



City of Fitchburg
 Planning/Zoning Department
 5520 Lacy Road
 Fitchburg, WI 53711
 (608-270-4200)

LAND DIVISION APPLICATION

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: 18

4. No. Of Buildable Lots Proposed: 13

5. Zoning District: Existing: A-T & R-D; Proposed: PDD/GIP

6. Current Owner of Property: Hartung Brothers, Inc

Address: 2662 Blaney Road Phone No: 608-852-8772

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: 

Owner's or Authorized Agent's Signature

Steven J. Hartung

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: June 21, 2022

Ordinance Section No. _____ Fee Paid: \$3,815

Permit Request No. PP-2462-22

Receipt No: 18.000451

Jun 23, 2022

DAY, DAN D'ONOFRIO, KOTTKE & ASSOCIATES

LICENSES & PERMITS

PP-2462-22 3,815.00

Total: 3,815.00

CHECK

Check No: 799 3,815.00

Payor:

SARA INVESTMENT REAL ESTATE

Total Applied: 3,815.00

Change Tendered: .00

06/23/2022 02:58PM

CITY OF FITCHBURG

5520 LACY RD

FITCHBURG WI 53711

608-270-4200

June 21, 2022

Deanna Schmidt
City of Fitchburg – Planning & Zoning
5520 Lacy Road
Fitchburg, WI 53711

RE: Hartung Fields
Preliminary Plat Submittal

Dear Deanna:

On behalf of Sara Investment Real Estate and Hartung Brothers, we are pleased to submit for the Preliminary Plat for Hartung Fields. Vandewalle Associates will be providing a separate zoning submittal for the City's review. The preliminary plat proposes to divide the current parcels into lots for employment, retail and multifamily uses along with maintaining the existing uses for the Hartung Brothers seed and farming operations. More detail on the land use is included in the zoning submittal.

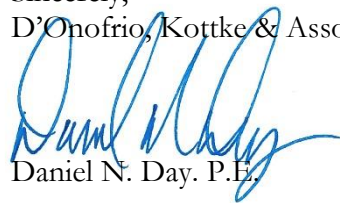
Enclosed with the Preliminary Plat Submittal is the following:

- Land Division Application (1 copy)
- Check in the amount of \$3,815 for the Application Fee
- Preliminary Plat (34" x 44" - 1 copy, 11" x 17" - 1 copy)
- Preliminary Engineering Plans (1 copy)
- Draft Storm Water Management Report (1 copy)

All the above information will be submitted in digital format.

We look forward to working with the City of Fitchburg in the review and approval of this project.

Sincerely,
D'Onofrio, Kottke & Associates, Inc.



Daniel N. Day, P.E.

cc: Jonathan Stevens, Sara Investment Real Estate
Brian Munson, Vandewalle Associates



SURVEYOR'S CERTIFICATE

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

Dated this 21st day of June, 2022.

Brett T. Stoffregen
BRETT T. STOFFREGEN, Professional Land Surveyor, S-2742

LEGAL DESCRIPTION

A parcel of land and Blaney Road to be vacated by the City of Fitchburg, located in O.L. 1 & 2 of the NE1/4 of the NE1/4 and the SE1/4 of the NE1/4 of Section 14, T6N, R14E, City of Fitchburg, Dane County, Wisconsin to-wit:

Commencing at the North 1/4 corner of said Section 14; thence S88°02'00"E, 44.82 feet along the north line of said NE1/4 to the point of beginning; thence continuing S88°02'00"E, 648.78 feet; thence S01°58'00"W, 33.00 feet; thence S52°21'18"E, 122.96 feet; thence S88°02'00"E, 120.00 feet; thence N75°59'53"E, 260.03 feet; thence N01°58'00"E, 33.00 feet to a point on the north line of said NE1/4; thence S88°02'00"E, 1100.04 feet along said north line; thence S01°57'59"W, 33.00 feet; thence S85°49'41"E, 441.37 feet to a point on the East line of said NE1/4; also being on the West right-of-way line of U.S.M. 141; thence S00°45'14"W, 2086.81 feet along said East line and West right-of-way line to a point of curve; thence along said West right-of-way line along a curve to the right which has a radius of 11,317.85 feet and a chord which bears S03°04'05"W, 584.23 feet to a point on the South line of said NE1/4; thence N88°04'04"W, 2698.24 feet along said South line to the center of said Section 14; thence N87°19'33"E, 23.23 feet along the South line of said NE1/4 to a point of curve on the East right-of-way line of former Chicago & Northwestern Railroad right-of-way; thence northerly along said East right-of-way line on a curve to the right which has a radius of 8,538.75 feet and a chord which bears S00°12'15"E, 644.24 feet; thence N02°25'24"E, 1484.26 feet along said East right-of-way line to a point of curve; thence northerly along said East right-of-way line on a curve to the right which has a radius of 4,021.42 feet and a chord which bears N05°11'17"E, 604.81 feet to the point of beginning. Containing 167.569 acres.

- NOTES**
- All intersection right-of-way radii are 15', unless noted.
 - Existing Zonings: Rural Development, Exclusive Agriculture, Proposed Zonings.
 - Land Owner/Subdividers:
 - Parkland Brothers, Inc., 708 Heartland Trail, Suite 2000, Madison, WI
 - Land Properties, Inc., 120 E. Lakeside Street, WI
 - Surveyors and Engineers:
 - D'Onofrio Kottke & Assoc., 7550 Westward Way, Madison, WI
 - Other Designations:
 - O.L. 1: Dedicated to the Public for Stormwater Management
 - O.L. 2: Dedicated to the Public for Blaney/Harvester Farm purposes
 - O.L. 3: Dedicated to the Public for Park purposes
 - O.L. 4: Dedicated to the Public for Park purposes
 - O.L. 5: Dedicated to the Public for Stormwater Management

LEGEND

●	FOUND 1" IRON PIPE
●	FOUND 1-1/4" REBAR
●	FOUND 3/4" REBAR
SS	SANITARY SEWER
W	WATER MAIN
ST	STORM SEWER
G	GAS MAIN
OHE	OVERHEAD ELECTRIC
UHE	UNDERGROUND ELECTRIC
UT	UNDERGROUND TELECOMMUNICATION
□	ELECTRIC BOX
□	TELECOMMUNICATION PEDESTAL
□	TELECOMMUNICATION VAULT
○	MANHOLE
○	CATCH BASIN/INLET
○	POWER POLE
○	POWER POLE W/LIGHT
○	LIGHT POLE
○	VALVE
○	HYDRANT
□	CONCRETE
—	FENCE
—	CONCRETE CURB AND GUTTER
—	RAILROAD TRACK
WL	WETLANDS

DATE: 06-21-22 REVISED: FN: 21-07-130 Sheet Number: 1 of 1	SCALE: 1" = 100' (PAGE SIZE: 34X44) GRID NORTH WISCONSIN COORDINATE REFERENCE SYSTEMS (DANE ZONE) NAD83(2011)	PRELIMINARY PLAT HARTUNG FIELDS CITY OF FITCHBURG, DANE COUNTY, WISCONSIN	 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
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HARTUNG FIELDS PRELIMINARY ENGINEERING PLANS

CITY OF FITCHBURG DANE COUNTY, WISCONSIN

CONTACTS:

CONSTRUCTION PROJECT MANAGER - TBD

PLAN DESIGNER - D'ONOFRIO, KOTTKE & ASSOCIATES INC.
WILL KOTTLER, 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

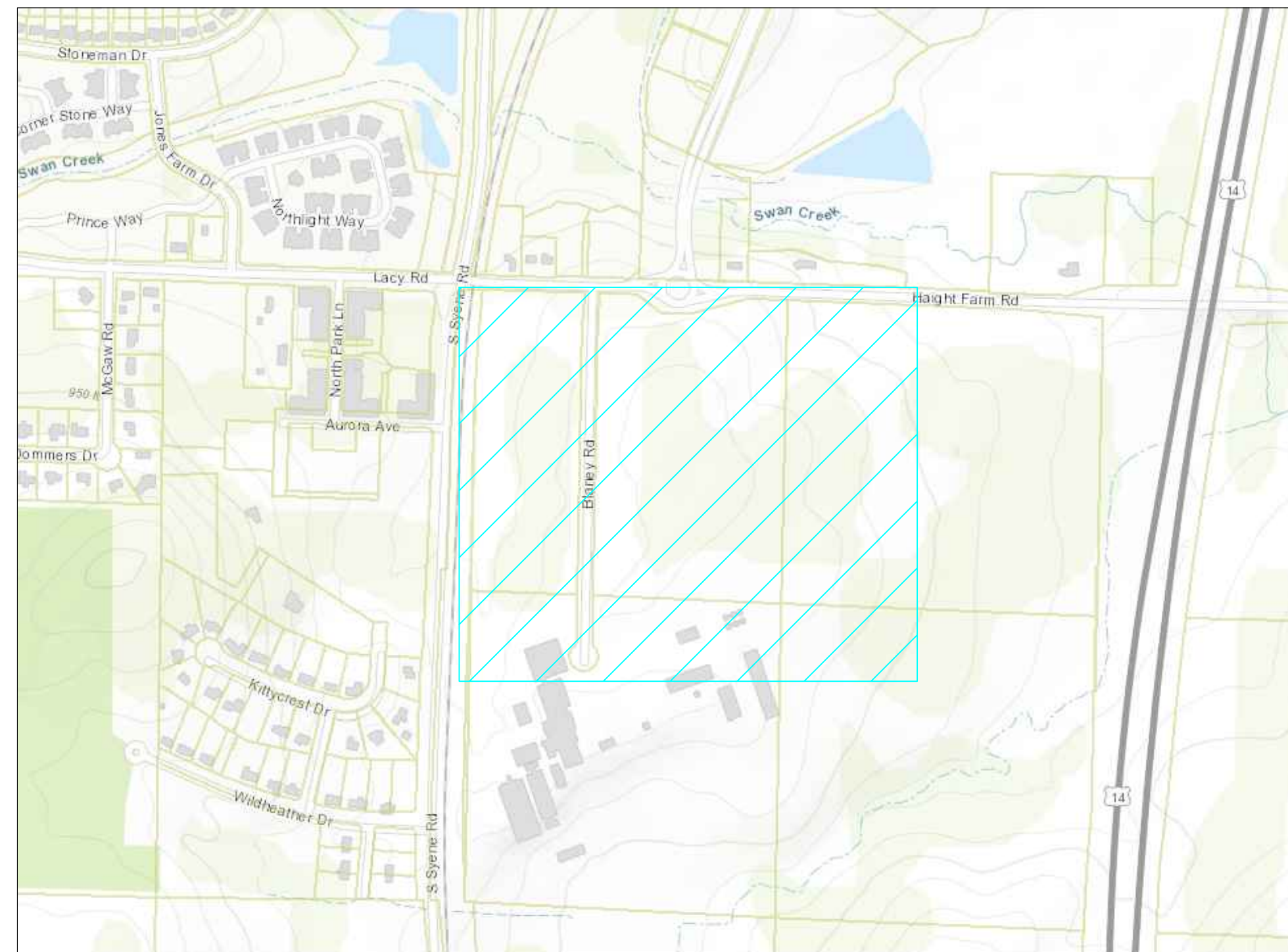
CITY OF FITCHBURG URBAN FORESTER
ANNA HEALY
608-270-4289

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



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SHEET NO.	DESCRIPTION
1	COVER SHEET
2	OVERALL GRADING PLAN
3	PROPOSED GRADING PLAN
4	PROPOSED GRADING PLAN
5	PROPOSED GRADING PLAN
6	PROPOSED GRADING PLAN
7	OVERALL UTILITY PLAN
8	PROPOSED UTILITY PLAN
9	PROPOSED UTILITY PLAN
10	PROPOSED UTILITY PLAN
11	PROPOSED UTILITY PLAN
12	PROPOSED UTILITY PLAN
13	BOTANICAL DRIVE - P&P
14	BOTANICAL DRIVE - P&P
15	BOTANICAL DRIVE - P&P
16	BLANEY ROAD - P&P
17	BLANEY ROAD - P&P
18	BLANEY ROAD - P&P
19	HYBRID WAY - P&P
20	HYBRID WAY - P&P
21	HYBRID WAY - P&P
22	HARVESTER PASS - P&P
23	HARVESTER PASS - P&P
24	HARVESTER PASS - P&P
25	E STREET - P&P



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7530 Westward Way, Madison, WI 53717
Phone: 608.833.7530 • Fax: 608.833.1089
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FN: 21-04-109

ISSUE DATE: 06-21-2022

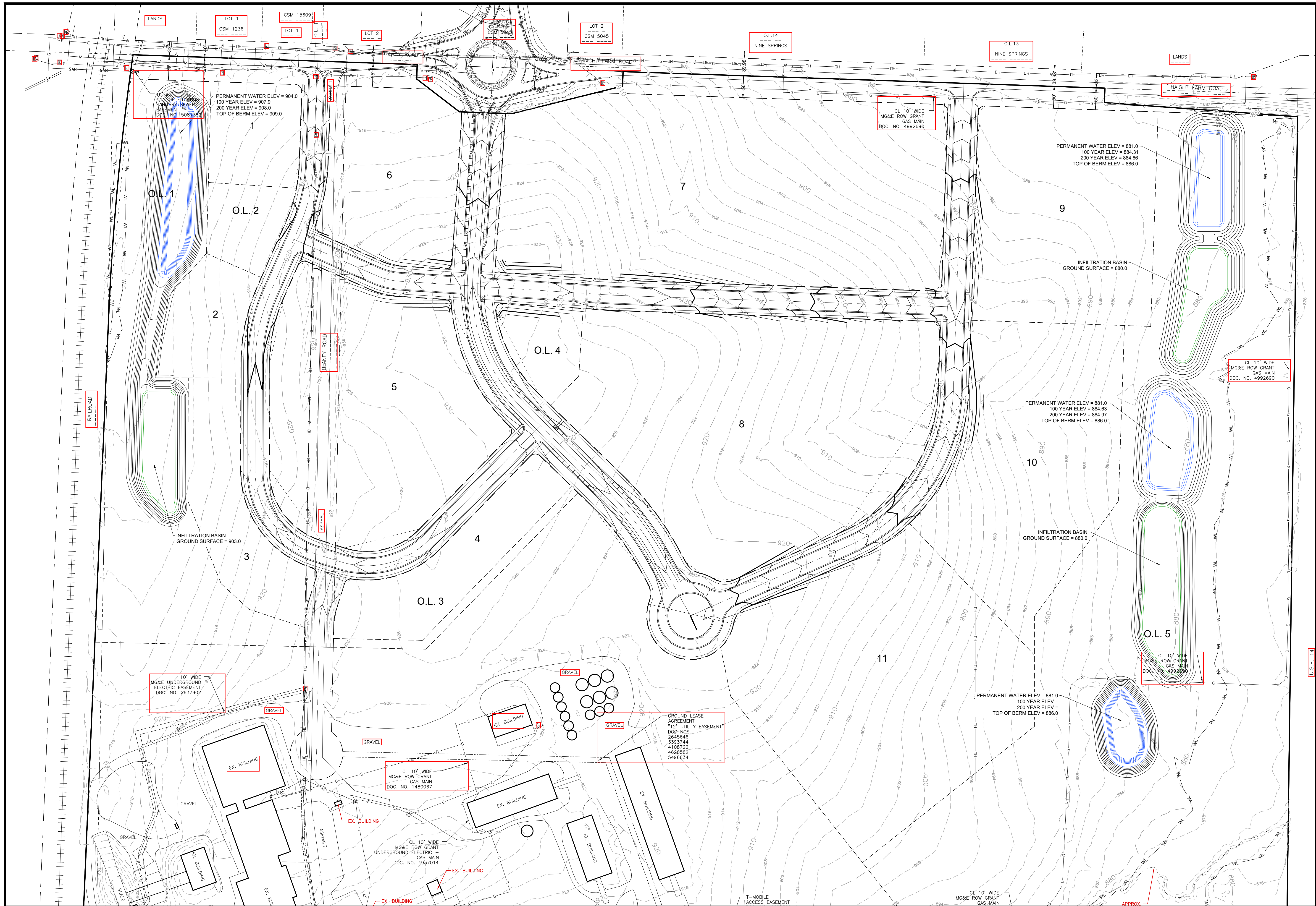
SHEET 1 of 25

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7530 Westward Way, Madison, WI 53717
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COVER
HARTUNG FIELDS
CITY OF FITCHBURG, DANE COUNTY, WI 53711

DATE: 06-21-2022
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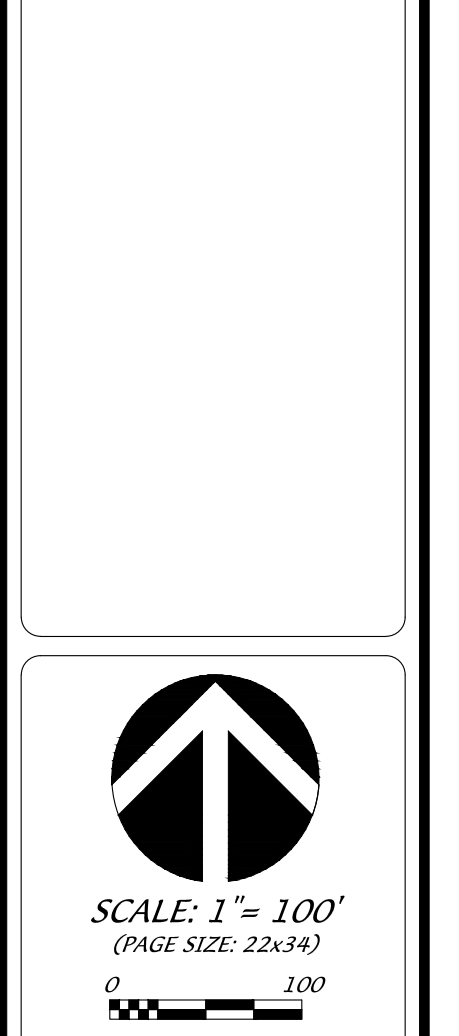
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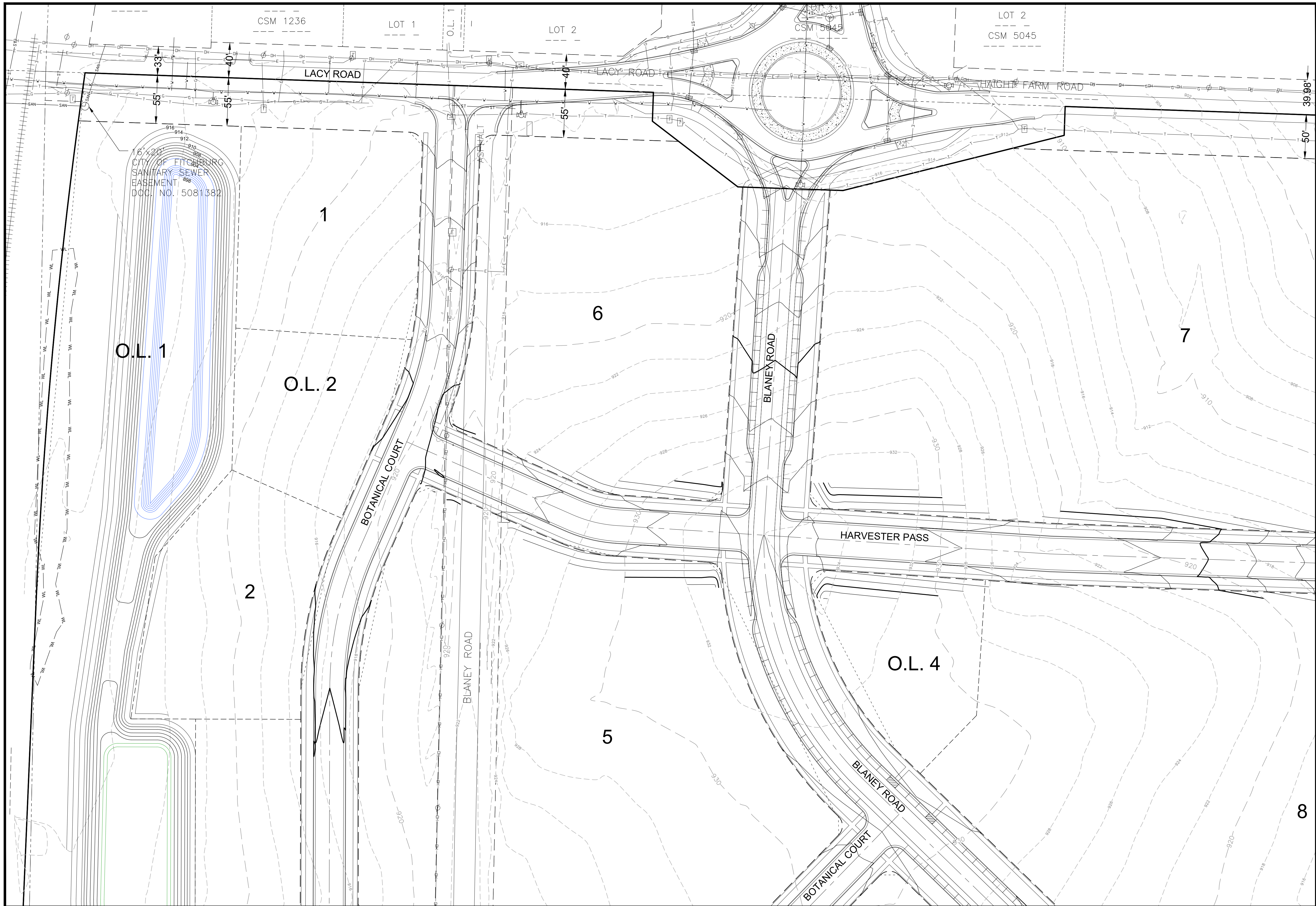
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OVERALL GRADING PLAN
HARTUNG FIELDS
 CITY OF FITCHBURG, DANE COUNTY, WI 53711



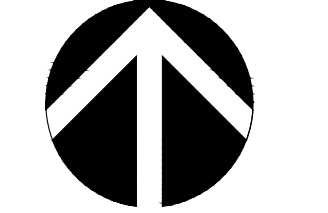
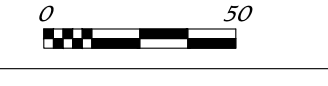
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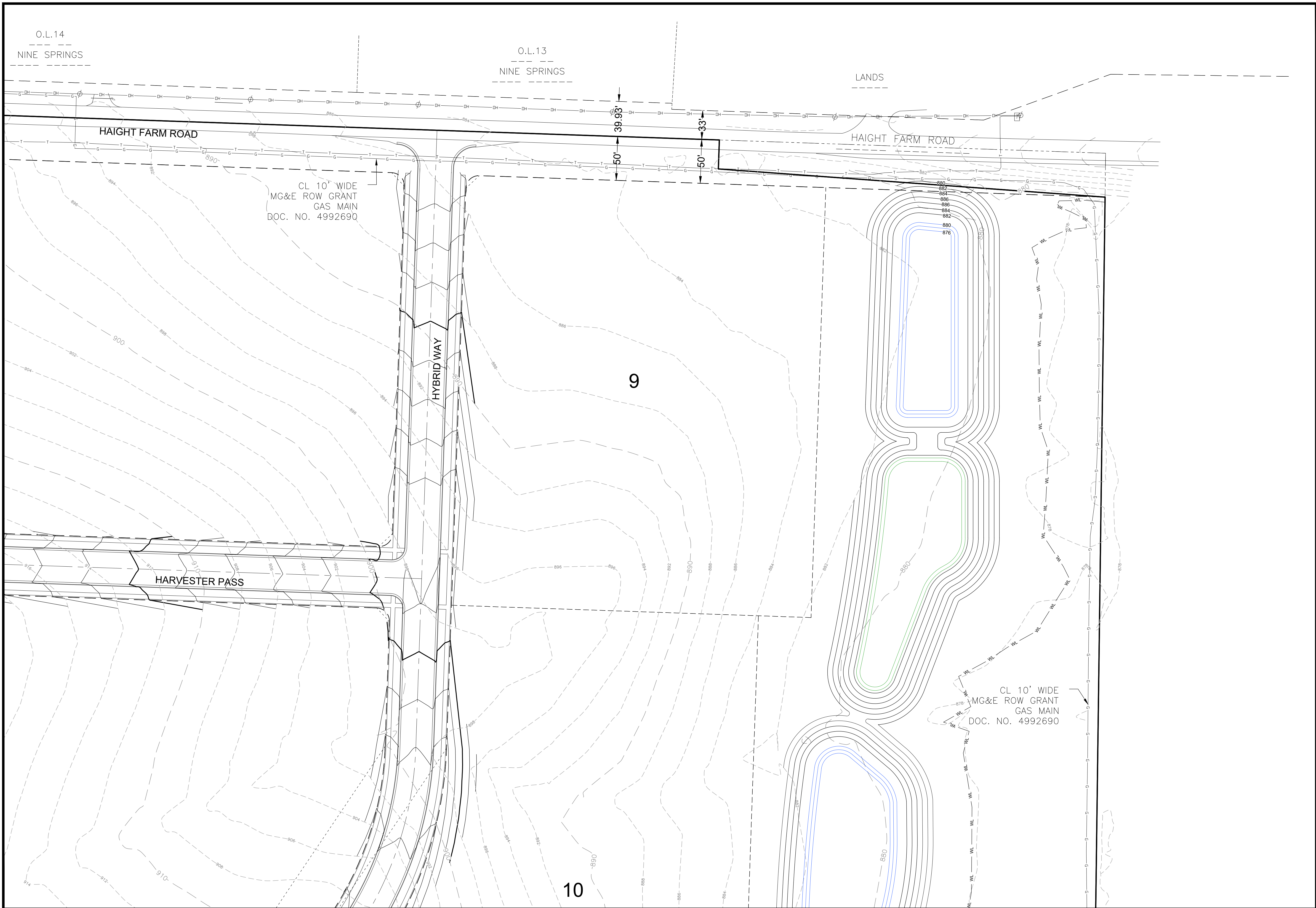
16'x20'
CITY OF FITCHBURG
SANITARY SEWER
EASEMENT
DOC. NO. 5081382

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7530 Westward Way, Madison, WI 53717
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PROPOSED GRADING PLAN
HARTUNG FIELDS
CITY OF FITCHBURG, DANE COUNTY, WI 53711

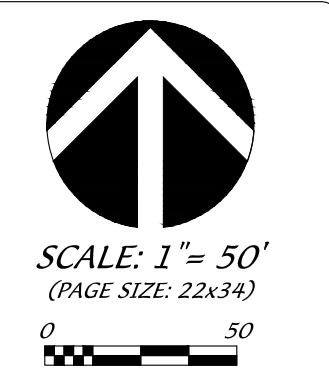

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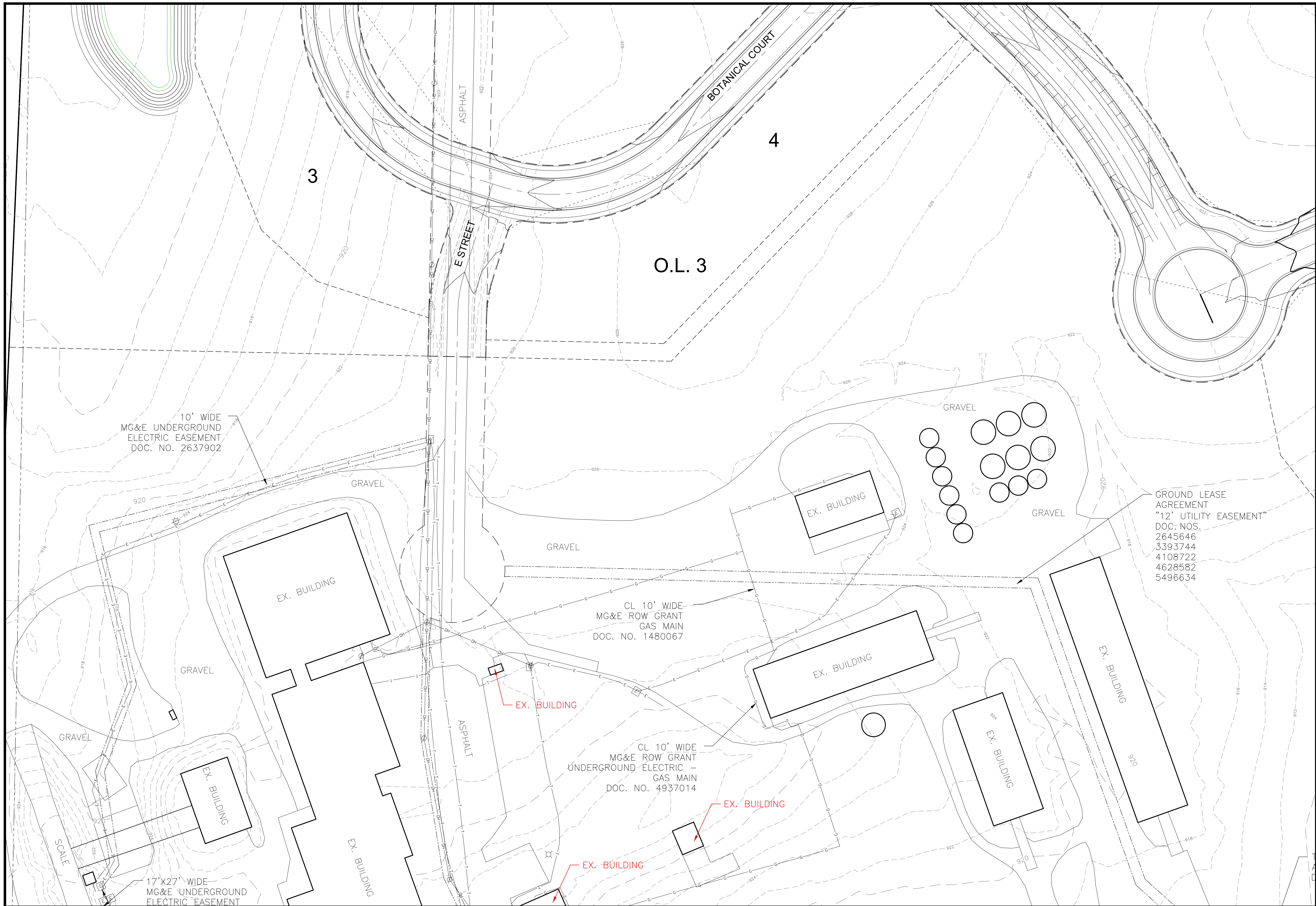
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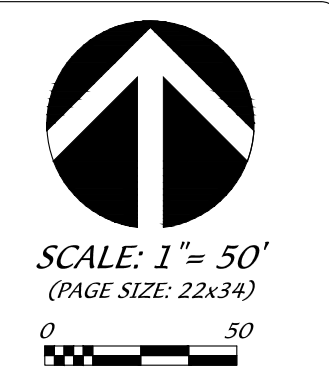


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PROPOSED GRADING PLAN
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 CITY OF FITCHBURG, DANE COUNTY, WI 53711



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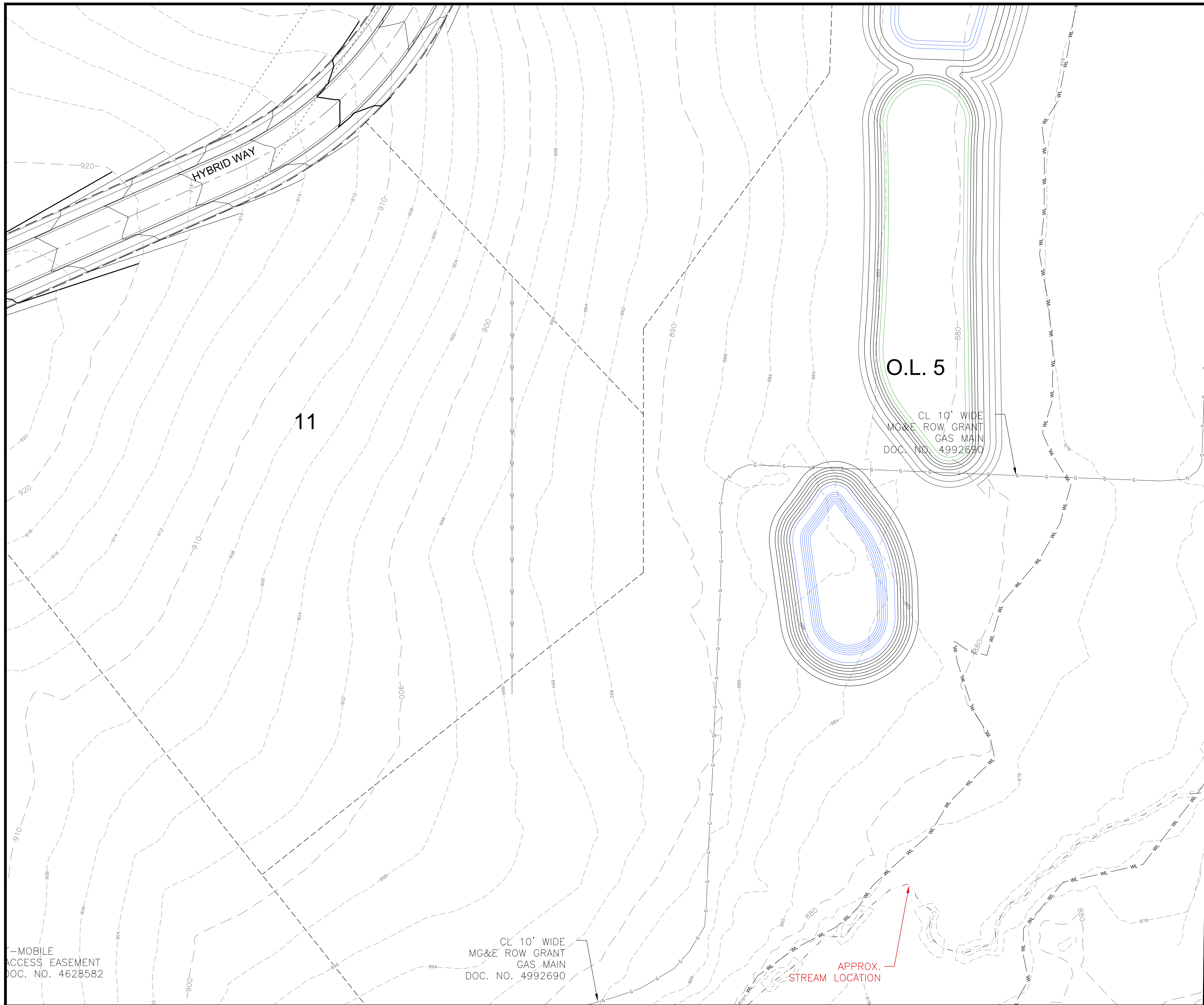
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MOBILE ACCESS EASEMENT
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CL 10' WIDE
MG&E ROW GRANT
GAS MAIN
DOC. NO. 4992690

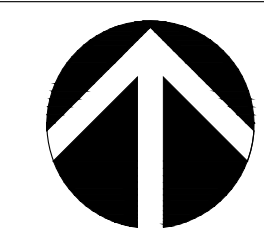
APPROX.
STREAM LOCATION

U.S.H. 14

PROPOSED GRADING PLAN

HARTUNG FIELDS

CITY OF FITCHBURG, DANE COUNTY, WI 53711



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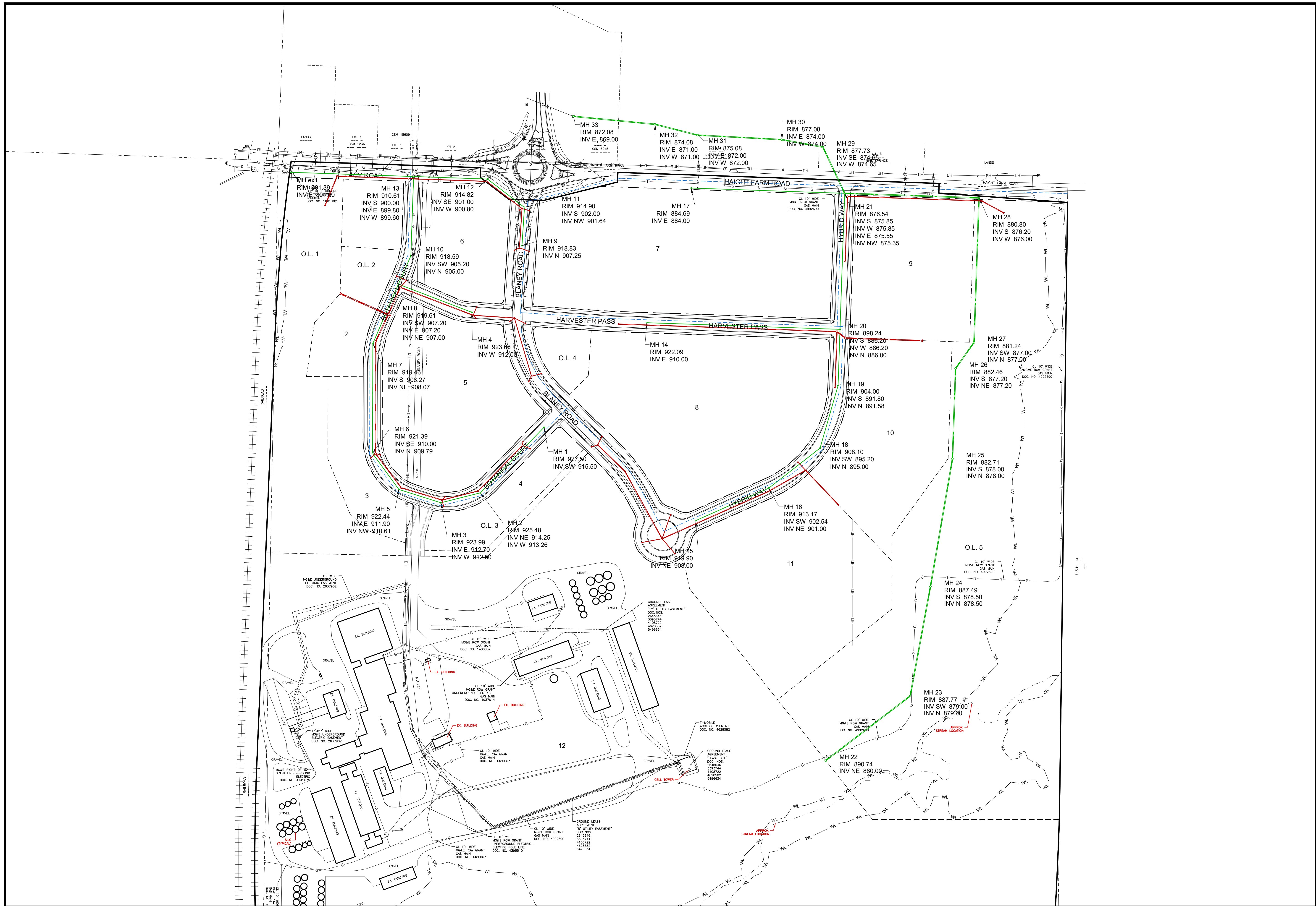
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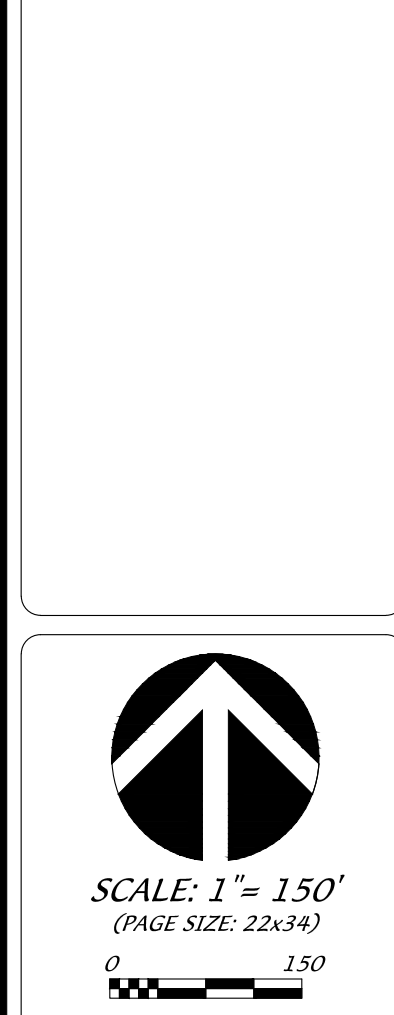
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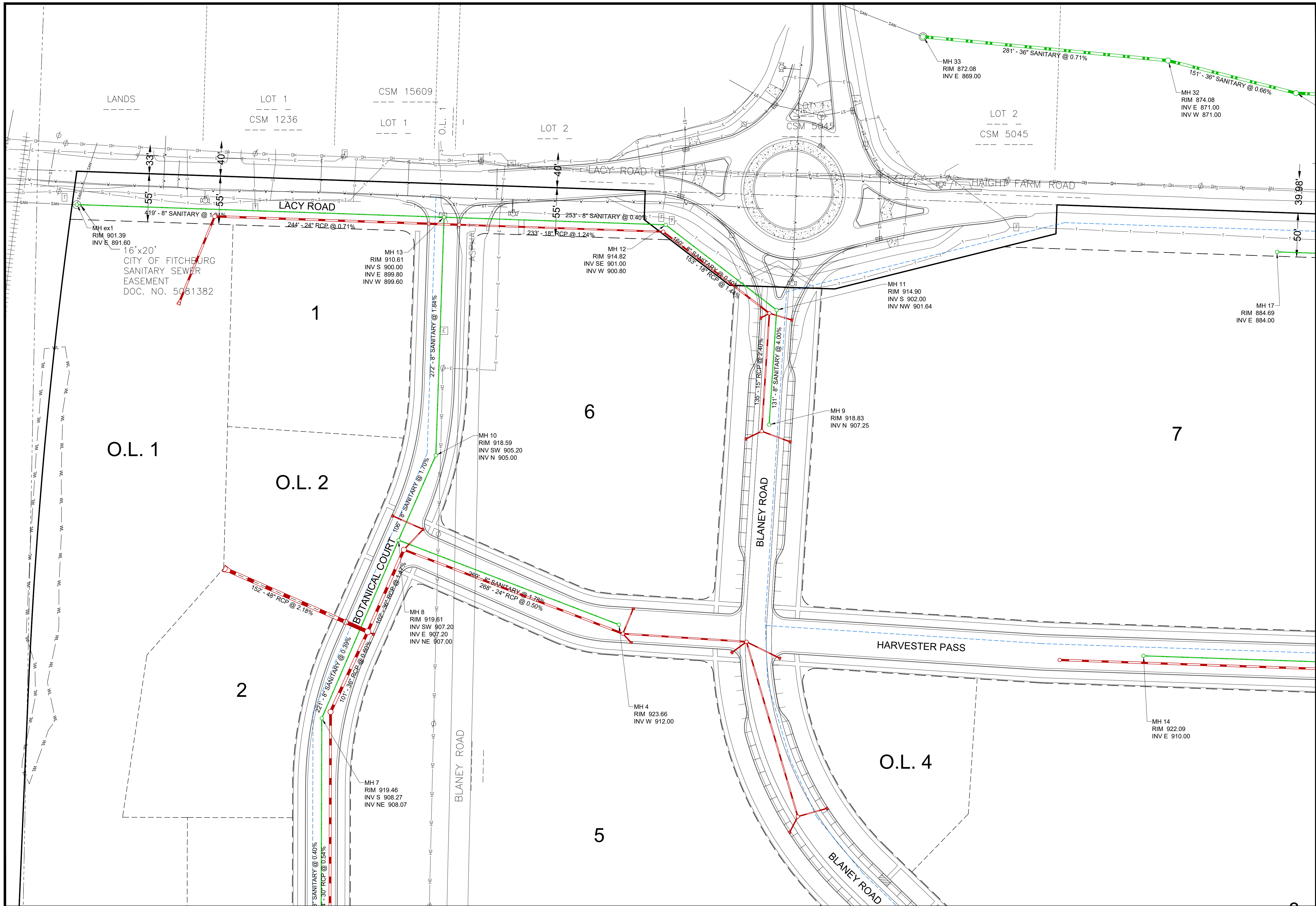
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OVERALL UTILITY PLAN
HARTUNG FIELDS
 CITY OF FITCHBURG, DANE COUNTY, WI 53711

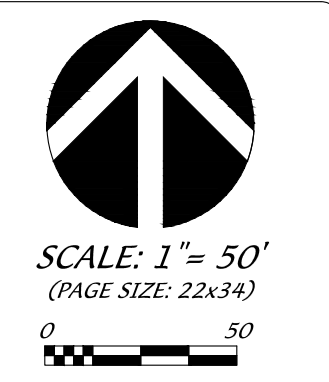


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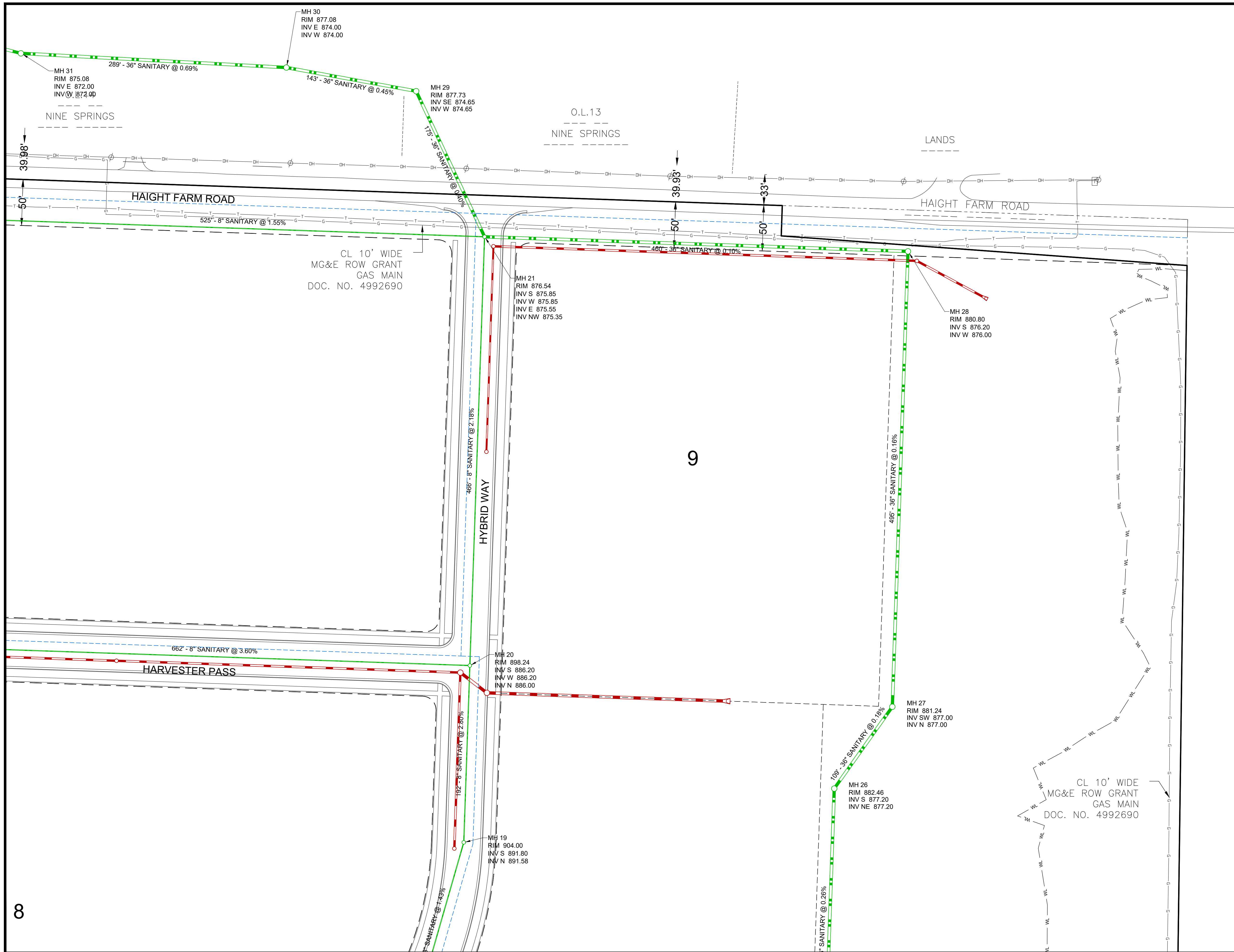


PROPOSED UTILITY PLAN
HARTUNG FIELDS
 CITY OF FITCHBURG, DANE COUNTY, WI 53711

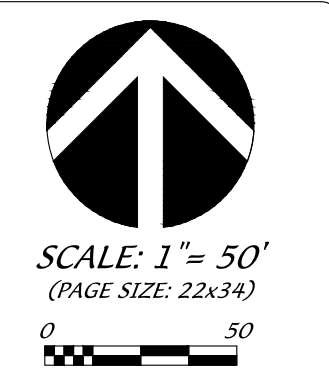


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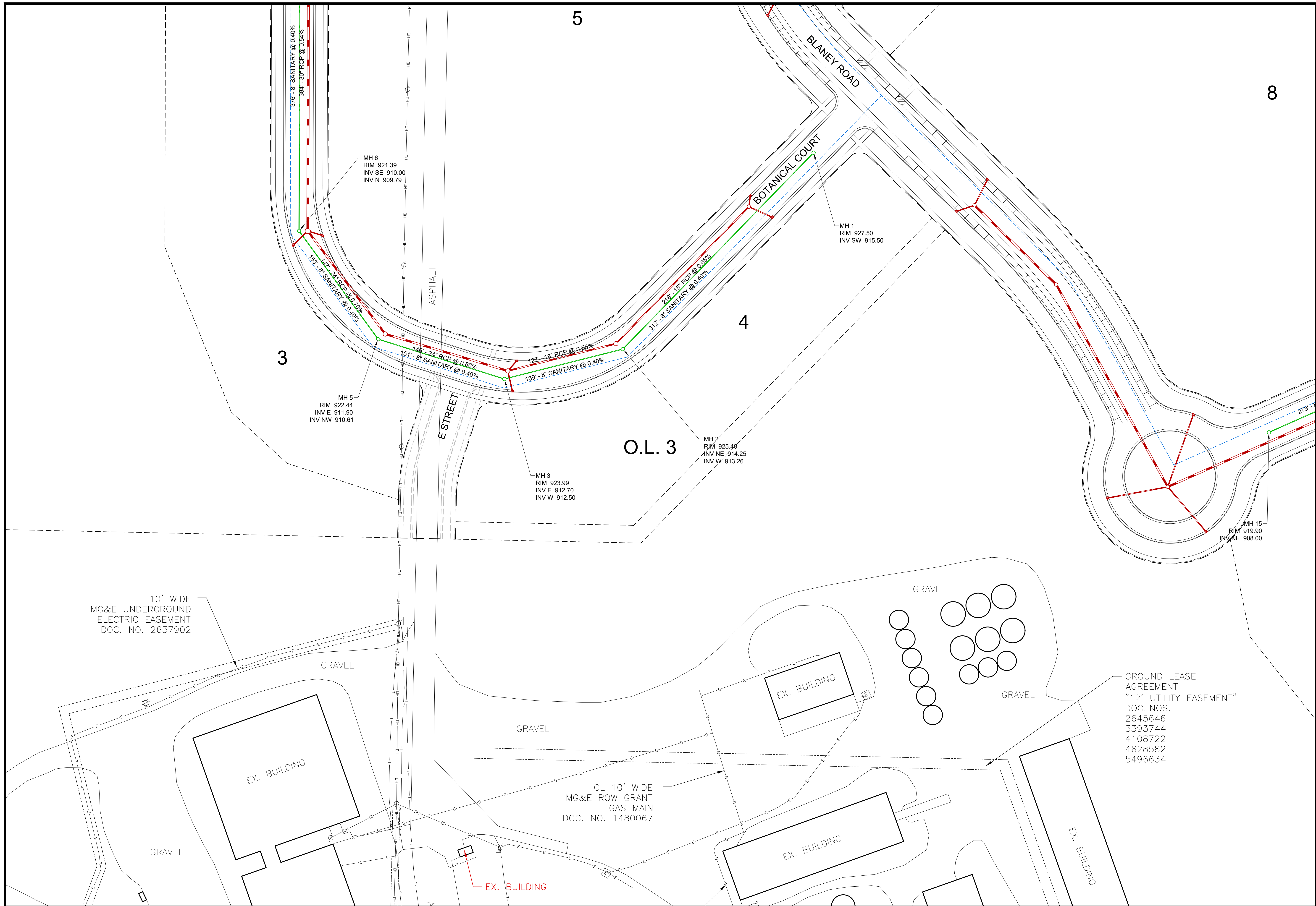


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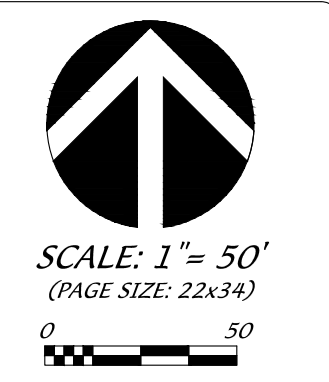
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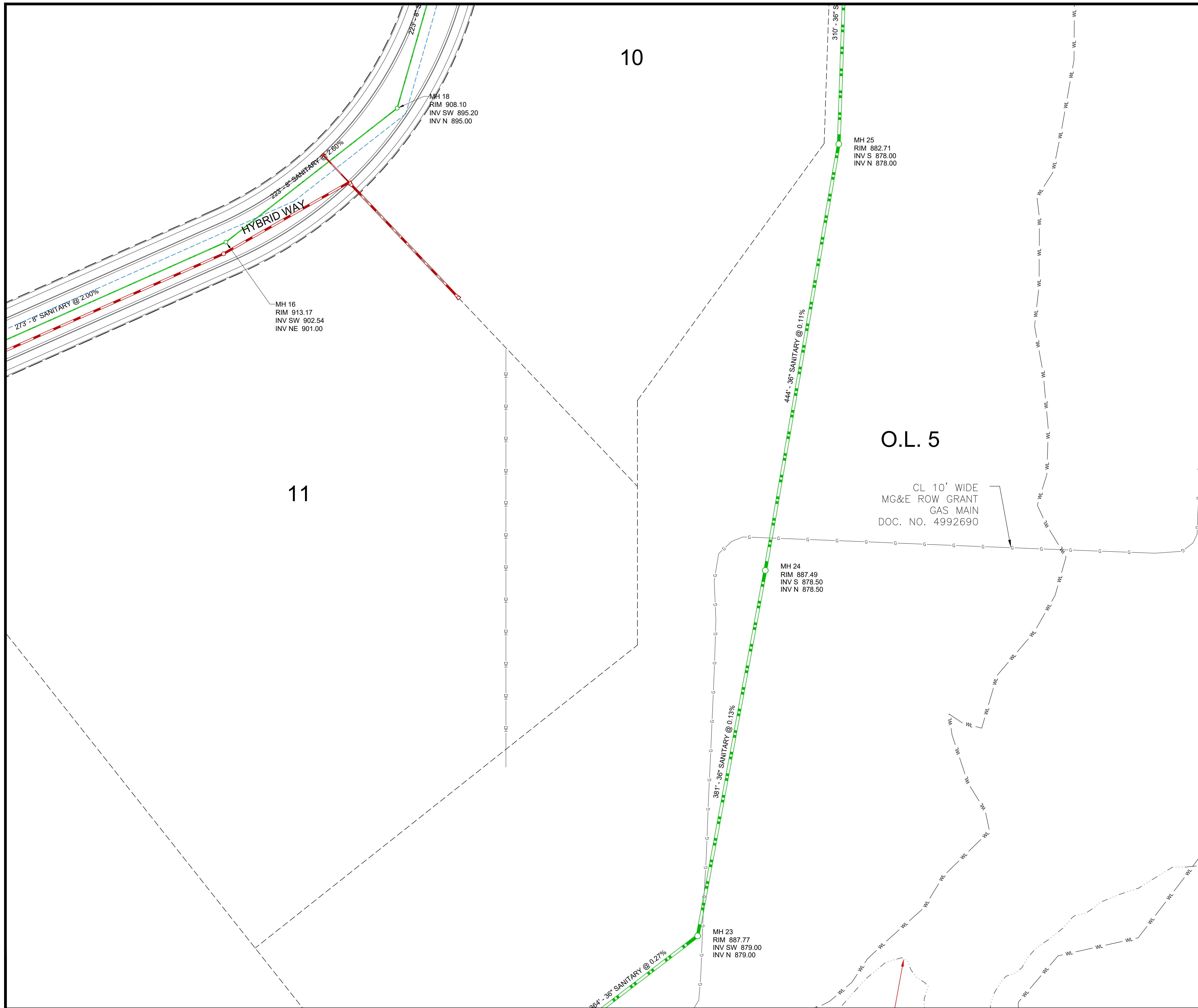
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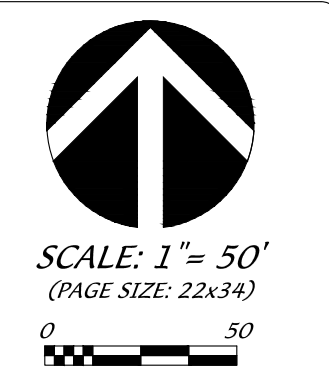
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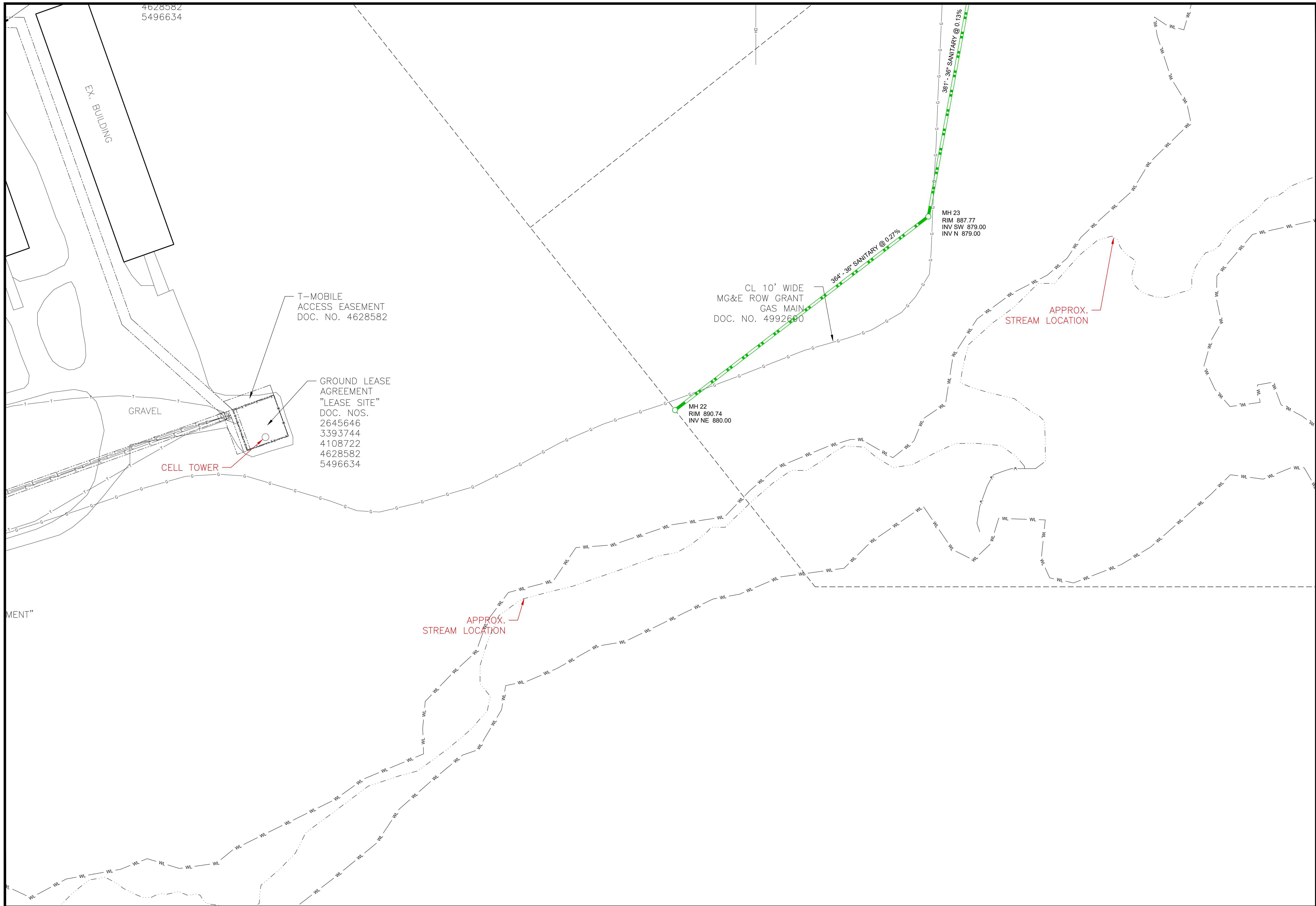


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4628582
5496634

EX. BUILDING

T-MOBILE
ACCESS EASEMENT
DOC. NO. 4628582

GROUND LEASE
AGREEMENT
"LEASE SITE"
DOC. NOS.
2645646
3393744
4108722
4628582
5496634

GRAVEL

CELL TOWER

CL 10' WIDE
MG&E ROW GRANT
GAS MAIN
DOC. NO. 4992680

MH 22
RIM 890.74
INV NE 880.00

MH 23
RIM 887.77
INV SW 879.00
INV N 879.00

364" - 36" SANITARY @ 0.27%

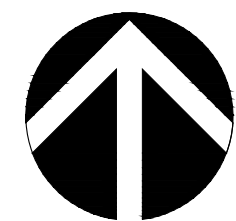
381" - 36" SANITARY @ 0.13%

APPROX.
STREAM LOCATION

APPROX.
STREAM LOCATION

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7530 Westward Way, Madison, WI 53717
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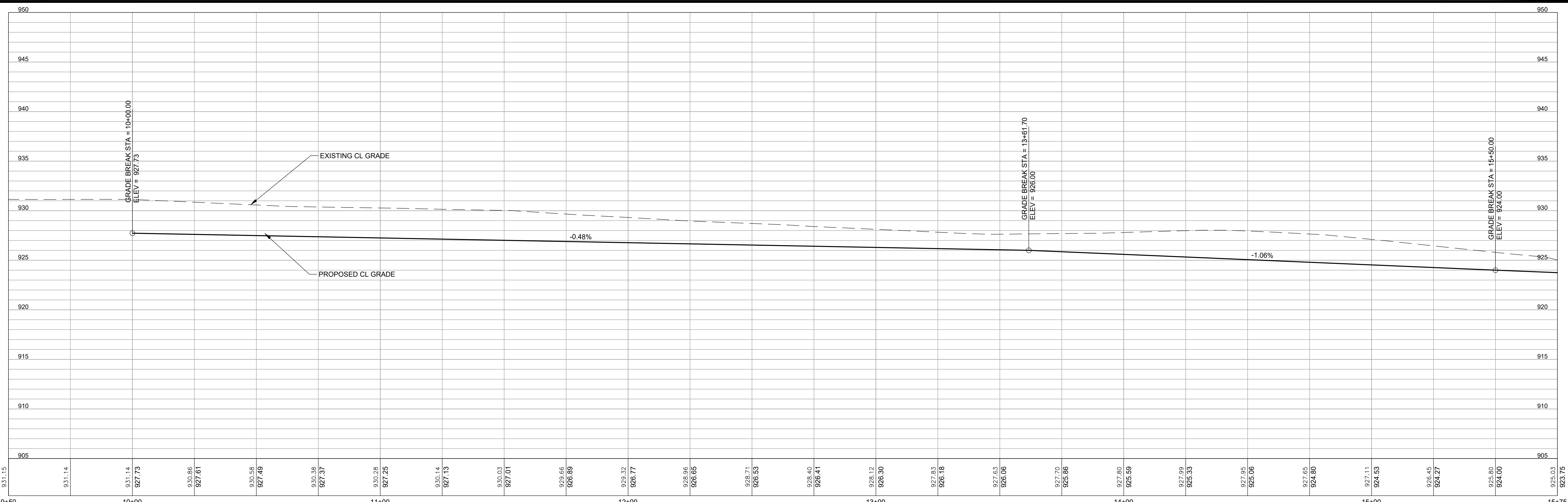
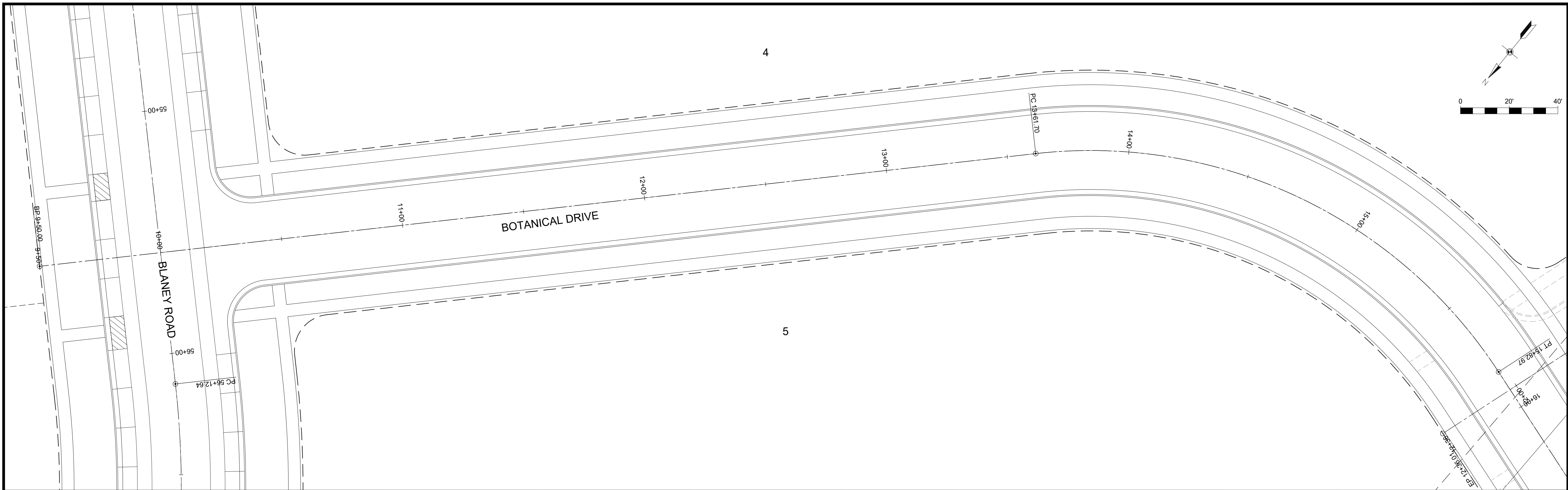
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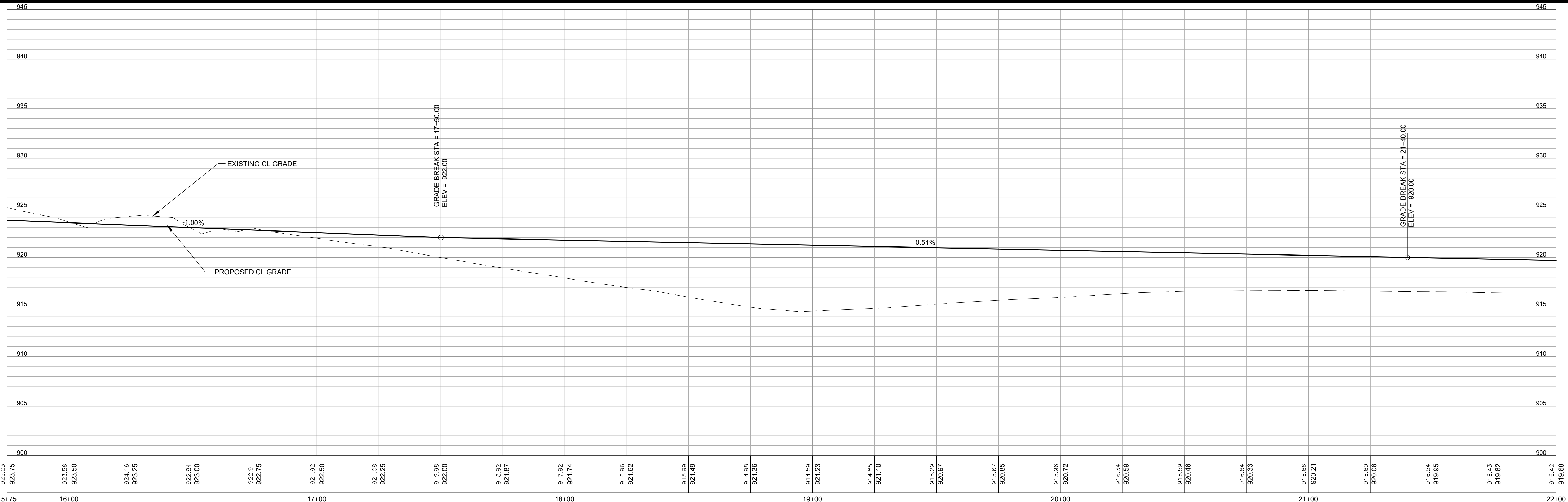
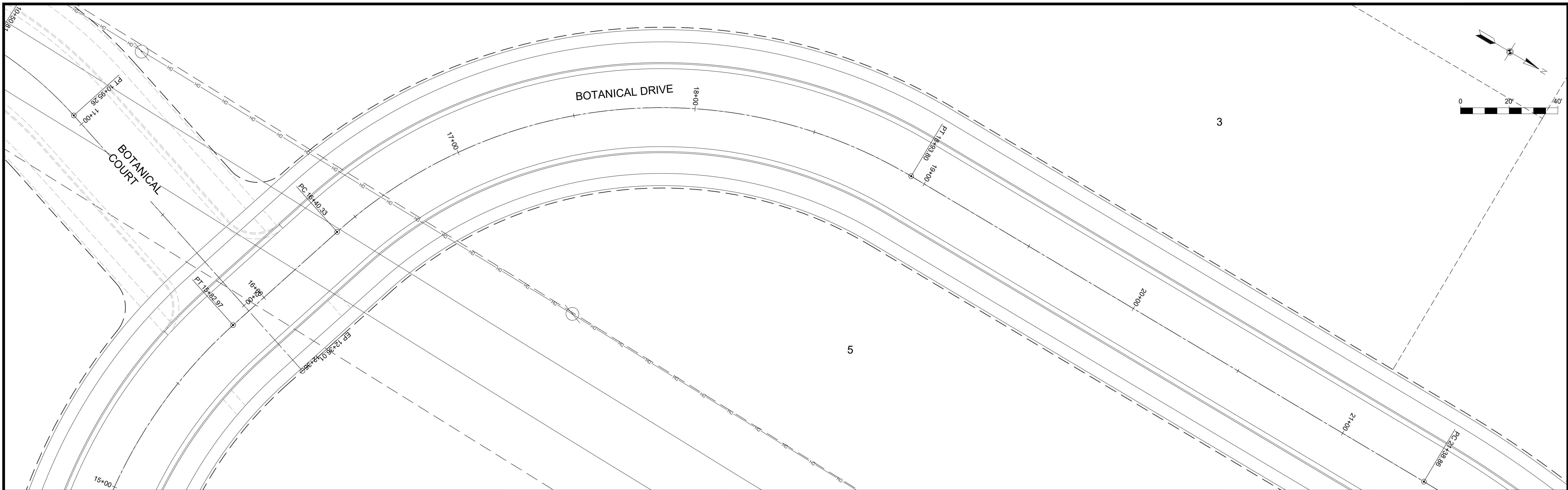
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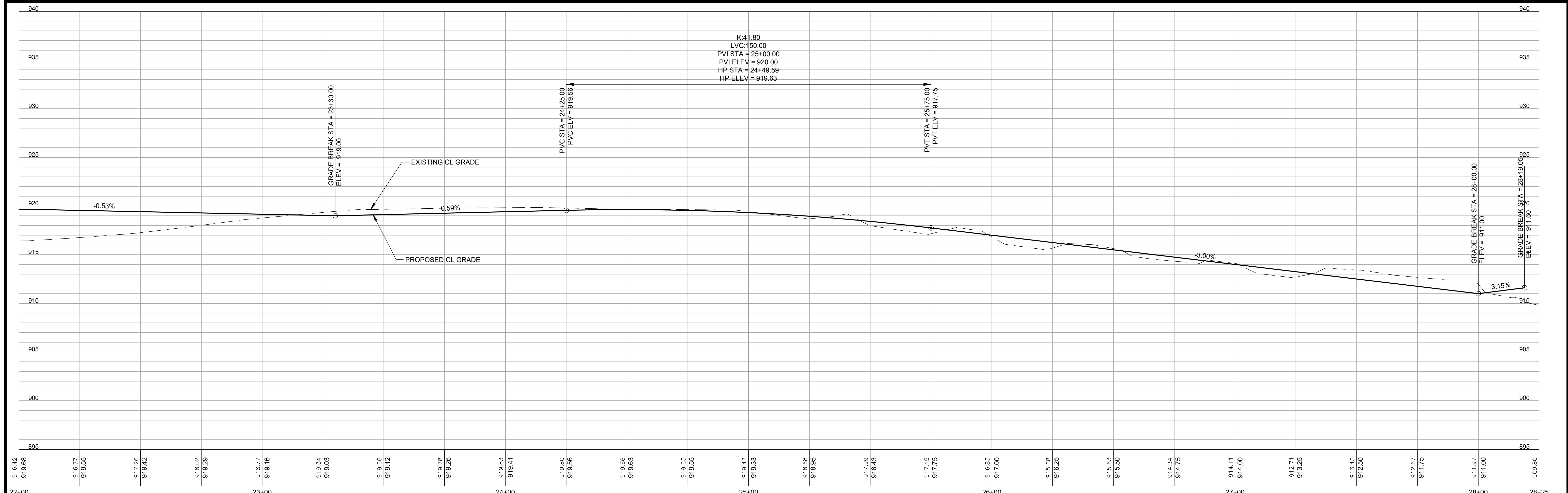
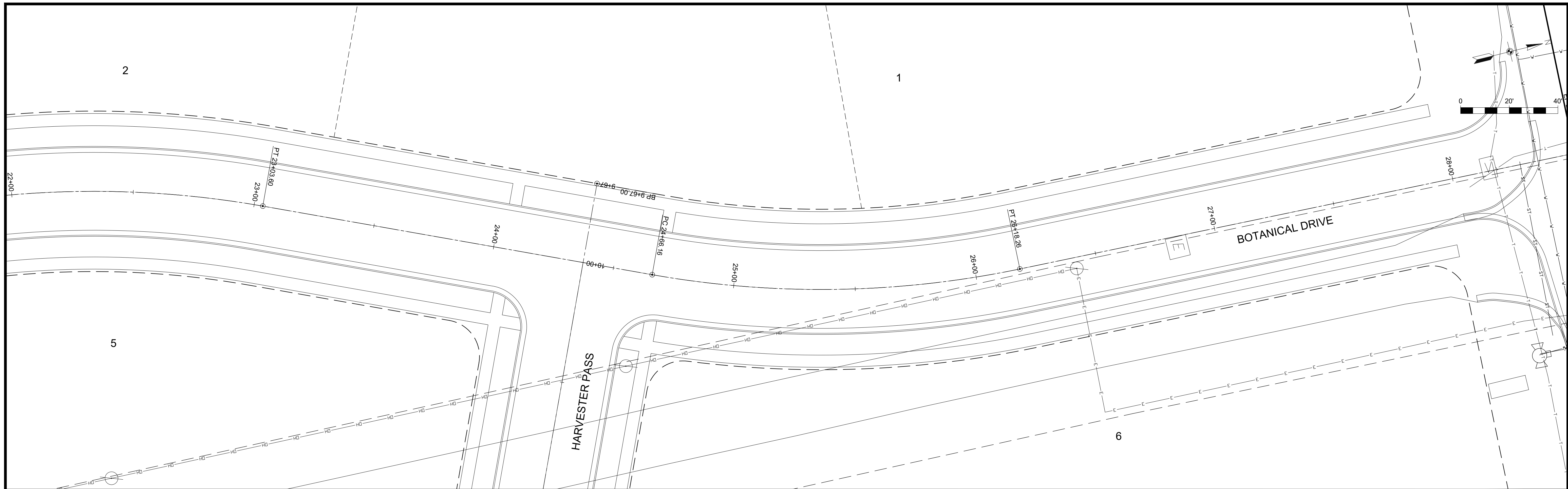
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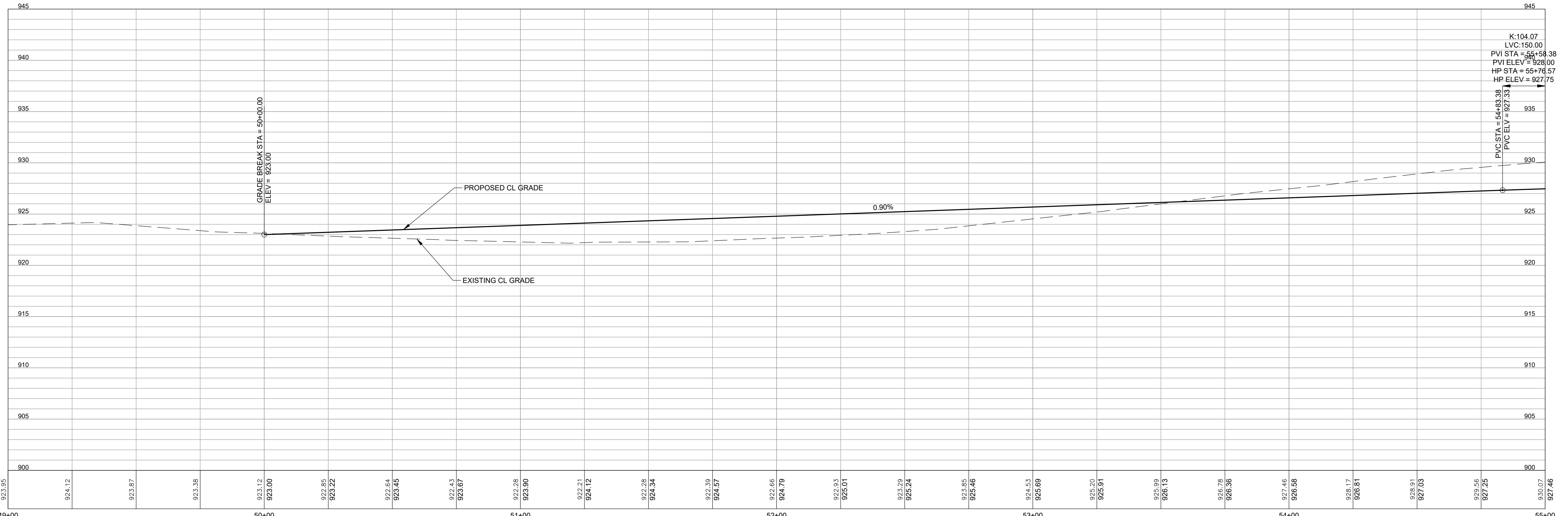
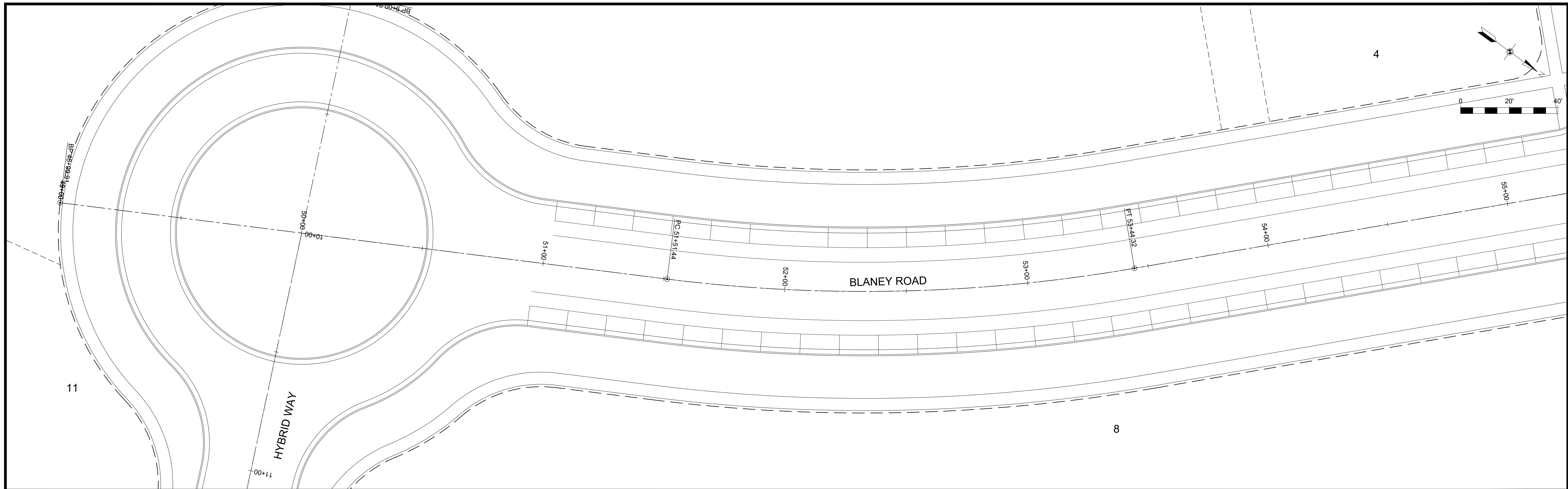
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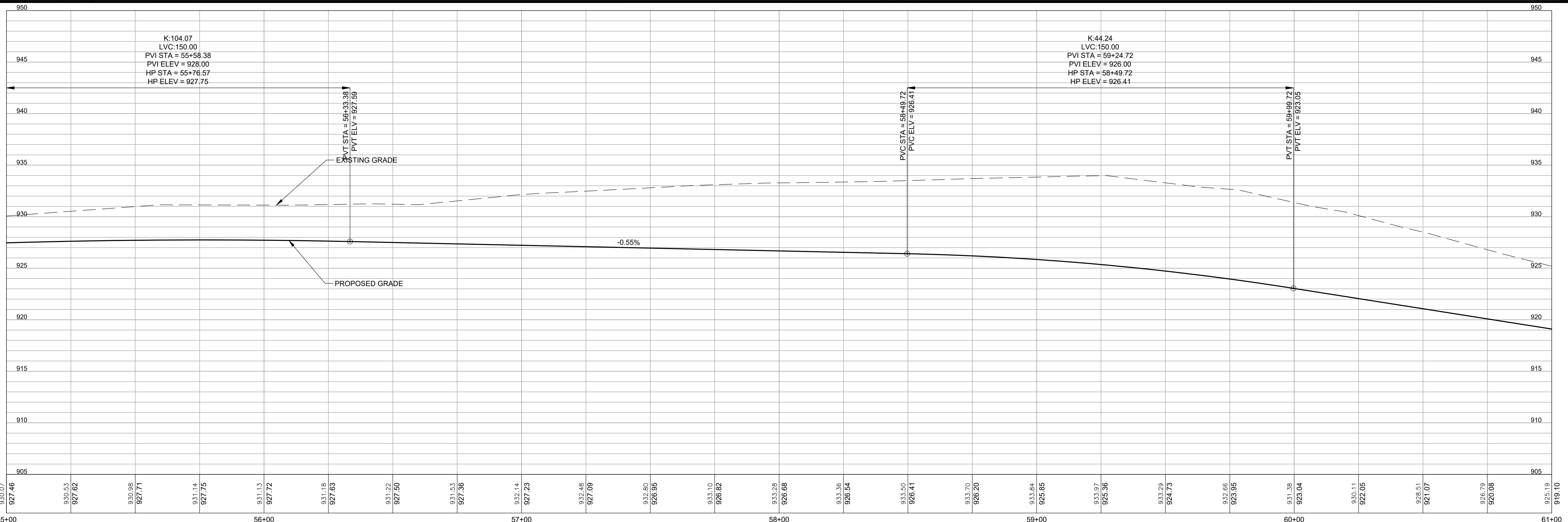
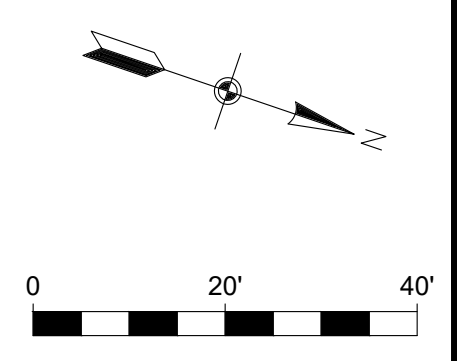
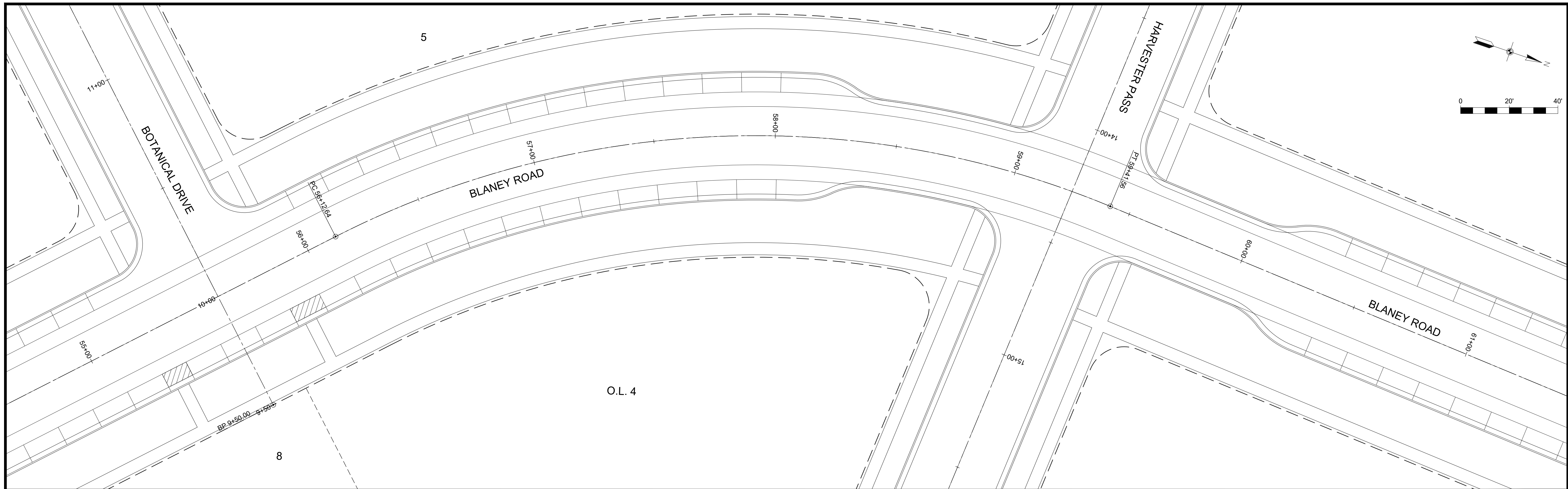
12 of 25

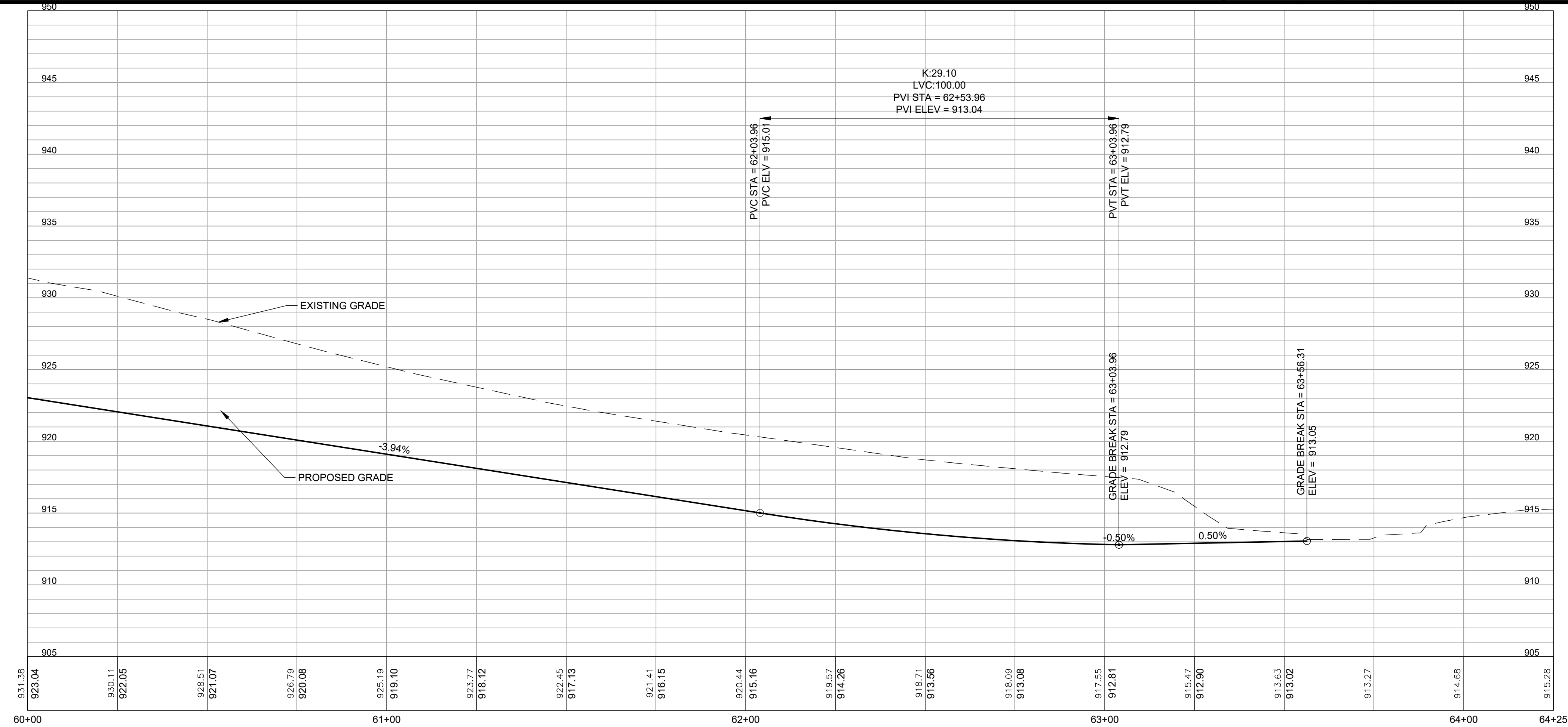
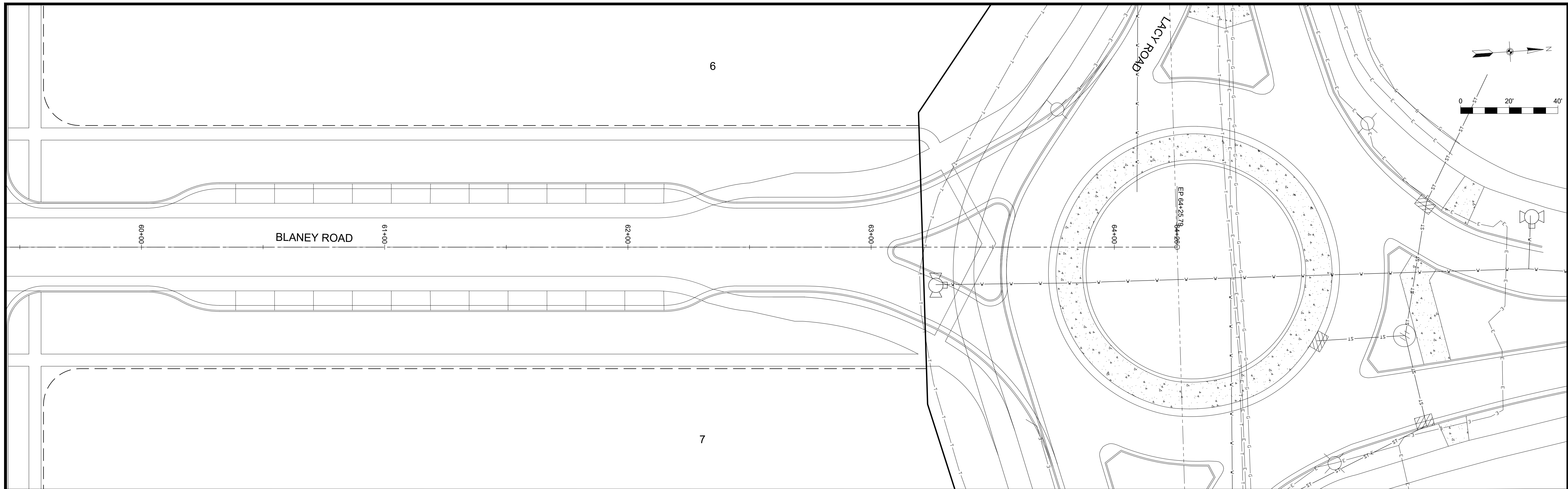


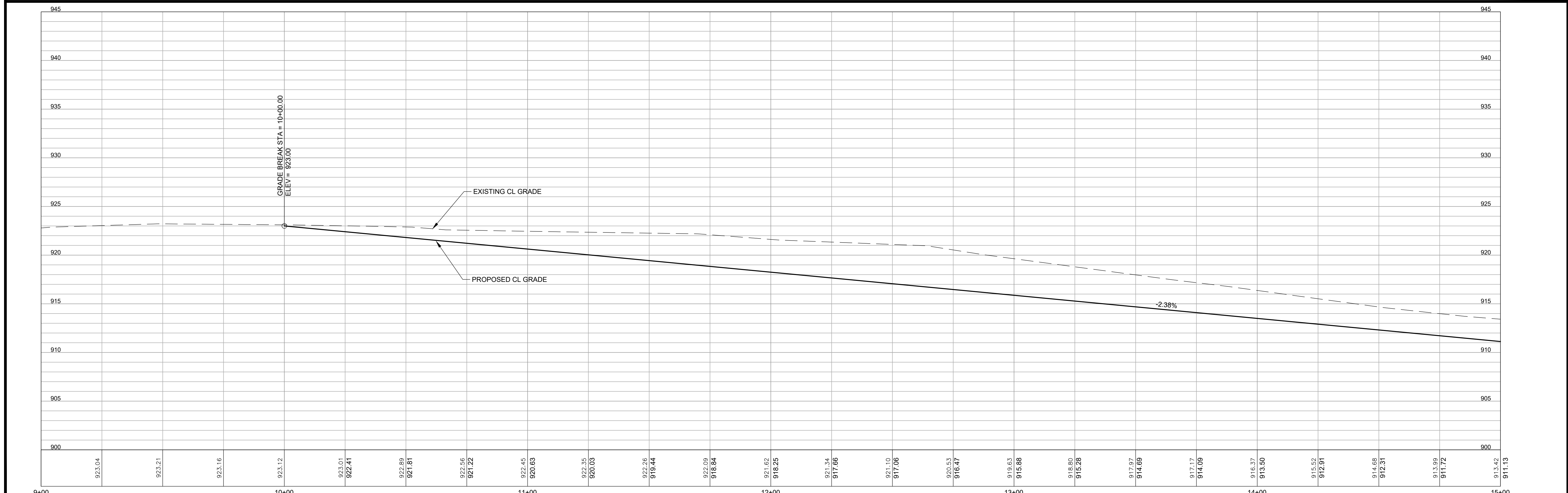
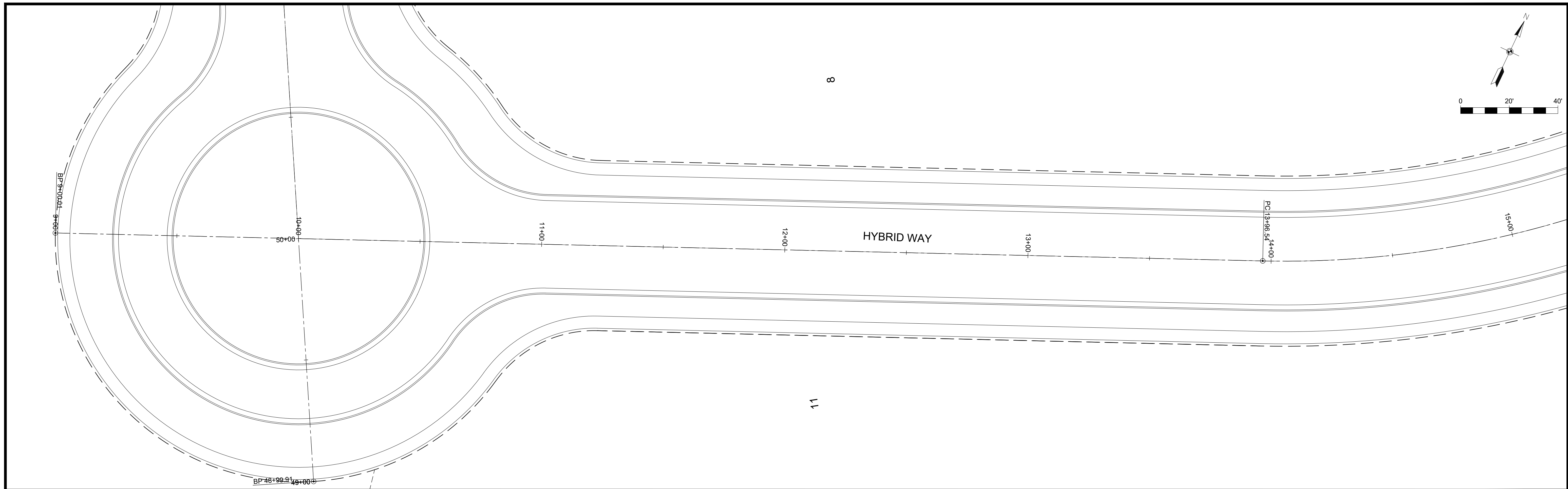


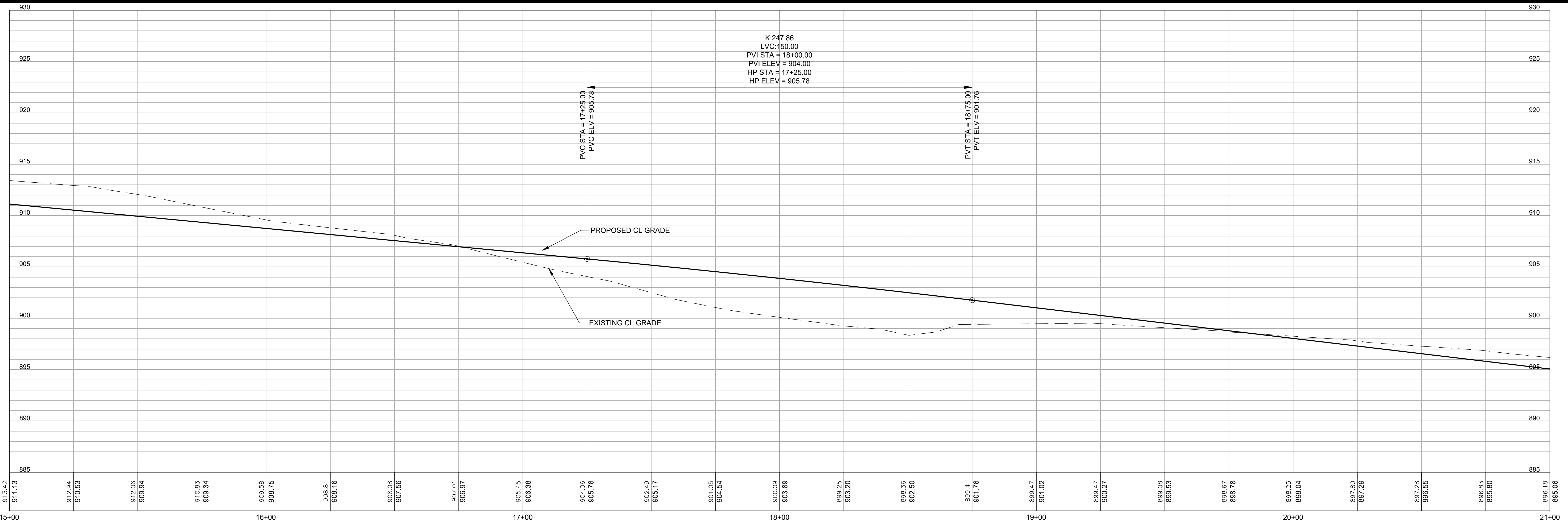
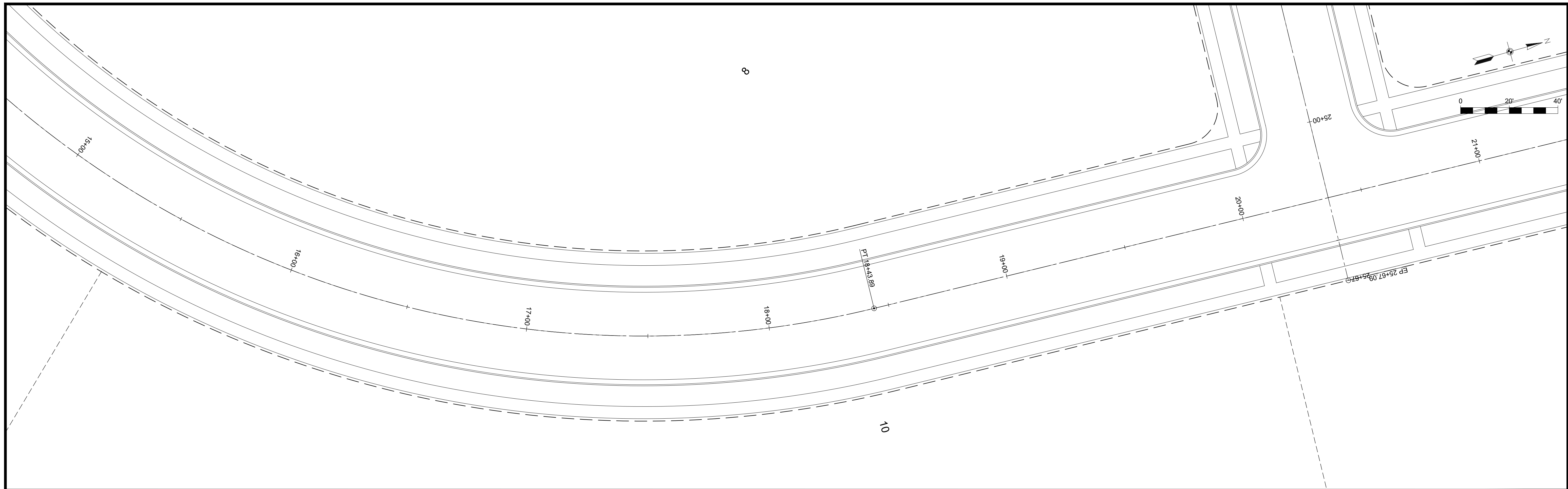


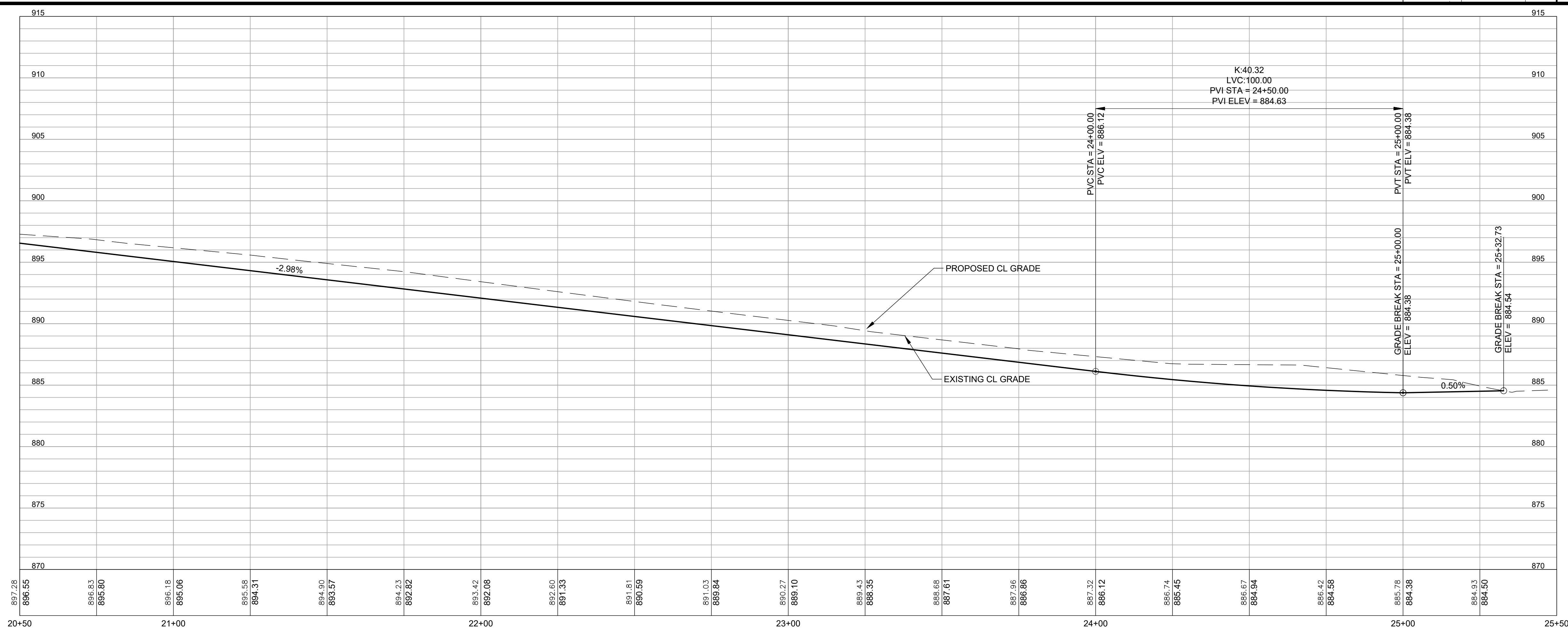
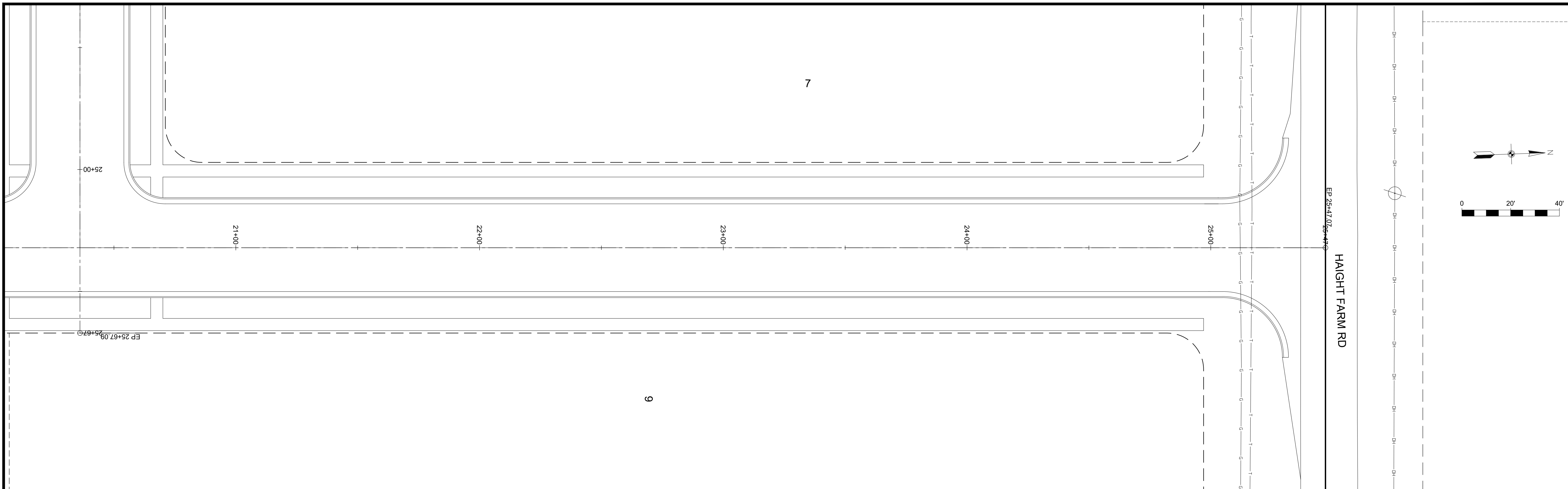


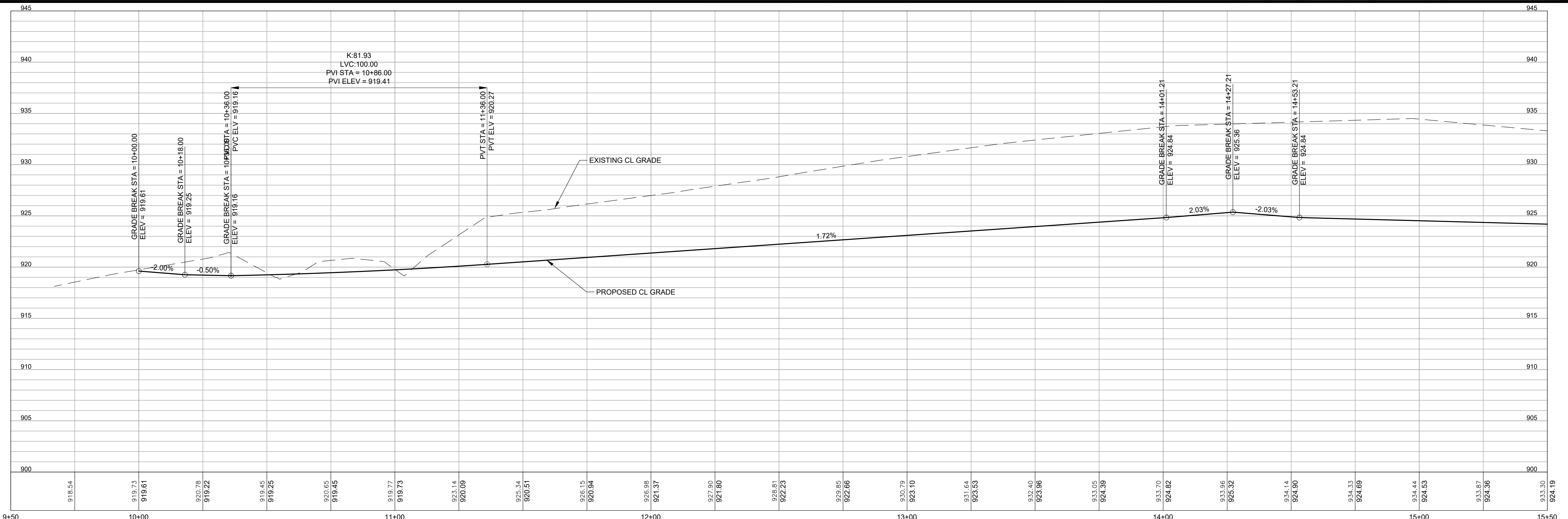
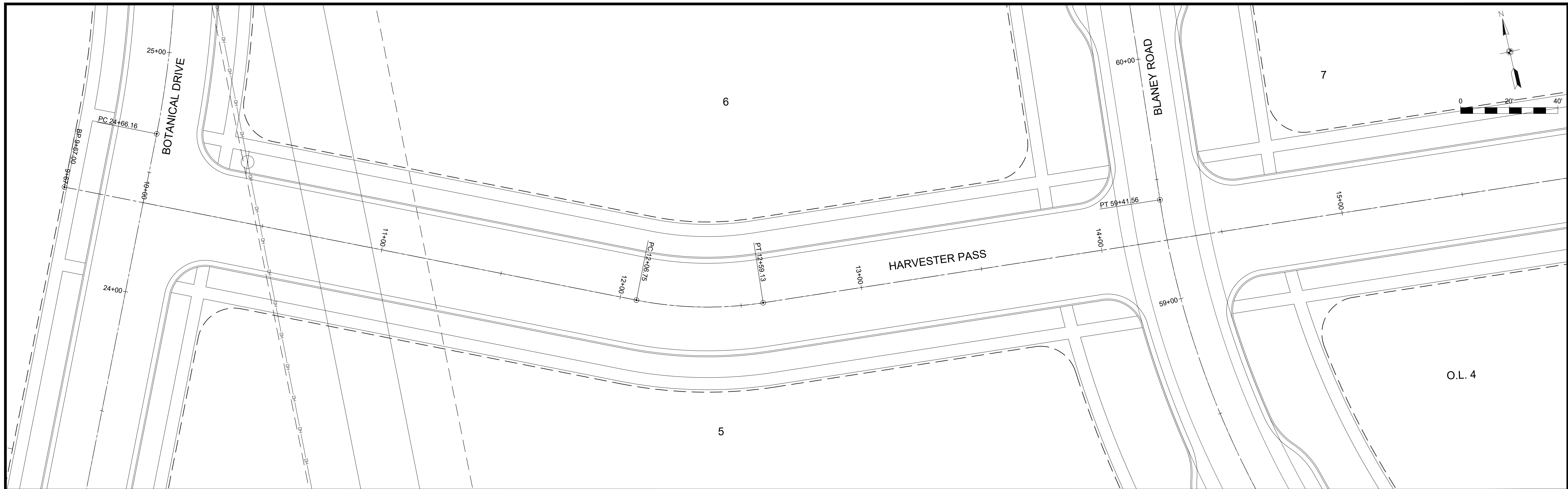


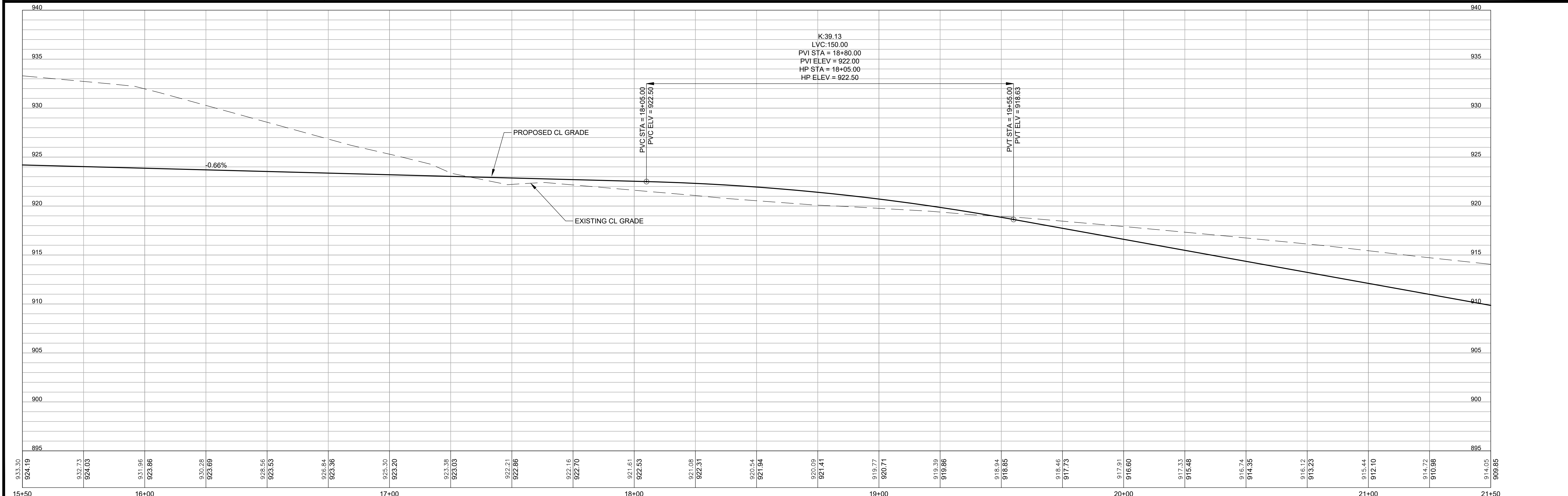
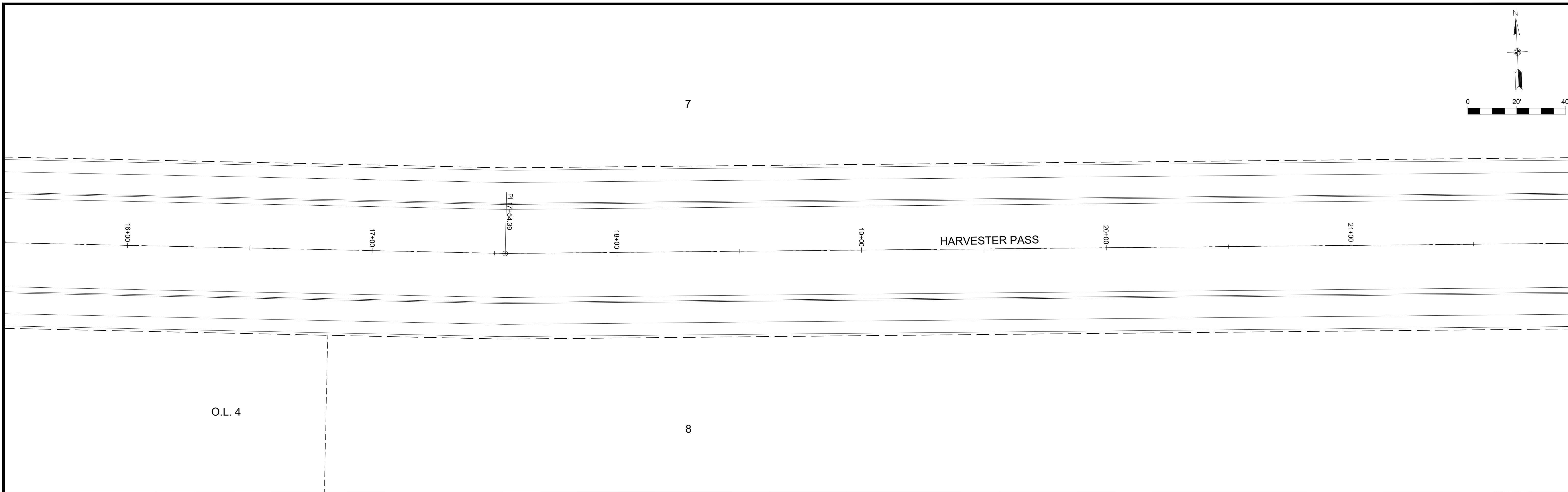
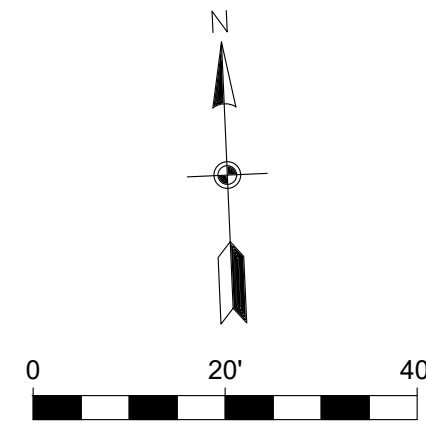


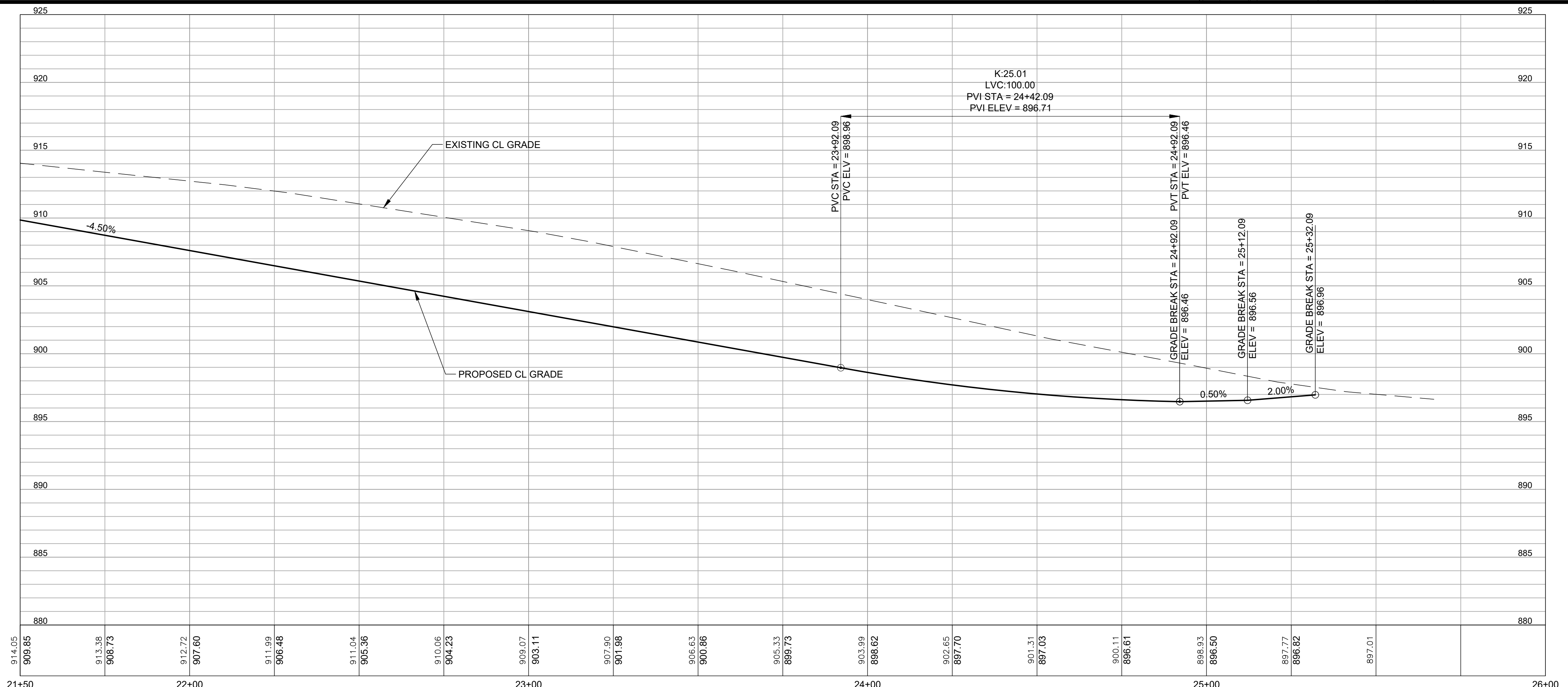
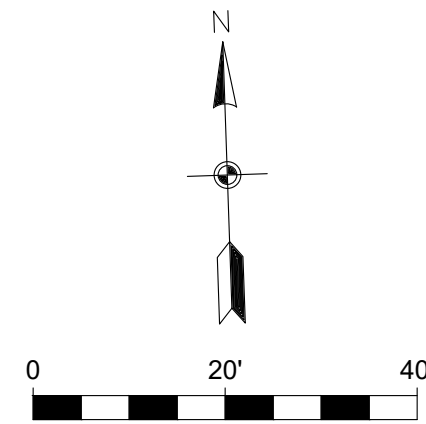
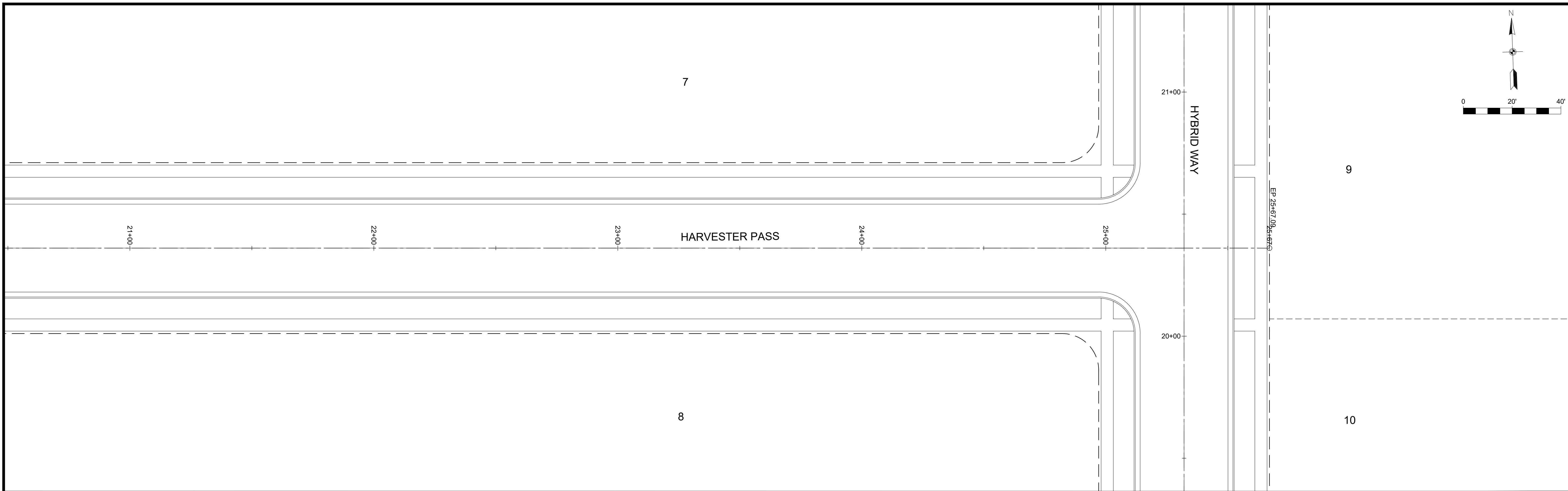


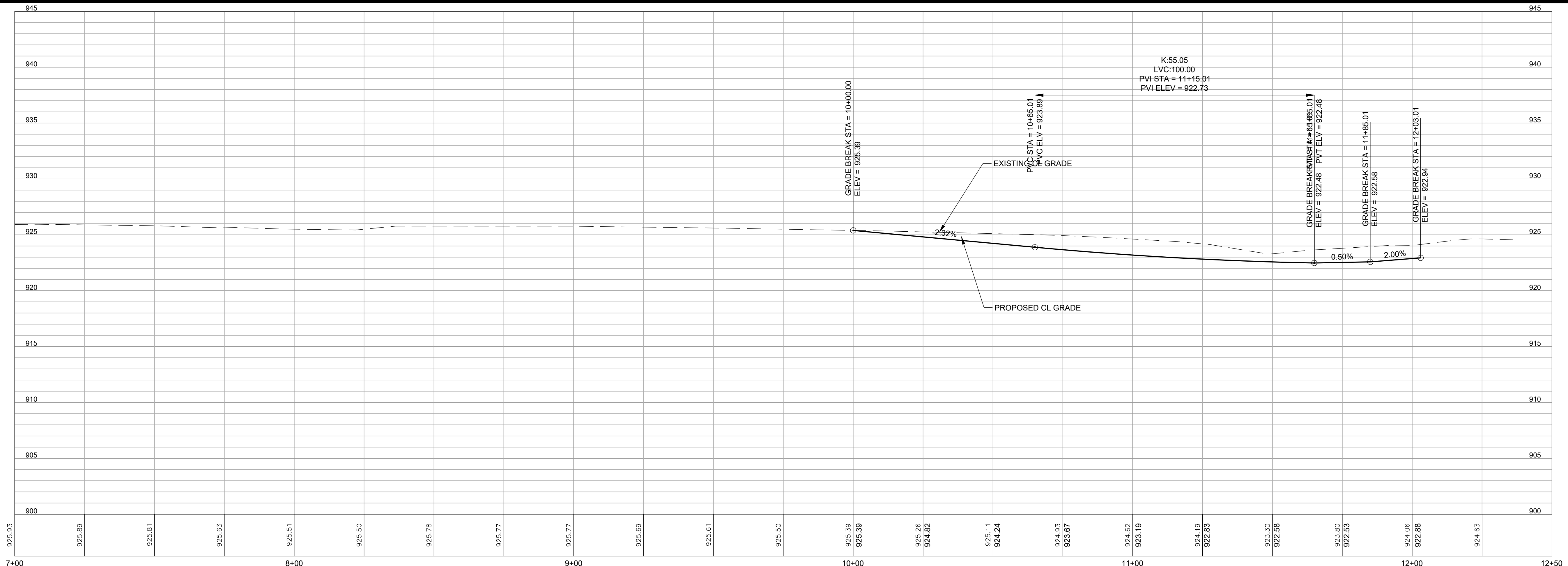
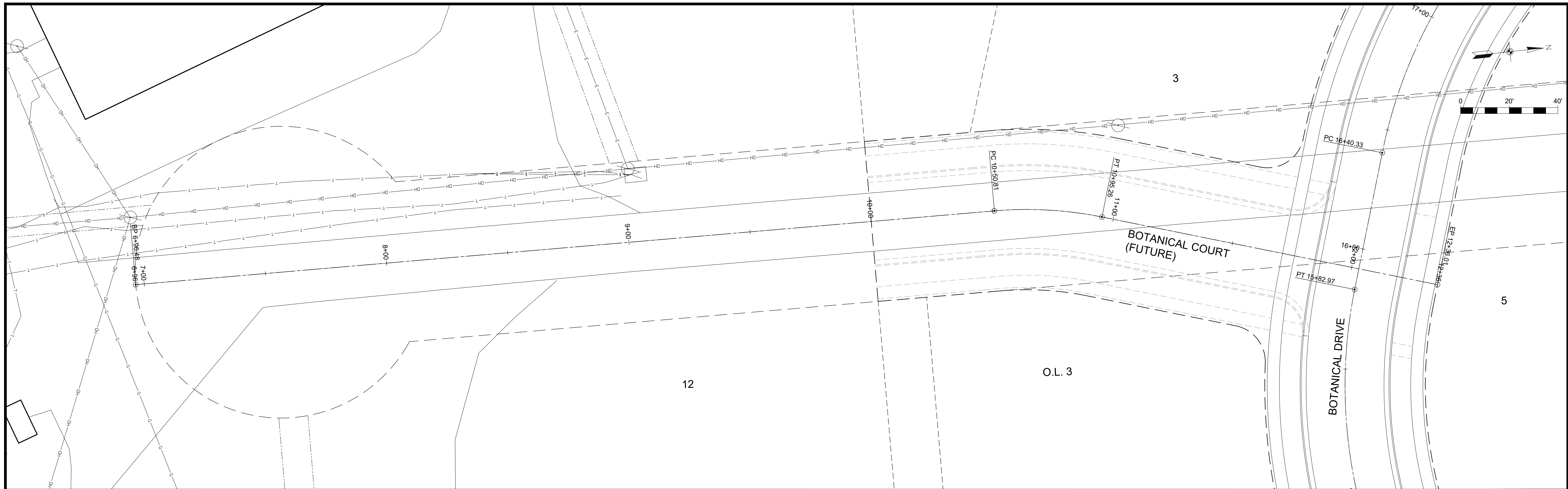












**SARA INVESTMENT REAL ESTATE
HARTUNG FIELDS**

**RESIDENTIAL AND COMMERCIAL MULTI-USE
LACY ROAD
FITCHBURG, WI 53719**

STORM WATER MANAGEMENT REPORT

PRELIMINARY

DRAFT

6/21/2022

PREPARED FOR

Sara Investment Real Estate
1955 Atwood Avenue, Suite 201
Madison, WI 53704

June 21, 2022

PREPARED BY

D'Onofrio, Kottke & Associates, Inc.
7530 Westward Way
Madison, Wisconsin 53717

FN: 21-04-109

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INTRODUCTION

The intent of this report is to provide details on how the proposed multi-use commercial and residential development along Lacy Road will be developed so that it is constructed in accordance with applicable Storm Water Management Standards. The details and application relating to erosion control permits is not part of this report and will follow at a later date to coincide with the construction phases of the project.

A multi-use commercial and residential development is being proposed along Lacy Road in the City of Fitchburg. The project scope involves the construction of public roads, storm water management facilities and site amenities. The site improvements will include grading, base, pavement, utilities, and storm water retention and infiltration ponds.

The proposed project is contained within Dane County Parcel Numbers 0609-141-8500-9 0609-141-8000-4, and 0609-141-9500-7. The proposed 83 acre plat is located on the South side of the Lacy Road and Haight Farm Road round-a-bout is about 1/4 mile east of Syene Road in NE 1/2 of Section 14, Township 06 North, Range 09 East, City of Fitchburg, Wisconsin. A location map can be found in Exhibit 1.

The existing conditions of the site are mainly agricultural use. The proposed development requires land disturbing activity in excess of 4,000 square feet and the cumulative addition of more than 20,000 square feet of impervious surface to the site. Therefore, according to the City of Fitchburg and State of Wisconsin ordinances, the site requires stormwater control permits. The intent of this report is to provide details on how the site will be developed so that it is constructed in accordance with applicable Storm Water Control Standards.

Total disturbed area of the project is more than 1-acre, so a DNR Notice of Intent is also required. The Erosion Control standards and practices to meet those standards will be covered in a later report.

STANDARDS & RESULTS

The proposed development requires the following stormwater management performance standards.

Sediment Control

Standard: Design storm water management practices for new development to reduce the sediment load by 80% based on the average annual record.

Design Results: Sediment from the site will be reduced by 80% by routing the developed site runoff through wet detention basins prior to leaving the site. A minimum of 60% of the sediment will be removed by the wet detention basin that enters the infiltration basin. WinSLAMM was used for modeling the sediment load reduction. See Appendix B for sediment reduction calculations.

Oil & Grease Control

Standard: For Commercial or Industrial developments, the first 1/2" of runoff shall be treated using the best oil and grease removal technology available.

Design Results: Oil and grease will be controlled by Flexstorm Pure Filters for permanent inlet protection to meet the oil & grease control requirements for inlets accepting water from the parking and private drive areas.

Temperature Control

Standards: 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: This site is located within a thermally sensitive area according to DCiMap Land and Water Resource Viewer 2.1.1. By meeting the infiltration requirements for the development, the thermal control requirements will also be met.

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, and 100 year 24-hour design storm events.

Design Results: Detention systems will maintain the development's existing peak runoff rates for the 1, 2, 10 and 100 year- 24-hour storm events. The peak flow comparison chart for site can be found in the stormwater management measures section of this report and the HydroCAD output can be found within Appendix D. The soil curve number for the post development lawn areas surrounding the buildings and parking has been dropped by a soil class.

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

Description	CN
Existing Type B Soil	68
Existing Type C Soil	78
Roof/Pavement	98
Infiltration, Biobed, and Wet Pond Surface Area	100
Post Development Lawn Areas (Dropped by a Soil Class)	74
Post Development Open Space and Parkland	same as pre

Infiltration

Standards: City of Fitchburg - infiltrate sufficient runoff volume so that 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 entire site through the addition of an infiltration basin at the south-central location of the site. The infiltration basin was sized utilizing WinSLAMM modeling software. A minimum of 60% sediment reduction will occur in the proposed wet detention basin cell prior to entering the designed infiltration basin.

Geotech reports for infiltration are pending. This preliminary design was set assuming a 0.50 in/hr soil infiltration rate. Final design will be based on Wisconsin DSDS Soil and Site Evaluation – Storm reports. Results shown in Appendix B. Current results based on the assume 0.50 in/hr showing less than required stay-on will be adjusted once final soil infiltration rates are received.

STORM WATER MANAGEMENT MEASURES

The site was modeled as two drainage areas in proposed conditions. The northeastern 4 acres of the development will drain into a wet detention pond that will discharge into the existing Lacy Road storm sewer. The remaining 23 acres of the improved areas will drain to a wet detention pond at a south-central location. This larger wet pond will discharge to an infiltration basin with an overflow to the Badger Mill Creek. Peak flow, sediment reduction, and stayon requirements will be met for the entire site with these basin systems.

The peak flow comparison for this site was analyzed at a culvert outlet at the northeast pond in combination with control outlet structures and overflow weir configuration for the south-central pond and 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 shows the runoff from the project leaving in existing and proposed conditions. The site was designed to utilize wet detention basins for sediment and peak flow reduction and an infiltration basin to meet stayon requirements. The peak flow results from the stormwater modeling and basin design are shown in Table 1. The detention basin systems will maintain the combined existing peak runoff rates leaving the plat for the 1, 2, 10, and 100-year 24-hour storm events. The NE pond safely passes the 100 year and 500-year events with overflow directly to the Right-of-Way of Lacy Road. The South-Central Pond and Basin overflow directly to Badger Mill Creek during these events. See appendix D for the existing and proposed HydroCad design information. See Exhibit 6 for graphic of basin and flow data.

WinSLAMM modeling software was used for sediment load reduction calculations on the site. Sediment from the site will be reduced by a minimum of 80% by routing the proposed developed site stormwater through 2 wet detention basins. See appendix B for sediment reduction calculations. Infiltration modeling for the site was also calculated using WinSLAMM and meets the 90% predevelopment standard per the ordinance. The standard was met through the proposed infiltration basin at a south-central location of the site. The infiltration basin will be implemented when at a minimum 75% of the site is complete.

Table 1 - Summary of Peak Runoff Rates

PEAK FLOW COMPARISON CHART (CFS)

24-HR STORM EVENT (PEAK FLOW IN CFS)-PEAK FLOW COMPARISON						
		1YR	2YR	10YR	100YR	200YR
HYDROCAD	EXISTING ONSITE DRAINAGE					
1S	Existing Residential	6.57	9.90	24.55	61.67	75.29
2S	Existing Commercial	11.62	18.29	48.92	129.11	158.96
1L	Existing Total Site	18.19	28.19	73.47	190.75	234.22
HYDROCAD	Total Site Drainage Area (83.10 Acres)					
1L	Existing Total Site	18.19	28.19	73.47	190.75	234.22
	Proposed Total Treated	15.72	20.73	46.72	125.51	198.27
3L	Proposed Total Untreated	165.56	203.74	344.32	637.72	736.64
	Residential Site Drainage Area (26.53 Acres)					
1S	Existing Residential	6.57	9.90	24.55	61.67	75.29
	Proposed Residential Treated w/Basins	3.80	6.72	16.17	47.14	67.38
3S	Proposed Residential Untreated	49.43	61.37	105.67	198.77	230.22
	Wet Pond Basin Stage	905.83	906.14	906.92	907.91	908.00
	Commercial Site Drainage Areas (56.57 Acres)					
	Existing Commercial - North	3.16	4.97	13.29	35.08	43.19
	Proposed Commercial - North, Treated w/Basins	3.06	3.47	10.56	25.74	42.12
	Proposed Commercial - North, Untreated	36.78	44.39	71.87	128.12	146.98
	Basin Stage Elevation	882.98	883.17	883.62	884.31	884.66
	Existing Commercial - South	8.06	12.69	33.94	89.56	110.27
	Proposed Commercial - Central, Treated w/Basins	9.76	12.04	20.84	62.03	95.28
	Proposed Commercial - Central, Untreated	79.41	98.04	166.87	310.93	359.55
	Basin Stage Elevation	883.18	883.39	883.86	884.63	884.97

CONCLUSIONS

As the results indicate, the storm water system and erosion control for the proposed development, meets the City of Fitchburg and State of Wisconsin Ordinances. The peak flow, thermal, sediment control, and infiltration requirements have been met or exceeded for this site.

APPENDIX A

SEDIMENT CONTROL DESIGN (WINSLAMM)

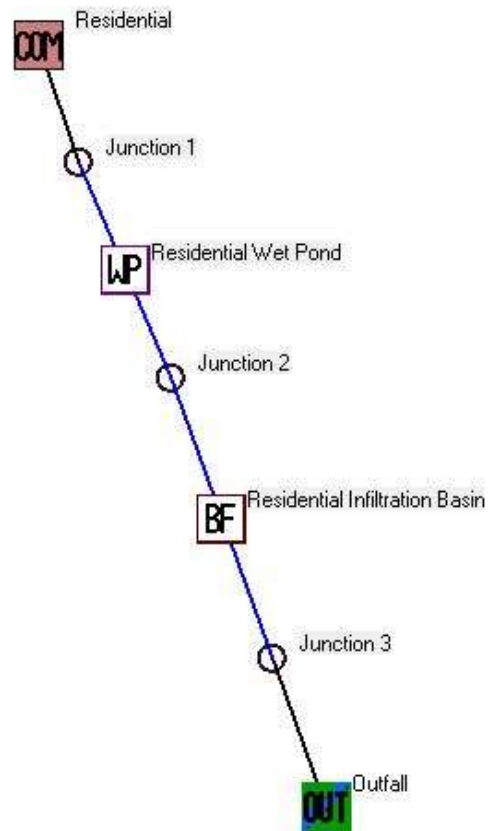
SEDIMENTATION REDUCTION CALCULATIONS (SLAMM)

WinSlamm Design

The proposed Slamm design model shows a minimum of 80% sediment reduction.

Residential - OVERALL

Model Schematic:



Model Input Information:

Data file name: U:\User\2104109\Engineering\SWMP\WinSLAMM\2104109_Hartung TSS and Infiltration Modeling_Res Overall.mdb
WinSLAMM Version 10.4.0
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: 06-20-2022 Time: 18:15:17
 Site information:

Pre-Development Area Description	Pre-Development Area (ac)	Pre-Development CN
HSG B	22.500	68
HSG C	3.100	78
Impervious	.930	98
Total Area (ac)/Composite CN	26.530	70

LU# 1 - Commercial: Residential Total area (ac): 26.534

- 1 - Roofs 1: 4.844 ac. Pitched Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
- 13 - Paved Parking 1: 2.278 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
- 25 - Driveways 1: 4.312 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
- 31 - Sidewalks 1: 1.264 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
- 45 - Large Landscaped Areas 1: 13.836 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

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

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: Sharp Crested Weir

1. Sharp crested weir length (ft): 10
2. Sharp crested weir height from invert: 3
3. Sharp crested weir invert elevation above datum (ft): 8

Outlet type: Orifice 1

1. Orifice diameter (ft): 1.5
2. Number of orifices: 1
3. Invert elevation above datum (ft): 6

Outlet type: Orifice 2

1. Orifice diameter (ft): 1
2. Number of orifices: 1
3. Invert elevation above datum (ft): 7.16

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 20
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): 4
2. Stand pipe height above datum (ft): 8.66

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	0.4240	0.00	0.00
2	1.00	0.4640	0.00	0.00
3	2.00	0.5050	0.00	0.00
4	3.00	0.5470	0.00	0.00
5	4.00	0.5890	0.00	0.00
6	5.00	0.6330	0.00	0.00
7	6.00	0.8340	0.00	0.00
8	7.00	0.9040	0.00	0.00
9	8.00	0.9750	0.00	0.00
10	9.00	1.0480	0.00	0.00
11	10.00	1.1210	0.00	0.00
12	11.00	1.1960	0.00	0.00

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

1. Top area (square feet) = 37500
2. Bottom area (square feet) = 17750
3. Depth (ft): 6
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): 5
- 3. Height of datum to bottom of weir opening: 4

Outlet type: Surface Discharge Pipe

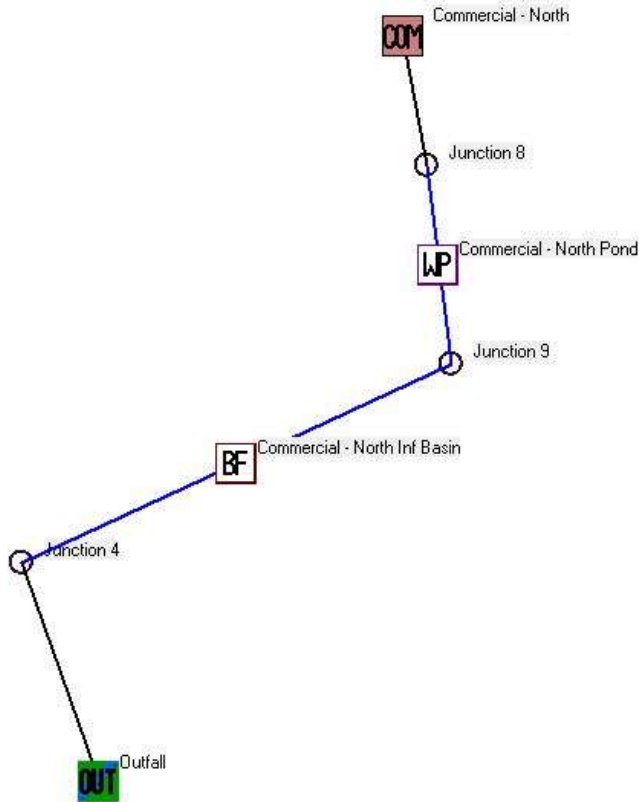
- 1. Surface discharge pipe outlet diameter (ft): 1.5
- 2. Pipe invert elevation above datum (ft): 1
- 3. Number of surface pipe outlets: 1

Output Sediment Reduction:

Land Uses	Junctions	Control Practices	Outfall	Output Summary		
File Name: U:\User\2104109\Engineering\SWMP\WinSLAMM\2104109_Hartung TSS and Infiltration Modeling_Res Overall.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	1.147E+06		0.37	100.3	7186	
Outfall Total with Controls	430922	62.43 %	0.14	39.11	1052	85.36 %
Current File Output: Annualized Total After Outfall Controls		432106	Years in Model Run:	1.00	1055	
<input type="button" value="Print Output Summary to Text File"/> <input type="button" value="Print Output Summary to .csv File"/>		Total Area Modeled (ac)		26.534		
Total Control Practice Costs				Receiving Water Impacts Due To Stormwater Runoff (CWP Impervious Cover Model)		
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					
				<input type="button" value="Perform Outfall Flow Duration Curve Calculations"/>		
				Without Controls		Approximate Urban Stream Classification
				Calculated Rv		
				0.37	Poor	
				With Controls		
				0.14	Fair	

Commercial - NORTH

Model Schematic:



Model Input Information:

Data file name: U:\User\2104109\Engineering\SWMP\WinSLAMM\2104109_Hartung TSS and Infiltration Modeling_Com North.mdb
WinSLAMM Version 10.4.0

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: 06-20-2022 Time: 18:21:03

Site information:

Pre-Development Area Description	Pre-Development Area (ac)	Pre-Development CN
HSG B	15.370	68
HSG C	.560	78
Total Area (ac)/Composite CN	15.930	68

LU# 1 - Commercial: Commercial - North Total area (ac): 15.923

1 - Roofs 1: 3.430 ac. Pitched Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

13 - Paved Parking 1: 5.856 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

25 - Driveways 1: 0.287 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
 31 - Sidewalks 1: 0.056 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
 45 - Large Landscaped Areas 1: 6.294 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

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

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): 1
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): 10
3. Height from datum to bottom of weir opening: 9

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 4
2. Stand pipe height above datum (ft): 8.5

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	0.2000	0.00	0.00
2	1.00	0.2500	0.00	0.00
3	2.00	0.3000	0.00	0.00
4	3.00	0.3500	0.00	0.00
5	4.00	0.4000	0.00	0.00
6	5.00	0.8000	0.00	0.00
7	6.00	0.9000	0.00	0.00
8	7.00	0.9500	0.00	0.00
9	8.00	1.0000	0.00	0.00
10	9.00	1.0500	0.00	0.00
11	10.00	1.1000	0.00	0.00

Control Practice 2: Biofilter CP# 1 (DS) - Commercial - North Inf Basin

1. Top area (square feet) = 25000
2. Bottom area (square feet) = 15300
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): 0.001
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): 5
3. Height of datum to bottom of weir opening: 1

Output Sediment Reduction:

Land Uses	Junctions	Control Practices	Outfall	Output Summary
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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	838828		0.45	96.89	5074	
Outfall Total with Controls	256730	69.39 %	0.14	27.44	439.8	91.33 %

Current File Output: Annualized Total After Outfall Controls

	257435	Years in Model Run:	1.00	441.0
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Print Output
Summary to Text
File

Print Output
Summary to .csv
File

Total Area Modeled (ac)

Receiving Water Impacts Due To Stormwater Runoff

(CWP Impervious Cover Model)

	Calculated Rv	Approximate Urban Stream Classification
Without Controls	0.45	Poor
With Controls	0.14	Fair

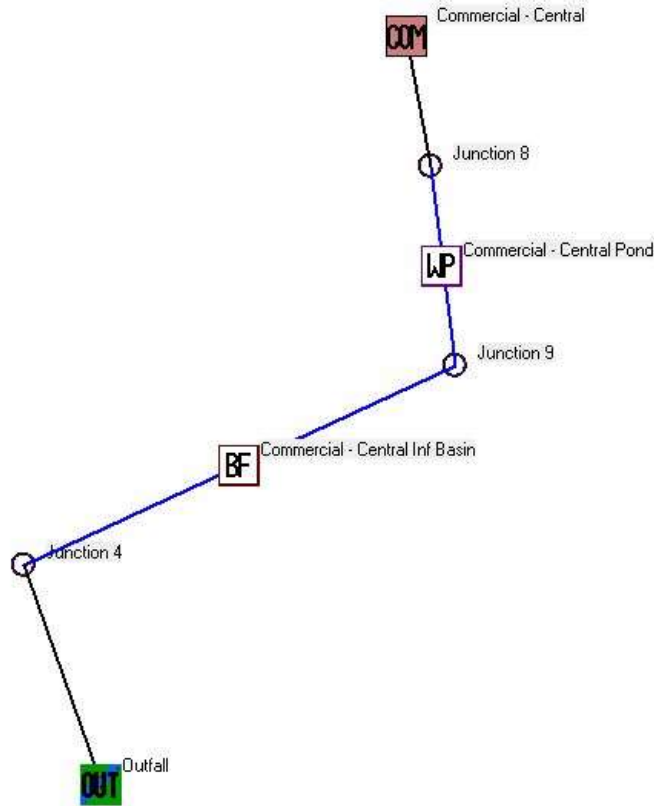
Total Control Practice Costs

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

Commercial - CENTRAL

Model Schematic:



Model Input Information:

Data file name: U:\User\2104109\Engineering\SWMP\WinSLAMM\2104109_Hartung TSS and Infiltration Modeling_Com Central.mdb
 WinSLAMM Version 10.4.0

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: 06-20-2022 Time: 18:27:22

Site information:

Pre-Development Area Description	Pre-Development Area (ac)	Pre-Development CN
HSG B	25.817	68
HSG C	.940	78
Total Area (ac)/Composite CN	26.757	68

LU# 1 - Commercial: Commercial - Central Total area (ac): 26.757

1 - Roofs 1: 4.367 ac. Pitched Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

13 - Paved Parking 1: 6.037 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

25 - Driveways 1: 3.526 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
 31 - Sidewalks 1: 0.654 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
 45 - Large Landscaped Areas 1: 12.173 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

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

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): 1
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): 10
3. Height from datum to bottom of weir opening: 9

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 4
2. Stand pipe height above datum (ft): 8.5

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	0.2000	0.00	0.00
2	1.00	0.2500	0.00	0.00
3	2.00	0.3000	0.00	0.00
4	3.00	0.3500	0.00	0.00
5	4.00	0.4000	0.00	0.00
6	5.00	0.8000	0.00	0.00
7	6.00	0.9000	0.00	0.00
8	7.00	0.9500	0.00	0.00
9	8.00	1.0000	0.00	0.00
10	9.00	1.0500	0.00	0.00
11	10.00	1.1000	0.00	0.00

Control Practice 2: Biofilter CP# 1 (DS) - Commercial - Central Inf Basin

1. Top area (square feet) = 32000
2. Bottom area (square feet) = 20850
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): 0.001
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

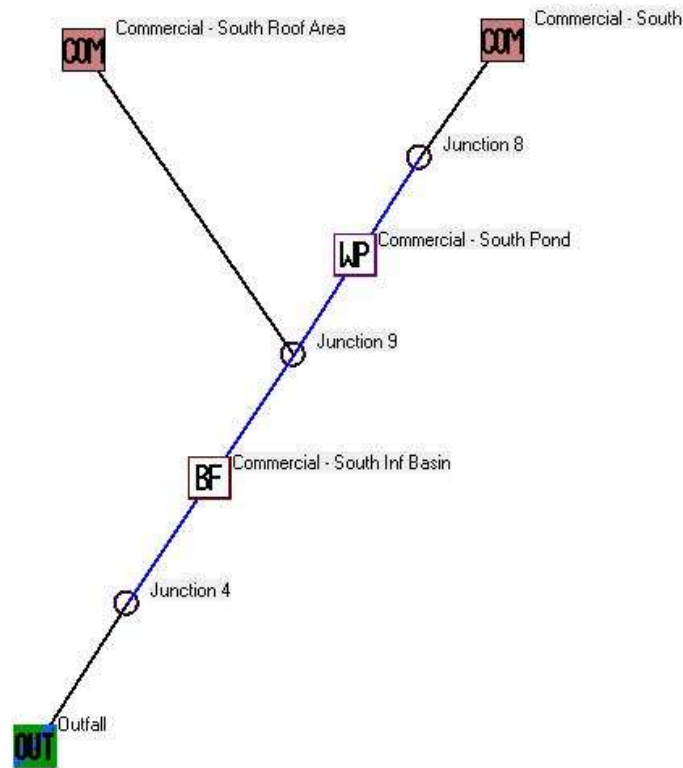
1. Weir crest length (ft): 20
2. Weir crest width (ft): 5
3. Height of datum to bottom of weir opening: 1

Output Sediment Reduction:

Land Uses	Junctions	Control Practices	Outfall	Output Summary											
<p>File Name: <input style="width: 100%;" type="text" value="U:\User\2104109\Engineering\SWMP\WinSLAMM\2104109_Hartung TSS and Infiltration Modeling_Com Central.mdb"/></p>															
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	1.271E+06		0.41	106.8	8470										
Outfall Total with Controls	429757	66.19 %	0.14	34.40	922.9	89.10 %									
<hr/>															
Current File Output: Annualized Total After Outfall Controls	430938	Years in Model Run:	1.00		925.5										
<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 30%;"> <div style="margin-bottom: 10px;"> <input type="button" value="Print Output Summary to Text File"/> </div> <div> <input type="button" value="Print Output Summary to .csv File"/> </div> </div> <div style="width: 30%; text-align: center;"> <p>Total Area Modeled (ac)</p> <input style="width: 100px;" type="text" value="26.757"/> </div> <div style="width: 30%; text-align: right;"> <p>Receiving Water Impacts Due To Stormwater Runoff (CWP Impervious Cover Model)</p> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th style="text-align: center;">Calculated Rv</th> <th style="text-align: center;">Approximate Urban Stream Classification</th> </tr> </thead> <tbody> <tr> <td>Without Controls</td> <td style="text-align: center;">0.41</td> <td style="text-align: center;">Poor</td> </tr> <tr> <td>With Controls</td> <td style="text-align: center;">0.14</td> <td style="text-align: center;">Fair</td> </tr> </tbody> </table> </div> </div>								Calculated Rv	Approximate Urban Stream Classification	Without Controls	0.41	Poor	With Controls	0.14	Fair
	Calculated Rv	Approximate Urban Stream Classification													
Without Controls	0.41	Poor													
With Controls	0.14	Fair													
<hr/>															
Total Control Practice Costs															
Capital Cost	<input style="width: 100%;" type="text" value="N/A"/>														
Land Cost	<input style="width: 100%;" type="text" value="N/A"/>														
Annual Maintenance Cost	<input style="width: 100%;" type="text" value="N/A"/>														
Present Value of All Costs	<input style="width: 100%;" type="text" value="N/A"/>														
Annualized Value of All Costs	<input style="width: 100%;" type="text" value="N/A"/>														
<input type="button" value="Perform Outfall Flow Duration Curve Calculations"/>															

Commercial - SOUTH

Model Schematic:



Model Input Information:

Data file name: U:\User\2104109\Engineering\SWMP\WinSLAMM\2104109_Hartung TSS and Infiltration Modeling_Com South.mdb
WinSLAMM Version 10.4.0

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: 06-20-2022 Time: 18:30:04

Site information:

Pre-Development Area Description	Pre-Development Area (ac)	Pre-Development CN
HSG B	13.410	68
HSG C	.490	78
Total Area (ac)/Composite CN	13.900	68

LU# 1 - Commercial: Commercial - South Total area (ac): 12.253

13 - Paved Parking 1: 3.292 ac. Connected Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 8.961 ac. Normal Silty Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 2 - Commercial: Commercial - South Roof Area Total area (ac): 1.640

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

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): 1
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): 10
3. Height from datum to bottom of weir opening: 9

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 4
2. Stand pipe height above datum (ft): 8.5

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	0.2000	0.00	0.00
2	1.00	0.2500	0.00	0.00
3	2.00	0.3000	0.00	0.00
4	3.00	0.3500	0.00	0.00
5	4.00	0.4000	0.00	0.00
6	5.00	0.8000	0.00	0.00
7	6.00	0.9000	0.00	0.00
8	7.00	0.9500	0.00	0.00
9	8.00	1.0000	0.00	0.00
10	9.00	1.0500	0.00	0.00
11	10.00	1.1000	0.00	0.00

Control Practice 2: Biofilter CP# 1 (DS) - Commercial - South Inf Basin

1. Top area (square feet) = 12000
2. Bottom area (square feet) = 5250
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): 0.001
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): 5
3. Height of datum to bottom of weir opening: 1

Output Sediment Reduction:

Land Uses	Junctions	Control Practices	Outfall	Output Summary		
File Name: U:\User\2104109\Engineering\SWMP\WinSLAMM\2104109_Hartung TSS and Infiltration Modeling_Com South.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	463331		0.29	108.9	3149	
Outfall Total with Controls	224471	51.55 %	0.14	29.98	420.1	86.66 %
Current File Output: Annualized Total After Outfall Controls						
	225088	Years in Model Run:	1.00		421.3	
<input type="button" value="Print Output Summary to Text File"/>		<input type="button" value="Print Output Summary to .csv File"/>		Total Area Modeled (ac) <input style="width: 100px;" type="text" value="13.893"/>		
Total Control Practice Costs				Receiving Water Impacts Due To Stormwater Runoff (CWP Impervious Cover Model)		
Capital Cost	<input style="width: 100px;" type="text" value="N/A"/>		<input type="button" value="Perform Outfall Flow Duration Curve Calculations"/>			
Land Cost	<input style="width: 100px;" type="text" value="N/A"/>					
Annual Maintenance Cost	<input style="width: 100px;" type="text" value="N/A"/>					
Present Value of All Costs	<input style="width: 100px;" type="text" value="N/A"/>					
Annualized Value of All Costs	<input style="width: 100px;" type="text" value="N/A"/>					
			Calculated Rv	Approximate Urban Stream Classification		
Without Controls			0.29	<input style="width: 100px;" type="text" value="Poor"/>		
With Controls			0.14	<input style="width: 100px;" type="text" value="Fair"/>		

APPENDIX B

INFILTRATION DESIGN (WINSLAMM)

Infiltration Design - RESIDENTAIL

Pre-Development Runoff (SLAMM) = 102421 CF

Description	Area (ac)	CN
1 HSG B	22.500	68
2 HSG C	3.100	78
3 Impervious	0.930	98
4	0.000	0
5	0.000	0
6	0.000	0
Total Area (ac)	26.530	
Composite CN		70
Total Model Area (ac): 26.534		
Clear	Cancel	Continue

Summary of Stay-On Requirements

Lot Area ac	Rain Total in	Rain Total cf	Outfall Total cf	Total Losses cf	Pre-Dev Runoff cf	Pre- Developed cf	90% STAYON in
26.534	28.81	2774934	430922	2344012	102421	2672513	24.97

POST-DEVELOPED LOSSES	2344012
PRE-DEVELOPED LOSSES	÷ 2672513
	88%

SLAMM Stay-On Calculations

Land Uses	Junctions	Control Practices	Outfall					
Runoff Volume (cf)	Part. Solids Yield (lbs)	Part. Solids Conc. (mg/L)	Pollutant Yield (lbs)	Pollut.				
Data File: U:\User\2104109\Engineering\SWMP\WinSLAMM\2104109_Hartung TSS and Infiltration Modeling_Res Overall.r								
Rain File: WisReg - Madison WI 1981.RAN								
Date: 06-20-22 Time: 6:10:05 PM								
Site Description:								
Runoff Volume Total (cf) at the Outfall								
Rain Number	Start Date	Rain Total (in)	Outfall Total (cf)	Rv	Total Losses (in.)	Calculated CN*	Event Peak Flow (cfs)	Pre-Dev Runoff Vol.
91	10/15/81	0.02	0	0.000	0.02	n/a	0.000	n/a
92	10/17/81	0.95	21246	0.232	0.73	87.9	1.664	190
93	10/18/81	0.06	0	0.000	0.06	n/a	0.000	n/a
94	10/21/81	0.06	0	0.000	0.06	n/a	0.000	n/a
95	10/21/81	0.01	0	0.000	0.01	n/a	0.000	n/a
96	10/24/81	0.01	0	0.000	0.01	n/a	0.000	n/a
97	10/31/81	0.01	0	0.000	0.01	n/a	0.000	n/a
98	11/05/81	0.04	0	0.000	0.04	n/a	0.000	n/a
99	11/15/81	0.07	0	0.000	0.07	n/a	0.000	n/a
100	11/18/81	0.05	0	0.000	0.05	n/a	0.000	n/a
101	11/19/81	0.26	0	0.000	0.26	n/a	0.000	n/a
102	11/23/81	0.18	0	0.000	0.18	n/a	0.000	n/a
103	11/25/81	0.89	345.1	0.004	0.89	72.2	0.064	24
104	11/30/81	0.37	0	0.000	0.37	n/a	0.000	n/a
105	12/03/81	-	-	-	-	-	-	-
106	12/14/81	-	-	-	-	-	-	-
107	12/20/81	-	-	-	-	-	-	-
108	12/26/81	-	-	-	-	-	-	-
109	12/31/81	-	-	-	-	-	-	-
Minimum:		0.00	0	0.000	0.01	72.2	0.000	0.0
Maximum:		2.59	110787	0.444	1.44	91.0	5.112	48055.0
Average:		0.26	3953	0.028	0.22	84.9	3.369	7878.5
Total:		28.81	430922		24.34			102421.00
* Note: NRCS does not recommend using CN method for rains < 0.5 in. See 'PreDevelopment Areas and CN' Help for more info.								

Infiltration Design – Commercial NORTH

Pre-Development Runoff (SLAMM) = 49108 CF

Description	Area (ac)	CN
1 HSG B	15.370	68
2 HSG C	0.560	78
3	0.000	0
4	0.000	0
5	0.000	0
6	0.000	0
Total Area (ac)	15.930	
Composite CN		68
Total Model Area (ac):		15.923

Clear Cancel Continue

Summary of Stay-On Requirements

Lot Area	Rain Total	Rain Total	Outfall Total	Total Losses	Pre-Dev Runoff	Pre-Developed	90% STAYON
ac	in	cf	cf	cf	cf	cf	in
15.923	28.81	1665232	256730	1408502	49108	1616124	25.16

POST-DEVELOPED LOSSES	1408502
PRE-DEVELOPED LOSSES	÷ 1616124
	87%

SLAMM Stay-On Calculations

Land Uses	Junctions	Control Practices	Outfall	Outp				
Runoff Volume (cf)	Part. Solids Yield (lbs)	Part. Solids Conc. (mg/L)	Pollutant Yield (lbs)	Pollutant C				
Data File: U:\User\2104109\Engineering\SW\MP\WinSLAMM\2104109_Hartung TSS and Infiltration Modeling_Com North.mc								
Rain File: WisReg - Madison WI 1981.RAN								
Date: 06-20-22 Time: 6:19:50 PM								
Site Description:								
Runoff Volume Total (cf) at the Outfall								
Rain Number	Start Date	Rain Total (in)	Outfall Total (cf)	Rv	Total Losses (in.)	Calculated CN*	Event Peak Flow (cfs)	Pre-Dev Runoff Vol.
91	10/15/81	0.02	0	0.000	0.02	n/a	0.000	n/a
92	10/17/81	0.95	10718	0.195	0.76	86.5	0.690	1
93	10/18/81	0.06	0	0.000	0.06	n/a	0.000	n/a
94	10/21/81	0.06	0	0.000	0.06	n/a	0.000	n/a
95	10/21/81	0.01	0	0.000	0.01	n/a	0.000	n/a
96	10/24/81	0.01	0	0.000	0.01	n/a	0.000	n/a
97	10/31/81	0.01	0	0.000	0.01	n/a	0.000	n/a
98	11/05/81	0.04	0	0.000	0.04	n/a	0.000	n/a
99	11/15/81	0.07	0	0.000	0.07	n/a	0.000	n/a
100	11/18/81	0.05	0	0.000	0.05	n/a	0.000	n/a
101	11/19/81	0.26	0	0.000	0.26	n/a	0.000	n/a
102	11/23/81	0.18	0	0.000	0.18	n/a	0.000	n/a
103	11/25/81	0.89	0	0.000	0.89	n/a	0.000	n/a
104	11/30/81	0.37	0	0.000	0.37	n/a	0.000	n/a
105	12/03/81	-	-	-	-	-	-	-
106	12/14/81	-	-	-	-	-	-	-
107	12/20/81	-	-	-	-	-	-	-
108	12/26/81	-	-	-	-	-	-	-
109	12/31/81	-	-	-	-	-	-	-
Minimum:		0.00	0	0.000	0.01	82.3	0.000	0.0
Maximum:		2.59	69972	0.467	1.38	90.8	2.709	24739.0
Average:		0.26	2355	0.027	0.22	85.1	1.735	4464.4
Total:		28.81	256730		24.37			49108.00
* Note: NRCS does not recommend using CN method for rains < 0.5 in.								
See 'PreDevelopment Areas and CN' Help for more info.								

Infiltration Design - Commercial CENTRAL

Pre-Development Runoff (SLAMM) = 82486 CF

Description	Area (ac)	CN
1 HSG B	25.817	68
2 HSG C	0.940	78
3	0.000	0
4	0.000	0
5	0.000	0
6	0.000	0
Total Area (ac)	26.757	
Composite CN		68
Total Model Area (ac): 26.757		

Clear Cancel Continue

Summary of Stay-On Requirements

Lot Area	Rain Total	Rain Total	Outfall Total	Total Losses	Pre-Dev Runoff	Pre-Developed	90% STAYON
ac	in	cf	cf	cf	cf	cf	in
26.757	28.81	2798255	429757	2368498	82486	2715769	25.16

POST-DEVELOPED LOSSES	2368498
PRE-DEVELOPED LOSSES	÷ 2715769
	87%

SLAMM Stay-On Calculations

Land Uses	Junctions	Control Practices	Outfall	Output :				
Runoff Volume (cf)	Part. Solids Yield (lbs)	Part. Solids Conc. (mg/L)	Pollutant Yield (lbs)	Pollutant Con				
Data File: U:\User\2104109\Engineering\SWMP\WinSLAMM\2104109_Hartung TSS and Infiltration Modeling_Com Central.mdt								
Rain File: WisReg - Madison WI 1981.RAN								
Date: 06-20-22 Time: 6:26:00 PM								
Site Description:								
Runoff Volume Total (cf) at the Outfall								
Rain Number	Start Date	Rain Total (in)	Outfall Total (cf)	Rv	Total Losses (in.)	Calculated CN*	Event Peak Flow (cfs)	Pre-Dev Runoff Vol.
91	10/15/81	0.02	0	0.000	0.02	n/a	0.000	n/a
92	10/17/81	0.95	19852	0.215	0.75	87.3	1.033	2
93	10/18/81	0.06	0	0.000	0.06	n/a	0.000	n/a
94	10/21/81	0.06	0	0.000	0.06	n/a	0.000	n/a
95	10/21/81	0.01	0	0.000	0.01	n/a	0.000	n/a
96	10/24/81	0.01	0	0.000	0.01	n/a	0.000	n/a
97	10/31/81	0.01	0	0.000	0.01	n/a	0.000	n/a
98	11/05/81	0.04	0	0.000	0.04	n/a	0.000	n/a
99	11/15/81	0.07	0	0.000	0.07	n/a	0.000	n/a
100	11/18/81	0.05	0	0.000	0.05	n/a	0.000	n/a
101	11/19/81	0.26	0	0.000	0.26	n/a	0.000	n/a
102	11/23/81	0.18	0	0.000	0.18	n/a	0.000	n/a
103	11/25/81	0.89	0	0.000	0.89	n/a	0.000	n/a
104	11/30/81	0.37	0	0.000	0.37	n/a	0.000	n/a
105	12/03/81	-	-	-	-	-	-	-
106	12/14/81	-	-	-	-	-	-	-
107	12/20/81	-	-	-	-	-	-	-
108	12/26/81	-	-	-	-	-	-	-
109	12/31/81	-	-	-	-	-	-	-
Minimum:		0.00	0	0.000	0.01	82.9	0.000	0.0
Maximum:		2.59	112650	0.448	1.43	90.8	4.032	41552.0
Average:		0.26	3943	0.027	0.22	84.9	2.412	6873.8
Total:		28.81	429757		24.39			82486.00
* Note: NRCS does not recommend using CN method for rains < 0.5 in.								
See 'PreDevelopment Areas and CN' Help for more info.								

Infiltration Design - Commercial SOUTH

Pre-Development Runoff (SLAMM) = 42851 CF

Description	Area (ac)	CN
1 HSG B	13.410	68
2 HSG C	0.490	78
3	0.000	0
4	0.000	0
5	0.000	0
6	0.000	0
Total Area (ac)	13.900	
Composite CN		68
Total Model Area (ac): 13.893		
Clear	Cancel	Continue

Summary of Stay-On Requirements

Lot Area ac	Rain Total in	Rain Total cf	Outfall Total cf	Total Losses cf	Pre-Dev Runoff cf	Pre- Developed cf	90% STAYON in
13.893	28.81	1452934	224471	1228463	42851	1410083	25.16

POST-DEVELOPED LOSSES	1228463
PRE-DEVELOPED LOSSES	÷ 1410083
	87%

SLAMM Stay-On Calculations

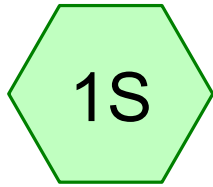
Land Uses	Junctions	Control Practices	Outfall	Outp				
Runoff Volume (cf)	Part. Solids Yield (lbs)	Part. Solids Conc. (mg/L)	Pollutant Yield (lbs)	Pollutant C				
Data File: U:\User\2104109\Engineering\SWMP\WinSLAMM\2104109_Hartung TSS and Infiltration Modeling_Com South.n								
Rain File: WisReg - Madison WI 1981.RAN								
Date: 06-20-22 Time: 6:29:11 PM								
Site Description:								
Runoff Volume Total (cf) at the Outfall								
Rain Number	Start Date	Rain Total (in)	Outfall Total (cf)	Rv	Total Losses (in.)	Calculated CN*	Event Peak Flow (cfs)	Pre-Dev Runoff Vol.
91	10/15/81	0.02	0	0.000	0.02	n/a	0.000	n/a
92	10/17/81	0.95	10874	0.227	0.73	87.7	0.990	1
93	10/18/81	0.06	0	0.000	0.06	n/a	0.000	n/a
94	10/21/81	0.06	0	0.000	0.06	n/a	0.000	n/a
95	10/21/81	0.01	0	0.000	0.01	n/a	0.000	n/a
96	10/24/81	0.01	0	0.000	0.01	n/a	0.000	n/a
97	10/31/81	0.01	0	0.000	0.01	n/a	0.000	n/a
98	11/05/81	0.04	0	0.000	0.04	n/a	0.000	n/a
99	11/15/81	0.07	0	0.000	0.07	n/a	0.000	n/a
100	11/18/81	0.05	0	0.000	0.05	n/a	0.000	n/a
101	11/19/81	0.26	0	0.000	0.26	n/a	0.000	n/a
102	11/23/81	0.18	0	0.000	0.18	n/a	0.000	n/a
103	11/25/81	0.89	3465	0.077	0.82	81.4	0.375	0
104	11/30/81	0.37	0	0.000	0.37	n/a	0.000	n/a
105	12/03/81	-	-	-	-	-	-	-
106	12/14/81	-	-	-	-	-	-	-
107	12/20/81	-	-	-	-	-	-	-
108	12/26/81	-	-	-	-	-	-	-
109	12/31/81	-	-	-	-	-	-	-
Minimum:		0.00	0	0.000	0.01	78.2	0.000	0.0
Maximum:		2.59	51628	0.395	1.57	90.7	4.061	21586.0
Average:		0.26	2059	0.030	0.22	83.9	1.860	2255.3
Total:		28.81	224471		24.37			42851.00
* Note: NRCS does not recommend using CN method for rains < 0.5 in.								
See 'PreDevelopment Areas and CN' Help for more info.								

APPENDIX C

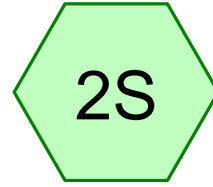
RUNOFF RATE CONTROL (HydroCAD)

C1

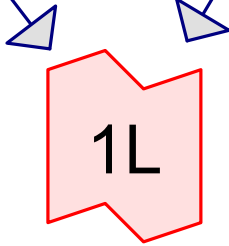
PRE-DEVELOPMENT
EXISTING
Pre-Existing Site Conditions Prior To Construction



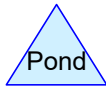
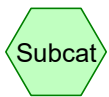
EX Overall Residential



EX Overall Commercial



Total EX Drainage



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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
79.093	68	Cropland, HSG B (1S, 2S)
5.158	78	Cropland, HSG C (1S, 2S)
0.879	98	Paved, HSG B (1S)
85.131	69	TOTAL AREA

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MSE 24-hr 4 1yr Rainfall=2.49"

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Summary for Subcatchment 1S: EX Overall Residential

Runoff = 6.57 cfs @ 12.63 hrs, Volume= 0.996 af, Depth= 0.45"

Routed to Link 1L : Total EX Drainage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 1yr Rainfall=2.49"

	Area (sf)	CN	Description
*	981,200	68	Cropland, HSG B
*	136,300	78	Cropland, HSG C
*	38,300	98	Paved, HSG B
	1,155,800	70	Weighted Average
	1,117,500		96.69% Pervious Area
	38,300		3.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	300	0.0447	0.31		Sheet Flow, Sheet
					Range n= 0.130 P2= 2.84"
22.0	967	0.0110	0.73		Shallow Concentrated Flow, Shallow
					Short Grass Pasture Kv= 7.0 fps
38.2	1,267	Total			

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MSE 24-hr 4 1yr Rainfall=2.49"

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Summary for Subcatchment 2S: EX Overall Commercial

Runoff = 11.62 cfs @ 12.64 hrs, Volume= 1.873 af, Depth= 0.38"

Routed to Link 1L : Total EX Drainage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 1yr Rainfall=2.49"

Area (sf)	CN	Description
* 2,464,100	68	Cropland, HSG B
* 88,400	78	Cropland, HSG C
2,552,500	68	Weighted Average
2,552,500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	300	0.0187	0.22		Sheet Flow, Sheet
					Range n= 0.130 P2= 2.84"
14.5	1,112	0.0332	1.28		Shallow Concentrated Flow, Shallow
					Short Grass Pasture Kv= 7.0 fps
37.4	1,412	Total			

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MSE 24-hr 4 1yr Rainfall=2.49"

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Summary for Link 1L: Total EX Drainage

Inflow Area = 85.131 ac, 1.03% Impervious, Inflow Depth = 0.40" for 1yr event
Inflow = 18.19 cfs @ 12.64 hrs, Volume= 2.869 af
Primary = 18.19 cfs @ 12.64 hrs, Volume= 2.869 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 19L

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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MSE 24-hr 4 2yr Rainfall=2.84"

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Summary for Subcatchment 1S: EX Overall Residential

Runoff = 9.90 cfs @ 12.61 hrs, Volume= 1.387 af, Depth= 0.63"

Routed to Link 1L : Total EX Drainage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2yr Rainfall=2.84"

Area (sf)	CN	Description
* 981,200	68	Cropland, HSG B
* 136,300	78	Cropland, HSG C
* 38,300	98	Paved, HSG B
1,155,800	70	Weighted Average
1,117,500		96.69% Pervious Area
38,300		3.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	300	0.0447	0.31		Sheet Flow, Sheet Range n= 0.130 P2= 2.84"
22.0	967	0.0110	0.73		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
38.2	1,267	Total			

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MSE 24-hr 4 2yr Rainfall=2.84"

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Summary for Subcatchment 2S: EX Overall Commercial

Runoff = 18.29 cfs @ 12.61 hrs, Volume= 2.666 af, Depth= 0.55"
 Routed to Link 1L : Total EX Drainage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 2yr Rainfall=2.84"

	Area (sf)	CN	Description
*	2,464,100	68	Cropland, HSG B
*	88,400	78	Cropland, HSG C
	2,552,500	68	Weighted Average
	2,552,500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	300	0.0187	0.22		Sheet Flow, Sheet
					Range n= 0.130 P2= 2.84"
14.5	1,112	0.0332	1.28		Shallow Concentrated Flow, Shallow
					Short Grass Pasture Kv= 7.0 fps
37.4	1,412	Total			

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MSE 24-hr 4 2yr Rainfall=2.84"

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Summary for Link 1L: Total EX Drainage

Inflow Area = 85.131 ac, 1.03% Impervious, Inflow Depth = 0.57" for 2yr event
Inflow = 28.19 cfs @ 12.61 hrs, Volume= 4.053 af
Primary = 28.19 cfs @ 12.61 hrs, Volume= 4.053 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 19L

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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MSE 24-hr 4 10yr Rainfall=4.09"

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Summary for Subcatchment 1S: EX Overall Residential

Runoff = 24.55 cfs @ 12.57 hrs, Volume= 3.074 af, Depth= 1.39"

Routed to Link 1L : Total EX Drainage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 10yr Rainfall=4.09"

Area (sf)	CN	Description
* 981,200	68	Cropland, HSG B
* 136,300	78	Cropland, HSG C
* 38,300	98	Paved, HSG B
1,155,800	70	Weighted Average
1,117,500		96.69% Pervious Area
38,300		3.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	300	0.0447	0.31		Sheet Flow, Sheet
					Range n= 0.130 P2= 2.84"
22.0	967	0.0110	0.73		Shallow Concentrated Flow, Shallow
					Short Grass Pasture Kv= 7.0 fps
38.2	1,267	Total			

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MSE 24-hr 4 10yr Rainfall=4.09"

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Summary for Subcatchment 2S: EX Overall Commercial

Runoff = 48.92 cfs @ 12.57 hrs, Volume= 6.164 af, Depth= 1.26"

Routed to Link 1L : Total EX Drainage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 10yr Rainfall=4.09"

	Area (sf)	CN	Description
*	2,464,100	68	Cropland, HSG B
*	88,400	78	Cropland, HSG C
	2,552,500	68	Weighted Average
	2,552,500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	300	0.0187	0.22		Sheet Flow, Sheet
					Range n= 0.130 P2= 2.84"
14.5	1,112	0.0332	1.28		Shallow Concentrated Flow, Shallow
					Short Grass Pasture Kv= 7.0 fps
37.4	1,412	Total			

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MSE 24-hr 4 10yr Rainfall=4.09"

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Summary for Link 1L: Total EX Drainage

Inflow Area = 85.131 ac, 1.03% Impervious, Inflow Depth = 1.30" for 10yr event
Inflow = 73.47 cfs @ 12.57 hrs, Volume= 9.238 af
Primary = 73.47 cfs @ 12.57 hrs, Volume= 9.238 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 19L

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

2104109_Hartung Drainage Areas

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MSE 24-hr 4 100yr Rainfall=6.66"

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Summary for Subcatchment 1S: EX Overall Residential

Runoff = 61.67 cfs @ 12.54 hrs, Volume= 7.380 af, Depth= 3.34"
 Routed to Link 1L : Total EX Drainage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 100yr Rainfall=6.66"

	Area (sf)	CN	Description
*	981,200	68	Cropland, HSG B
*	136,300	78	Cropland, HSG C
*	38,300	98	Paved, HSG B
	1,155,800	70	Weighted Average
	1,117,500		96.69% Pervious Area
	38,300		3.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	300	0.0447	0.31		Sheet Flow, Sheet
					Range n= 0.130 P2= 2.84"
22.0	967	0.0110	0.73		Shallow Concentrated Flow, Shallow
					Short Grass Pasture Kv= 7.0 fps
38.2	1,267	Total			

2104109_Hartung Drainage Areas

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MSE 24-hr 4 100yr Rainfall=6.66"

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Summary for Subcatchment 2S: EX Overall Commercial

Runoff = 129.11 cfs @ 12.53 hrs, Volume= 15.320 af, Depth= 3.14"

Routed to Link 1L : Total EX Drainage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100yr Rainfall=6.66"

	Area (sf)	CN	Description
*	2,464,100	68	Cropland, HSG B
*	88,400	78	Cropland, HSG C
	2,552,500	68	Weighted Average
	2,552,500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	300	0.0187	0.22		Sheet Flow, Sheet
					Range n= 0.130 P2= 2.84"
14.5	1,112	0.0332	1.28		Shallow Concentrated Flow, Shallow
					Short Grass Pasture Kv= 7.0 fps
37.4	1,412	Total			

2104109_Hartung Drainage Areas

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MSE 24-hr 4 100yr Rainfall=6.66"

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Summary for Link 1L: Total EX Drainage

Inflow Area = 85.131 ac, 1.03% Impervious, Inflow Depth = 3.20" for 100yr event
Inflow = 190.75 cfs @ 12.54 hrs, Volume= 22.700 af
Primary = 190.75 cfs @ 12.54 hrs, Volume= 22.700 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 19L

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

2104109_Hartung Drainage Areas

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MSE 24-hr 4 200yr Rainfall=7.53"

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Summary for Subcatchment 1S: EX Overall Residential

Runoff = 75.29 cfs @ 12.54 hrs, Volume= 8.984 af, Depth= 4.06"

Routed to Link 1L : Total EX Drainage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 200yr Rainfall=7.53"

	Area (sf)	CN	Description
*	981,200	68	Cropland, HSG B
*	136,300	78	Cropland, HSG C
*	38,300	98	Paved, HSG B
	1,155,800	70	Weighted Average
	1,117,500		96.69% Pervious Area
	38,300		3.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	300	0.0447	0.31		Sheet Flow, Sheet
					Range n= 0.130 P2= 2.84"
22.0	967	0.0110	0.73		Shallow Concentrated Flow, Shallow
					Short Grass Pasture Kv= 7.0 fps
38.2	1,267	Total			

2104109_Hartung Drainage Areas

MSE 24-hr 4 200yr Rainfall=7.53"

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Summary for Subcatchment 2S: EX Overall Commercial

Runoff = 158.96 cfs @ 12.53 hrs, Volume= 18.769 af, Depth= 3.84"
 Routed to Link 1L : Total EX Drainage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 200yr Rainfall=7.53"

	Area (sf)	CN	Description
*	2,464,100	68	Cropland, HSG B
*	88,400	78	Cropland, HSG C
	2,552,500	68	Weighted Average
	2,552,500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	300	0.0187	0.22		Sheet Flow, Sheet Range n= 0.130 P2= 2.84"
14.5	1,112	0.0332	1.28		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
37.4	1,412	Total			

2104109_Hartung Drainage Areas

MSE 24-hr 4 200yr Rainfall=7.53"

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Summary for Link 1L: Total EX Drainage

Inflow Area = 85.131 ac, 1.03% Impervious, Inflow Depth = 3.91" for 200yr event
Inflow = 234.22 cfs @ 12.53 hrs, Volume= 27.753 af
Primary = 234.22 cfs @ 12.53 hrs, Volume= 27.753 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 19L

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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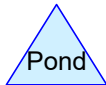
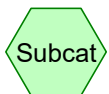
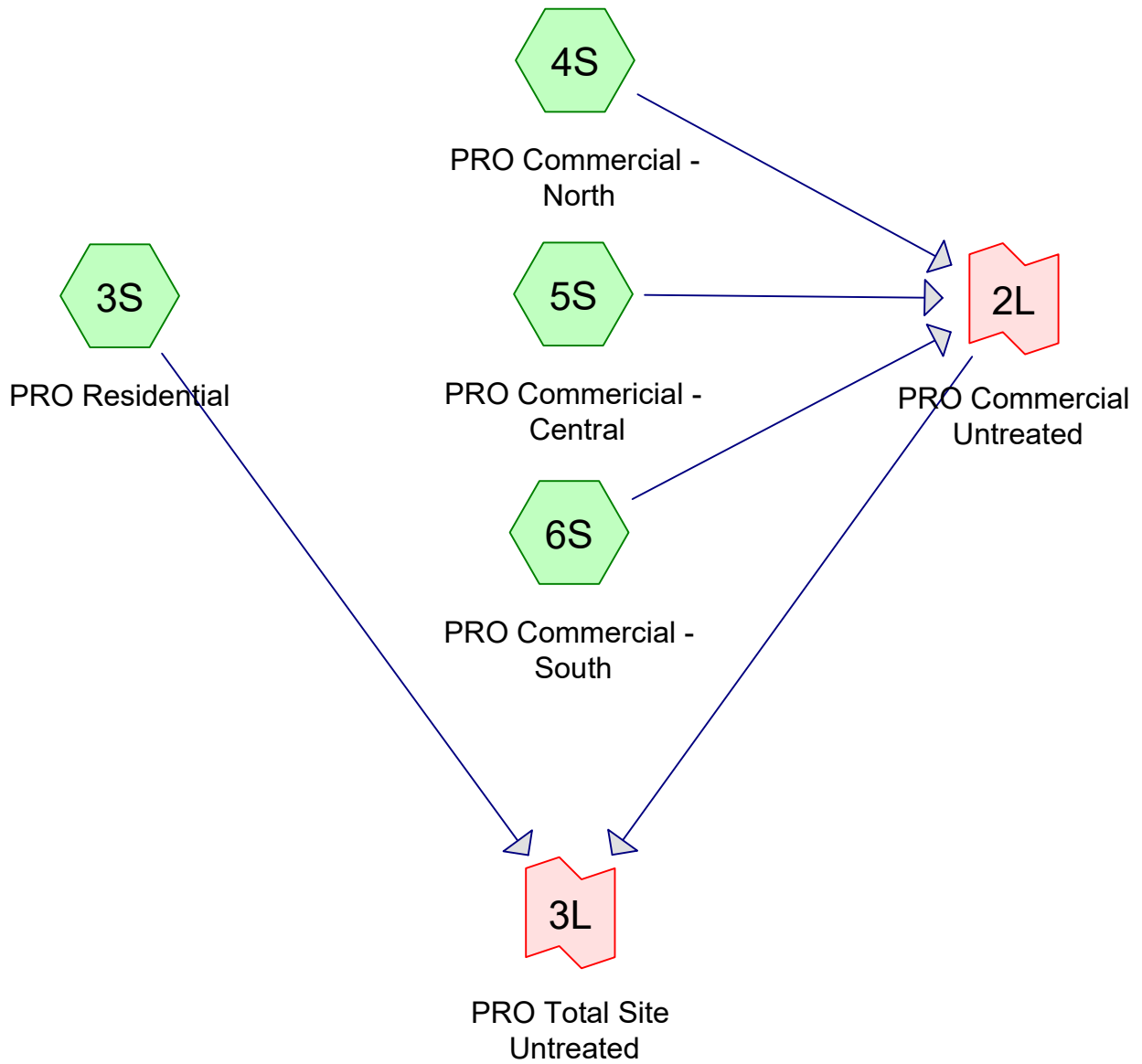
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C2

POST-DEVELOPMENT

NO CONTROLS

**Post-Construction Site Conditions with no additional
storm water management facilities installed.**



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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
41.264	74	>75% Grass cover, Good, HSG C (3S, 4S, 5S, 6S)
25.587	98	Drives/Parking (3S, 4S, 5S, 6S)
14.280	98	Roof (3S, 4S, 5S, 6S)
1.975	98	Sidewalk (3S, 4S, 5S)
83.106	86	TOTAL AREA

2104109_Hartung Drainage Areas

MSE 24-hr 4 1yr Rainfall=2.49"

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Summary for Subcatchment 3S: PRO Residential

Runoff = 49.43 cfs @ 12.12 hrs, Volume= 2.588 af, Depth= 1.17"
 Routed to Link 3L : PRO Total Site Untreated

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 1yr Rainfall=2.49"

Area (sf)	CN	Description
* 210,990	98	Roof
* 287,060	98	Drives/Parking
* 55,070	98	Sidewalk
602,680	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
1,155,800	85	Weighted Average
602,680		52.14% Pervious Area
553,120		47.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	20	0.0200	0.94		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
0.6	200	0.0750	5.56		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
4.2	1,500	0.0100	5.94	10.50	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.2	1,720	Total			

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MSE 24-hr 4 1yr Rainfall=2.49"

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Summary for Subcatchment 4S: PRO Commercial - North

Runoff = 36.78 cfs @ 12.12 hrs, Volume= 1.919 af, Depth= 1.45"
 Routed to Link 2L : PRO Commercial Untreated

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 1yr Rainfall=2.49"

Area (sf)	CN	Description
* 149,400	98	Roof
* 267,570	98	Drives/Parking
* 2,460	98	Sidewalk
274,171	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
693,601	89	Weighted Average
274,171		39.53% Pervious Area
419,430		60.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	160	0.0250	1.56		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
3.3	1,600	0.0187	8.13	14.36	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.0	1,760	Total			

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MSE 24-hr 4 1yr Rainfall=2.49"

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Summary for Subcatchment 5S: PRO Commercial - Central

Runoff = 56.02 cfs @ 12.12 hrs, Volume= 2.905 af, Depth= 1.30"
Routed to Link 2L : PRO Commercial Untreated

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 1yr Rainfall=2.49"

	Area (sf)	CN	Description
*	190,230	98	Roof
*	416,545	98	Drives/Parking
*	28,480	98	Sidewalk
	530,270	74	>75% Grass cover, Good, HSG C
*	0	100	Water Surface, HSG C
	1,165,525	87	Weighted Average
	530,270		45.50% Pervious Area
	635,255		54.50% Impervious Area

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

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MSE 24-hr 4 1yr Rainfall=2.49"

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Summary for Subcatchment 6S: PRO Commercial - South

Runoff = 23.39 cfs @ 12.12 hrs, Volume= 1.214 af, Depth= 1.05"
 Routed to Link 2L : PRO Commercial Untreated

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 1yr Rainfall=2.49"

	Area (sf)	CN	Description
*	71,425	98	Roof
*	143,385	98	Drives/Parking
*	0	98	Sidewalk
	390,340	74	>75% Grass cover, Good, HSG C
*	0	100	Water Surface, HSG C
	605,150	83	Weighted Average
	390,340		64.50% Pervious Area
	214,810		35.50% Impervious Area

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

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MSE 24-hr 4 1yr Rainfall=2.49"

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Summary for Link 2L: PRO Commercial Untreated

Inflow Area = 56.572 ac, 51.52% Impervious, Inflow Depth = 1.28" for 1yr event
Inflow = 116.18 cfs @ 12.12 hrs, Volume= 6.037 af
Primary = 116.18 cfs @ 12.12 hrs, Volume= 6.037 af, Atten= 0%, Lag= 0.0 min
Routed to Link 3L : PRO Total Site Untreated

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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MSE 24-hr 4 1yr Rainfall=2.49"

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Summary for Link 3L: PRO Total Site Untreated

Inflow Area = 83.106 ac, 50.35% Impervious, Inflow Depth = 1.25" for 1yr event
Inflow = 165.56 cfs @ 12.12 hrs, Volume= 8.625 af
Primary = 165.56 cfs @ 12.12 hrs, Volume= 8.625 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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MSE 24-hr 4 2yr Rainfall=2.84"

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Summary for Subcatchment 3S: PRO Residential

Runoff = 61.37 cfs @ 12.12 hrs, Volume= 3.217 af, Depth= 1.45"
 Routed to Link 3L : PRO Total Site Untreated

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 2yr Rainfall=2.84"

Area (sf)	CN	Description
* 210,990	98	Roof
* 287,060	98	Drives/Parking
* 55,070	98	Sidewalk
602,680	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
1,155,800	85	Weighted Average
602,680		52.14% Pervious Area
553,120		47.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	20	0.0200	0.94		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
0.6	200	0.0750	5.56		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
4.2	1,500	0.0100	5.94	10.50	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.2	1,720	Total			

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MSE 24-hr 4 2yr Rainfall=2.84"

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Summary for Subcatchment 4S: PRO Commercial - North

Runoff = 44.39 cfs @ 12.12 hrs, Volume= 2.330 af, Depth= 1.76"
 Routed to Link 2L : PRO Commercial Untreated

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 2yr Rainfall=2.84"

Area (sf)	CN	Description
* 149,400	98	Roof
* 267,570	98	Drives/Parking
* 2,460	98	Sidewalk
274,171	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
693,601	89	Weighted Average
274,171		39.53% Pervious Area
419,430		60.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	160	0.0250	1.56		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
3.3	1,600	0.0187	8.13	14.36	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.0	1,760	Total			

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MSE 24-hr 4 2yr Rainfall=2.84"

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Summary for Subcatchment 5S: PRO Commerical - Central

Runoff = 68.55 cfs @ 12.12 hrs, Volume= 3.568 af, Depth= 1.60"
 Routed to Link 2L : PRO Commercial Untreated

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 2yr Rainfall=2.84"

	Area (sf)	CN	Description
*	190,230	98	Roof
*	416,545	98	Drives/Parking
*	28,480	98	Sidewalk
	530,270	74	>75% Grass cover, Good, HSG C
*	0	100	Water Surface, HSG C
	1,165,525	87	Weighted Average
	530,270		45.50% Pervious Area
	635,255		54.50% Impervious Area

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

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MSE 24-hr 4 2yr Rainfall=2.84"

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Summary for Subcatchment 6S: PRO Commercial - South

Runoff = 29.50 cfs @ 12.12 hrs, Volume= 1.527 af, Depth= 1.32"
Routed to Link 2L : PRO Commercial Untreated

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2yr Rainfall=2.84"

	Area (sf)	CN	Description
*	71,425	98	Roof
*	143,385	98	Drives/Parking
*	0	98	Sidewalk
	390,340	74	>75% Grass cover, Good, HSG C
*	0	100	Water Surface, HSG C
	605,150	83	Weighted Average
	390,340		64.50% Pervious Area
	214,810		35.50% Impervious Area

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

Summary for Link 2L: PRO Commercial Untreated

Inflow Area = 56.572 ac, 51.52% Impervious, Inflow Depth = 1.57" for 2yr event
Inflow = 142.42 cfs @ 12.12 hrs, Volume= 7.425 af
Primary = 142.42 cfs @ 12.12 hrs, Volume= 7.425 af, Atten= 0%, Lag= 0.0 min
Routed to Link 3L : PRO Total Site Untreated

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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MSE 24-hr 4 2yr Rainfall=2.84"

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Summary for Link 3L: PRO Total Site Untreated

Inflow Area = 83.106 ac, 50.35% Impervious, Inflow Depth = 1.54" for 2yr event
Inflow = 203.74 cfs @ 12.12 hrs, Volume= 10.641 af
Primary = 203.74 cfs @ 12.12 hrs, Volume= 10.641 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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MSE 24-hr 4 10yr Rainfall=4.09"

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Summary for Subcatchment 3S: PRO Residential

Runoff = 105.67 cfs @ 12.12 hrs, Volume= 5.613 af, Depth= 2.54"
 Routed to Link 3L : PRO Total Site Untreated

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 10yr Rainfall=4.09"

Area (sf)	CN	Description
* 210,990	98	Roof
* 287,060	98	Drives/Parking
* 55,070	98	Sidewalk
602,680	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
1,155,800	85	Weighted Average
602,680		52.14% Pervious Area
553,120		47.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	20	0.0200	0.94		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
0.6	200	0.0750	5.56		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
4.2	1,500	0.0100	5.94	10.50	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.2	1,720	Total			

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MSE 24-hr 4 10yr Rainfall=4.09"

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Summary for Subcatchment 4S: PRO Commercial - North

Runoff = 71.87 cfs @ 12.11 hrs, Volume= 3.858 af, Depth= 2.91"
 Routed to Link 2L : PRO Commercial Untreated

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 10yr Rainfall=4.09"

Area (sf)	CN	Description
* 149,400	98	Roof
* 267,570	98	Drives/Parking
* 2,460	98	Sidewalk
274,171	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
693,601	89	Weighted Average
274,171		39.53% Pervious Area
419,430		60.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	160	0.0250	1.56		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
3.3	1,600	0.0187	8.13	14.36	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.0	1,760	Total			

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MSE 24-hr 4 10yr Rainfall=4.09"

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Summary for Subcatchment 5S: PRO Commercial - Central

Runoff = 114.38 cfs @ 12.11 hrs, Volume= 6.063 af, Depth= 2.72"
 Routed to Link 2L : PRO Commercial Untreated

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 10yr Rainfall=4.09"

	Area (sf)	CN	Description
*	190,230	98	Roof
*	416,545	98	Drives/Parking
*	28,480	98	Sidewalk
	530,270	74	>75% Grass cover, Good, HSG C
*	0	100	Water Surface, HSG C
	1,165,525	87	Weighted Average
	530,270		45.50% Pervious Area
	635,255		54.50% Impervious Area

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

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MSE 24-hr 4 10yr Rainfall=4.09"

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Summary for Subcatchment 6S: PRO Commercial - South

Runoff = 52.49 cfs @ 12.12 hrs, Volume= 2.737 af, Depth= 2.36"
Routed to Link 2L : PRO Commercial Untreated

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 10yr Rainfall=4.09"

	Area (sf)	CN	Description
*	71,425	98	Roof
*	143,385	98	Drives/Parking
*	0	98	Sidewalk
	390,340	74	>75% Grass cover, Good, HSG C
*	0	100	Water Surface, HSG C
	605,150	83	Weighted Average
	390,340		64.50% Pervious Area
	214,810		35.50% Impervious Area

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

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MSE 24-hr 4 10yr Rainfall=4.09"

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Summary for Link 2L: PRO Commercial Untreated

Inflow Area = 56.572 ac, 51.52% Impervious, Inflow Depth = 2.69" for 10yr event
Inflow = 238.73 cfs @ 12.12 hrs, Volume= 12.659 af
Primary = 238.73 cfs @ 12.12 hrs, Volume= 12.659 af, Atten= 0%, Lag= 0.0 min
Routed to Link 3L : PRO Total Site Untreated

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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MSE 24-hr 4 10yr Rainfall=4.09"

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Summary for Link 3L: PRO Total Site Untreated

Inflow Area = 83.106 ac, 50.35% Impervious, Inflow Depth = 2.64" for 10yr event
Inflow = 344.32 cfs @ 12.12 hrs, Volume= 18.272 af
Primary = 344.32 cfs @ 12.12 hrs, Volume= 18.272 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

2104109_Hartung Drainage Areas

MSE 24-hr 4 100yr Rainfall=6.66"

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Summary for Subcatchment 3S: PRO Residential

Runoff = 198.77 cfs @ 12.12 hrs, Volume= 10.897 af, Depth= 4.93"

Routed to Link 3L : PRO Total Site Untreated

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100yr Rainfall=6.66"

Area (sf)	CN	Description
* 210,990	98	Roof
* 287,060	98	Drives/Parking
* 55,070	98	Sidewalk
602,680	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
1,155,800	85	Weighted Average
602,680		52.14% Pervious Area
553,120		47.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	20	0.0200	0.94		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
0.6	200	0.0750	5.56		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
4.2	1,500	0.0100	5.94	10.50	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.2	1,720	Total			

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MSE 24-hr 4 100yr Rainfall=6.66"

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Summary for Subcatchment 4S: PRO Commercial - North

Runoff = 128.12 cfs @ 12.11 hrs, Volume= 7.132 af, Depth> 5.37"
 Routed to Link 2L : PRO Commercial Untreated

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 100yr Rainfall=6.66"

Area (sf)	CN	Description
* 149,400	98	Roof
* 267,570	98	Drives/Parking
* 2,460	98	Sidewalk
274,171	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
693,601	89	Weighted Average
274,171		39.53% Pervious Area
419,430		60.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	160	0.0250	1.56		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
3.3	1,600	0.0187	8.13	14.36	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.0	1,760	Total			

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MSE 24-hr 4 100yr Rainfall=6.66"

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Summary for Subcatchment 5S: PRO Commerical - Central

Runoff = 209.29 cfs @ 12.11 hrs, Volume= 11.486 af, Depth> 5.15"
 Routed to Link 2L : PRO Commercial Untreated

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 100yr Rainfall=6.66"

	Area (sf)	CN	Description
*	190,230	98	Roof
*	416,545	98	Drives/Parking
*	28,480	98	Sidewalk
	530,270	74	>75% Grass cover, Good, HSG C
*	0	100	Water Surface, HSG C
	1,165,525	87	Weighted Average
	530,270		45.50% Pervious Area
	635,255		54.50% Impervious Area

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

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MSE 24-hr 4 100yr Rainfall=6.66"

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Summary for Subcatchment 6S: PRO Commercial - South

Runoff = 101.65 cfs @ 12.11 hrs, Volume= 5.450 af, Depth= 4.71"
 Routed to Link 2L : PRO Commercial Untreated

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 100yr Rainfall=6.66"

	Area (sf)	CN	Description
*	71,425	98	Roof
*	143,385	98	Drives/Parking
*	0	98	Sidewalk
	390,340	74	>75% Grass cover, Good, HSG C
*	0	100	Water Surface, HSG C
	605,150	83	Weighted Average
	390,340		64.50% Pervious Area
	214,810		35.50% Impervious Area

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

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MSE 24-hr 4 100yr Rainfall=6.66"

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Summary for Link 2L: PRO Commercial Untreated

Inflow Area = 56.572 ac, 51.52% Impervious, Inflow Depth > 5.11" for 100yr event
Inflow = 439.05 cfs @ 12.11 hrs, Volume= 24.067 af
Primary = 439.05 cfs @ 12.11 hrs, Volume= 24.067 af, Atten= 0%, Lag= 0.0 min
Routed to Link 3L : PRO Total Site Untreated

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

Summary for Link 3L: PRO Total Site Untreated

Inflow Area = 83.106 ac, 50.35% Impervious, Inflow Depth > 5.05" for 100yr event
Inflow = 637.72 cfs @ 12.11 hrs, Volume= 34.964 af
Primary = 637.72 cfs @ 12.11 hrs, Volume= 34.964 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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MSE 24-hr 4 200yr Rainfall=7.53"

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Summary for Subcatchment 3S: PRO Residential

Runoff = 230.22 cfs @ 12.12 hrs, Volume= 12.737 af, Depth= 5.76"
 Routed to Link 3L : PRO Total Site Untreated

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 200yr Rainfall=7.53"

Area (sf)	CN	Description
* 210,990	98	Roof
* 287,060	98	Drives/Parking
* 55,070	98	Sidewalk
602,680	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
1,155,800	85	Weighted Average
602,680		52.14% Pervious Area
553,120		47.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	20	0.0200	0.94		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
0.6	200	0.0750	5.56		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
4.2	1,500	0.0100	5.94	10.50	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.2	1,720	Total			

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MSE 24-hr 4 200yr Rainfall=7.53"

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Summary for Subcatchment 4S: PRO Commercial - North

Runoff = 146.98 cfs @ 12.11 hrs, Volume= 8.254 af, Depth> 6.22"
 Routed to Link 2L : PRO Commercial Untreated

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 200yr Rainfall=7.53"

Area (sf)	CN	Description
* 149,400	98	Roof
* 267,570	98	Drives/Parking
* 2,460	98	Sidewalk
274,171	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
693,601	89	Weighted Average
274,171		39.53% Pervious Area
419,430		60.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	160	0.0250	1.56		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
3.3	1,600	0.0187	8.13	14.36	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.0	1,760	Total			

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MSE 24-hr 4 200yr Rainfall=7.53"

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Summary for Subcatchment 5S: PRO Commercial - Central

Runoff = 241.21 cfs @ 12.11 hrs, Volume= 13.360 af, Depth> 5.99"

Routed to Link 2L : PRO Commercial Untreated

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 200yr Rainfall=7.53"

	Area (sf)	CN	Description
*	190,230	98	Roof
*	416,545	98	Drives/Parking
*	28,480	98	Sidewalk
	530,270	74	>75% Grass cover, Good, HSG C
*	0	100	Water Surface, HSG C
	1,165,525	87	Weighted Average
	530,270		45.50% Pervious Area
	635,255		54.50% Impervious Area

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

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MSE 24-hr 4 200yr Rainfall=7.53"

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Summary for Subcatchment 6S: PRO Commercial - South

Runoff = 118.35 cfs @ 12.11 hrs, Volume= 6.402 af, Depth= 5.53"
Routed to Link 2L : PRO Commercial Untreated

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 200yr Rainfall=7.53"

	Area (sf)	CN	Description
*	71,425	98	Roof
*	143,385	98	Drives/Parking
*	0	98	Sidewalk
	390,340	74	>75% Grass cover, Good, HSG C
*	0	100	Water Surface, HSG C
	605,150	83	Weighted Average
	390,340		64.50% Pervious Area
	214,810		35.50% Impervious Area

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

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MSE 24-hr 4 200yr Rainfall=7.53"

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Summary for Link 2L: PRO Commercial Untreated

Inflow Area = 56.572 ac, 51.52% Impervious, Inflow Depth > 5.94" for 200yr event
Inflow = 506.53 cfs @ 12.11 hrs, Volume= 28.016 af
Primary = 506.53 cfs @ 12.11 hrs, Volume= 28.016 af, Atten= 0%, Lag= 0.0 min
Routed to Link 3L : PRO Total Site Untreated

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

Summary for Link 3L: PRO Total Site Untreated

Inflow Area = 83.106 ac, 50.35% Impervious, Inflow Depth > 5.88" for 200yr event
Inflow = 736.64 cfs @ 12.11 hrs, Volume= 40.754 af
Primary = 736.64 cfs @ 12.11 hrs, Volume= 40.754 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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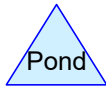
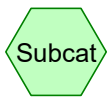
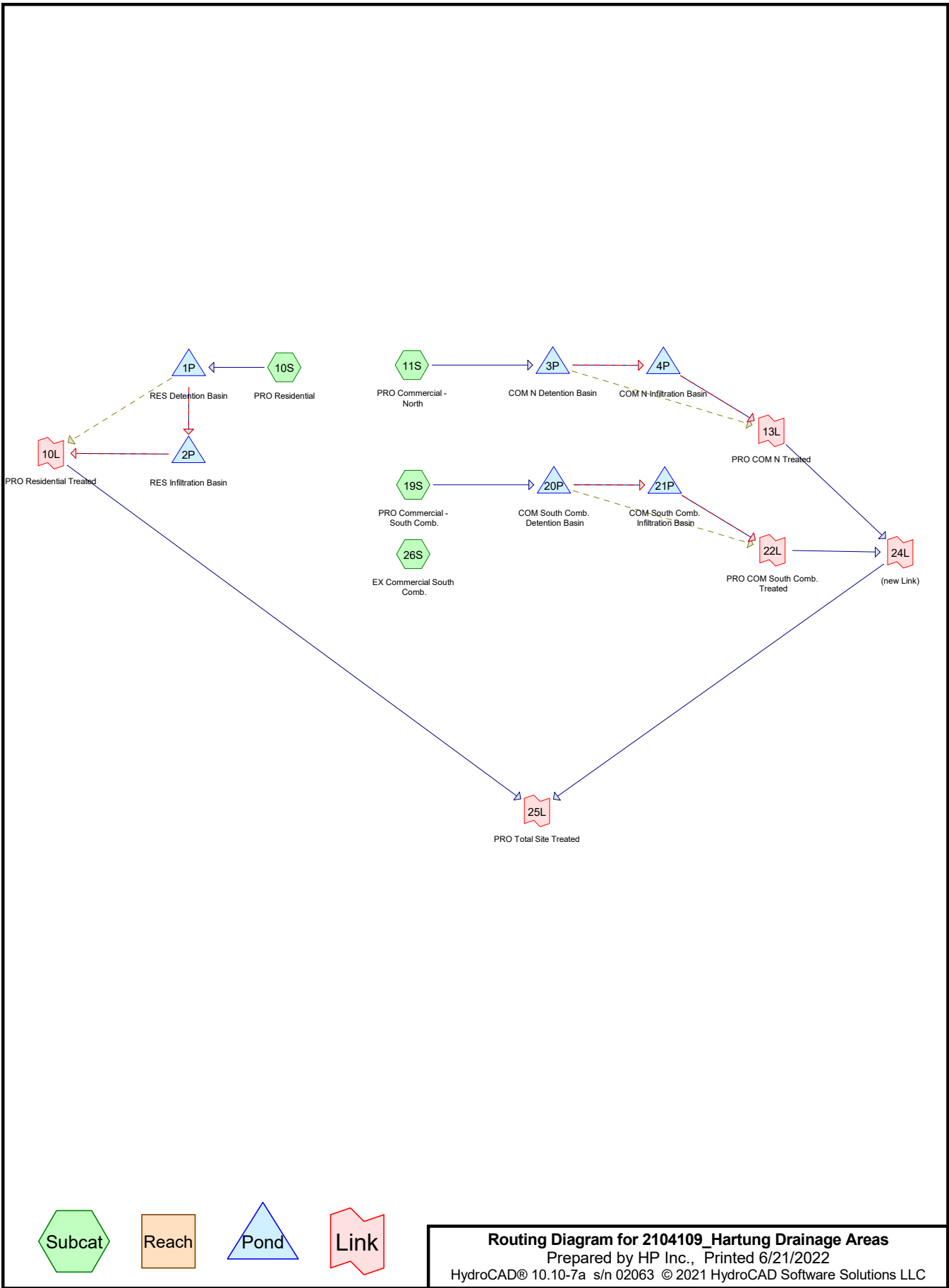
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POST-DEVELOPMENT WITH CONTROLS

**Post-Construction Site Conditions *with* proposed
storm water management facilities installed.**



Routing Diagram for 2104109_Hartung Drainage Areas
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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
29.091	74	>75% Grass cover, Good, HSG C (10S, 11S, 19S)
39.241	68	Cropland, HSG B (26S)
1.408	78	Cropland, HSG C (26S)
25.587	98	Drives/Parking (10S, 11S, 19S)
14.280	98	Roof (10S, 11S, 19S)
1.975	98	Sidewalk (10S, 11S, 19S)
111.581	81	TOTAL AREA

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MSE 24-hr 4 1yr Rainfall=2.49"

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Summary for Subcatchment 10S: PRO Residential

Runoff = 49.43 cfs @ 12.12 hrs, Volume= 2.588 af, Depth= 1.17"
 Routed to Pond 1P : RES Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 1yr Rainfall=2.49"

Area (sf)	CN	Description
* 210,990	98	Roof
* 287,060	98	Drives/Parking
* 55,070	98	Sidewalk
602,680	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
1,155,800	85	Weighted Average
602,680		52.14% Pervious Area
553,120		47.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	20	0.0200	0.94		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
0.6	200	0.0750	5.56		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
4.2	1,500	0.0100	5.94	10.50	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.2	1,720	Total			

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Summary for Subcatchment 11S: PRO Commercial - North

Runoff = 36.78 cfs @ 12.12 hrs, Volume= 1.919 af, Depth= 1.45"
 Routed to Pond 3P : COM N Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 1yr Rainfall=2.49"

	Area (sf)	CN	Description
*	149,400	98	Roof
*	267,570	98	Drives/Parking
*	2,460	98	Sidewalk
	274,171	74	>75% Grass cover, Good, HSG C
*	0	100	Water Surface, HSG C
	693,601	89	Weighted Average
	274,171		39.53% Pervious Area
	419,430		60.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	160	0.0250	1.56		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
3.3	1,600	0.0187	8.13	14.36	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.0	1,760	Total			

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MSE 24-hr 4 1yr Rainfall=2.49"

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Summary for Subcatchment 19S: PRO Commercial - South Comb.

Runoff = 68.90 cfs @ 12.12 hrs, Volume= 3.612 af, Depth= 1.52"

Routed to Pond 20P : COM South Comb. Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 1yr Rainfall=2.49"

Area (sf)	CN	Description
* 261,655	98	Roof
* 559,930	98	Drives/Parking
* 28,480	98	Sidewalk
390,340	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
1,240,405	90	Weighted Average
390,340		31.47% Pervious Area
850,065		68.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	160	0.0250	1.56		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
3.3	1,600	0.0187	8.13	14.36	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.0	1,760	Total			

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MSE 24-hr 4 1yr Rainfall=2.49"

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Summary for Subcatchment 26S: EX Commercial South Comb.

Runoff = 8.06 cfs @ 12.64 hrs, Volume= 1.299 af, Depth= 0.38"
Routed to nonexistent node 27L

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 1yr Rainfall=2.49"

	Area (sf)	CN	Description
*	1,709,350	68	Cropland, HSG B
*	61,325	78	Cropland, HSG C
	1,770,675	68	Weighted Average
	1,770,675		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	300	0.0187	0.22		Sheet Flow, Sheet
					Range n= 0.130 P2= 2.84"
14.5	1,112	0.0332	1.28		Shallow Concentrated Flow, Shallow
					Short Grass Pasture Kv= 7.0 fps
37.4	1,412	Total			

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MSE 24-hr 4 1yr Rainfall=2.49"

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Summary for Pond 1P: RES Detention Basin

Inflow Area = 26.534 ac, 47.86% Impervious, Inflow Depth = 1.17" for 1yr event
 Inflow = 49.43 cfs @ 12.12 hrs, Volume= 2.588 af
 Outflow = 6.46 cfs @ 12.61 hrs, Volume= 2.520 af, Atten= 87%, Lag= 29.3 min
 Primary = 2.66 cfs @ 12.61 hrs, Volume= 1.883 af
 Routed to Pond 2P : RES Infiltration Basin
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Pond 2P : RES Infiltration Basin
 Tertiary = 3.80 cfs @ 12.61 hrs, Volume= 0.637 af
 Routed to Link 10L : PRO Residential Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 905.83' @ 12.61 hrs Surf.Area= 32,094 sf Storage= 54,714 cf

Plug-Flow detention time= 337.2 min calculated for 2.519 af (97% of inflow)
 Center-of-Mass det. time= 324.9 min (1,146.9 - 822.0)

Volume	Invert	Avail.Storage	Storage Description
#1	904.00'	168,775 cf	RES Pond Live Storage (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
904.00	27,800	0	0
905.00	30,150	28,975	28,975
906.00	32,500	31,325	60,300
907.00	34,900	33,700	94,000
908.00	37,400	36,150	130,150
909.00	39,850	38,625	168,775

Device	Routing	Invert	Outlet Devices
#1	Primary	904.00'	12.0" Round Culvert to INF Basin L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 904.00' / 904.00' S= 0.0000 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	906.00'	Overflow Weir to INF Basin, C= 2.50 Offset (feet) 0.00 9.00 24.00 33.00 Height (feet) 3.00 0.00 0.00 3.00
#3	Tertiary	903.00'	42.0" Round Release Structure Outlet L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 903.00' / 902.00' S= 0.0333 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 9.62 sf
#4	Device 3	907.25'	48.0" Horiz. Release Structure Rim Grate C= 0.600 Limited to weir flow at low heads
#5	Device 3	905.00'	24.0" Vert. Release Structure Orifice C= 0.600 Limited to weir flow at low heads

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MSE 24-hr 4 1yr Rainfall=2.49"

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Primary OutFlow Max=2.66 cfs @ 12.61 hrs HW=905.83' TW=903.24' (Dynamic Tailwater)

↑1=Culvert to INF Basin (Barrel Controls 2.66 cfs @ 3.39 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=904.00' TW=903.00' (Dynamic Tailwater)

↑2=Overflow Weir to INF Basin (Controls 0.00 cfs)

Tertiary OutFlow Max=3.79 cfs @ 12.61 hrs HW=905.83' TW=0.00' (Dynamic Tailwater)

↑3=Release Structure Outlet (Passes 3.79 cfs of 47.66 cfs potential flow)

↑4=Release Structure Rim Grate (Controls 0.00 cfs)

↑5=Release Structure Orifice (Orifice Controls 3.79 cfs @ 3.10 fps)

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MSE 24-hr 4 1yr Rainfall=2.49"

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Summary for Pond 2P: RES Infiltration Basin

Inflow Area = 26.534 ac, 47.86% Impervious, Inflow Depth > 0.85" for 1yr event
 Inflow = 2.66 cfs @ 12.61 hrs, Volume= 1.883 af
 Outflow = 1.38 cfs @ 18.35 hrs, Volume= 1.883 af, Atten= 48%, Lag= 344.4 min
 Discarded = 0.27 cfs @ 18.35 hrs, Volume= 1.071 af
 Primary = 1.11 cfs @ 18.35 hrs, Volume= 0.812 af
 Routed to Link 10L : PRO Residential Treated
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Link 10L : PRO Residential Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 904.47' @ 18.35 hrs Surf.Area= 21,411 sf Storage= 28,239 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 588.6 min (1,846.8 - 1,258.2)

Volume	Invert	Avail.Storage	Storage Description
#1	903.00'	158,750 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
903.00	17,000	0	0
904.00	20,000	18,500	18,500
905.00	23,000	21,500	40,000
906.00	26,000	24,500	64,500
907.00	29,500	27,750	92,250
908.00	33,000	31,250	123,500
909.00	37,500	35,250	158,750

Device	Routing	Invert	Outlet Devices
#1	Discarded	903.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 890.00'
#2	Primary	904.00'	18.0" Round Inf Basin Outlet Culvert L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 904.00' / 903.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#3	Secondary	907.50'	Emergency Spillway, C= 2.50 Offset (feet) 0.00 8.00 28.00 36.00 Height (feet) 2.00 0.00 0.00 2.00

Discarded OutFlow Max=0.27 cfs @ 18.35 hrs HW=904.47' (Free Discharge)
 ↑1=Exfiltration (Controls 0.27 cfs)

Primary OutFlow Max=1.11 cfs @ 18.35 hrs HW=904.47' TW=0.00' (Dynamic Tailwater)
 ↑2=Inf Basin Outlet Culvert (Inlet Controls 1.11 cfs @ 2.33 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=903.00' TW=0.00' (Dynamic Tailwater)
 ↑3=Emergency Spillway (Controls 0.00 cfs)

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MSE 24-hr 4 1yr Rainfall=2.49"

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Summary for Pond 3P: COM N Detention Basin

Inflow Area = 15.923 ac, 60.47% Impervious, Inflow Depth = 1.45" for 1yr event
 Inflow = 36.78 cfs @ 12.12 hrs, Volume= 1.919 af
 Outflow = 4.79 cfs @ 12.58 hrs, Volume= 1.883 af, Atten= 87%, Lag= 27.8 min
 Primary = 1.73 cfs @ 12.58 hrs, Volume= 1.243 af
 Routed to Pond 4P : COM N Infiltration Basin
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Pond 4P : COM N Infiltration Basin
 Tertiary = 3.06 cfs @ 12.58 hrs, Volume= 0.640 af
 Routed to Link 13L : PRO COM N Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 882.98' @ 12.58 hrs Surf.Area= 23,003 sf Storage= 42,344 cf

Plug-Flow detention time= 303.2 min calculated for 1.883 af (98% of inflow)
 Center-of-Mass det. time= 292.5 min (1,100.8 - 808.3)

Volume	Invert	Avail.Storage	Storage Description
#1	881.00'	119,705 cf	COM N Live Storage (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
881.00	19,700	0	0
882.00	21,330	20,515	20,515
883.00	23,030	22,180	42,695
884.00	24,760	23,895	66,590
885.00	26,550	25,655	92,245
886.00	28,370	27,460	119,705

Device	Routing	Invert	Outlet Devices
#1	Primary	881.00'	8.0" Round Culvert to INF Basin L= 36.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 881.00' / 881.00' S= 0.0000 '/ Cc= 0.900 n= 0.013, Flow Area= 0.35 sf
#2	Secondary	883.00'	Weir to INF Basin, C= 2.50 Offset (feet) 0.00 10.00 50.00 60.00 Height (feet) 2.50 0.00 0.00 2.50
#3	Tertiary	880.00'	36.0" Round Release Structure Outlet L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 880.00' / 878.00' S= 0.0400 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 7.07 sf
#4	Device 3	881.83'	12.0" Vert. Release Structure Orifice C= 0.600 Limited to weir flow at low heads
#5	Device 3	884.00'	48.0" Horiz. Release Structure Overflow Gate C= 0.600 Limited to weir flow at low heads

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Primary OutFlow Max=1.73 cfs @ 12.58 hrs HW=882.98' TW=880.19' (Dynamic Tailwater)

↑1=Culvert to INF Basin (Barrel Controls 1.73 cfs @ 4.96 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=881.00' TW=880.00' (Dynamic Tailwater)

↑2=Weir to INF Basin (Controls 0.00 cfs)

Tertiary OutFlow Max=3.06 cfs @ 12.58 hrs HW=882.98' TW=0.00' (Dynamic Tailwater)

↑3=Release Structure Outlet (Passes 3.06 cfs of 41.54 cfs potential flow)

↑4=Release Structure Orifice (Orifice Controls 3.06 cfs @ 3.89 fps)

↑5=Release Structure Overflow Gate (Controls 0.00 cfs)

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Summary for Pond 4P: COM N Infiltration Basin

Inflow Area = 15.923 ac, 60.47% Impervious, Inflow Depth > 0.94" for 1yr event
 Inflow = 1.73 cfs @ 12.58 hrs, Volume= 1.243 af
 Outflow = 0.72 cfs @ 19.67 hrs, Volume= 1.243 af, Atten= 58%, Lag= 425.3 min
 Discarded = 0.26 cfs @ 19.67 hrs, Volume= 0.910 af
 Primary = 0.46 cfs @ 19.67 hrs, Volume= 0.334 af
 Routed to Link 13L : PRO COM N Treated
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Link 13L : PRO COM N Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 881.30' @ 19.67 hrs Surf.Area= 18,061 sf Storage= 21,755 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 656.5 min (1,896.8 - 1,240.3)

Volume	Invert	Avail.Storage	Storage Description
#1	880.00'	128,238 cf	COM N Inf Storage (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
880.00	15,475	0	0
881.00	17,450	16,463	16,463
882.00	19,500	18,475	34,938
883.00	21,650	20,575	55,513
884.00	23,350	22,500	78,013
885.00	25,100	24,225	102,238
886.00	26,900	26,000	128,238

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 875.00'
#2	Primary	881.00'	18.0" Round Inf Basin Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 881.00' / 880.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#3	Secondary	884.50'	Emergency Overflow Weir, C= 2.50 Offset (feet) 0.00 8.00 28.00 36.00 Height (feet) 2.00 0.00 0.00 2.00

Discarded OutFlow Max=0.26 cfs @ 19.67 hrs HW=881.30' (Free Discharge)
 ↑1=Exfiltration (Controls 0.26 cfs)

Primary OutFlow Max=0.46 cfs @ 19.67 hrs HW=881.30' TW=0.00' (Dynamic Tailwater)
 ↑2=Inf Basin Culvert (Inlet Controls 0.46 cfs @ 1.86 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=880.00' TW=0.00' (Dynamic Tailwater)
 ↑3=Emergency Overflow Weir (Controls 0.00 cfs)

Summary for Pond 20P: COM South Comb. Detention Basin

Inflow Area = 28.476 ac, 68.53% Impervious, Inflow Depth = 1.52" for 1yr event
 Inflow = 68.90 cfs @ 12.12 hrs, Volume= 3.612 af
 Outflow = 21.75 cfs @ 12.30 hrs, Volume= 3.555 af, Atten= 68%, Lag= 11.0 min
 Primary = 4.22 cfs @ 12.30 hrs, Volume= 2.097 af
 Routed to Pond 21P : COM South Comb. Infiltration Basin
 Secondary = 7.75 cfs @ 12.30 hrs, Volume= 0.172 af
 Routed to Pond 21P : COM South Comb. Infiltration Basin
 Tertiary = 9.79 cfs @ 12.30 hrs, Volume= 1.286 af
 Routed to Link 22L : PRO COM South Comb. Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 883.18' @ 12.30 hrs Surf.Area= 33,983 sf Storage= 68,295 cf

Plug-Flow detention time= 224.6 min calculated for 3.553 af (98% of inflow)
 Center-of-Mass det. time= 217.7 min (1,022.2 - 804.5)

Volume	Invert	Avail.Storage	Storage Description
#1	881.00'	174,305 cf	COM N Live Storage (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
881.00	28,540	0	0
882.00	31,000	29,770	29,770
883.00	33,520	32,260	62,030
884.00	36,090	34,805	96,835
885.00	38,720	37,405	134,240
886.00	41,410	40,065	174,305

Device	Routing	Invert	Outlet Devices
#1	Primary	881.00'	12.0" Round Culvert to INF Basin L= 36.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 881.00' / 881.00' S= 0.0000 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	883.00'	Weir to INF Basin, C= 2.50 Offset (feet) 0.00 10.00 50.00 60.00 Height (feet) 2.50 0.00 0.00 2.50
#3	Tertiary	880.00'	36.0" Round Release Structure Outlet L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 880.00' / 878.00' S= 0.0400 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 7.07 sf
#4	Device 3	881.75'	24.0" Vert. Release Structure Orifice C= 0.600 Limited to weir flow at low heads
#5	Device 3	884.00'	60.0" Horiz. Release Structure Overflow Grate C= 0.600 Limited to weir flow at low heads

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Primary OutFlow Max=4.22 cfs @ 12.30 hrs HW=883.18' TW=880.26' (Dynamic Tailwater)

↑1=Culvert to INF Basin (Barrel Controls 4.22 cfs @ 5.37 fps)

Secondary OutFlow Max=7.73 cfs @ 12.30 hrs HW=883.18' TW=880.26' (Dynamic Tailwater)

↑2=Weir to INF Basin (Weir Controls 7.73 cfs @ 1.04 fps)

Tertiary OutFlow Max=9.78 cfs @ 12.30 hrs HW=883.18' TW=0.00' (Dynamic Tailwater)

↑3=Release Structure Outlet (Passes 9.78 cfs of 44.11 cfs potential flow)

↑4=Release Structure Orifice (Orifice Controls 9.78 cfs @ 4.07 fps)

↑5=Release Structure Overflow Gate (Controls 0.00 cfs)

Summary for Pond 21P: COM South Comb. Infiltration Basin

Inflow Area = 28.476 ac, 68.53% Impervious, Inflow Depth > 0.96" for 1yr event
 Inflow = 11.97 cfs @ 12.30 hrs, Volume= 2.269 af
 Outflow = 1.51 cfs @ 17.23 hrs, Volume= 2.269 af, Atten= 87%, Lag= 295.7 min
 Discarded = 0.42 cfs @ 17.23 hrs, Volume= 1.467 af
 Primary = 1.09 cfs @ 17.23 hrs, Volume= 0.802 af
 Routed to Link 22L : PRO COM South Comb. Treated
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Link 22L : PRO COM South Comb. Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 881.47' @ 17.23 hrs Surf.Area= 28,592 sf Storage= 39,450 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 627.8 min (1,773.0 - 1,145.2)

Volume	Invert	Avail.Storage	Storage Description
#1	880.00'	193,923 cf	COM N Inf Storage (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
880.00	25,225	0	0
881.00	27,500	26,363	26,363
882.00	29,840	28,670	55,033
883.00	32,230	31,035	86,068
884.00	34,680	33,455	119,523
885.00	37,185	35,933	155,455
886.00	39,750	38,468	193,923

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 875.00'
#2	Primary	881.00'	18.0" Round Inf Basin Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 881.00' / 880.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#3	Secondary	884.50'	Emergency Overflow Weir, C= 2.50 Offset (feet) 0.00 8.00 28.00 36.00 Height (feet) 2.00 0.00 0.00 2.00

Discarded OutFlow Max=0.42 cfs @ 17.23 hrs HW=881.47' (Free Discharge)
 ↑1=Exfiltration (Controls 0.42 cfs)

Primary OutFlow Max=1.09 cfs @ 17.23 hrs HW=881.47' TW=0.00' (Dynamic Tailwater)
 ↑2=Inf Basin Culvert (Inlet Controls 1.09 cfs @ 2.33 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=880.00' TW=0.00' (Dynamic Tailwater)
 ↑3=Emergency Overflow Weir (Controls 0.00 cfs)

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Summary for Link 10L: PRO Residential Treated

Inflow Area = 26.534 ac, 47.86% Impervious, Inflow Depth = 0.66" for 1yr event
Inflow = 3.80 cfs @ 12.61 hrs, Volume= 1.449 af
Primary = 3.80 cfs @ 12.61 hrs, Volume= 1.449 af, Atten= 0%, Lag= 0.0 min
Routed to Link 25L : PRO Total Site Treated

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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Summary for Link 13L: PRO COM N Treated

Inflow Area = 15.923 ac, 60.47% Impervious, Inflow Depth = 0.73" for 1yr event
Inflow = 3.06 cfs @ 12.58 hrs, Volume= 0.974 af
Primary = 3.06 cfs @ 12.58 hrs, Volume= 0.974 af, Atten= 0%, Lag= 0.0 min
Routed to Link 24L : (new Link)

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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Summary for Link 22L: PRO COM South Comb. Treated

Inflow Area = 28.476 ac, 68.53% Impervious, Inflow Depth = 0.88" for 1yr event
Inflow = 9.79 cfs @ 12.30 hrs, Volume= 2.088 af
Primary = 9.79 cfs @ 12.30 hrs, Volume= 2.088 af, Atten= 0%, Lag= 0.0 min
Routed to Link 24L : (new Link)

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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Summary for Link 24L: (new Link)

Inflow Area = 44.399 ac, 65.64% Impervious, Inflow Depth = 0.83" for 1yr event
Inflow = 12.57 cfs @ 12.32 hrs, Volume= 3.062 af
Primary = 12.57 cfs @ 12.32 hrs, Volume= 3.062 af, Atten= 0%, Lag= 0.0 min
Routed to Link 25L : PRO Total Site Treated

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

Summary for Link 25L: PRO Total Site Treated

Inflow Area = 70.932 ac, 58.99% Impervious, Inflow Depth = 0.76" for 1yr event
Inflow = 15.72 cfs @ 12.43 hrs, Volume= 4.511 af
Primary = 15.72 cfs @ 12.43 hrs, Volume= 4.511 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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MSE 24-hr 4 2yr Rainfall=2.84"

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Summary for Subcatchment 10S: PRO Residential

Runoff = 61.37 cfs @ 12.12 hrs, Volume= 3.217 af, Depth= 1.45"
 Routed to Pond 1P : RES Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 2yr Rainfall=2.84"

Area (sf)	CN	Description
* 210,990	98	Roof
* 287,060	98	Drives/Parking
* 55,070	98	Sidewalk
602,680	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
1,155,800	85	Weighted Average
602,680		52.14% Pervious Area
553,120		47.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	20	0.0200	0.94		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
0.6	200	0.0750	5.56		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
4.2	1,500	0.0100	5.94	10.50	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.2	1,720	Total			

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MSE 24-hr 4 2yr Rainfall=2.84"

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Summary for Subcatchment 11S: PRO Commercial - North

Runoff = 44.39 cfs @ 12.12 hrs, Volume= 2.330 af, Depth= 1.76"
 Routed to Pond 3P : COM N Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 2yr Rainfall=2.84"

Area (sf)	CN	Description
* 149,400	98	Roof
* 267,570	98	Drives/Parking
* 2,460	98	Sidewalk
274,171	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
693,601	89	Weighted Average
274,171		39.53% Pervious Area
419,430		60.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	160	0.0250	1.56		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
3.3	1,600	0.0187	8.13	14.36	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.0	1,760	Total			

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MSE 24-hr 4 2yr Rainfall=2.84"

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Summary for Subcatchment 19S: PRO Commercial - South Comb.

Runoff = 82.61 cfs @ 12.12 hrs, Volume= 4.361 af, Depth= 1.84"

Routed to Pond 20P : COM South Comb. Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2yr Rainfall=2.84"

Area (sf)	CN	Description
* 261,655	98	Roof
* 559,930	98	Drives/Parking
* 28,480	98	Sidewalk
390,340	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
1,240,405	90	Weighted Average
390,340		31.47% Pervious Area
850,065		68.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	160	0.0250	1.56		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
3.3	1,600	0.0187	8.13	14.36	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.0	1,760	Total			

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MSE 24-hr 4 2yr Rainfall=2.84"

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Summary for Subcatchment 26S: EX Commercial South Comb.

Runoff = 12.69 cfs @ 12.61 hrs, Volume= 1.849 af, Depth= 0.55"
Routed to nonexistent node 27L

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2yr Rainfall=2.84"

	Area (sf)	CN	Description
*	1,709,350	68	Cropland, HSG B
*	61,325	78	Cropland, HSG C
	1,770,675	68	Weighted Average
	1,770,675		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	300	0.0187	0.22		Sheet Flow, Sheet
					Range n= 0.130 P2= 2.84"
14.5	1,112	0.0332	1.28		Shallow Concentrated Flow, Shallow
					Short Grass Pasture Kv= 7.0 fps
37.4	1,412	Total			

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MSE 24-hr 4 2yr Rainfall=2.84"

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Summary for Pond 1P: RES Detention Basin

Inflow Area = 26.534 ac, 47.86% Impervious, Inflow Depth = 1.45" for 2yr event
 Inflow = 61.37 cfs @ 12.12 hrs, Volume= 3.217 af
 Outflow = 11.83 cfs @ 12.47 hrs, Volume= 3.149 af, Atten= 81%, Lag= 20.7 min
 Primary = 3.12 cfs @ 12.47 hrs, Volume= 2.071 af
 Routed to Pond 2P : RES Infiltration Basin
 Secondary = 1.99 cfs @ 12.47 hrs, Volume= 0.058 af
 Routed to Pond 2P : RES Infiltration Basin
 Tertiary = 6.72 cfs @ 12.47 hrs, Volume= 1.020 af
 Routed to Link 10L : PRO Residential Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 906.14' @ 12.47 hrs Surf.Area= 32,834 sf Storage= 64,851 cf

Plug-Flow detention time= 289.1 min calculated for 3.147 af (98% of inflow)
 Center-of-Mass det. time= 279.4 min (1,096.1 - 816.8)

Volume	Invert	Avail.Storage	Storage Description
#1	904.00'	168,775 cf	RES Pond Live Storage (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
904.00	27,800	0	0
905.00	30,150	28,975	28,975
906.00	32,500	31,325	60,300
907.00	34,900	33,700	94,000
908.00	37,400	36,150	130,150
909.00	39,850	38,625	168,775

Device	Routing	Invert	Outlet Devices
#1	Primary	904.00'	12.0" Round Culvert to INF Basin L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 904.00' / 904.00' S= 0.0000 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	906.00'	Overflow Weir to INF Basin, C= 2.50 Offset (feet) 0.00 9.00 24.00 33.00 Height (feet) 3.00 0.00 0.00 3.00
#3	Tertiary	903.00'	42.0" Round Release Structure Outlet L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 903.00' / 902.00' S= 0.0333 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 9.62 sf
#4	Device 3	907.25'	48.0" Horiz. Release Structure Rim Grate C= 0.600 Limited to weir flow at low heads
#5	Device 3	905.00'	24.0" Vert. Release Structure Orifice C= 0.600 Limited to weir flow at low heads

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Primary OutFlow Max=3.12 cfs @ 12.47 hrs HW=906.14' TW=903.29' (Dynamic Tailwater)

↑**1=Culvert to INF Basin** (Barrel Controls 3.12 cfs @ 3.97 fps)

Secondary OutFlow Max=1.97 cfs @ 12.47 hrs HW=906.14' TW=903.29' (Dynamic Tailwater)

↑**2=Overflow Weir to INF Basin** (Weir Controls 1.97 cfs @ 0.90 fps)

Tertiary OutFlow Max=6.71 cfs @ 12.47 hrs HW=906.14' TW=0.00' (Dynamic Tailwater)

↑**3=Release Structure Outlet** (Passes 6.71 cfs of 54.86 cfs potential flow)

↑**4=Release Structure Rim Grate** (Controls 0.00 cfs)

↑**5=Release Structure Orifice** (Orifice Controls 6.71 cfs @ 3.63 fps)

Summary for Pond 2P: RES Infiltration Basin

Inflow Area = 26.534 ac, 47.86% Impervious, Inflow Depth > 0.96" for 2yr event
 Inflow = 5.12 cfs @ 12.47 hrs, Volume= 2.129 af
 Outflow = 1.58 cfs @ 17.58 hrs, Volume= 2.129 af, Atten= 69%, Lag= 306.5 min
 Discarded = 0.28 cfs @ 17.58 hrs, Volume= 1.090 af
 Primary = 1.31 cfs @ 17.58 hrs, Volume= 1.039 af
 Routed to Link 10L : PRO Residential Treated
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Link 10L : PRO Residential Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 904.51' @ 17.58 hrs Surf.Area= 21,542 sf Storage= 29,173 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 544.5 min (1,775.7 - 1,231.2)

Volume	Invert	Avail.Storage	Storage Description
#1	903.00'	158,750 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
903.00	17,000	0	0
904.00	20,000	18,500	18,500
905.00	23,000	21,500	40,000
906.00	26,000	24,500	64,500
907.00	29,500	27,750	92,250
908.00	33,000	31,250	123,500
909.00	37,500	35,250	158,750

Device	Routing	Invert	Outlet Devices
#1	Discarded	903.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 890.00'
#2	Primary	904.00'	18.0" Round Inf Basin Outlet Culvert L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 904.00' / 903.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#3	Secondary	907.50'	Emergency Spillway, C= 2.50 Offset (feet) 0.00 8.00 28.00 36.00 Height (feet) 2.00 0.00 0.00 2.00

Discarded OutFlow Max=0.28 cfs @ 17.58 hrs HW=904.51' (Free Discharge)
 ↑1=Exfiltration (Controls 0.28 cfs)

Primary OutFlow Max=1.31 cfs @ 17.58 hrs HW=904.51' TW=0.00' (Dynamic Tailwater)
 ↑2=Inf Basin Outlet Culvert (Inlet Controls 1.31 cfs @ 2.44 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=903.00' TW=0.00' (Dynamic Tailwater)
 ↑3=Emergency Spillway (Controls 0.00 cfs)

Summary for Pond 3P: COM N Detention Basin

Inflow Area = 15.923 ac, 60.47% Impervious, Inflow Depth = 1.76" for 2yr event
 Inflow = 44.39 cfs @ 12.12 hrs, Volume= 2.330 af
 Outflow = 12.57 cfs @ 12.32 hrs, Volume= 2.294 af, Atten= 72%, Lag= 12.5 min
 Primary = 1.85 cfs @ 12.32 hrs, Volume= 1.332 af
 Routed to Pond 4P : COM N Infiltration Basin
 Secondary = 7.24 cfs @ 12.32 hrs, Volume= 0.199 af
 Routed to Pond 4P : COM N Infiltration Basin
 Tertiary = 3.47 cfs @ 12.32 hrs, Volume= 0.763 af
 Routed to Link 13L : PRO COM N Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 883.17' @ 12.32 hrs Surf.Area= 23,328 sf Storage= 46,812 cf

Plug-Flow detention time= 262.5 min calculated for 2.293 af (98% of inflow)
 Center-of-Mass det. time= 255.7 min (1,059.3 - 803.7)

Volume	Invert	Avail.Storage	Storage Description
#1	881.00'	119,705 cf	COM N Live Storage (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
881.00	19,700	0	0
882.00	21,330	20,515	20,515
883.00	23,030	22,180	42,695
884.00	24,760	23,895	66,590
885.00	26,550	25,655	92,245
886.00	28,370	27,460	119,705

Device	Routing	Invert	Outlet Devices
#1	Primary	881.00'	8.0" Round Culvert to INF Basin L= 36.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 881.00' / 881.00' S= 0.0000 '/ Cc= 0.900 n= 0.013, Flow Area= 0.35 sf
#2	Secondary	883.00'	Weir to INF Basin, C= 2.50 Offset (feet) 0.00 10.00 50.00 60.00 Height (feet) 2.50 0.00 0.00 2.50
#3	Tertiary	880.00'	36.0" Round Release Structure Outlet L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 880.00' / 878.00' S= 0.0400 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 7.07 sf
#4	Device 3	881.83'	12.0" Vert. Release Structure Orifice C= 0.600 Limited to weir flow at low heads
#5	Device 3	884.00'	48.0" Horiz. Release Structure Overflow Gate C= 0.600 Limited to weir flow at low heads

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Primary OutFlow Max=1.85 cfs @ 12.32 hrs HW=883.17' TW=880.29' (Dynamic Tailwater)

↑1=Culvert to INF Basin (Barrel Controls 1.85 cfs @ 5.30 fps)

Secondary OutFlow Max=7.04 cfs @ 12.32 hrs HW=883.17' TW=880.29' (Dynamic Tailwater)

↑2=Weir to INF Basin (Weir Controls 7.04 cfs @ 1.01 fps)

Tertiary OutFlow Max=3.46 cfs @ 12.32 hrs HW=883.17' TW=0.00' (Dynamic Tailwater)

↑3=Release Structure Outlet (Passes 3.46 cfs of 43.97 cfs potential flow)

↑4=Release Structure Orifice (Orifice Controls 3.46 cfs @ 4.41 fps)

↑5=Release Structure Overflow Gate (Controls 0.00 cfs)

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Summary for Pond 4P: COM N Infiltration Basin

Inflow Area = 15.923 ac, 60.47% Impervious, Inflow Depth > 1.15" for 2yr event
 Inflow = 9.10 cfs @ 12.32 hrs, Volume= 1.531 af
 Outflow = 1.04 cfs @ 16.66 hrs, Volume= 1.531 af, Atten= 89%, Lag= 260.3 min
 Discarded = 0.26 cfs @ 16.66 hrs, Volume= 0.937 af
 Primary = 0.78 cfs @ 16.66 hrs, Volume= 0.594 af
 Routed to Link 13L : PRO COM N Treated
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Link 13L : PRO COM N Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 881.39' @ 16.66 hrs Surf.Area= 18,250 sf Storage= 23,432 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 580.6 min (1,751.8 - 1,171.1)

Volume	Invert	Avail.Storage	Storage Description
#1	880.00'	128,238 cf	COM N Inf Storage (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
880.00	15,475	0	0
881.00	17,450	16,463	16,463
882.00	19,500	18,475	34,938
883.00	21,650	20,575	55,513
884.00	23,350	22,500	78,013
885.00	25,100	24,225	102,238
886.00	26,900	26,000	128,238

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 875.00'
#2	Primary	881.00'	18.0" Round Inf Basin Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 881.00' / 880.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#3	Secondary	884.50'	Emergency Overflow Weir, C= 2.50 Offset (feet) 0.00 8.00 28.00 36.00 Height (feet) 2.00 0.00 0.00 2.00

Discarded OutFlow Max=0.26 cfs @ 16.66 hrs HW=881.39' (Free Discharge)
 ↑1=Exfiltration (Controls 0.26 cfs)

Primary OutFlow Max=0.78 cfs @ 16.66 hrs HW=881.39' TW=0.00' (Dynamic Tailwater)
 ↑2=Inf Basin Culvert (Inlet Controls 0.78 cfs @ 2.13 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=880.00' TW=0.00' (Dynamic Tailwater)
 ↑3=Emergency Overflow Weir (Controls 0.00 cfs)

Summary for Pond 20P: COM South Comb. Detention Basin

Inflow Area = 28.476 ac, 68.53% Impervious, Inflow Depth = 1.84" for 2yr event
 Inflow = 82.61 cfs @ 12.12 hrs, Volume= 4.361 af
 Outflow = 41.76 cfs @ 12.22 hrs, Volume= 4.304 af, Atten= 49%, Lag= 6.3 min
 Primary = 4.59 cfs @ 12.22 hrs, Volume= 2.260 af
 Routed to Pond 21P : COM South Comb. Infiltration Basin
 Secondary = 25.13 cfs @ 12.22 hrs, Volume= 0.525 af
 Routed to Pond 21P : COM South Comb. Infiltration Basin
 Tertiary = 12.04 cfs @ 12.22 hrs, Volume= 1.519 af
 Routed to Link 22L : PRO COM South Comb. Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 883.39' @ 12.22 hrs Surf.Area= 34,527 sf Storage= 75,668 cf

Plug-Flow detention time= 197.8 min calculated for 4.304 af (99% of inflow)
 Center-of-Mass det. time= 190.1 min (990.2 - 800.1)

Volume	Invert	Avail.Storage	Storage Description
#1	881.00'	174,305 cf	COM N Live Storage (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
881.00	28,540	0	0
882.00	31,000	29,770	29,770
883.00	33,520	32,260	62,030
884.00	36,090	34,805	96,835
885.00	38,720	37,405	134,240
886.00	41,410	40,065	174,305

Device	Routing	Invert	Outlet Devices
#1	Primary	881.00'	12.0" Round Culvert to INF Basin L= 36.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 881.00' / 881.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	883.00'	Weir to INF Basin, C= 2.50 Offset (feet) 0.00 10.00 50.00 60.00 Height (feet) 2.50 0.00 0.00 2.50
#3	Tertiary	880.00'	36.0" Round Release Structure Outlet L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 880.00' / 878.00' S= 0.0400 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 7.07 sf
#4	Device 3	881.75'	24.0" Vert. Release Structure Orifice C= 0.600 Limited to weir flow at low heads
#5	Device 3	884.00'	60.0" Horiz. Release Structure Overflow Grate C= 0.600 Limited to weir flow at low heads

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Primary OutFlow Max=4.56 cfs @ 12.22 hrs HW=883.37' TW=880.41' (Dynamic Tailwater)

↑1=Culvert to INF Basin (Barrel Controls 4.56 cfs @ 5.80 fps)

Secondary OutFlow Max=23.57 cfs @ 12.22 hrs HW=883.37' TW=880.41' (Dynamic Tailwater)

↑2=Weir to INF Basin (Weir Controls 23.57 cfs @ 1.47 fps)

Tertiary OutFlow Max=11.86 cfs @ 12.22 hrs HW=883.37' TW=0.00' (Dynamic Tailwater)

↑3=Release Structure Outlet (Passes 11.86 cfs of 46.59 cfs potential flow)

↑4=Release Structure Orifice (Orifice Controls 11.86 cfs @ 4.34 fps)

↑5=Release Structure Overflow Gate (Controls 0.00 cfs)

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Summary for Pond 21P: COM South Comb. Infiltration Basin

Inflow Area = 28.476 ac, 68.53% Impervious, Inflow Depth > 1.17" for 2yr event
 Inflow = 29.71 cfs @ 12.22 hrs, Volume= 2.785 af
 Outflow = 2.21 cfs @ 15.14 hrs, Volume= 2.785 af, Atten= 93%, Lag= 175.0 min
 Discarded = 0.43 cfs @ 15.14 hrs, Volume= 1.504 af
 Primary = 1.78 cfs @ 15.14 hrs, Volume= 1.281 af
 Routed to Link 22L : PRO COM South Comb. Treated
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Link 22L : PRO COM South Comb. Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 881.61' @ 15.14 hrs Surf.Area= 28,919 sf Storage= 43,469 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 546.1 min (1,635.5 - 1,089.3)

Volume	Invert	Avail.Storage	Storage Description
#1	880.00'	193,923 cf	COM N Inf Storage (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
880.00	25,225	0	0
881.00	27,500	26,363	26,363
882.00	29,840	28,670	55,033
883.00	32,230	31,035	86,068
884.00	34,680	33,455	119,523
885.00	37,185	35,933	155,455
886.00	39,750	38,468	193,923

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 875.00'
#2	Primary	881.00'	18.0" Round Inf Basin Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 881.00' / 880.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#3	Secondary	884.50'	Emergency Overflow Weir, C= 2.50 Offset (feet) 0.00 8.00 28.00 36.00 Height (feet) 2.00 0.00 0.00 2.00

Discarded OutFlow Max=0.43 cfs @ 15.14 hrs HW=881.61' (Free Discharge)
 ↑1=Exfiltration (Controls 0.43 cfs)

Primary OutFlow Max=1.78 cfs @ 15.14 hrs HW=881.61' TW=0.00' (Dynamic Tailwater)
 ↑2=Inf Basin Culvert (Inlet Controls 1.78 cfs @ 2.65 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=880.00' TW=0.00' (Dynamic Tailwater)
 ↑3=Emergency Overflow Weir (Controls 0.00 cfs)

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Summary for Link 10L: PRO Residential Treated

Inflow Area = 26.534 ac, 47.86% Impervious, Inflow Depth = 0.93" for 2yr event
Inflow = 6.72 cfs @ 12.47 hrs, Volume= 2.058 af
Primary = 6.72 cfs @ 12.47 hrs, Volume= 2.058 af, Atten= 0%, Lag= 0.0 min
Routed to Link 25L : PRO Total Site Treated

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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MSE 24-hr 4 2yr Rainfall=2.84"

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Summary for Link 13L: PRO COM N Treated

Inflow Area = 15.923 ac, 60.47% Impervious, Inflow Depth = 1.02" for 2yr event
Inflow = 3.47 cfs @ 12.32 hrs, Volume= 1.357 af
Primary = 3.47 cfs @ 12.32 hrs, Volume= 1.357 af, Atten= 0%, Lag= 0.0 min
Routed to Link 24L : (new Link)

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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MSE 24-hr 4 2yr Rainfall=2.84"

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Summary for Link 22L: PRO COM South Comb. Treated

Inflow Area = 28.476 ac, 68.53% Impervious, Inflow Depth = 1.18" for 2yr event
Inflow = 12.04 cfs @ 12.22 hrs, Volume= 2.801 af
Primary = 12.04 cfs @ 12.22 hrs, Volume= 2.801 af, Atten= 0%, Lag= 0.0 min
Routed to Link 24L : (new Link)

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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Summary for Link 24L: (new Link)

Inflow Area = 44.399 ac, 65.64% Impervious, Inflow Depth = 1.12" for 2yr event
Inflow = 15.23 cfs @ 12.23 hrs, Volume= 4.158 af
Primary = 15.23 cfs @ 12.23 hrs, Volume= 4.158 af, Atten= 0%, Lag= 0.0 min
Routed to Link 25L : PRO Total Site Treated

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

Summary for Link 25L: PRO Total Site Treated

Inflow Area = 70.932 ac, 58.99% Impervious, Inflow Depth = 1.05" for 2yr event
Inflow = 20.73 cfs @ 12.31 hrs, Volume= 6.217 af
Primary = 20.73 cfs @ 12.31 hrs, Volume= 6.217 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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MSE 24-hr 4 10yr Rainfall=4.09"

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Summary for Subcatchment 10S: PRO Residential

Runoff = 105.67 cfs @ 12.12 hrs, Volume= 5.613 af, Depth= 2.54"
 Routed to Pond 1P : RES Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 10yr Rainfall=4.09"

Area (sf)	CN	Description
* 210,990	98	Roof
* 287,060	98	Drives/Parking
* 55,070	98	Sidewalk
602,680	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
1,155,800	85	Weighted Average
602,680		52.14% Pervious Area
553,120		47.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	20	0.0200	0.94		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
0.6	200	0.0750	5.56		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
4.2	1,500	0.0100	5.94	10.50	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.2	1,720	Total			

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MSE 24-hr 4 10yr Rainfall=4.09"

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Summary for Subcatchment 11S: PRO Commercial - North

Runoff = 71.87 cfs @ 12.11 hrs, Volume= 3.858 af, Depth= 2.91"
 Routed to Pond 3P : COM N Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 10yr Rainfall=4.09"

Area (sf)	CN	Description
* 149,400	98	Roof
* 267,570	98	Drives/Parking
* 2,460	98	Sidewalk
274,171	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
693,601	89	Weighted Average
274,171		39.53% Pervious Area
419,430		60.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	160	0.0250	1.56		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
3.3	1,600	0.0187	8.13	14.36	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.0	1,760	Total			

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MSE 24-hr 4 10yr Rainfall=4.09"

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Summary for Subcatchment 19S: PRO Commercial - South Comb.

Runoff = 131.80 cfs @ 12.11 hrs, Volume= 7.130 af, Depth= 3.00"
 Routed to Pond 20P : COM South Comb. Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 10yr Rainfall=4.09"

Area (sf)	CN	Description
* 261,655	98	Roof
* 559,930	98	Drives/Parking
* 28,480	98	Sidewalk
390,340	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
1,240,405	90	Weighted Average
390,340		31.47% Pervious Area
850,065		68.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	160	0.0250	1.56		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
3.3	1,600	0.0187	8.13	14.36	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.0	1,760	Total			

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MSE 24-hr 4 10yr Rainfall=4.09"

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Summary for Subcatchment 26S: EX Commercial South Comb.

Runoff = 33.94 cfs @ 12.57 hrs, Volume= 4.276 af, Depth= 1.26"
Routed to nonexistent node 27L

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 10yr Rainfall=4.09"

	Area (sf)	CN	Description
*	1,709,350	68	Cropland, HSG B
*	61,325	78	Cropland, HSG C
	1,770,675	68	Weighted Average
	1,770,675		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	300	0.0187	0.22		Sheet Flow, Sheet
					Range n= 0.130 P2= 2.84"
14.5	1,112	0.0332	1.28		Shallow Concentrated Flow, Shallow
					Short Grass Pasture Kv= 7.0 fps
37.4	1,412	Total			

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MSE 24-hr 4 10yr Rainfall=4.09"

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Summary for Pond 1P: RES Detention Basin

Inflow Area = 26.534 ac, 47.86% Impervious, Inflow Depth = 2.54" for 10yr event
 Inflow = 105.67 cfs @ 12.12 hrs, Volume= 5.613 af
 Outflow = 56.46 cfs @ 12.22 hrs, Volume= 5.544 af, Atten= 47%, Lag= 6.0 min
 Primary = 4.05 cfs @ 12.22 hrs, Volume= 2.475 af
 Routed to Pond 2P : RES Infiltration Basin
 Secondary = 37.78 cfs @ 12.22 hrs, Volume= 1.208 af
 Routed to Pond 2P : RES Infiltration Basin
 Tertiary = 14.63 cfs @ 12.22 hrs, Volume= 1.860 af
 Routed to Link 10L : PRO Residential Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 906.92' @ 12.22 hrs Surf.Area= 34,704 sf Storage= 91,156 cf

Plug-Flow detention time= 191.6 min calculated for 5.541 af (99% of inflow)
 Center-of-Mass det. time= 186.5 min (990.1 - 803.6)

Volume	Invert	Avail.Storage	Storage Description
#1	904.00'	168,775 cf	RES Pond Live Storage (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
904.00	27,800	0	0
905.00	30,150	28,975	28,975
906.00	32,500	31,325	60,300
907.00	34,900	33,700	94,000
908.00	37,400	36,150	130,150
909.00	39,850	38,625	168,775

Device	Routing	Invert	Outlet Devices
#1	Primary	904.00'	12.0" Round Culvert to INF Basin L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 904.00' / 904.00' S= 0.0000 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	906.00'	Overflow Weir to INF Basin, C= 2.50 Offset (feet) 0.00 9.00 24.00 33.00 Height (feet) 3.00 0.00 0.00 3.00
#3	Tertiary	903.00'	42.0" Round Release Structure Outlet L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 903.00' / 902.00' S= 0.0333 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 9.62 sf
#4	Device 3	907.25'	48.0" Horiz. Release Structure Rim Grate C= 0.600 Limited to weir flow at low heads
#5	Device 3	905.00'	24.0" Vert. Release Structure Orifice C= 0.600 Limited to weir flow at low heads

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Primary OutFlow Max=4.03 cfs @ 12.22 hrs HW=906.90' TW=903.94' (Dynamic Tailwater)

↑1=Culvert to INF Basin (Barrel Controls 4.03 cfs @ 5.13 fps)

Secondary OutFlow Max=36.50 cfs @ 12.22 hrs HW=906.90' TW=903.93' (Dynamic Tailwater)

↑2=Overflow Weir to INF Basin (Weir Controls 36.50 cfs @ 1.99 fps)

Tertiary OutFlow Max=14.45 cfs @ 12.22 hrs HW=906.90' TW=0.00' (Dynamic Tailwater)

↑3=Release Structure Outlet (Passes 14.45 cfs of 67.89 cfs potential flow)

↑4=Release Structure Rim Grate (Controls 0.00 cfs)

↑5=Release Structure Orifice (Orifice Controls 14.45 cfs @ 4.69 fps)

Summary for Pond 2P: RES Infiltration Basin

Inflow Area = 26.534 ac, 47.86% Impervious, Inflow Depth > 1.67" for 10yr event
 Inflow = 41.83 cfs @ 12.22 hrs, Volume= 3.684 af
 Outflow = 7.25 cfs @ 12.81 hrs, Volume= 3.684 af, Atten= 83%, Lag= 35.7 min
 Discarded = 0.32 cfs @ 12.81 hrs, Volume= 1.150 af
 Primary = 6.92 cfs @ 12.81 hrs, Volume= 2.534 af
 Routed to Link 10L : PRO Residential Treated
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Link 10L : PRO Residential Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 905.40' @ 12.81 hrs Surf.Area= 24,205 sf Storage= 49,480 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 361.1 min (1,435.6 - 1,074.5)

Volume	Invert	Avail.Storage	Storage Description
#1	903.00'	158,750 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
903.00	17,000	0	0
904.00	20,000	18,500	18,500
905.00	23,000	21,500	40,000
906.00	26,000	24,500	64,500
907.00	29,500	27,750	92,250
908.00	33,000	31,250	123,500
909.00	37,500	35,250	158,750

Device	Routing	Invert	Outlet Devices
#1	Discarded	903.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 890.00'
#2	Primary	904.00'	18.0" Round Inf Basin Outlet Culvert L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 904.00' / 903.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#3	Secondary	907.50'	Emergency Spillway, C= 2.50 Offset (feet) 0.00 8.00 28.00 36.00 Height (feet) 2.00 0.00 0.00 2.00

Discarded OutFlow Max=0.32 cfs @ 12.81 hrs HW=905.40' (Free Discharge)
 ↑1=Exfiltration (Controls 0.32 cfs)

Primary OutFlow Max=6.92 cfs @ 12.81 hrs HW=905.40' TW=0.00' (Dynamic Tailwater)
 ↑2=Inf Basin Outlet Culvert (Inlet Controls 6.92 cfs @ 4.03 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=903.00' TW=0.00' (Dynamic Tailwater)
 ↑3=Emergency Spillway (Controls 0.00 cfs)

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Summary for Pond 3P: COM N Detention Basin

Inflow Area = 15.923 ac, 60.47% Impervious, Inflow Depth = 2.91" for 10yr event
 Inflow = 71.87 cfs @ 12.11 hrs, Volume= 3.858 af
 Outflow = 56.81 cfs @ 12.17 hrs, Volume= 3.822 af, Atten= 21%, Lag= 3.4 min
 Primary = 2.11 cfs @ 12.17 hrs, Volume= 1.529 af
 Routed to Pond 4P : COM N Infiltration Basin
 Secondary = 50.42 cfs @ 12.17 hrs, Volume= 1.215 af
 Routed to Pond 4P : COM N Infiltration Basin
 Tertiary = 4.29 cfs @ 12.17 hrs, Volume= 1.078 af
 Routed to Link 13L : PRO COM N Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 883.62' @ 12.17 hrs Surf.Area= 24,095 sf Storage= 57,401 cf

Plug-Flow detention time= 182.6 min calculated for 3.820 af (99% of inflow)
 Center-of-Mass det. time= 179.1 min (970.9 - 791.8)

Volume	Invert	Avail.Storage	Storage Description
#1	881.00'	119,705 cf	COM N Live Storage (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
881.00	19,700	0	0
882.00	21,330	20,515	20,515
883.00	23,030	22,180	42,695
884.00	24,760	23,895	66,590
885.00	26,550	25,655	92,245
886.00	28,370	27,460	119,705

Device	Routing	Invert	Outlet Devices
#1	Primary	881.00'	8.0" Round Culvert to INF Basin L= 36.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 881.00' / 881.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf
#2	Secondary	883.00'	Weir to INF Basin, C= 2.50 Offset (feet) 0.00 10.00 50.00 60.00 Height (feet) 2.50 0.00 0.00 2.50
#3	Tertiary	880.00'	36.0" Round Release Structure Outlet L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 880.00' / 878.00' S= 0.0400 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 7.07 sf
#4	Device 3	881.83'	12.0" Vert. Release Structure Orifice C= 0.600 Limited to weir flow at low heads
#5	Device 3	884.00'	48.0" Horiz. Release Structure Overflow Gate C= 0.600 Limited to weir flow at low heads

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Primary OutFlow Max=2.10 cfs @ 12.17 hrs HW=883.59' TW=881.05' (Dynamic Tailwater)

↑1=Culvert to INF Basin (Barrel Controls 2.10 cfs @ 6.00 fps)

Secondary OutFlow Max=47.74 cfs @ 12.17 hrs HW=883.59' TW=881.04' (Dynamic Tailwater)

↑2=Weir to INF Basin (Weir Controls 47.74 cfs @ 1.80 fps)

Tertiary OutFlow Max=4.25 cfs @ 12.17 hrs HW=883.59' TW=0.00' (Dynamic Tailwater)

↑3=Release Structure Outlet (Passes 4.25 cfs of 49.23 cfs potential flow)

↑4=Release Structure Orifice (Orifice Controls 4.25 cfs @ 5.41 fps)

↑5=Release Structure Overflow Grate (Controls 0.00 cfs)

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Summary for Pond 4P: COM N Infiltration Basin

Inflow Area = 15.923 ac, 60.47% Impervious, Inflow Depth = 2.07" for 10yr event
 Inflow = 52.52 cfs @ 12.17 hrs, Volume= 2.743 af
 Outflow = 7.45 cfs @ 12.62 hrs, Volume= 2.744 af, Atten= 86%, Lag= 26.8 min
 Discarded = 0.34 cfs @ 12.62 hrs, Volume= 0.997 af
 Primary = 7.11 cfs @ 12.62 hrs, Volume= 1.747 af
 Routed to Link 13L : PRO COM N Treated
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Link 13L : PRO COM N Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 882.44' @ 12.62 hrs Surf.Area= 20,440 sf Storage= 43,669 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 368.9 min (1,384.4 - 1,015.4)

Volume	Invert	Avail.Storage	Storage Description
#1	880.00'	128,238 cf	COM N Inf Storage (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
880.00	15,475	0	0
881.00	17,450	16,463	16,463
882.00	19,500	18,475	34,938
883.00	21,650	20,575	55,513
884.00	23,350	22,500	78,013
885.00	25,100	24,225	102,238
886.00	26,900	26,000	128,238

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 875.00'
#2	Primary	881.00'	18.0" Round Inf Basin Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 881.00' / 880.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#3	Secondary	884.50'	Emergency Overflow Weir, C= 2.50 Offset (feet) 0.00 8.00 28.00 36.00 Height (feet) 2.00 0.00 0.00 2.00

Discarded OutFlow Max=0.34 cfs @ 12.62 hrs HW=882.44' (Free Discharge)
 ↑1=Exfiltration (Controls 0.34 cfs)

Primary OutFlow Max=7.10 cfs @ 12.62 hrs HW=882.44' TW=0.00' (Dynamic Tailwater)
 ↑2=Inf Basin Culvert (Inlet Controls 7.10 cfs @ 4.08 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=880.00' TW=0.00' (Dynamic Tailwater)
 ↑3=Emergency Overflow Weir (Controls 0.00 cfs)

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Summary for Pond 20P: COM South Comb. Detention Basin

Inflow Area = 28.476 ac, 68.53% Impervious, Inflow Depth = 3.00" for 10yr event
 Inflow = 131.80 cfs @ 12.11 hrs, Volume= 7.130 af
 Outflow = 106.34 cfs @ 12.17 hrs, Volume= 7.073 af, Atten= 19%, Lag= 3.1 min
 Primary = 5.30 cfs @ 12.17 hrs, Volume= 2.563 af
 Routed to Pond 21P : COM South Comb. Infiltration Basin
 Secondary = 85.11 cfs @ 12.17 hrs, Volume= 2.078 af
 Routed to Pond 21P : COM South Comb. Infiltration Basin
 Tertiary = 15.93 cfs @ 12.17 hrs, Volume= 2.432 af
 Routed to Link 22L : PRO COM South Comb. Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 883.86' @ 12.17 hrs Surf.Area= 35,731 sf Storage= 91,969 cf

Plug-Flow detention time= 141.8 min calculated for 7.073 af (99% of inflow)
 Center-of-Mass det. time= 136.8 min (925.3 - 788.5)

Volume	Invert	Avail.Storage	Storage Description
#1	881.00'	174,305 cf	COM N Live Storage (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
881.00	28,540	0	0
882.00	31,000	29,770	29,770
883.00	33,520	32,260	62,030
884.00	36,090	34,805	96,835
885.00	38,720	37,405	134,240
886.00	41,410	40,065	174,305

Device	Routing	Invert	Outlet Devices
#1	Primary	881.00'	12.0" Round Culvert to INF Basin L= 36.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 881.00' / 881.00' S= 0.0000 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	883.00'	Weir to INF Basin, C= 2.50 Offset (feet) 0.00 10.00 50.00 60.00 Height (feet) 2.50 0.00 0.00 2.50
#3	Tertiary	880.00'	36.0" Round Release Structure Outlet L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 880.00' / 878.00' S= 0.0400 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 7.07 sf
#4	Device 3	881.75'	24.0" Vert. Release Structure Orifice C= 0.600 Limited to weir flow at low heads
#5	Device 3	884.00'	60.0" Horiz. Release Structure Overflow Gate C= 0.600 Limited to weir flow at low heads

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Primary OutFlow Max=5.27 cfs @ 12.17 hrs HW=883.84' TW=881.45' (Dynamic Tailwater)

↑1=Culvert to INF Basin (Barrel Controls 5.27 cfs @ 6.71 fps)

Secondary OutFlow Max=81.86 cfs @ 12.17 hrs HW=883.84' TW=881.44' (Dynamic Tailwater)

↑2=Weir to INF Basin (Weir Controls 81.86 cfs @ 2.09 fps)

Tertiary OutFlow Max=15.78 cfs @ 12.17 hrs HW=883.84' TW=0.00' (Dynamic Tailwater)

↑3=Release Structure Outlet (Passes 15.78 cfs of 52.04 cfs potential flow)

↑4=Release Structure Orifice (Orifice Controls 15.78 cfs @ 5.02 fps)

↑5=Release Structure Overflow Gate (Controls 0.00 cfs)

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Summary for Pond 21P: COM South Comb. Infiltration Basin

Inflow Area = 28.476 ac, 68.53% Impervious, Inflow Depth = 1.96" for 10yr event
 Inflow = 90.41 cfs @ 12.17 hrs, Volume= 4.641 af
 Outflow = 10.00 cfs @ 12.63 hrs, Volume= 4.641 af, Atten= 89%, Lag= 27.8 min
 Discarded = 0.57 cfs @ 12.63 hrs, Volume= 1.598 af
 Primary = 9.43 cfs @ 12.63 hrs, Volume= 3.043 af
 Routed to Link 22L : PRO COM South Comb. Treated
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Link 22L : PRO COM South Comb. Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 882.98' @ 12.63 hrs Surf.Area= 32,181 sf Storage= 85,408 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 373.6 min (1,352.7 - 979.1)

Volume	Invert	Avail.Storage	Storage Description
#1	880.00'	193,923 cf	COM N Inf Storage (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
880.00	25,225	0	0
881.00	27,500	26,363	26,363
882.00	29,840	28,670	55,033
883.00	32,230	31,035	86,068
884.00	34,680	33,455	119,523
885.00	37,185	35,933	155,455
886.00	39,750	38,468	193,923

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 875.00'
#2	Primary	881.00'	18.0" Round Inf Basin Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 881.00' / 880.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#3	Secondary	884.50'	Emergency Overflow Weir, C= 2.50 Offset (feet) 0.00 8.00 28.00 36.00 Height (feet) 2.00 0.00 0.00 2.00

Discarded OutFlow Max=0.57 cfs @ 12.63 hrs HW=882.98' (Free Discharge)
 ↑1=Exfiltration (Controls 0.57 cfs)

Primary OutFlow Max=9.43 cfs @ 12.63 hrs HW=882.98' TW=0.00' (Dynamic Tailwater)
 ↑2=Inf Basin Culvert (Inlet Controls 9.43 cfs @ 5.34 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=880.00' TW=0.00' (Dynamic Tailwater)
 ↑3=Emergency Overflow Weir (Controls 0.00 cfs)

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Summary for Link 10L: PRO Residential Treated

Inflow Area = 26.534 ac, 47.86% Impervious, Inflow Depth = 1.99" for 10yr event
Inflow = 16.17 cfs @ 12.50 hrs, Volume= 4.394 af
Primary = 16.17 cfs @ 12.50 hrs, Volume= 4.394 af, Atten= 0%, Lag= 0.0 min
Routed to Link 25L : PRO Total Site Treated

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

Summary for Link 13L: PRO COM N Treated

Inflow Area = 15.923 ac, 60.47% Impervious, Inflow Depth = 2.13" for 10yr event
Inflow = 10.56 cfs @ 12.58 hrs, Volume= 2.825 af
Primary = 10.56 cfs @ 12.58 hrs, Volume= 2.825 af, Atten= 0%, Lag= 0.0 min
Routed to Link 24L : (new Link)

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

Summary for Link 22L: PRO COM South Comb. Treated

Inflow Area = 28.476 ac, 68.53% Impervious, Inflow Depth = 2.31" for 10yr event
Inflow = 20.84 cfs @ 12.32 hrs, Volume= 5.475 af
Primary = 20.84 cfs @ 12.32 hrs, Volume= 5.475 af, Atten= 0%, Lag= 0.0 min
Routed to Link 24L : (new Link)

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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Summary for Link 24L: (new Link)

Inflow Area = 44.399 ac, 65.64% Impervious, Inflow Depth = 2.24" for 10yr event
Inflow = 30.58 cfs @ 12.47 hrs, Volume= 8.300 af
Primary = 30.58 cfs @ 12.47 hrs, Volume= 8.300 af, Atten= 0%, Lag= 0.0 min
Routed to Link 25L : PRO Total Site Treated

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

Summary for Link 25L: PRO Total Site Treated

Inflow Area = 70.932 ac, 58.99% Impervious, Inflow Depth = 2.15" for 10yr event
Inflow = 46.72 cfs @ 12.48 hrs, Volume= 12.694 af
Primary = 46.72 cfs @ 12.48 hrs, Volume= 12.694 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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MSE 24-hr 4 100yr Rainfall=6.66"

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Summary for Subcatchment 10S: PRO Residential

Runoff = 198.77 cfs @ 12.12 hrs, Volume= 10.897 af, Depth= 4.93"
 Routed to Pond 1P : RES Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 100yr Rainfall=6.66"

Area (sf)	CN	Description
* 210,990	98	Roof
* 287,060	98	Drives/Parking
* 55,070	98	Sidewalk
602,680	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
1,155,800	85	Weighted Average
602,680		52.14% Pervious Area
553,120		47.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	20	0.0200	0.94		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
0.6	200	0.0750	5.56		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
4.2	1,500	0.0100	5.94	10.50	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.2	1,720	Total			

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Summary for Subcatchment 11S: PRO Commercial - North

Runoff = 128.12 cfs @ 12.11 hrs, Volume= 7.132 af, Depth> 5.37"

Routed to Pond 3P : COM N Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100yr Rainfall=6.66"

Area (sf)	CN	Description
* 149,400	98	Roof
* 267,570	98	Drives/Parking
* 2,460	98	Sidewalk
274,171	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
693,601	89	Weighted Average
274,171		39.53% Pervious Area
419,430		60.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	160	0.0250	1.56		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
3.3	1,600	0.0187	8.13	14.36	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.0	1,760	Total			

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Summary for Subcatchment 19S: PRO Commercial - South Comb.

Runoff = 232.07 cfs @ 12.11 hrs, Volume= 13.017 af, Depth> 5.49"

Routed to Pond 20P : COM South Comb. Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100yr Rainfall=6.66"

Area (sf)	CN	Description
* 261,655	98	Roof
* 559,930	98	Drives/Parking
* 28,480	98	Sidewalk
390,340	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
1,240,405	90	Weighted Average
390,340		31.47% Pervious Area
850,065		68.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	160	0.0250	1.56		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
3.3	1,600	0.0187	8.13	14.36	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.0	1,760	Total			

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Summary for Subcatchment 26S: EX Commercial South Comb.

Runoff = 89.56 cfs @ 12.53 hrs, Volume= 10.627 af, Depth= 3.14"
Routed to nonexistent node 27L

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
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	Area (sf)	CN	Description
*	1,709,350	68	Cropland, HSG B
*	61,325	78	Cropland, HSG C
	1,770,675	68	Weighted Average
	1,770,675		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	300	0.0187	0.22		Sheet Flow, Sheet Range n= 0.130 P2= 2.84"
14.5	1,112	0.0332	1.28		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
37.4	1,412	Total			

Summary for Pond 1P: RES Detention Basin

Inflow Area = 26.534 ac, 47.86% Impervious, Inflow Depth = 4.93" for 100yr event
 Inflow = 198.77 cfs @ 12.12 hrs, Volume= 10.897 af
 Outflow = 159.28 cfs @ 12.17 hrs, Volume= 10.827 af, Atten= 20%, Lag= 3.1 min
 Primary = 4.77 cfs @ 12.13 hrs, Volume= 2.638 af
 Routed to Pond 2P : RES Infiltration Basin
 Secondary = 117.45 cfs @ 12.17 hrs, Volume= 3.426 af
 Routed to Pond 2P : RES Infiltration Basin
 Tertiary = 37.34 cfs @ 12.17 hrs, Volume= 4.763 af
 Routed to Link 10L : PRO Residential Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 907.81' @ 12.17 hrs Surf.Area= 36,923 sf Storage= 123,054 cf

Plug-Flow detention time= 128.6 min calculated for 10.827 af (99% of inflow)
 Center-of-Mass det. time= 124.6 min (912.5 - 787.9)

Volume	Invert	Avail.Storage	Storage Description
#1	904.00'	168,775 cf	RES Pond Live Storage (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
904.00	27,800	0	0
905.00	30,150	28,975	28,975
906.00	32,500	31,325	60,300
907.00	34,900	33,700	94,000
908.00	37,400	36,150	130,150
909.00	39,850	38,625	168,775

Device	Routing	Invert	Outlet Devices
#1	Primary	904.00'	12.0" Round Culvert to INF Basin L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 904.00' / 904.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	906.00'	Overflow Weir to INF Basin, C= 2.50 Offset (feet) 0.00 9.00 24.00 33.00 Height (feet) 3.00 0.00 0.00 3.00
#3	Tertiary	903.00'	42.0" Round Release Structure Outlet L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 903.00' / 902.00' S= 0.0333 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 9.62 sf
#4	Device 3	907.25'	48.0" Horiz. Release Structure Rim Grate C= 0.600 Limited to weir flow at low heads
#5	Device 3	905.00'	24.0" Vert. Release Structure Orifice C= 0.600 Limited to weir flow at low heads

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Primary OutFlow Max=4.20 cfs @ 12.13 hrs HW=907.67' TW=905.61' (Dynamic Tailwater)

↑1=Culvert to INF Basin (Outlet Controls 4.20 cfs @ 5.34 fps)

Secondary OutFlow Max=113.30 cfs @ 12.17 hrs HW=907.77' TW=906.21' (Dynamic Tailwater)

↑2=Overflow Weir to INF Basin (Weir Controls 113.30 cfs @ 2.49 fps)

Tertiary OutFlow Max=35.77 cfs @ 12.17 hrs HW=907.77' TW=0.00' (Dynamic Tailwater)

↑3=Release Structure Outlet (Passes 35.77 cfs of 80.57 cfs potential flow)

↑4=Release Structure Rim Grate (Weir Controls 15.62 cfs @ 2.37 fps)

↑5=Release Structure Orifice (Orifice Controls 20.15 cfs @ 6.41 fps)

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Summary for Pond 2P: RES Infiltration Basin

Inflow Area = 26.534 ac, 47.86% Impervious, Inflow Depth = 2.74" for 100yr event
 Inflow = 121.94 cfs @ 12.17 hrs, Volume= 6.064 af
 Outflow = 15.65 cfs @ 12.35 hrs, Volume= 6.064 af, Atten= 87%, Lag= 10.8 min
 Discarded = 0.46 cfs @ 12.35 hrs, Volume= 1.237 af
 Primary = 14.29 cfs @ 12.35 hrs, Volume= 4.823 af
 Routed to Link 10L : PRO Residential Treated
 Secondary = 0.91 cfs @ 12.35 hrs, Volume= 0.005 af
 Routed to Link 10L : PRO Residential Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 907.57' @ 12.35 hrs Surf.Area= 31,492 sf Storage= 109,606 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 261.9 min (1,238.7 - 976.8)

Volume	Invert	Avail.Storage	Storage Description
#1	903.00'	158,750 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
903.00	17,000	0	0
904.00	20,000	18,500	18,500
905.00	23,000	21,500	40,000
906.00	26,000	24,500	64,500
907.00	29,500	27,750	92,250
908.00	33,000	31,250	123,500
909.00	37,500	35,250	158,750

Device	Routing	Invert	Outlet Devices
#1	Discarded	903.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 890.00'
#2	Primary	904.00'	18.0" Round Inf Basin Outlet Culvert L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 904.00' / 903.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#3	Secondary	907.50'	Emergency Spillway, C= 2.50 Offset (feet) 0.00 8.00 28.00 36.00 Height (feet) 2.00 0.00 0.00 2.00

Discarded OutFlow Max=0.46 cfs @ 12.35 hrs HW=907.56' (Free Discharge)
 ↑1=Exfiltration (Controls 0.46 cfs)

Primary OutFlow Max=14.27 cfs @ 12.35 hrs HW=907.56' TW=0.00' (Dynamic Tailwater)
 ↑2=Inf Basin Outlet Culvert (Inlet Controls 14.27 cfs @ 8.08 fps)

Secondary OutFlow Max=0.88 cfs @ 12.35 hrs HW=907.57' TW=0.00' (Dynamic Tailwater)
 ↑3=Emergency Spillway (Weir Controls 0.88 cfs @ 0.64 fps)

Summary for Pond 3P: COM N Detention Basin

Inflow Area = 15.923 ac, 60.47% Impervious, Inflow Depth > 5.37" for 100yr event
 Inflow = 128.12 cfs @ 12.11 hrs, Volume= 7.132 af
 Outflow = 115.80 cfs @ 12.14 hrs, Volume= 7.095 af, Atten= 10%, Lag= 1.9 min
 Primary = 2.16 cfs @ 12.04 hrs, Volume= 1.644 af
 Routed to Pond 4P : COM N Infiltration Basin
 Secondary = 109.13 cfs @ 12.14 hrs, Volume= 3.283 af
 Routed to Pond 4P : COM N Infiltration Basin
 Tertiary = 12.27 cfs @ 12.45 hrs, Volume= 2.168 af
 Routed to Link 13L : PRO COM N Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 884.31' @ 12.45 hrs Surf.Area= 25,307 sf Storage= 74,436 cf

Plug-Flow detention time= 129.4 min calculated for 7.095 af (99% of inflow)
 Center-of-Mass det. time= 126.1 min (903.8 - 777.7)

Volume	Invert	Avail.Storage	Storage Description
#1	881.00'	119,705 cf	COM N Live Storage (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
881.00	19,700	0	0
882.00	21,330	20,515	20,515
883.00	23,030	22,180	42,695
884.00	24,760	23,895	66,590
885.00	26,550	25,655	92,245
886.00	28,370	27,460	119,705

Device	Routing	Invert	Outlet Devices
#1	Primary	881.00'	8.0" Round Culvert to INF Basin L= 36.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 881.00' / 881.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf
#2	Secondary	883.00'	Weir to INF Basin, C= 2.50 Offset (feet) 0.00 10.00 50.00 60.00 Height (feet) 2.50 0.00 0.00 2.50
#3	Tertiary	880.00'	36.0" Round Release Structure Outlet L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 880.00' / 878.00' S= 0.0400 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 7.07 sf
#4	Device 3	881.83'	12.0" Vert. Release Structure Orifice C= 0.600 Limited to weir flow at low heads
#5	Device 3	884.00'	48.0" Horiz. Release Structure Overflow Gate C= 0.600 Limited to weir flow at low heads

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Primary OutFlow Max=1.95 cfs @ 12.04 hrs HW=883.70' TW=882.04' (Dynamic Tailwater)

↳ **1=Culvert to INF Basin** (Outlet Controls 1.95 cfs @ 5.57 fps)

Secondary OutFlow Max=99.15 cfs @ 12.14 hrs HW=883.99' TW=883.42' (Dynamic Tailwater)

↳ **2=Weir to INF Basin** (Weir Controls 99.15 cfs @ 2.08 fps)

Tertiary OutFlow Max=12.17 cfs @ 12.45 hrs HW=884.30' TW=0.00' (Dynamic Tailwater)

↳ **3=Release Structure Outlet** (Passes 12.17 cfs of 56.98 cfs potential flow)

↳ **4=Release Structure Orifice** (Orifice Controls 5.31 cfs @ 6.76 fps)

↳ **5=Release Structure Overflow Grate** (Weir Controls 6.86 cfs @ 1.80 fps)

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Summary for Pond 4P: COM N Infiltration Basin

Inflow Area = 15.923 ac, 60.47% Impervious, Inflow Depth = 3.71" for 100yr event
 Inflow = 110.89 cfs @ 12.14 hrs, Volume= 4.927 af
 Outflow = 14.24 cfs @ 12.26 hrs, Volume= 4.927 af, Atten= 87%, Lag= 6.8 min
 Discarded = 0.47 cfs @ 12.26 hrs, Volume= 1.084 af
 Primary = 13.77 cfs @ 12.26 hrs, Volume= 3.843 af
 Routed to Link 13L : PRO COM N Treated
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
 Routed to Link 13L : PRO COM N Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 884.37' @ 12.26 hrs Surf.Area= 23,995 sf Storage= 86,741 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 246.0 min (1,165.8 - 919.8)

Volume	Invert	Avail.Storage	Storage Description
#1	880.00'	128,238 cf	COM N Inf Storage (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
880.00	15,475	0	0
881.00	17,450	16,463	16,463
882.00	19,500	18,475	34,938
883.00	21,650	20,575	55,513
884.00	23,350	22,500	78,013
885.00	25,100	24,225	102,238
886.00	26,900	26,000	128,238

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 875.00'
#2	Primary	881.00'	18.0" Round Inf Basin Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 881.00' / 880.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#3	Secondary	884.50'	Emergency Overflow Weir, C= 2.50 Offset (feet) 0.00 8.00 28.00 36.00 Height (feet) 2.00 0.00 0.00 2.00

Discarded OutFlow Max=0.47 cfs @ 12.26 hrs HW=884.35' (Free Discharge)
 ↑1=Exfiltration (Controls 0.47 cfs)

Primary OutFlow Max=13.71 cfs @ 12.26 hrs HW=884.35' TW=0.00' (Dynamic Tailwater)
 ↑2=Inf Basin Culvert (Inlet Controls 13.71 cfs @ 7.76 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=880.00' TW=0.00' (Dynamic Tailwater)
 ↑3=Emergency Overflow Weir (Controls 0.00 cfs)

Summary for Pond 20P: COM South Comb. Detention Basin

Inflow Area = 28.476 ac, 68.53% Impervious, Inflow Depth > 5.49" for 100yr event
 Inflow = 232.07 cfs @ 12.11 hrs, Volume= 13.017 af
 Outflow = 206.92 cfs @ 12.14 hrs, Volume= 12.960 af, Atten= 11%, Lag= 1.8 min
 Primary = 5.36 cfs @ 12.04 hrs, Volume= 2.875 af
 Routed to Pond 21P : COM South Comb. Infiltration Basin
 Secondary = 173.42 cfs @ 12.14 hrs, Volume= 3.880 af
 Routed to Pond 21P : COM South Comb. Infiltration Basin
 Tertiary = 46.33 cfs @ 12.37 hrs, Volume= 6.205 af
 Routed to Link 22L : PRO COM South Comb. Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 884.63' @ 12.37 hrs Surf.Area= 37,744 sf Storage= 120,353 cf

Plug-Flow detention time= 100.1 min calculated for 12.952 af (99% of inflow)
 Center-of-Mass det. time= 99.3 min (874.4 - 775.1)

Volume	Invert	Avail.Storage	Storage Description
#1	881.00'	174,305 cf	COM N Live Storage (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
881.00	28,540	0	0
882.00	31,000	29,770	29,770
883.00	33,520	32,260	62,030
884.00	36,090	34,805	96,835
885.00	38,720	37,405	134,240
886.00	41,410	40,065	174,305

Device	Routing	Invert	Outlet Devices
#1	Primary	881.00'	12.0" Round Culvert to INF Basin L= 36.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 881.00' / 881.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	883.00'	Weir to INF Basin, C= 2.50 Offset (feet) 0.00 10.00 50.00 60.00 Height (feet) 2.50 0.00 0.00 2.50
#3	Tertiary	880.00'	36.0" Round Release Structure Outlet L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 880.00' / 878.00' S= 0.0400 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 7.07 sf
#4	Device 3	881.75'	24.0" Vert. Release Structure Orifice C= 0.600 Limited to weir flow at low heads
#5	Device 3	884.00'	60.0" Horiz. Release Structure Overflow Grate C= 0.600 Limited to weir flow at low heads

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Primary OutFlow Max=4.70 cfs @ 12.04 hrs HW=883.93' TW=882.39' (Dynamic Tailwater)

↳ **1=Culvert to INF Basin** (Inlet Controls 4.70 cfs @ 5.98 fps)

Secondary OutFlow Max=139.24 cfs @ 12.14 hrs HW=884.32' TW=883.80' (Dynamic Tailwater)

↳ **2=Weir to INF Basin** (Weir Controls 139.24 cfs @ 2.08 fps)

Tertiary OutFlow Max=45.63 cfs @ 12.37 hrs HW=884.62' TW=0.00' (Dynamic Tailwater)

↳ **3=Release Structure Outlet** (Passes 45.63 cfs of 60.10 cfs potential flow)

↳ **4=Release Structure Orifice** (Orifice Controls 20.67 cfs @ 6.58 fps)

↳ **5=Release Structure Overflow Grate** (Weir Controls 24.96 cfs @ 2.57 fps)

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Summary for Pond 21P: COM South Comb. Infiltration Basin

Inflow Area = 28.476 ac, 68.53% Impervious, Inflow Depth = 2.85" for 100yr event
 Inflow = 177.83 cfs @ 12.14 hrs, Volume= 6.755 af
 Outflow = 24.32 cfs @ 12.26 hrs, Volume= 6.755 af, Atten= 86%, Lag= 6.9 min
 Discarded = 0.75 cfs @ 12.26 hrs, Volume= 1.727 af
 Primary = 14.87 cfs @ 12.26 hrs, Volume= 4.956 af
 Routed to Link 22L : PRO COM South Comb. Treated
 Secondary = 8.70 cfs @ 12.26 hrs, Volume= 0.072 af
 Routed to Link 22L : PRO COM South Comb. Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 884.80' @ 12.26 hrs Surf.Area= 36,692 sf Storage= 148,189 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 300.7 min (1,225.4 - 924.7)

Volume	Invert	Avail.Storage	Storage Description
#1	880.00'	193,923 cf	COM N Inf Storage (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
880.00	25,225	0	0
881.00	27,500	26,363	26,363
882.00	29,840	28,670	55,033
883.00	32,230	31,035	86,068
884.00	34,680	33,455	119,523
885.00	37,185	35,933	155,455
886.00	39,750	38,468	193,923

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 875.00'
#2	Primary	881.00'	18.0" Round Inf Basin Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 881.00' / 880.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#3	Secondary	884.50'	Emergency Overflow Weir, C= 2.50 Offset (feet) 0.00 8.00 28.00 36.00 Height (feet) 2.00 0.00 0.00 2.00

Discarded OutFlow Max=0.75 cfs @ 12.26 hrs HW=884.78' (Free Discharge)
 ↑1=Exfiltration (Controls 0.75 cfs)

Primary OutFlow Max=14.82 cfs @ 12.26 hrs HW=884.78' TW=0.00' (Dynamic Tailwater)
 ↑2=Inf Basin Culvert (Inlet Controls 14.82 cfs @ 8.39 fps)

Secondary OutFlow Max=8.07 cfs @ 12.26 hrs HW=884.79' TW=0.00' (Dynamic Tailwater)
 ↑3=Emergency Overflow Weir (Weir Controls 8.07 cfs @ 1.26 fps)

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Summary for Link 10L: PRO Residential Treated

Inflow Area = 26.534 ac, 47.86% Impervious, Inflow Depth = 4.34" for 100yr event
Inflow = 47.14 cfs @ 12.18 hrs, Volume= 9.590 af
Primary = 47.14 cfs @ 12.18 hrs, Volume= 9.590 af, Atten= 0%, Lag= 0.0 min
Routed to Link 25L : PRO Total Site Treated

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

Summary for Link 13L: PRO COM N Treated

Inflow Area = 15.923 ac, 60.47% Impervious, Inflow Depth = 4.53" for 100yr event
Inflow = 25.74 cfs @ 12.44 hrs, Volume= 6.011 af
Primary = 25.74 cfs @ 12.44 hrs, Volume= 6.011 af, Atten= 0%, Lag= 0.0 min
Routed to Link 24L : (new Link)

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

Summary for Link 22L: PRO COM South Comb. Treated

Inflow Area = 28.476 ac, 68.53% Impervious, Inflow Depth = 4.73" for 100yr event
Inflow = 62.03 cfs @ 12.35 hrs, Volume= 11.233 af
Primary = 62.03 cfs @ 12.35 hrs, Volume= 11.233 af, Atten= 0%, Lag= 0.0 min
Routed to Link 24L : (new Link)

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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Summary for Link 24L: (new Link)

Inflow Area = 44.399 ac, 65.64% Impervious, Inflow Depth = 4.66" for 100yr event
Inflow = 86.99 cfs @ 12.36 hrs, Volume= 17.244 af
Primary = 86.99 cfs @ 12.36 hrs, Volume= 17.244 af, Atten= 0%, Lag= 0.0 min
Routed to Link 25L : PRO Total Site Treated

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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Summary for Link 25L: PRO Total Site Treated

Inflow Area = 70.932 ac, 58.99% Impervious, Inflow Depth = 4.54" for 100yr event
Inflow = 125.51 cfs @ 12.38 hrs, Volume= 26.834 af
Primary = 125.51 cfs @ 12.38 hrs, Volume= 26.834 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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Summary for Subcatchment 10S: PRO Residential

Runoff = 230.22 cfs @ 12.12 hrs, Volume= 12.737 af, Depth= 5.76"
 Routed to Pond 1P : RES Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 200yr Rainfall=7.53"

Area (sf)	CN	Description
* 210,990	98	Roof
* 287,060	98	Drives/Parking
* 55,070	98	Sidewalk
602,680	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
1,155,800	85	Weighted Average
602,680		52.14% Pervious Area
553,120		47.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	20	0.0200	0.94		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
0.6	200	0.0750	5.56		Shallow Concentrated Flow, Shallow Conc Paved Kv= 20.3 fps
4.2	1,500	0.0100	5.94	10.50	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.2	1,720	Total			

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MSE 24-hr 4 200yr Rainfall=7.53"

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Summary for Subcatchment 11S: PRO Commercial - North

Runoff = 146.98 cfs @ 12.11 hrs, Volume= 8.254 af, Depth> 6.22"
 Routed to Pond 3P : COM N Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 MSE 24-hr 4 200yr Rainfall=7.53"

Area (sf)	CN	Description
* 149,400	98	Roof
* 267,570	98	Drives/Parking
* 2,460	98	Sidewalk
274,171	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
693,601	89	Weighted Average
274,171		39.53% Pervious Area
419,430		60.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	160	0.0250	1.56		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
3.3	1,600	0.0187	8.13	14.36	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.0	1,760	Total			

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Summary for Subcatchment 19S: PRO Commercial - South Comb.

Runoff = 265.66 cfs @ 12.11 hrs, Volume= 15.028 af, Depth> 6.33"

Routed to Pond 20P : COM South Comb. Detention Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 200yr Rainfall=7.53"

Area (sf)	CN	Description
* 261,655	98	Roof
* 559,930	98	Drives/Parking
* 28,480	98	Sidewalk
390,340	74	>75% Grass cover, Good, HSG C
* 0	100	Water Surface, HSG C
1,240,405	90	Weighted Average
390,340		31.47% Pervious Area
850,065		68.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	160	0.0250	1.56		Sheet Flow, Sheet Smooth surfaces n= 0.011 P2= 2.84"
3.3	1,600	0.0187	8.13	14.36	Pipe Channel, Pipe Flow 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013 Concrete pipe, bends & connections
5.0	1,760	Total			

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MSE 24-hr 4 200yr Rainfall=7.53"

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Summary for Subcatchment 26S: EX Commercial South Comb.

Runoff = 110.27 cfs @ 12.53 hrs, Volume= 13.020 af, Depth= 3.84"
Routed to nonexistent node 27L

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 200yr Rainfall=7.53"

	Area (sf)	CN	Description
*	1,709,350	68	Cropland, HSG B
*	61,325	78	Cropland, HSG C
	1,770,675	68	Weighted Average
	1,770,675		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.9	300	0.0187	0.22		Sheet Flow, Sheet Range n= 0.130 P2= 2.84"
14.5	1,112	0.0332	1.28		Shallow Concentrated Flow, Shallow Short Grass Pasture Kv= 7.0 fps
37.4	1,412	Total			

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Summary for Pond 1P: RES Detention Basin

Inflow Area = 26.534 ac, 47.86% Impervious, Inflow Depth = 5.76" for 200yr event
 Inflow = 230.22 cfs @ 12.12 hrs, Volume= 12.737 af
 Outflow = 190.05 cfs @ 12.16 hrs, Volume= 12.668 af, Atten= 17%, Lag= 2.7 min
 Primary = 4.58 cfs @ 12.08 hrs, Volume= 2.769 af
 Routed to Pond 2P : RES Infiltration Basin
 Secondary = 138.37 cfs @ 12.16 hrs, Volume= 3.933 af
 Routed to Pond 2P : RES Infiltration Basin
 Tertiary = 47.78 cfs @ 12.17 hrs, Volume= 5.965 af
 Routed to Link 10L : PRO Residential Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 908.00' @ 12.17 hrs Surf.Area= 37,392 sf Storage= 130,031 cf

Plug-Flow detention time= 116.6 min calculated for 12.668 af (99% of inflow)
 Center-of-Mass det. time= 113.1 min (897.4 - 784.3)

Volume	Invert	Avail.Storage	Storage Description
#1	904.00'	168,775 cf	RES Pond Live Storage (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
904.00	27,800	0	0
905.00	30,150	28,975	28,975
906.00	32,500	31,325	60,300
907.00	34,900	33,700	94,000
908.00	37,400	36,150	130,150
909.00	39,850	38,625	168,775

Device	Routing	Invert	Outlet Devices
#1	Primary	904.00'	12.0" Round Culvert to INF Basin L= 100.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 904.00' / 904.00' S= 0.0000 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	906.00'	Overflow Weir to INF Basin, C= 2.50 Offset (feet) 0.00 9.00 24.00 33.00 Height (feet) 3.00 0.00 0.00 3.00
#3	Tertiary	903.00'	42.0" Round Release Structure Outlet L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 903.00' / 902.00' S= 0.0333 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 9.62 sf
#4	Device 3	907.25'	48.0" Horiz. Release Structure Rim Grate C= 0.600 Limited to weir flow at low heads
#5	Device 3	905.00'	24.0" Vert. Release Structure Orifice C= 0.600 Limited to weir flow at low heads

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Primary OutFlow Max=4.02 cfs @ 12.08 hrs HW=907.58' TW=905.69' (Dynamic Tailwater)

└─1=Culvert to INF Basin (Outlet Controls 4.02 cfs @ 5.12 fps)

Secondary OutFlow Max=126.41 cfs @ 12.16 hrs HW=907.97' TW=906.87' (Dynamic Tailwater)

└─2=Overflow Weir to INF Basin (Weir Controls 126.41 cfs @ 2.39 fps)

Tertiary OutFlow Max=46.00 cfs @ 12.17 hrs HW=907.96' TW=0.00' (Dynamic Tailwater)

└─3=Release Structure Outlet (Passes 46.00 cfs of 83.05 cfs potential flow)

└─┬─4=Release Structure Rim Grate (Weir Controls 24.80 cfs @ 2.76 fps)

└─┬─5=Release Structure Orifice (Orifice Controls 21.20 cfs @ 6.75 fps)

Summary for Pond 2P: RES Infiltration Basin

Inflow Area = 26.534 ac, 47.86% Impervious, Inflow Depth = 3.03" for 200yr event
 Inflow = 142.40 cfs @ 12.16 hrs, Volume= 6.702 af
 Outflow = 31.34 cfs @ 12.28 hrs, Volume= 6.702 af, Atten= 78%, Lag= 7.5 min
 Discarded = 0.48 cfs @ 12.28 hrs, Volume= 1.258 af
 Primary = 15.20 cfs @ 12.28 hrs, Volume= 5.194 af
 Routed to Link 10L : PRO Residential Treated
 Secondary = 15.65 cfs @ 12.28 hrs, Volume= 0.251 af
 Routed to Link 10L : PRO Residential Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 907.94' @ 12.28 hrs Surf.Area= 32,798 sf Storage= 121,600 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 244.9 min (1,205.5 - 960.6)

Volume	Invert	Avail.Storage	Storage Description
#1	903.00'	158,750 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
903.00	17,000	0	0
904.00	20,000	18,500	18,500
905.00	23,000	21,500	40,000
906.00	26,000	24,500	64,500
907.00	29,500	27,750	92,250
908.00	33,000	31,250	123,500
909.00	37,500	35,250	158,750

Device	Routing	Invert	Outlet Devices
#1	Discarded	903.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 890.00'
#2	Primary	904.00'	18.0" Round Inf Basin Outlet Culvert L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 904.00' / 903.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#3	Secondary	907.50'	Emergency Spillway, C= 2.50 Offset (feet) 0.00 8.00 28.00 36.00 Height (feet) 2.00 0.00 0.00 2.00

Discarded OutFlow Max=0.48 cfs @ 12.28 hrs HW=907.92' (Free Discharge)
 ↑1=Exfiltration (Controls 0.48 cfs)

Primary OutFlow Max=15.15 cfs @ 12.28 hrs HW=907.92' TW=0.00' (Dynamic Tailwater)
 ↑2=Inf Basin Outlet Culvert (Inlet Controls 15.15 cfs @ 8.58 fps)

Secondary OutFlow Max=14.67 cfs @ 12.28 hrs HW=907.92' TW=0.00' (Dynamic Tailwater)
 ↑3=Emergency Spillway (Weir Controls 14.67 cfs @ 1.48 fps)

Summary for Pond 3P: COM N Detention Basin

Inflow Area = 15.923 ac, 60.47% Impervious, Inflow Depth > 6.22" for 200yr event
 Inflow = 146.98 cfs @ 12.11 hrs, Volume= 8.254 af
 Outflow = 135.78 cfs @ 12.13 hrs, Volume= 8.217 af, Atten= 8%, Lag= 1.2 min
 Primary = 2.05 cfs @ 11.96 hrs, Volume= 1.718 af
 Routed to Pond 4P : COM N Infiltration Basin
 Secondary = 128.47 cfs @ 12.13 hrs, Volume= 3.617 af
 Routed to Pond 4P : COM N Infiltration Basin
 Tertiary = 27.62 cfs @ 12.31 hrs, Volume= 2.882 af
 Routed to Link 13L : PRO COM N Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 884.66' @ 12.31 hrs Surf.Area= 25,936 sf Storage= 83,439 cf

Plug-Flow detention time= 116.4 min calculated for 8.212 af (99% of inflow)
 Center-of-Mass det. time= 115.6 min (890.3 - 774.7)

Volume	Invert	Avail.Storage	Storage Description
#1	881.00'	119,705 cf	COM N Live Storage (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
881.00	19,700	0	0
882.00	21,330	20,515	20,515
883.00	23,030	22,180	42,695
884.00	24,760	23,895	66,590
885.00	26,550	25,655	92,245
886.00	28,370	27,460	119,705

Device	Routing	Invert	Outlet Devices
#1	Primary	881.00'	8.0" Round Culvert to INF Basin L= 36.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 881.00' / 881.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf
#2	Secondary	883.00'	Weir to INF Basin, C= 2.50 Offset (feet) 0.00 10.00 50.00 60.00 Height (feet) 2.50 0.00 0.00 2.50
#3	Tertiary	880.00'	36.0" Round Release Structure Outlet L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 880.00' / 878.00' S= 0.0400 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 7.07 sf
#4	Device 3	881.83'	12.0" Vert. Release Structure Orifice C= 0.600 Limited to weir flow at low heads
#5	Device 3	884.00'	48.0" Horiz. Release Structure Overflow Gate C= 0.600 Limited to weir flow at low heads

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Primary OutFlow Max=1.93 cfs @ 11.96 hrs HW=883.54' TW=881.91' (Dynamic Tailwater)

↑1=Culvert to INF Basin (Outlet Controls 1.93 cfs @ 5.52 fps)

Secondary OutFlow Max=64.45 cfs @ 12.13 hrs HW=884.07' TW=883.93' (Dynamic Tailwater)

↑2=Weir to INF Basin (Weir Controls 64.45 cfs @ 1.23 fps)

Tertiary OutFlow Max=26.87 cfs @ 12.31 hrs HW=884.64' TW=0.00' (Dynamic Tailwater)

↑3=Release Structure Outlet (Passes 26.87 cfs of 60.33 cfs potential flow)

↑4=Release Structure Orifice (Orifice Controls 5.75 cfs @ 7.32 fps)

↑5=Release Structure Overflow Gate (Weir Controls 21.12 cfs @ 2.62 fps)

Summary for Pond 4P: COM N Infiltration Basin

Inflow Area = 15.923 ac, 60.47% Impervious, Inflow Depth = 4.02" for 200yr event
 Inflow = 129.96 cfs @ 12.13 hrs, Volume= 5.335 af
 Outflow = 19.32 cfs @ 12.22 hrs, Volume= 5.336 af, Atten= 85%, Lag= 5.2 min
 Discarded = 0.49 cfs @ 12.22 hrs, Volume= 1.103 af
 Primary = 14.68 cfs @ 12.22 hrs, Volume= 4.181 af
 Routed to Link 13L : PRO COM N Treated
 Secondary = 4.15 cfs @ 12.22 hrs, Volume= 0.051 af
 Routed to Link 13L : PRO COM N Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 884.73' @ 12.22 hrs Surf.Area= 24,621 sf Storage= 95,428 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 234.9 min (1,145.9 - 911.0)

Volume	Invert	Avail.Storage	Storage Description
#1	880.00'	128,238 cf	COM N Inf Storage (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
880.00	15,475	0	0
881.00	17,450	16,463	16,463
882.00	19,500	18,475	34,938
883.00	21,650	20,575	55,513
884.00	23,350	22,500	78,013
885.00	25,100	24,225	102,238
886.00	26,900	26,000	128,238

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 875.00'
#2	Primary	881.00'	18.0" Round Inf Basin Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 881.00' / 880.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#3	Secondary	884.50'	Emergency Overflow Weir, C= 2.50 Offset (feet) 0.00 8.00 28.00 36.00 Height (feet) 2.00 0.00 0.00 2.00

Discarded OutFlow Max=0.49 cfs @ 12.22 hrs HW=884.67' (Free Discharge)
 ↑1=Exfiltration (Controls 0.49 cfs)

Primary OutFlow Max=14.53 cfs @ 12.22 hrs HW=884.67' TW=0.00' (Dynamic Tailwater)
 ↑2=Inf Basin Culvert (Inlet Controls 14.53 cfs @ 8.22 fps)

Secondary OutFlow Max=3.62 cfs @ 12.22 hrs HW=884.67' TW=0.00' (Dynamic Tailwater)
 ↑3=Emergency Overflow Weir (Weir Controls 3.62 cfs @ 0.99 fps)

Summary for Pond 20P: COM South Comb. Detention Basin

Inflow Area = 28.476 ac, 68.53% Impervious, Inflow Depth > 6.33" for 200yr event
 Inflow = 265.66 cfs @ 12.11 hrs, Volume= 15.028 af
 Outflow = 233.55 cfs @ 12.13 hrs, Volume= 14.970 af, Atten= 12%, Lag= 1.2 min
 Primary = 5.03 cfs @ 11.96 hrs, Volume= 3.044 af
 Routed to Pond 21P : COM South Comb. Infiltration Basin
 Secondary = 194.93 cfs @ 12.13 hrs, Volume= 4.342 af
 Routed to Pond 21P : COM South Comb. Infiltration Basin
 Tertiary = 63.43 cfs @ 12.30 hrs, Volume= 7.584 af
 Routed to Link 22L : PRO COM South Comb. Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 884.97' @ 12.30 hrs Surf.Area= 38,649 sf Storage= 133,227 cf

Plug-Flow detention time= 93.7 min calculated for 14.969 af (100% of inflow)
 Center-of-Mass det. time= 91.1 min (863.4 - 772.3)

Volume	Invert	Avail.Storage	Storage Description
#1	881.00'	174,305 cf	COM N Live Storage (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
881.00	28,540	0	0
882.00	31,000	29,770	29,770
883.00	33,520	32,260	62,030
884.00	36,090	34,805	96,835
885.00	38,720	37,405	134,240
886.00	41,410	40,065	174,305

Device	Routing	Invert	Outlet Devices
#1	Primary	881.00'	12.0" Round Culvert to INF Basin L= 36.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 881.00' / 881.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	883.00'	Weir to INF Basin, C= 2.50 Offset (feet) 0.00 10.00 50.00 60.00 Height (feet) 2.50 0.00 0.00 2.50
#3	Tertiary	880.00'	36.0" Round Release Structure Outlet L= 50.0' Ke= 0.500 Inlet / Outlet Invert= 880.00' / 878.00' S= 0.0400 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 7.07 sf
#4	Device 3	881.75'	24.0" Vert. Release Structure Orifice C= 0.600 Limited to weir flow at low heads
#5	Device 3	884.00'	60.0" Horiz. Release Structure Overflow Gate C= 0.600 Limited to weir flow at low heads

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Primary OutFlow Max=4.63 cfs @ 11.96 hrs HW=883.71' TW=882.22' (Dynamic Tailwater)

↑1=Culvert to INF Basin (Inlet Controls 4.63 cfs @ 5.89 fps)

Secondary OutFlow Max=87.33 cfs @ 12.13 hrs HW=884.43' TW=884.30' (Dynamic Tailwater)

↑2=Weir to INF Basin (Weir Controls 87.33 cfs @ 1.18 fps)

Tertiary OutFlow Max=63.40 cfs @ 12.30 hrs HW=884.97' TW=0.00' (Dynamic Tailwater)

↑3=Release Structure Outlet (Inlet Controls 63.40 cfs @ 8.97 fps)

↑4=Release Structure Orifice (Passes < 22.54 cfs potential flow)

↑5=Release Structure Overflow Grate (Passes < 49.08 cfs potential flow)

Summary for Pond 21P: COM South Comb. Infiltration Basin

Inflow Area = 28.476 ac, 68.53% Impervious, Inflow Depth = 3.11" for 200yr event
 Inflow = 198.73 cfs @ 12.13 hrs, Volume= 7.387 af
 Outflow = 39.98 cfs @ 12.21 hrs, Volume= 7.387 af, Atten= 80%, Lag= 5.2 min
 Discarded = 0.78 cfs @ 12.22 hrs, Volume= 1.754 af
 Primary = 15.54 cfs @ 12.22 hrs, Volume= 5.285 af
 Routed to Link 22L : PRO COM South Comb. Treated
 Secondary = 23.66 cfs @ 12.21 hrs, Volume= 0.348 af
 Routed to Link 22L : PRO COM South Comb. Treated

Routing by Dyn-Stor-Ind method, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs
 Peak Elev= 885.08' @ 12.22 hrs Surf.Area= 37,397 sf Storage= 158,539 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 283.4 min (1,196.1 - 912.6)

Volume	Invert	Avail.Storage	Storage Description
#1	880.00'	193,923 cf	COM N Inf Storage (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
880.00	25,225	0	0
881.00	27,500	26,363	26,363
882.00	29,840	28,670	55,033
883.00	32,230	31,035	86,068
884.00	34,680	33,455	119,523
885.00	37,185	35,933	155,455
886.00	39,750	38,468	193,923

Device	Routing	Invert	Outlet Devices
#1	Discarded	880.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 875.00'
#2	Primary	881.00'	18.0" Round Inf Basin Culvert L= 50.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 881.00' / 880.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#3	Secondary	884.50'	Emergency Overflow Weir, C= 2.50 Offset (feet) 0.00 8.00 28.00 36.00 Height (feet) 2.00 0.00 0.00 2.00

Discarded OutFlow Max=0.78 cfs @ 12.22 hrs HW=885.03' (Free Discharge)
 ↑1=Exfiltration (Controls 0.78 cfs)

Primary OutFlow Max=15.41 cfs @ 12.22 hrs HW=885.03' TW=0.00' (Dynamic Tailwater)
 ↑2=Inf Basin Culvert (Inlet Controls 15.41 cfs @ 8.72 fps)

Secondary OutFlow Max=21.07 cfs @ 12.21 hrs HW=885.03' TW=0.00' (Dynamic Tailwater)
 ↑3=Emergency Overflow Weir (Weir Controls 21.07 cfs @ 1.63 fps)

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Summary for Link 10L: PRO Residential Treated

Inflow Area = 26.534 ac, 47.86% Impervious, Inflow Depth = 5.16" for 200yr event
Inflow = 67.38 cfs @ 12.31 hrs, Volume= 11.410 af
Primary = 67.38 cfs @ 12.31 hrs, Volume= 11.410 af, Atten= 0%, Lag= 0.0 min
Routed to Link 25L : PRO Total Site Treated

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

Summary for Link 13L: PRO COM N Treated

Inflow Area = 15.923 ac, 60.47% Impervious, Inflow Depth = 5.36" for 200yr event
Inflow = 42.12 cfs @ 12.31 hrs, Volume= 7.114 af
Primary = 42.12 cfs @ 12.31 hrs, Volume= 7.114 af, Atten= 0%, Lag= 0.0 min
Routed to Link 24L : (new Link)

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

Summary for Link 22L: PRO COM South Comb. Treated

Inflow Area = 28.476 ac, 68.53% Impervious, Inflow Depth = 5.57" for 200yr event
Inflow = 95.28 cfs @ 12.25 hrs, Volume= 13.217 af
Primary = 95.28 cfs @ 12.25 hrs, Volume= 13.217 af, Atten= 0%, Lag= 0.0 min
Routed to Link 24L : (new Link)

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

Summary for Link 24L: (new Link)

Inflow Area = 44.399 ac, 65.64% Impervious, Inflow Depth = 5.49" for 200yr event
Inflow = 134.10 cfs @ 12.27 hrs, Volume= 20.331 af
Primary = 134.10 cfs @ 12.27 hrs, Volume= 20.331 af, Atten= 0%, Lag= 0.0 min
Routed to Link 25L : PRO Total Site Treated

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

Summary for Link 25L: PRO Total Site Treated

Inflow Area = 70.932 ac, 58.99% Impervious, Inflow Depth = 5.37" for 200yr event
Inflow = 198.27 cfs @ 12.28 hrs, Volume= 31.741 af
Primary = 198.27 cfs @ 12.28 hrs, Volume= 31.741 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-96.00 hrs, dt= 0.05 hrs

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Project Reports

- 1 Routing Diagram
- 2 Area Listing (selected nodes)

1yr Event

- 3 Subcat 10S: PRO Residential
- 4 Subcat 11S: PRO Commercial - North
- 5 Subcat 19S: PRO Commercial - South Comb.
- 6 Subcat 26S: EX Commercial South Comb.
- 7 Pond 1P: RES Detention Basin
- 9 Pond 2P: RES Infiltration Basin
- 10 Pond 3P: COM N Detention Basin
- 12 Pond 4P: COM N Infiltration Basin
- 13 Pond 20P: COM South Comb. Detention Basin
- 15 Pond 21P: COM South Comb. Infiltration Basin
- 16 Link 10L: PRO Residential Treated
- 17 Link 13L: PRO COM N Treated
- 18 Link 22L: PRO COM South Comb. Treated
- 19 Link 24L: (new Link)
- 20 Link 25L: PRO Total Site Treated

2yr Event

- 21 Subcat 10S: PRO Residential
- 22 Subcat 11S: PRO Commercial - North
- 23 Subcat 19S: PRO Commercial - South Comb.
- 24 Subcat 26S: EX Commercial South Comb.
- 25 Pond 1P: RES Detention Basin
- 27 Pond 2P: RES Infiltration Basin
- 28 Pond 3P: COM N Detention Basin
- 30 Pond 4P: COM N Infiltration Basin
- 31 Pond 20P: COM South Comb. Detention Basin
- 33 Pond 21P: COM South Comb. Infiltration Basin
- 34 Link 10L: PRO Residential Treated
- 35 Link 13L: PRO COM N Treated
- 36 Link 22L: PRO COM South Comb. Treated
- 37 Link 24L: (new Link)
- 38 Link 25L: PRO Total Site Treated

10yr Event

- 39 Subcat 10S: PRO Residential
- 40 Subcat 11S: PRO Commercial - North
- 41 Subcat 19S: PRO Commercial - South Comb.
- 42 Subcat 26S: EX Commercial South Comb.
- 43 Pond 1P: RES Detention Basin
- 45 Pond 2P: RES Infiltration Basin
- 46 Pond 3P: COM N Detention Basin

2104109_Hartung Drainage Areas

Prepared by HP Inc.

HydroCAD® 10.10-7a s/n 02063 © 2021 HydroCAD Software Solutions LLC

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Printed 6/21/2022

- 48 Pond 4P: COM N Infiltration Basin
- 49 Pond 20P: COM South Comb. Detention Basin
- 51 Pond 21P: COM South Comb. Infiltration Basin
- 52 Link 10L: PRO Residential Treated
- 53 Link 13L: PRO COM N Treated
- 54 Link 22L: PRO COM South Comb. Treated
- 55 Link 24L: (new Link)
- 56 Link 25L: PRO Total Site Treated

100yr Event

- 57 Subcat 10S: PRO Residential
- 58 Subcat 11S: PRO Commercial - North
- 59 Subcat 19S: PRO Commercial - South Comb.
- 60 Subcat 26S: EX Commercial South Comb.
- 61 Pond 1P: RES Detention Basin
- 63 Pond 2P: RES Infiltration Basin
- 64 Pond 3P: COM N Detention Basin
- 66 Pond 4P: COM N Infiltration Basin
- 67 Pond 20P: COM South Comb. Detention Basin
- 69 Pond 21P: COM South Comb. Infiltration Basin
- 70 Link 10L: PRO Residential Treated
- 71 Link 13L: PRO COM N Treated
- 72 Link 22L: PRO COM South Comb. Treated
- 73 Link 24L: (new Link)
- 74 Link 25L: PRO Total Site Treated

200yr Event

- 75 Subcat 10S: PRO Residential
- 76 Subcat 11S: PRO Commercial - North
- 77 Subcat 19S: PRO Commercial - South Comb.
- 78 Subcat 26S: EX Commercial South Comb.
- 79 Pond 1P: RES Detention Basin
- 81 Pond 2P: RES Infiltration Basin
- 82 Pond 3P: COM N Detention Basin
- 84 Pond 4P: COM N Infiltration Basin
- 85 Pond 20P: COM South Comb. Detention Basin
- 87 Pond 21P: COM South Comb. Infiltration Basin
- 88 Link 10L: PRO Residential Treated
- 89 Link 13L: PRO COM N Treated
- 90 Link 22L: PRO COM South Comb. Treated
- 91 Link 24L: (new Link)
- 92 Link 25L: PRO Total Site Treated

APPENDIX D

SITE SOILS EVALUATION

Wisconsin Department of Safety and Professional Services
Division of Safety and Buildings

SOIL EVALUATION - STORM

In accordance with SPS 382.365 and 385, Wis. Adm. Code

Attach complete site plan on paper not less than 8 1/2 x 11 inches in size. Plan must include, but not be limited to: vertical and horizontal reference point (BM), direction and percent slope, scale or dimensions, north arrow, and BM referenced to nearest road.

County Dane County	
Parcel I.D. FN: 21-07-130	
Reviewed by	Date

Please print all information

Personal information you provide may be used for secondary purposes (Privacy Law, s. 15.04 (1) (m).

Property Owner Hartung Brothers, Inc.				Property Location South Corner of Lacy Road and Haight Farm Road		
Property Owner's Mailing Address 708 Heartland Trail, Suite 2000				Lot #	Block #	Subd. Name or CSM#
City Madison	State WI	Zip Code	Phone Number ()	<input checked="" type="checkbox"/> City	<input type="checkbox"/> Village	<input type="checkbox"/> Town
				Nearest Road Fitchburg, WI		

Drainage area _____ <input type="checkbox"/> sq. ft. <input type="checkbox"/> acres Optional: Test Site Suitable for (check all that apply) <input type="checkbox"/> Irrigation <input type="checkbox"/> Bioretention trench <input type="checkbox"/> Trench(es) <input type="checkbox"/> Rain garden <input type="checkbox"/> Infiltration Pond <input type="checkbox"/> Reuse <input type="checkbox"/> infiltration trench <input type="checkbox"/> Retention Pond <input type="checkbox"/> Other _____	Hydraulic Application Test Method: <input checked="" type="checkbox"/> Morphological Evaluation <input type="checkbox"/> Double-Ring Infiltrometer <input type="checkbox"/> Other (specify) _____
--	--

Obs. # Boring B-1
 Pit Ground surface elev. 904.2 ft. Depth to limiting factor 144 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	NRCS Infiltration Rate	
									Inches/Hr	
1	0 to 12	Topsoil								
2	12 to 48	10YR 5/3	-	CL	1, m, sbk	mfi	a	<15	0.03	
3	48 to 144	10YR 5/4 & 6/4	-	G SL	1, m, sbk	mfr	-	15 to <35	0.50	
4	144 to 180	10YR 6/4	-	VG LS	0, cr	ml	-	35 to <60	1.63	

Obs. # Boring B-2
 Pit Ground surface elev. 905.3 ft. Depth to limiting factor 36 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	NRCS Infiltration Rate	
									Inches/Hr	
1	0 to 11	Topsoil								
2	11 to 36	10YR 4/3	-	CL	1, m, sbk	mfi	a	<15	0.03	
3	36 to 84	10YR 6/1	c, 2, d, 10YR 5/6	SiCL	1, m, sbk	mfr	-	<15	0.04	
4	84 to 96	10YR 6/1	m, 2, d, 10YR 5/6	SiL	1, m, sbk	mfr	-	<15	0.13	
5	96 to 144	10YR 5/6	-	SL	1, m, sbk	mfr	-	<15	0.50	
6	144 to 180	10YR 5/6	-	LS	0, ml	mfr	-	<15	1.63	

CST/PSS Name (Please Print) Paul J Koszarek, P.E., CST	Signature	WI-CST Number 1263130
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Address 9856 S 57th Street, Milwaukee, WI	Date Evaluation Conducted 5/17/2022	Telephone Number (414) 423-0255
--	--	------------------------------------

Obs. # Boring B-3
 Pit Ground surface elev. 907.7 ft. Depth to limiting factor 36 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	NRCS Infiltration Rate
									Inches/Hr
1	0 to 10	Topsoil							
2	10 to 36	10YR 4/3	-	CL	1, m, sbk	mfi	a	<15	0.03
3	36 to 66	10YR 4/3	f, 2, f, 10YR 6/6	CL	1, m, sbk	mfi	-	<15	0.03
4	66 to 144	7.5YR 5/4	-	G LS	1, m, sbk	mvfr	-	15 to <35	1.63
5	144 to 180	10YR 5/4 & 6/4	-	LS	1, m, sbk	mvfr	-	<15	1.63

Obs. # Boring B-22
 Pit Ground surface elev. 880.8 ft. Depth to limiting factor 66 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	NRCS Infiltration Rate
									Inches/Hr
1	0 to 12	Topsoil							
2	12 to 36	10YR 4/3	-	CL	1, m, sbk	mfi	a	<15	0.03
3	36 to 66	10YR 6/4	c, 2, f, 10YR 6/6	SiCL	1, m, sbk	mfi	-	<15	0.04
4	66 to 180	10YR 8/1 & 8/6	-	fiS ¹	1, c, pl	ml	-	<15	1.63

Obs. # Boring B-23
 Pit Ground surface elev. 878.8 ft. Depth to limiting factor 0 in. (ground surface)

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	NRCS Infiltration Rate
									Inches/Hr
1	0 to 36	10YR 2/1	-	SiL ²	1, m, pl	mvfr	a	<15	0.13
2	36 to 66	10YR 6/1	c, 2, d, 10YR 6/6	SiCL	1, m, sbk	mfr	-	<15	0.04
3	66 to 96	7.5YR 4/6	-	G SL	1, m, sbk	mvfr	-	15 to <35	0.50
4	96 to 144	10YR 8/2	-	fiS ¹	0, gr	ml	-	<15	1.63
5	144 to 180	10YR 7/6	-	VG SL ¹	2, m, pl	mfr	-	35 to <60	0.50

Obs. # Boring B-24
 Pit Ground surface elev. 879.6 ft. Depth to limiting factor 36 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	NRCS Infiltration Rate
									Inches/Hr
1	0 to 12	Topsoil							
2	12 to 36	10YR 5/3	-	CL	1, m, sbk	mfi	a	<15	0.03
3	36 to 84	10YR 6/1	m, 2, d, 10YR 6/6	SiL	1, m, sbk	mfr	-	<15	0.13

4	84 to 144	7.5YR 4/6	-	LS	0, gr	ml	-	<15	1.63
5	144 to 180	10YR 7/4	-	G LS ¹	0, gr	ml	-	15 to <35	1.63

Obs. # Boring B-25
 Pit Ground surface elev. 879.6 ft. Depth to limiting factor 24 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	NRCS Infiltration Rate
									Inches/Hr
1	0 to 18	Topsoil							
2	18 to 24	10YR 4/3	-	SCL ³	0, m	mfi	a	<15	0.11
3	24 to 54	10YR 6/1	c, 2, d, 10YR 6/6	SiCL	1, m, sbk	mfr	-	<15	0.04
4	54 to 144	10YR 5/3 & 7.5YR 4/6	-	LS	1, m, pl to 0, gr	mvfr to ml	-	<15	1.63
5	144 to 180	10YR 7/6	-	VG CoS ¹	0, gr	ml	-	35 to <60	3.60

Obs. # Boring B-26
 Pit Ground surface elev. 883.6 ft. Depth to limiting factor 0 in. (ground surface)

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	NRCS Infiltration Rate
									Inches/Hr
1	0 to 18	Topsoil							
2	18 to 48	10YR 4/3 & 6/4	-	SCL ³	0, m	mvfr	a	<15	0.11
3	48 to 78	10YR 6/4	m, 2, d, 10YR 6/6	G SL	1, m, sbk	mvfr	-	15 to <35	0.50
4	78 to 168	7.5YR 4/6	-	G LS	0, m	ml	-	15 to <35	1.63
5	168 to 180	10YR 7/6	-	VG LS ¹	2, m, pl	mvfr	-	35 to <60	1.63

Obs. # Boring B-27
 Pit Ground surface elev. 892.9 ft. Depth to limiting factor 168 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	NRCS Infiltration Rate
									Inches/Hr
1	0 to 11	Topsoil							
2	11 to 180	10YR 6/4 & 7.5YR 4/6	-	G SL	1, m, sbk	mvfr	a	15 to <35	0.50

1. Possible Weathered Bedrock
2. Thickened Topsoil - Organic Soil
3. Fill Soils

APPENDIX E

MAINTENANCE AGREEMENT

DECLARATION OF CONDITIONS AND RESTRICTIONS FOR
MAINTENANCE OF STORMWATER MANAGEMENT MEASURES

RECITALS:

- A. Sara Investments Real Estate (“Owner”) is the owner of Hartung Lands more particularly described on Exhibit A attached hereto (the “Property”).
- B. Owner desires to construct stormwater management measures on the Property in accordance with certain plans and specifications approved by the City of Fitchburg (the “City”).
- C. The City requires Owner to record this Declaration of Conditions and Restrictions for Maintenance of Stormwater Management Measures (this “Declaration”) regarding maintenance of certain stormwater management measures (“Stormwater Management Measures”) to be located on the Property all as more particularly described in Exhibit A and shown on Exhibit B. Owner agrees to maintain the Stormwater Management Measures and to grant to the City the rights set forth below.

NOW, THEREFORE, in consideration of the declarations herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the owner agrees as follows:

- 1. Maintenance. Owner and its successors and assigns shall be responsible to repair and maintain the Stormwater Management Measures located on the Property in good condition and in working order and such that the measures comply with approved plans on file with the City. Said maintenance shall be at the Owner’s sole cost and expense. Owner will conduct such maintenance or repair work in accordance with all applicable laws, codes, regulations, and similar requirements. *Specific maintenance tasks and their schedules shall be conducted in accordance with Exhibit B.*
- 2. Easement to City. If Owner fails to maintain the Stormwater Management Measures as required in Section 1, then the City shall have the right, after providing Owner with written notice of the maintenance issue (each, a “Maintenance Notice”) and thirty (30) days to comply with the City’s Maintenance Notice, to enter the Property in order to conduct the maintenance specified in the Maintenance Notice. The City will conduct such maintenance work in accordance with all applicable laws, codes, regulations, and similar requirements and will not unreasonably interfere with Owner’s use of Property. All costs and expenses incurred by the City in conducting such maintenance may be charged to Owner by placing the amount on the tax roll for the Property as a special assessment in accordance with Section 66.0703, Wis. Stats.
- 3. Term/Termination. The term of this Declaration shall commence on the date that this Declaration is filed of record with the Register of Deeds Office for Dane County, Wisconsin, and except as otherwise herein specifically provided, shall continue in perpetuity. Notwithstanding the foregoing, this Declaration may be terminated by recording with the Register of Deeds Office for Dane County, Wisconsin, a written instrument of termination signed by the City and all of the then-owners of the Property.
- 4. Miscellaneous.
 - (a) Notices. Any notice, request or demand required or permitted under this Declaration shall be in writing and shall be deemed given when personally served or three (3) days after the same has been deposited with the United States Post Office, registered or certified mail, return receipt requested, postage prepaid and addressed as follows:

If to Owner: Sara Investments Real Estate
1955 Atwood Avenue, Suite 201
Madison, WI 53704

If to the City: City Engineering Division
5520 Lacy Road
Fitchburg, WI 53711
Attn: City Engineer

Any party may change its address for the receipt of notice by written notice to the other.

This space reserved for recording data

Return to:
City of Fitchburg
5520 Lacy Road
Fitchburg, WI 53711

PIN#: TBD

EXHIBIT A
Stormwater Management Maintenance Measures

Legal Description of Property:

TBD.

Tax Parcel Number: **To be determined after Final Plat is recorded.**

Stormwater Management Measures Included in this Agreement (as shown on the attached Erosion Control Plan, Grading Plan, and Utility Plan, hereby made a part of Exhibit B):

- All site storm sewer pipes and structures
- Wet Detention Pond
- Infiltration Basin

Specific Maintenance Requirements:

Short Term Maintenance (during construction and/or restoration):

- The building construction contractor at the owner's expense or as agreed to by the owner and contractor shall perform inspection of all facilities during construction and until site stabilization.
- Inspections during construction shall be weekly and/or after a rainfall event of 0.5" or more.
- Repairs necessary to restore the facility to design performance will be made within 48 hours of the inspection.
- Deficiencies include, but are not limited to, rill erosion, sediment deposition in the infiltration pond or behind perimeter control, and deposition of sediment on the tracking pad.
- Tracking on the public right-of-way shall be inspected regularly during days that construction traffic is leaving the construction site. Any excessive sediment tracked onto the public right-of-way shall be scraped immediately. Thorough sweeping, with appropriate equipment that physically picks up and removes the sediment (vs. pushing it to other locations within the public right-of-way) shall be conducted at the end of each working day during construction activities.

Long Term Maintenance:

- Inspector qualifications for Long Term Maintenance: Inspectors under this item shall maintain a current Registered Professional Engineer License in the State of Wisconsin or possess an alternate certification approved by the **City of Fitchburg's** Public Works Department.
- All stormwater provisions constructed as part of this project are permanent in location and function over time. The constructed stormwater provisions such as wet detention ponds, infiltration basins, and storm structures shall not be removed or significantly altered without written permission from the **City of Fitchburg's** Public Works Department. Owner shall maintain records of inspections and maintenance as described below in accordance with Chapter 30 – Article II of the **City of Fitchburg** Municipal Code of Ordinances. Inspections and maintenance reports shall be submitted to the **City of Fitchburg's** Public Works Department on an annual basis.
- An operation and maintenance plan shall be developed that is consistent with the purposes of the infiltration device, its intended life, safety requirements and the criteria for its design. The plan shall be developed for inspection, operation and maintenance of the device. The plan shall assign responsibility for activities and the qualifications of the personnel performing the work.

STORM SEWER

- Proprietary oil and grease control devices shall be installed and maintained in a manner consistent with laboratory testing and modeling assumptions used to predict effectiveness. This includes the following requirements: the device shall be installed in accordance with manufacturer recommendations; the installed device shall be equipped with an internal or external bypass to divert flows in excess of the design treatment flow rate.
 - Approved oil and grease control companies are the following:
 - StormFilter
 - Up-Flo Filter
 - Other companies may request Dane County approval by submitting their devices and laboratory testing results. Dane County approval must be issued prior to installation.
- Oil and grease control filters will also provide total suspended solids (TSS) reduction. These filters shall be inspected semi-annually in early spring and early fall. Cleaning of TSS and other debris shall be performed anytime the sediment in the unit reaches 8 inches in depth or the volume exceeds 15% of the total storage volume.
- Visual inspection of components shall be performed and debris removed from inlets and storm sewer manholes.
- Repair inlet/outlet areas that are damaged or show signs or erosion.
- Rip-rap shall be replaced as necessary.
- Repairs must restore the component to the specifications of the original plan.

WET POND

- At a minimum, all components of the wet pond, including inlets, outlets, rip-rap, safety shelf, and sediment depth, shall be inspected annually.
- Embankments shall be kept clear of woody vegetation.
- To maximize filtration, mowing in buffer areas around stormwater ponds should be minimized. If occasional mowing is necessary, the mowing height is recommended to be no shorter than 6 inches. Applications of fertilizer, herbicide, pesticide or other chemicals are discouraged unless an approved chemical application plan is on file with the **City of Fitchburg's** Public Works Department.
- Sediment removal shall be required once the average depth of the permanent pool is 3.5 ft. At a minimum, accumulated sediment shall be removed every 20 years. Sediment shall be disposed of at an approved permitted landfill, per the direction of the **City of Fitchburg's** Public Works Department. (NR 500, Wis. Adm. Code).
- All weed and algae growth shall be removed and disposed of at an appropriate location as determined by the **City of Fitchburg's** Public Works Department. Applications of fertilizer, herbicide, pesticide or other chemicals are discouraged unless an approved chemical application plan is on file with the **City of Fitchburg's** Public Works Department.
- If the wet pond bottom is leaking, repair shall be completed by draining the remainder of the permanent pool and installing a new clay liner or repairing the damaged clay liner prior to bringing the wet pond back online.
- Excavation is prohibited below the original design depth unless geotechnical analysis is completed in accordance with DNR's guidance document "Wet Detention Pond (1001)."
- Repairs must restore the component to the specifications of the original plan.

INFILTRATION BASIN

- At minimum, quarterly inspections shall occur. Inspection shall include spreader and overflow spillway for indication of failure. Note the condition of vegetation as part of inspection. If standing water is observed over 50% of the basin floor 3 days after rainfall, the basin is clogged and measures should be undertaken to unclog it.
- Native Vegetation - Mowing (cutting) or burning shall be used to maintain the vegetation.
 - Establishment - The first mowing of newly planted seed shall occur once it reaches a height of 10 to 12 inches.
 - Mowing
 - Mowing shall reduce the height of plants to 5 to 6 inches.
 - After establishment, if burning cannot be accommodated, mowing shall occur once in the fall (after November 1). The area shall be mowed to a height of 5 to 6 inches.
 - Burning
 - Routine Maintenance - Beginning the second year, burning shall occur in the early spring (prior to May 1st) or in the late fall (after November 1st)
 - Burning shall be done two consecutive years and then up to three years can pass before the next burning.
 - Under no circumstances shall burning occur every other year.
- Restoration Procedures – these include removing the top 2 to 3 inches, chisel plowing and adding topsoil and compost. If deep tilling is used, the basin shall be drained and the soils dried to a depth of 8 inches. If the basin was planted in turf grass and clogging again occurs after these restoration procedures have been used, the owner /operator shall replant with prairie style vegetation using the soil preparation method recommended by the native nursery in the area.
- Trash shall be removed as quickly as possible once observed.
- Pretreatment - If wet detention is used, see WDNR Conservation Practice Technical Standard Wet Detention Basin (1001) for operations and maintenance requirements.
- Winter Maintenance - All draw down devices in the pond shall be opened during winter months to discourage infiltration of runoff water containing high levels of chlorides. If this practice is an enclosed basin, the use of chloride deicers shall be limited in the area draining to the basin to reduce the chance of exceeding the limits in ch. NR 140.
- Repairs must restore the component to the specifications of the original plan.

EXHIBIT B
Figures of Stormwater Management Maintenance Measures

EXHIBITS



LOCATION MAP

HARTUNG LANDS
 FITCHBURG, WISCONSIN

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

Exhibit 1



Soil Map may not be valid at this scale.

Map Scale: 1:3,770 if printed on B landscape (17" x 11") sheet.


0 50 100 200 300 Meters

0 150 300 600 900 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
Cu	Cut and fill land		0.4	0.4%
DsC2	Dresden silt loam, 6 to 12 percent slopes, eroded	B	0.2	0.1%
EfB	Elburn silt loam, 0 to 3 percent slopes	C	14.6	12.8%
GwC	Griswold loam, 6 to 12 percent slopes	B	2.5	2.2%
KrD2	Kidder soils, 10 to 20 percent slopes, eroded	B	0.2	0.2%
PnB	Plano silt loam, till substratum, 2 to 6 percent slopes	B	57.4	50.3%
PoB	Plano silt loam, gravelly substratum, 2 to 6 percent slopes	B	0.5	0.4%
RaA	Radford silt loam, 0 to 3 percent slopes	B/D	3.2	2.8%
RnB	Ringwood silt loam, 2 to 6 percent slopes	B	13.7	12.0%
RnC2	Ringwood silt loam, 6 to 12 percent slopes, eroded	B	13.2	11.5%
SaA	Sable silty clay loam, 0 to 2 percent slopes	B/D	8.3	7.3%
Totals for Area of Interest			114.2	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



PROJECT
LOCATION

AERIAL PHOTO

HARTUNG LANDS
FITCHBURG, WISCONSIN

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

Exhibit 3



AERIAL LOOKING NE



AERIAL LOOKING W



AERIAL LOOKING NW



AERIAL LOOKING SW



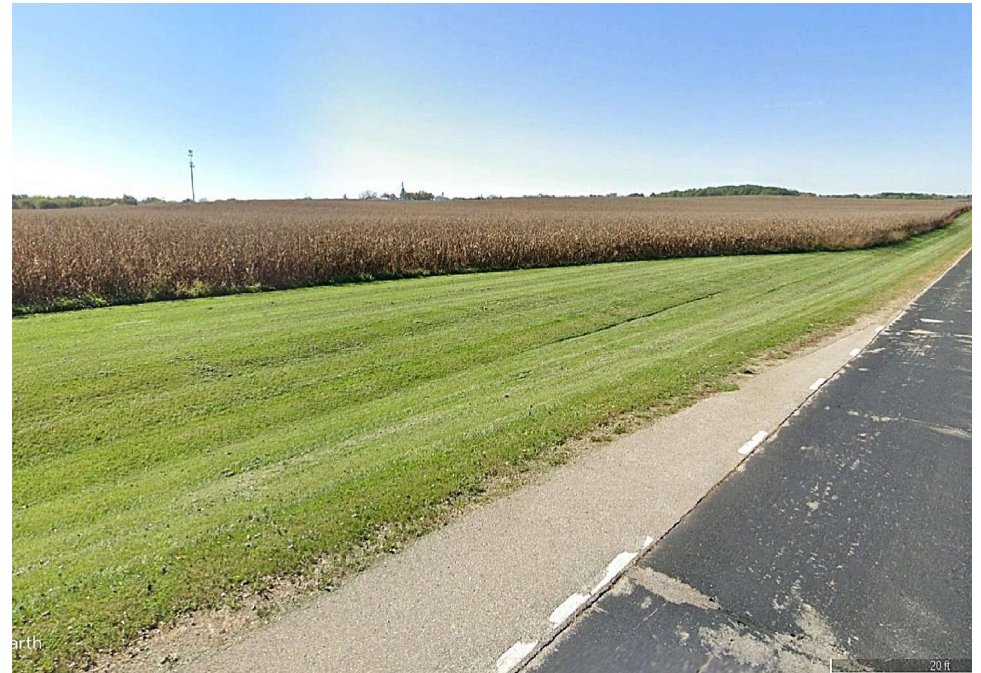
LACY@BLANEY LOOKING E



LACY ROUNDABOUT LOOKING S



LACY@BLANEY LOOKING S



HAIGHT FARM LOOKING WSW



Surface Water Data Viewer Map



Legend

- Wetland Class Areas
- Wetland Class Points
- Dammed pond
- Excavated pond
- Filled/drain wetland
- Wetland too small to delineate
- Filled excavated pond
- Filled Points
- Wetland Class Areas
- Filled Areas
- Wetland Class Areas
- Wetland Class Points
- Dammed pond
- Excavated pond
- Filled/drain wetland
- Wetland too small to delineate
- Filled excavated pond
- Filled Points
- Wetland Class Areas
- Filled Areas
- Wetland Identifications and Confirmations
- Municipality
- State Boundaries
- County Boundaries
- Major Roads**
- Interstate Highway
- State Highway
- US Highway
- County and Local Roads**
- County HWY
- Local Road
- Railroads
- Tribal Lands
- Rivers and Streams
- Intermittent Streams
- Lakes and Open water

0.3 0 0.13 0.3 Miles

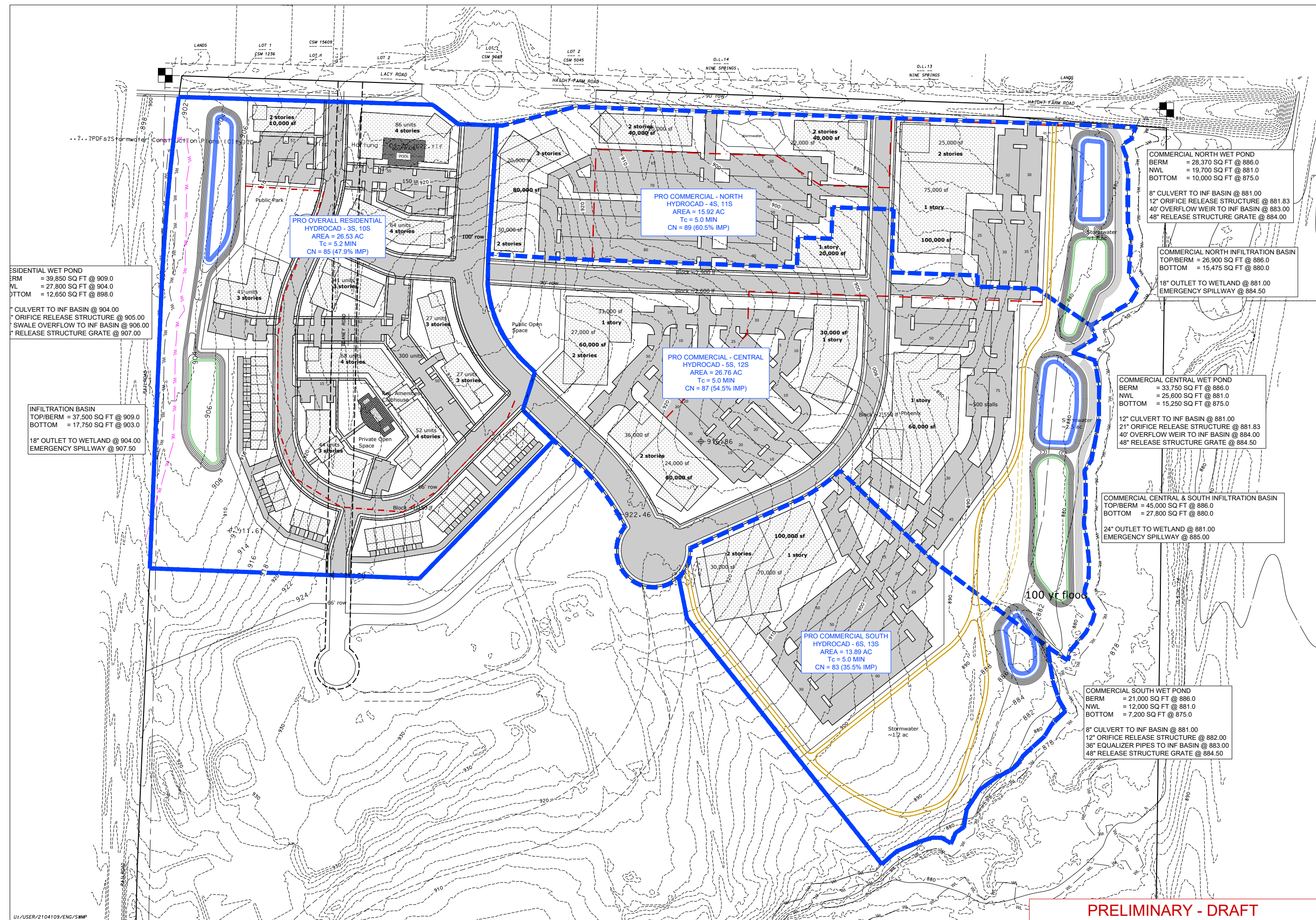
1:7,920

NAD_1983_HARN_Wisconsin_TM

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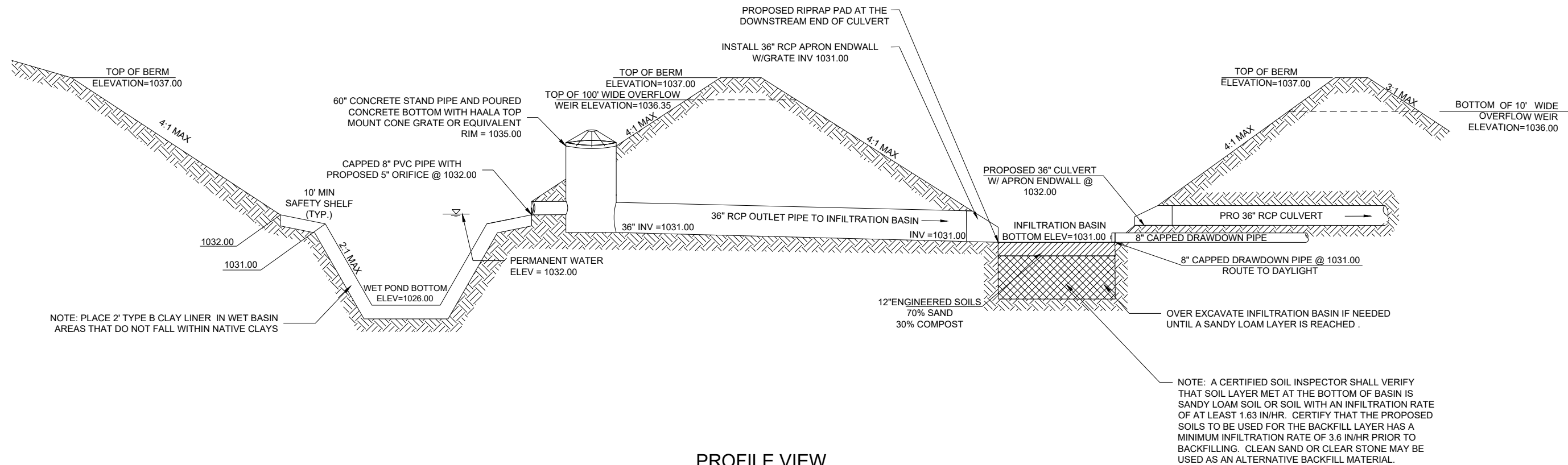
Notes

EXHIBIT 5



PRELIMINARY - DRAFT

PRELIMINARY DRAFT



PROFILE VIEW
PROPOSED WET DETENTION BASIN AND INFILTRATION BASIN
NOT TO SCALE

WET DETENTION AND INFILTRATION BASIN PROFILE DETAIL

HARTUNG LANDS

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DATE: 06-21-2022
REVISED:

DRAWN BY: DRH

FN: 21-04-109

Sheet Number:

EXHIBIT 7