#2	Primary	1,015.00'	30.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,015.00' / 1,014.00' S= 0.0200 ' / Cc= 0.900 n= 0.013, Flow Area= 4.91 sf
#3	Device 2	1,015.00'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Device 2	1,016.50'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	1,017.50'	5.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Fahey South Prelim SWMP

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MSE 24-hr 4 200yr 24hr Rainfall=7.53"

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Discarded OutFlow Max=0.56 cfs @ 12.52 hrs HW=1,018.63' (Free Discharge)
↑1=Exfiltration (Controls 0.56 cfs)

Primary OutFlow Max=36.43 cfs @ 12.52 hrs HW=1,018.63' (Free Discharge)
↑2=Culvert (Inlet Controls 36.43 cfs @ 7.42 fps)
↑3=Orifice/Grate (Passes < 1.74 cfs potential flow)
↑4=Orifice/Grate (Passes < 49.62 cfs potential flow)

Secondary OutFlow Max=16.03 cfs @ 12.52 hrs HW=1,018.63' (Free Discharge)
↑5=Broad-Crested Rectangular Weir (Weir Controls 16.03 cfs @ 2.85 fps)

Summary for Pond 9P: S Center Det Basin

Inflow Area = 25.666 ac, 8.23% Impervious, Inflow Depth > 5.99" for 200yr 24hr event
 Inflow = 179.20 cfs @ 12.20 hrs, Volume= 12.817 af
 Outflow = 140.13 cfs @ 12.29 hrs, Volume= 12.273 af, Atten= 22%, Lag= 5.3 min
 Primary = 23.70 cfs @ 12.25 hrs, Volume= 7.199 af
 Routed to Pond 6P : S Center Infiltration
 Secondary = 117.12 cfs @ 12.30 hrs, Volume= 5.074 af
 Routed to Pond 6P : S Center Infiltration

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,018.91' @ 12.30 hrs Surf.Area= 54,022 sf Storage= 180,192 cf

Plug-Flow detention time= 190.7 min calculated for 12.259 af (96% of inflow)
 Center-of-Mass det. time= 169.5 min (956.1 - 786.6)

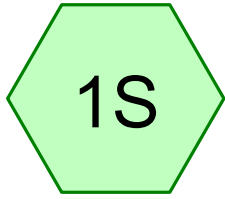
Volume	Invert	Avail.Storage	Storage Description
#1	1,015.00'	184,845 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,015.00	38,293	0	0
1,016.00	42,164	40,229	40,229
1,017.00	46,136	44,150	84,379
1,018.00	50,208	48,172	132,551
1,019.00	54,380	52,294	184,845

Device	Routing	Invert	Outlet Devices
#1	Primary	1,015.00'	24.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,015.00' / 1,015.00' S= 0.0000 '/ Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Secondary	1,018.00'	50.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

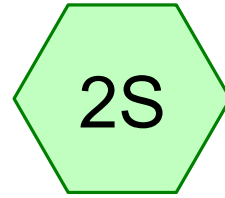
Primary OutFlow Max=22.38 cfs @ 12.25 hrs HW=1,018.88' TW=1,016.69' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 22.38 cfs @ 7.12 fps)

Secondary OutFlow Max=116.51 cfs @ 12.30 hrs HW=1,018.91' TW=1,017.22' (Dynamic Tailwater)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 116.51 cfs @ 2.56 fps)

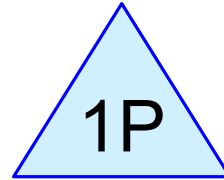
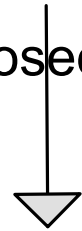
Multi-Family Drainage Area



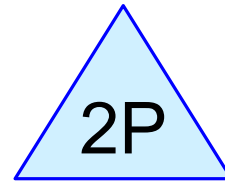
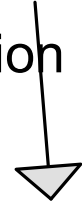
Existing Site



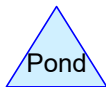
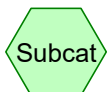
Proposed Site



Detention Basin



Infiltration Basin



Summary for Subcatchment 1S: Existing Site

Runoff = 2.60 cfs @ 12.52 hrs, Volume= 0.368 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 1yr 24hr Rainfall=2.49"

Area (ac)	CN	Description
* 11.500	68	Type B Soils
11.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.7	300	0.0330	0.22		Sheet Flow, Sheet Cultivated: Residue>20% n= 0.170 P2= 2.84"
6.2	350	0.0180	0.94		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
0.5	250	0.0480	8.73	174.63	Channel Flow, Channel Area= 20.0 sf Perim= 18.0' r= 1.11' n= 0.040
29.4	900	Total			

Summary for Subcatchment 2S: Proposed Site

Runoff = 21.11 cfs @ 12.13 hrs, Volume= 1.122 af, Depth= 1.17"
 Routed to Pond 1P : Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 1yr 24hr Rainfall=2.49"

Area (ac)	CN	Description
* 5.500	98	Impervious
* 0.500	98	Water
* 5.500	71	Vegetated
11.500	85	Weighted Average
5.500		47.83% Pervious Area
6.000		52.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TC

Summary for Pond 1P: Detention Basin

Inflow Area = 11.500 ac, 52.17% Impervious, Inflow Depth = 1.17" for 1yr 24hr event
 Inflow = 21.11 cfs @ 12.13 hrs, Volume= 1.122 af
 Outflow = 0.82 cfs @ 14.55 hrs, Volume= 1.093 af, Atten= 96%, Lag= 145.0 min
 Primary = 0.82 cfs @ 14.55 hrs, Volume= 1.093 af
 Routed to Pond 2P : Infiltration Basin

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,020.76' @ 14.55 hrs Surf.Area= 19,277 sf Storage= 30,269 cf

Plug-Flow detention time= 502.0 min calculated for 1.093 af (97% of inflow)
 Center-of-Mass det. time= 487.8 min (1,310.5 - 822.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,019.00'	79,711 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,019.00	15,247	0	0
1,020.00	17,499	16,373	16,373
1,021.00	19,852	18,676	35,049
1,022.00	22,306	21,079	56,128
1,023.00	24,860	23,583	79,711

Device	Routing	Invert	Outlet Devices
#1	Primary	1,018.50'	18.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,018.50' / 1,018.00' S= 0.0100 '/ Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,019.00'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	1,021.10'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	1,022.00'	40.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.82 cfs @ 14.55 hrs HW=1,020.76' TW=1,018.59' (Dynamic Tailwater)

- 1=Culvert (Passes 0.82 cfs of 10.23 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.82 cfs @ 5.99 fps)
- 3=Orifice/Grate (Controls 0.00 cfs)
- 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 2P: Infiltration Basin

Inflow Area = 11.500 ac, 52.17% Impervious, Inflow Depth > 1.14" for 1yr 24hr event
 Inflow = 0.82 cfs @ 14.55 hrs, Volume= 1.093 af
 Outflow = 0.67 cfs @ 20.75 hrs, Volume= 0.916 af, Atten= 18%, Lag= 372.1 min
 Discarded = 0.14 cfs @ 20.75 hrs, Volume= 0.413 af
 Primary = 0.52 cfs @ 20.75 hrs, Volume= 0.503 af
 Routed to Link 1L : Basin Outflow
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Link 1L : Basin Outflow

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,019.32' @ 20.75 hrs Surf.Area= 12,490 sf Storage= 14,558 cf

Plug-Flow detention time= 446.9 min calculated for 0.916 af (84% of inflow)
 Center-of-Mass det. time= 307.4 min (1,617.9 - 1,310.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,018.00'	76,708 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,018.00	9,564	0	0
1,019.00	11,753	10,659	10,659
1,020.00	14,044	12,899	23,557
1,021.00	16,436	15,240	38,797
1,022.00	18,930	17,683	56,480
1,023.00	21,525	20,228	76,708

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,018.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1.00'
#2	Primary	1,019.00'	18.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,019.00' / 1,018.50' S= 0.0100 '/ Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Secondary	1,022.00'	5.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.14 cfs @ 20.75 hrs HW=1,019.32' (Free Discharge)
 ↑1=Exfiltration (Controls 0.14 cfs)

Primary OutFlow Max=0.52 cfs @ 20.75 hrs HW=1,019.32' TW=0.00' (Dynamic Tailwater)
 ↑2=Culvert (Barrel Controls 0.52 cfs @ 2.84 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,018.00' TW=0.00' (Dynamic Tailwater)
 ↑3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Subcatchment 1S: Existing Site

Runoff = 4.10 cfs @ 12.49 hrs, Volume= 0.523 af, Depth= 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 2yr 24hr Rainfall=2.84"

Area (ac)	CN	Description
* 11.500	68	Type B Soils
11.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.7	300	0.0330	0.22		Sheet Flow, Sheet Cultivated: Residue>20% n= 0.170 P2= 2.84"
6.2	350	0.0180	0.94		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
0.5	250	0.0480	8.73	174.63	Channel Flow, Channel Area= 20.0 sf Perim= 18.0' r= 1.11' n= 0.040
29.4	900	Total			

Summary for Subcatchment 2S: Proposed Site

Runoff = 26.19 cfs @ 12.13 hrs, Volume= 1.394 af, Depth= 1.45"
 Routed to Pond 1P : Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 2yr 24hr Rainfall=2.84"

Area (ac)	CN	Description
* 5.500	98	Impervious
* 0.500	98	Water
* 5.500	71	Vegetated
11.500	85	Weighted Average
5.500		47.83% Pervious Area
6.000		52.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TC

Summary for Pond 1P: Detention Basin

Inflow Area = 11.500 ac, 52.17% Impervious, Inflow Depth = 1.45" for 2yr 24hr event
 Inflow = 26.19 cfs @ 12.13 hrs, Volume= 1.394 af
 Outflow = 1.28 cfs @ 13.60 hrs, Volume= 1.361 af, Atten= 95%, Lag= 88.1 min
 Primary = 1.28 cfs @ 13.60 hrs, Volume= 1.361 af
 Routed to Pond 2P : Infiltration Basin

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,021.15' @ 13.60 hrs Surf.Area= 20,225 sf Storage= 38,094 cf

Plug-Flow detention time= 536.0 min calculated for 1.359 af (97% of inflow)
 Center-of-Mass det. time= 523.7 min (1,341.2 - 817.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,019.00'	79,711 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,019.00	15,247	0	0
1,020.00	17,499	16,373	16,373
1,021.00	19,852	18,676	35,049
1,022.00	22,306	21,079	56,128
1,023.00	24,860	23,583	79,711

Device	Routing	Invert	Outlet Devices
#1	Primary	1,018.50'	18.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,018.50' / 1,018.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,019.00'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	1,021.10'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	1,022.00'	40.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.28 cfs @ 13.60 hrs HW=1,021.15' TW=1,018.46' (Dynamic Tailwater)

- 1=Culvert (Passes 1.28 cfs of 11.73 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.92 cfs @ 6.71 fps)
- 3=Orifice/Grate (Weir Controls 0.36 cfs @ 0.75 fps)
- 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 2P: Infiltration Basin

Inflow Area = 11.500 ac, 52.17% Impervious, Inflow Depth > 1.42" for 2yr 24hr event
 Inflow = 1.28 cfs @ 13.60 hrs, Volume= 1.361 af
 Outflow = 0.79 cfs @ 19.75 hrs, Volume= 1.160 af, Atten= 38%, Lag= 368.8 min
 Discarded = 0.15 cfs @ 19.75 hrs, Volume= 0.421 af
 Primary = 0.64 cfs @ 19.75 hrs, Volume= 0.738 af
 Routed to Link 1L : Basin Outflow
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Link 1L : Basin Outflow

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,019.36' @ 19.75 hrs Surf.Area= 12,576 sf Storage= 15,026 cf

Plug-Flow detention time= 388.1 min calculated for 1.158 af (85% of inflow)
 Center-of-Mass det. time= 251.7 min (1,592.9 - 1,341.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,018.00'	76,708 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,018.00	9,564	0	0
1,019.00	11,753	10,659	10,659
1,020.00	14,044	12,899	23,557
1,021.00	16,436	15,240	38,797
1,022.00	18,930	17,683	56,480
1,023.00	21,525	20,228	76,708

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,018.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1.00'
#2	Primary	1,019.00'	18.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,019.00' / 1,018.50' S= 0.0100 '/ Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Secondary	1,022.00'	5.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.15 cfs @ 19.75 hrs HW=1,019.36' (Free Discharge)
 ↑1=Exfiltration (Controls 0.15 cfs)

Primary OutFlow Max=0.64 cfs @ 19.75 hrs HW=1,019.36' TW=0.00' (Dynamic Tailwater)
 ↑2=Culvert (Barrel Controls 0.64 cfs @ 2.99 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,018.00' TW=0.00' (Dynamic Tailwater)
 ↑3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Subcatchment 1S: Existing Site

Runoff = 11.03 cfs @ 12.45 hrs, Volume= 1.210 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 10yr 24hr Rainfall=4.09"

Area (ac)	CN	Description
* 11.500	68	Type B Soils
11.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.7	300	0.0330	0.22		Sheet Flow, Sheet Cultivated: Residue>20% n= 0.170 P2= 2.84"
6.2	350	0.0180	0.94		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
0.5	250	0.0480	8.73	174.63	Channel Flow, Channel Area= 20.0 sf Perim= 18.0' r= 1.11' n= 0.040
29.4	900	Total			

Summary for Subcatchment 2S: Proposed Site

Runoff = 44.98 cfs @ 12.13 hrs, Volume= 2.433 af, Depth= 2.54"
 Routed to Pond 1P : Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 10yr 24hr Rainfall=4.09"

Area (ac)	CN	Description
* 5.500	98	Impervious
* 0.500	98	Water
* 5.500	71	Vegetated
11.500	85	Weighted Average
5.500		47.83% Pervious Area
6.000		52.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TC

Summary for Pond 1P: Detention Basin

Inflow Area = 11.500 ac, 52.17% Impervious, Inflow Depth = 2.54" for 10yr 24hr event
 Inflow = 44.98 cfs @ 12.13 hrs, Volume= 2.433 af
 Outflow = 13.19 cfs @ 12.33 hrs, Volume= 2.394 af, Atten= 71%, Lag= 11.8 min
 Primary = 13.19 cfs @ 12.33 hrs, Volume= 2.394 af
 Routed to Pond 2P : Infiltration Basin

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,021.64' @ 12.34 hrs Surf.Area= 21,434 sf Storage= 48,353 cf

Plug-Flow detention time= 365.1 min calculated for 2.391 af (98% of inflow)
 Center-of-Mass det. time= 357.2 min (1,161.6 - 804.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,019.00'	79,711 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,019.00	15,247	0	0
1,020.00	17,499	16,373	16,373
1,021.00	19,852	18,676	35,049
1,022.00	22,306	21,079	56,128
1,023.00	24,860	23,583	79,711

Device	Routing	Invert	Outlet Devices
#1	Primary	1,018.50'	18.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,018.50' / 1,018.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,019.00'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	1,021.10'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	1,022.00'	40.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=13.16 cfs @ 12.33 hrs HW=1,021.64' TW=1,018.73' (Dynamic Tailwater)

- 1=Culvert (Inlet Controls 13.16 cfs @ 7.45 fps)
- 2=Orifice/Grate (Passes < 1.02 cfs potential flow)
- 3=Orifice/Grate (Passes < 12.29 cfs potential flow)
- 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 2P: Infiltration Basin

Inflow Area = 11.500 ac, 52.17% Impervious, Inflow Depth > 2.50" for 10yr 24hr event
 Inflow = 13.19 cfs @ 12.33 hrs, Volume= 2.394 af
 Outflow = 4.24 cfs @ 13.23 hrs, Volume= 2.176 af, Atten= 68%, Lag= 54.1 min
 Discarded = 0.16 cfs @ 13.23 hrs, Volume= 0.443 af
 Primary = 4.07 cfs @ 13.23 hrs, Volume= 1.733 af
 Routed to Link 1L : Basin Outflow
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Link 1L : Basin Outflow

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,020.02' @ 13.23 hrs Surf.Area= 14,090 sf Storage= 23,828 cf

Plug-Flow detention time= 251.1 min calculated for 2.173 af (91% of inflow)
 Center-of-Mass det. time= 146.5 min (1,308.0 - 1,161.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,018.00'	76,708 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,018.00	9,564	0	0
1,019.00	11,753	10,659	10,659
1,020.00	14,044	12,899	23,557
1,021.00	16,436	15,240	38,797
1,022.00	18,930	17,683	56,480
1,023.00	21,525	20,228	76,708

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,018.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1.00'
#2	Primary	1,019.00'	18.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,019.00' / 1,018.50' S= 0.0100 '/ Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Secondary	1,022.00'	5.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.16 cfs @ 13.23 hrs HW=1,020.02' (Free Discharge)
 ↑1=Exfiltration (Controls 0.16 cfs)

Primary OutFlow Max=4.07 cfs @ 13.23 hrs HW=1,020.02' TW=0.00' (Dynamic Tailwater)
 ↑2=Culvert (Barrel Controls 4.07 cfs @ 4.50 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,018.00' TW=0.00' (Dynamic Tailwater)
 ↑3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Subcatchment 1S: Existing Site

Runoff = 29.05 cfs @ 12.43 hrs, Volume= 3.007 af, Depth= 3.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 100yr 24hr Rainfall=6.66"

Area (ac)	CN	Description
* 11.500	68	Type B Soils
11.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.7	300	0.0330	0.22		Sheet Flow, Sheet Cultivated: Residue>20% n= 0.170 P2= 2.84"
6.2	350	0.0180	0.94		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
0.5	250	0.0480	8.73	174.63	Channel Flow, Channel Area= 20.0 sf Perim= 18.0' r= 1.11' n= 0.040
29.4	900	Total			

Summary for Subcatchment 2S: Proposed Site

Runoff = 84.44 cfs @ 12.13 hrs, Volume= 4.723 af, Depth= 4.93"
 Routed to Pond 1P : Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 100yr 24hr Rainfall=6.66"

Area (ac)	CN	Description
* 5.500	98	Impervious
* 0.500	98	Water
* 5.500	71	Vegetated
11.500	85	Weighted Average
5.500		47.83% Pervious Area
6.000		52.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TC

Summary for Pond 1P: Detention Basin

Inflow Area = 11.500 ac, 52.17% Impervious, Inflow Depth = 4.93" for 100yr 24hr event
 Inflow = 84.44 cfs @ 12.13 hrs, Volume= 4.723 af
 Outflow = 65.15 cfs @ 12.19 hrs, Volume= 4.679 af, Atten= 23%, Lag= 3.5 min
 Primary = 65.15 cfs @ 12.19 hrs, Volume= 4.679 af
 Routed to Pond 2P : Infiltration Basin

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,022.60' @ 12.19 hrs Surf.Area= 23,842 sf Storage= 70,008 cf

Plug-Flow detention time= 228.2 min calculated for 4.679 af (99% of inflow)
 Center-of-Mass det. time= 222.5 min (1,011.2 - 788.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,019.00'	79,711 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,019.00	15,247	0	0
1,020.00	17,499	16,373	16,373
1,021.00	19,852	18,676	35,049
1,022.00	22,306	21,079	56,128
1,023.00	24,860	23,583	79,711

Device	Routing	Invert	Outlet Devices
#1	Primary	1,018.50'	18.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,018.50' / 1,018.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,019.00'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	1,021.10'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	1,022.00'	40.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=61.62 cfs @ 12.19 hrs HW=1,022.59' TW=1,020.26' (Dynamic Tailwater)

- 1=Culvert (Inlet Controls 12.99 cfs @ 7.35 fps)
- 2=Orifice/Grate (Passes < 1.00 cfs potential flow)
- 3=Orifice/Grate (Passes < 41.53 cfs potential flow)
- 4=Broad-Crested Rectangular Weir (Weir Controls 48.63 cfs @ 2.07 fps)

Summary for Pond 2P: Infiltration Basin

Inflow Area = 11.500 ac, 52.17% Impervious, Inflow Depth > 4.88" for 100yr 24hr event
 Inflow = 65.15 cfs @ 12.19 hrs, Volume= 4.679 af
 Outflow = 12.79 cfs @ 12.61 hrs, Volume= 4.446 af, Atten= 80%, Lag= 25.4 min
 Discarded = 0.22 cfs @ 12.61 hrs, Volume= 0.476 af
 Primary = 12.57 cfs @ 12.61 hrs, Volume= 3.970 af
 Routed to Link 1L : Basin Outflow
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Link 1L : Basin Outflow

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,021.93' @ 12.61 hrs Surf.Area= 18,760 sf Storage= 55,197 cf

Plug-Flow detention time= 152.4 min calculated for 4.441 af (95% of inflow)
 Center-of-Mass det. time= 86.7 min (1,097.9 - 1,011.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,018.00'	76,708 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,018.00	9,564	0	0
1,019.00	11,753	10,659	10,659
1,020.00	14,044	12,899	23,557
1,021.00	16,436	15,240	38,797
1,022.00	18,930	17,683	56,480
1,023.00	21,525	20,228	76,708

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,018.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1.00'
#2	Primary	1,019.00'	18.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,019.00' / 1,018.50' S= 0.0100 '/ Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Secondary	1,022.00'	5.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.22 cfs @ 12.61 hrs HW=1,021.93' (Free Discharge)
 ↑1=Exfiltration (Controls 0.22 cfs)

Primary OutFlow Max=12.56 cfs @ 12.61 hrs HW=1,021.93' TW=0.00' (Dynamic Tailwater)
 ↑2=Culvert (Inlet Controls 12.56 cfs @ 7.11 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=1,018.00' TW=0.00' (Dynamic Tailwater)
 ↑3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Subcatchment 1S: Existing Site

Runoff = 35.78 cfs @ 12.42 hrs, Volume= 3.683 af, Depth= 3.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 200yr 24hr Rainfall=7.53"

Area (ac)	CN	Description
* 11.500	68	Type B Soils
11.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.7	300	0.0330	0.22		Sheet Flow, Sheet Cultivated: Residue>20% n= 0.170 P2= 2.84"
6.2	350	0.0180	0.94		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
0.5	250	0.0480	8.73	174.63	Channel Flow, Channel Area= 20.0 sf Perim= 18.0' r= 1.11' n= 0.040
29.4	900	Total			

Summary for Subcatchment 2S: Proposed Site

Runoff = 97.76 cfs @ 12.13 hrs, Volume= 5.521 af, Depth= 5.76"
 Routed to Pond 1P : Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 200yr 24hr Rainfall=7.53"

Area (ac)	CN	Description
* 5.500	98	Impervious
* 0.500	98	Water
* 5.500	71	Vegetated
11.500	85	Weighted Average
5.500		47.83% Pervious Area
6.000		52.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TC

Summary for Pond 1P: Detention Basin

Inflow Area = 11.500 ac, 52.17% Impervious, Inflow Depth = 5.76" for 200yr 24hr event
 Inflow = 97.76 cfs @ 12.13 hrs, Volume= 5.521 af
 Outflow = 82.20 cfs @ 12.17 hrs, Volume= 5.476 af, Atten= 16%, Lag= 2.5 min
 Primary = 82.20 cfs @ 12.17 hrs, Volume= 5.476 af
 Routed to Pond 2P : Infiltration Basin

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,022.74' @ 12.17 hrs Surf.Area= 24,197 sf Storage= 73,341 cf

Plug-Flow detention time= 204.2 min calculated for 5.476 af (99% of inflow)
 Center-of-Mass det. time= 199.2 min (984.2 - 785.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,019.00'	79,711 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,019.00	15,247	0	0
1,020.00	17,499	16,373	16,373
1,021.00	19,852	18,676	35,049
1,022.00	22,306	21,079	56,128
1,023.00	24,860	23,583	79,711

Device	Routing	Invert	Outlet Devices
#1	Primary	1,018.50'	18.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,018.50' / 1,018.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,019.00'	5.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	1,021.10'	36.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Primary	1,022.00'	40.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=76.78 cfs @ 12.17 hrs HW=1,022.72' TW=1,020.90' (Dynamic Tailwater)

- 1=Culvert (Inlet Controls 11.47 cfs @ 6.49 fps)
- 2=Orifice/Grate (Passes < 0.89 cfs potential flow)
- 3=Orifice/Grate (Passes < 43.27 cfs potential flow)
- 4=Broad-Crested Rectangular Weir (Weir Controls 65.30 cfs @ 2.28 fps)

Summary for Pond 2P: Infiltration Basin

Inflow Area = 11.500 ac, 52.17% Impervious, Inflow Depth > 5.71" for 200yr 24hr event
 Inflow = 82.20 cfs @ 12.17 hrs, Volume= 5.476 af
 Outflow = 18.24 cfs @ 12.41 hrs, Volume= 5.240 af, Atten= 78%, Lag= 14.2 min
 Discarded = 0.23 cfs @ 12.41 hrs, Volume= 0.486 af
 Primary = 14.00 cfs @ 12.41 hrs, Volume= 4.589 af
 Routed to Link 1L : Basin Outflow
 Secondary = 4.01 cfs @ 12.41 hrs, Volume= 0.165 af
 Routed to Link 1L : Basin Outflow

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 1,022.46' @ 12.41 hrs Surf.Area= 20,115 sf Storage= 65,394 cf

Plug-Flow detention time= 138.1 min calculated for 5.234 af (96% of inflow)
 Center-of-Mass det. time= 80.2 min (1,064.4 - 984.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,018.00'	76,708 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,018.00	9,564	0	0
1,019.00	11,753	10,659	10,659
1,020.00	14,044	12,899	23,557
1,021.00	16,436	15,240	38,797
1,022.00	18,930	17,683	56,480
1,023.00	21,525	20,228	76,708

Device	Routing	Invert	Outlet Devices
#1	Discarded	1,018.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 1.00'
#2	Primary	1,019.00'	18.0" Round Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 1,019.00' / 1,018.50' S= 0.0100 '/ Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Secondary	1,022.00'	5.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

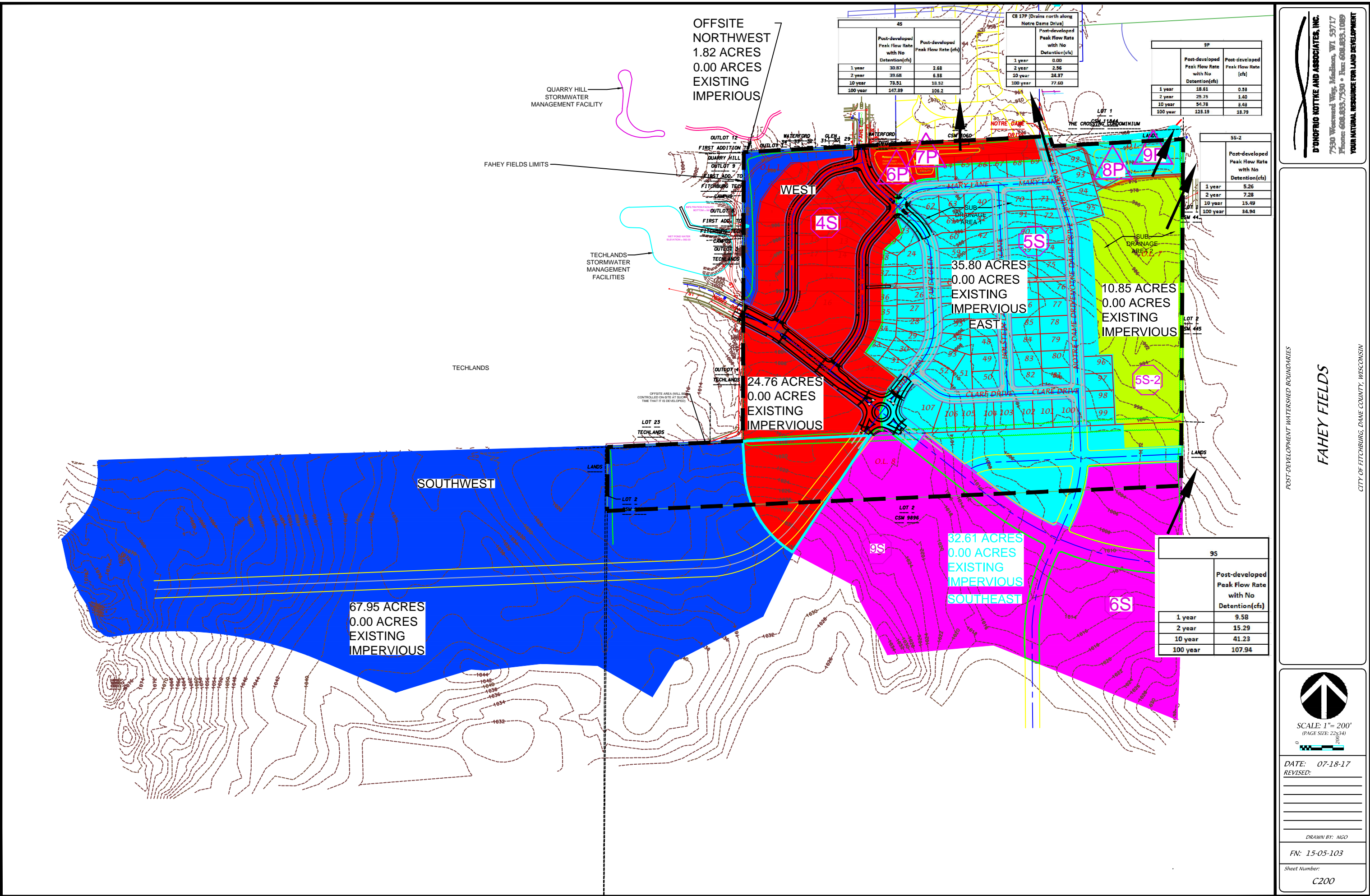
Discarded OutFlow Max=0.23 cfs @ 12.41 hrs HW=1,022.45' (Free Discharge)
 ↑1=Exfiltration (Controls 0.23 cfs)

Primary OutFlow Max=13.99 cfs @ 12.41 hrs HW=1,022.45' TW=0.00' (Dynamic Tailwater)
 ↑2=Culvert (Inlet Controls 13.99 cfs @ 7.92 fps)

Secondary OutFlow Max=3.97 cfs @ 12.41 hrs HW=1,022.45' TW=0.00' (Dynamic Tailwater)
 ↑3=Broad-Crested Rectangular Weir (Weir Controls 3.97 cfs @ 1.75 fps)

APPENDIX C

BYPASS PIPE SIZING



OFFSITE
NORTHWEST
1.82 ACRES
0.00 ACRES
EXISTING
IMPERVIOUS

	4S	
	Post-developed Peak Flow Rate with No Detention(cfs)	Post-developed Peak Flow Rate (cfs)
1 year	30.87	2.68
2 year	39.68	6.38
10 year	78.51	18.52
100 year	147.89	108.2

	CB 17P (Drains north along Notre Dame Drive)	
	Post-developed Peak Flow Rate with No Detention(cfs)	Post-developed Peak Flow Rate (cfs)
1 year	0.00	0.00
2 year	2.56	2.56
10 year	24.37	24.37
100 year	77.60	77.60

	9P	
	Post-developed Peak Flow Rate with No Detention(cfs)	Post-developed Peak Flow Rate (cfs)
1 year	18.61	0.98
2 year	25.75	1.40
10 year	54.78	3.43
100 year	128.19	18.79

	9S-2	
	Post-developed Peak Flow Rate with No Detention(cfs)	Post-developed Peak Flow Rate (cfs)
1 year	5.26	5.26
2 year	7.28	7.28
10 year	15.49	15.49
100 year	34.94	34.94

	9S	
	Post-developed Peak Flow Rate with No Detention(cfs)	Post-developed Peak Flow Rate (cfs)
1 year	9.58	9.58
2 year	15.29	15.29
10 year	41.23	41.23
100 year	107.94	107.94

67.95 ACRES
0.00 ACRES
EXISTING
IMPERVIOUS

24.76 ACRES
0.00 ACRES
EXISTING
IMPERVIOUS

32.61 ACRES
0.00 ACRES
EXISTING
IMPERVIOUS
SOUTHEAST

35.80 ACRES
0.00 ACRES
EXISTING
IMPERVIOUS

10.85 ACRES
0.00 ACRES
EXISTING
IMPERVIOUS

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YOUR NATURAL RESOURCE FOR LAND DEVELOPMENT

POST-DEVELOPMENT WATERSHED BOUNDARIES

FAHEY FIELDS

CITY OF FITCHBURG, DANE COUNTY, WISCONSIN



SCALE: 1" = 200'
(PAGE SIZE: 22x34)

DATE: 07-18-17
REVISED:

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FN: 15-05-103

Sheet Number:
C200

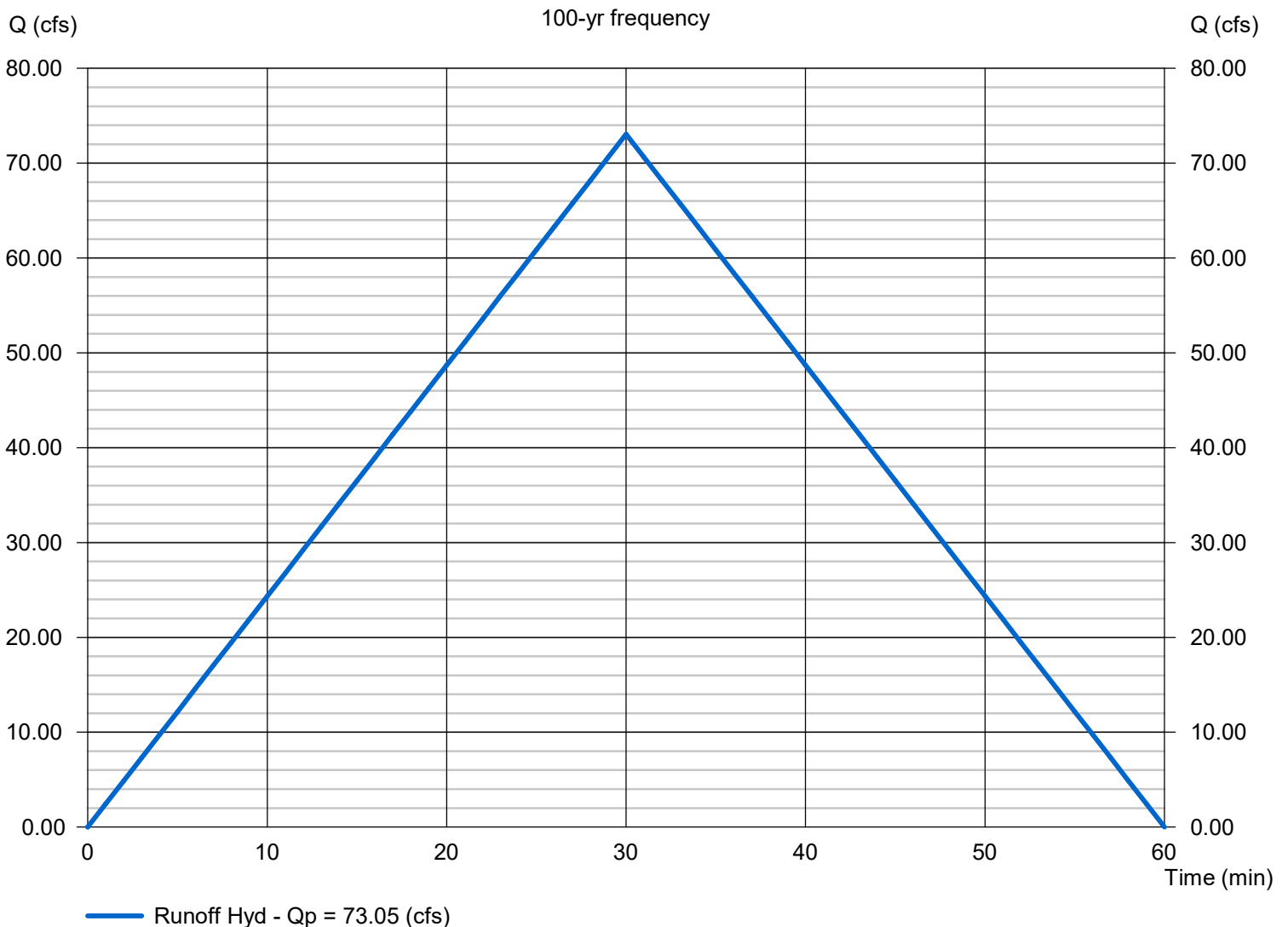
Hydrology Report

Offsite Lands to West

Hydrograph type	= Rational	Peak discharge (cfs)	= 73.05
Storm frequency (yrs)	= 100	Time interval (min)	= 1
Drainage area (ac)	= 67.950	Runoff coeff. (C)	= 0.25
Rainfall Inten (in/hr)	= 4.300	Tc by User (min)	= 30
IDF Curve	= Fitchburg IDF.IDF	Rec limb factor	= 1.00

Hydrograph Volume = 131,483 (cuft); 3.018 (acft)

Runoff Hydrograph



Channel Report

<Name>

Circular

Diameter (ft) = 3.50

Invert Elev (ft) = 1018.00

Slope (%) = 0.50

N-Value = 0.013

Calculations

Compute by: Q vs Depth

No. Increments = 10

Highlighted

Depth (ft) = 3.15

Q (cfs) = 75.84

Area (sqft) = 9.12

Velocity (ft/s) = 8.31

Wetted Perim (ft) = 8.75

Crit Depth, Yc (ft) = 2.73

Top Width (ft) = 2.09

EGL (ft) = 4.22

