

Preliminary Stormwater Management Facility Report

**US 301 (Gall Boulevard)
From Fowler Avenue to SR 56
Project Development & Environment (PD&E) Study**



Florida Department of Transportation

District 7

Work Program Item Segment No. 255796-1

ETDM Project No. 14194

Hillsborough and Pasco Counties, Florida

July 2023

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Prepared for:



Florida Department of Transportation
District Seven

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July 2023

Professional Engineer Certificate

I hereby certify that I am a registered professional engineer in the State of Florida practicing with Inwood Consulting Engineers, Inc., a corporation authorized to operate as an engineering business, FEID No. 59-3216593, by the State of Florida, Department of Professional Regulation, and Board of Professional Engineers. I have reviewed or approved the evaluation, findings, opinions and conclusions as reported in this Preliminary Stormwater Management Facilities Report.

The Final Preliminary Stormwater Management Facilities Report includes a summary of data collection efforts and design analysis of pond sites for the US 301 PD&E Study from Fowler Avenue to the proposed SR 56. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of civil engineering as applied through design standards and criteria set forth by the federal, state, and local regulatory agencies as well as professional judgment and experience.

DRAFT

Signature: _____

Name: Renato Chuw, P. E.

P.E. Number: 56050

Date: July 07, 2023

EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT) District Seven is conducting a Project Development and Environment (PD&E) study along US Highway 301 (US 301)/State Road 41 (SR 41) in Hillsborough and Pasco Counties to evaluate alternative roadway improvements along the corridor. The study limits are from Fowler Avenue/SR 582 in Hillsborough County to SR 56 in Pasco County, a distance of approximately 13.1 miles. The study involves widening this section of US 301 from a two-lane undivided roadway to a four-lane divided roadway and includes pedestrian and bicycle accommodations. This study also includes intersection improvements and access management recommendations. The proposed improvements are anticipated to increase safety along this segment of US 301 for all users and enhance the functionality of this important regional freight route.

The PD&E study objectives include the following: determine proposed typical sections and develop preliminary conceptual design plans for the proposed improvements, while minimizing impacts to the environment; consider agency and public comments; and ensure project compliance with all applicable federal and state laws. Federal funds are not planned to be used for the project, so this study is being conducted in accordance with the FDOT PD&E Manual, Part 1, Chapter 10, which addresses non-federal projects. A State Environmental Impact Report (SEIR) is being prepared as the environmental document for this study. The proposed improvements will include construction of stormwater management facility (SMF) and floodplain compensation (FPC) sites.

The purpose of this Preliminary Stormwater Management Facility Report is to discuss, analyze, and identify the stormwater management plan for the proposed roadway improvements based on environmental, hydrology and hydraulics, and economic factors. Stormwater management for water quality treatment and runoff attenuation will be provided using wet detention and dry retention stormwater management facilities. The design of the drainage and stormwater facilities will comply with the standards set forth by the FDOT Drainage Manual and the Southwest Florida Water Management District (SWFWMD) Environmental Resource Permit (ERP) manual.

Pond right-of-way areas have been calculated for each of the proposed roadway drainage basins along the project limits. The ponds include both Stormwater Management Facility (SMF) and Floodplain Compensation (FPC) sites. The analysis estimates right-of-way needs using a volumetric analysis, which accounts for water quality treatment and water quantity attenuation for runoff. Please note that the recommendations were based on pond sizes determined from preliminary data calculations, reasonable engineering judgment, and assumptions. Pond sizes and configurations may change during final design as more detailed information on SHWT, Wetland hydrologic information, and final roadway profile become available. Please refer to **Table 1** for a **Summary of Stormwater Pond and Floodplain Compensation Pond Areas**.

Table 1 – Summary of Stormwater Pond and Floodplain Compensation Pond Areas

Preferred SMF and FPCA Sites	Right-of-Way Area (ac) (Including Access Easement)
SMF 1A	2.54
SMF 3A	4.61
SMF 4A	3.11
SMF 5B	3.28
SMF 6C	5.41
SMF 7A	2.54
SMF 8B	2.45
SMF 9C	1.77
SMF 10B	4.42
SMF 12A	3.72
SMF 13A	5.44
FPC 1	8.07
FPC 2	7.45
FPC 3	3.49
FPC 5	25.47
FPC 6	2.15
FPC 7	5.66
FPC 8	8.47
Total	100.05

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
Professional Engineer Certificate	i
Executive Summary	1
Section 1.0 Introduction	1-6
1.1 PD&E Study Purpose	1-6
1.2 Project Purpose and Need	1-6
1.3 Project Description	1-7
1.4 Existing Facility and Proposed Improvements	1-9
1.4.1 Existing Facility	1-9
1.5 Proposed Improvements	1-9
1.6 Purpose of Report	1-10
Section 2.0 Design Criteria	2-1
Section 3.0 Data collection	3-1
Section 4.0 Existing Drainage Conditions	4-1
4.1 Topography & Hydrologic Features	4-1
4.2 Bridge Inspection Reports	4-2
4.3 Soils Data and Geotechnical Investigations	4-2
4.4 Environmental Characteristics	4-7
4.4.1 Land Use Data	4-7
4.4.2 Cultural Features	4-7
4.4.3 Natural and Biological Features	4-8
4.5 Floodplains/Floodways	4-8
4.5.1 Flooding History and Maintenance Concern	4-12
4.6 Existing Drainage Permits	4-12
4.6.1 Permit No. 32128	4-12
4.6.2 Permit No. 27321	4-12
4.6.3 Permit No. 20875	4-13
4.6.4 Permit No. 27103	4-13
4.7 Existing Drainage Basins	4-13
4.7.1 Basin 1	4-13
4.7.2 Basin 2	4-13

TABLE OF CONTENTS

4.7.3 Basin 3..... 4-14

4.7.4 Basin 4..... 4-14

4.7.5 Basin 5..... 4-14

4.7.6 Basin 6..... 4-14

4.7.7 Basin 7..... 4-15

4.7.8 Basin 8..... 4-15

4.7.9 Basin 9..... 4-15

4.7.10 Basin 10..... 4-16

4.7.11 Basin 11..... 4-16

4.7.12 Basin 12..... 4-16

4.7.13 Basin 13..... 4-16

Section 5.0 Proposed Drainage Conditions 5-1

5.1 Proposed SMFs 5-1

5.2 Methodology of SMF Determination 5-2

5.3 SMF Evaluation..... 5-2

5.3.1 Basin 1..... 5-2

5.3.1.1 SMF 1A.....5-2

5.3.1.2 SMF 1B.....5-3

5.3.1.3 SMF 1C.....5-3

5.3.2 Basin 2..... 5-3

5.3.3 Basin 3..... 5-3

5.3.3.1 SMF 3A.....5-4

5.3.3.2 SMF 3B.....5-4

5.3.3.3 SMF 3C.....5-4

5.3.4 Basin 4..... 5-5

5.3.4.1 SMF 4A.....5-5

5.3.4.2 SMF 4B.....5-5

5.3.4.3 SMF 4C.....5-5

5.3.5 Basin 5..... 5-6

5.3.5.1 SMF 5A.....5-6

5.3.5.2 SMF 5B.....5-6

5.3.5.3 SMF 5C.....5-6

5.3.6 Basin 6..... 5-7

5.3.6.1 SMF 6A.....5-7

5.3.6.2 SMF 6B.....5-7

5.3.6.3 SMF 6C.....5-7

5.3.7 Basin 7..... 5-8

5.3.7.1 SMF 7A.....5-8

TABLE OF CONTENTS

5.3.7.2 SMF 7B.....5-8

5.3.7.3 SMF 7C.....5-8

5.3.8 Basin 8..... 5-9

5.3.8.1 SMF 8A.....5-9

5.3.8.2 SMF 8B.....5-9

5.3.8.3 SMF 8C.....5-9

5.3.9 Basin 9..... 5-10

5.3.9.1 SMF 9A.....5-10

5.3.9.2 SMF 9B.....5-10

5.3.9.3 SMF 9C.....5-10

5.3.10 Basin 10..... 5-11

5.3.10.1 SMF 10A.....5-11

5.3.10.2 SMF 10B.....5-11

5.3.11 Basin 11..... 5-12

5.3.12 Basin 12..... 5-12

5.3.12.1 SMF 12A.....5-12

5.3.12.2 SMF 12B.....5-12

5.3.13 Basin 13..... 5-12

5.3.13.1 SMF 13A.....5-13

5.3.13.2 SMF 13B.....5-13

5.4 FPC Evaluation 5-13

5.4.1 FPC1.....5-13

5.4.2 FPC2.....5-14

5.4.3 FPC3.....5-14

5.4.5 FPC5.....5-14

5.4.6 FPC6.....5-14

5.4.7 FPC7.....5-15

5.4.8 FPC8.....5-15

5.5 Environmental Look Arouds (ELAs)..... 5-15

5.6 Nutrient Loading Analysis..... 5-15

Section 6.0 Conclusions and Recommendations..... 6-1

LIST OF FIGURES

Figure 1-1 Project Location Map 1-8
Figure 1-2 Existing Roadway Typical Section..... 1-9
Figure 1-3 Proposed Urban Typical Section 1-10
Figure 1-4 Proposed Suburban Typical Section 1-10
Figure 4-1 Floodplain Impact Areas (FIAs)..... 4-10

LIST OF TABLES

Table 1 – Summary of Stormwater Pond and Floodplain Compensation Pond Areas..... 2
Table 2 – Summary Existing Cross Drains, Bridges and Bridge Culverts 4-1
Table 3 – USDA NRCS Soil Survey Information: Hillsborough County 4-3
Table 4 – USDA NRCS Soil Survey Information: Pasco County..... 4-6
Table 5 – Summary of Floodplain Impact Areas (FIA) 4-11
Table 6 – Summary of Proposed Drainage Basins 5-1
Table 7 – Summary of Nutrient Loading 5-16
Table 8 – Recommended Stormwater Pond Sizes 6-2

LIST OF APPENDICES

Appendix A Exhibits
Appendix B Basin Maps
Appendix C Pond Design Calculations
Appendix D Floodplain Compensation Design Calculations
Appendix E Pond Alternatives Evaluation Matrix
Appendix F Existing Permits
Appendix G Cultural Resources Desktop Analysis

Appendix H Natural Resources Evaluation Report

Appendix I Contamination Screening Evaluation Report

Appendix J Correspondence

DRAFT

SECTION 1.0 INTRODUCTION

1.1 PD&E Study Purpose

The objective of the Project Development and Environment (PD&E) study is to assist the Florida Department of Transportation (FDOT) District Seven in reaching a decision on the type, location, and conceptual design of the proposed improvements for the widening of US 301 from Fowler Avenue to State Road (SR) 56, including stormwater management facility (SMF) and floodplain compensation (FPC) sites. This study documents the need for the improvements as well as the procedures utilized to develop and evaluate various improvements, including proposed typical sections, preliminary horizontal alignments, and intersection enhancement alternatives.

Federal funds are not planned to be used for the project, so this study is being conducted in accordance with the FDOT PD&E Manual, Part 1, Chapter 10, which addresses non-federal projects. The PD&E study satisfies all applicable requirements for a state funded project, and a State Environmental Impact Report (SEIR) is the environmental document for the project. This project was screened through the FDOT's Efficient Transportation Decision Making (ETDM) process as ETDM Project No. 14194. The ETDM Final Programming Screen Summary Report was published on April 21, 2015, containing comments from the Environmental Technical Advisory Team (ETAT) on the project's effects on various natural, physical, and social resources.

1.2 Project Purpose and Need

The purpose of this project is to provide additional roadway capacity and improve safety on this portion of US 301 in unincorporated Hillsborough and Pasco Counties. US 301 is a major north-south roadway near the City of Temple Terrace at the southern project limit in Hillsborough County, and the City of Zephyrhills at the northern project limit in Pasco County. This roadway extends from the Sarasota-Bradenton-Venice Metropolitan Statistical Area to the Georgia state line northwest of Jacksonville, thus providing a regional route between the Tampa Bay area and Jacksonville/I-95 corridor. US 301 serves both regional and local travel and connects residential centers in the Temple Terrace and Zephyrhills areas with employment centers in the Tampa area. It provides regional connectivity with I-75, I-4, SR 56, SR 54, and SR 52. US 301 has been designated by both Hillsborough and Pasco Counties' Emergency Management as an emergency evacuation route. In addition to increasing capacity, this project will add or enhance the multimodal facilities in this corridor.

The proposed widening of this portion of US 301 is expected to have positive mobility impacts. The Hillsborough Transportation Planning Organization's (TPO) It's Time Hillsborough 2045 Long Range Transportation Plan (LRTP) socioeconomic projections (November 2019) contain both population and employment projections. These projections show Hillsborough County's population increasing from 1,292,800 to 2,006,200 (a 55% increase) between 2015 and 2045. Employment is projected to increase from 830,800 to 1,705,400 (a 105% increase) between

2015 and 2045, mostly within the urban service area. The Pasco Metropolitan Planning Organization's (MPO) Mobility 2045 LRTP (March 2020) also documents socioeconomic projections. These projections show Pasco County's population increasing from 487,588 to 795,600 (a 63% increase) between 2015 and 2045. Employment is projected to increase from 157,500 to 266,592 (a 69% increase) between 2015 and 2045. Based on projected population and employment growth, the existing study corridor would experience failing levels of service in the future.

US 301 is a truck route that provides north-south access within eastern Hillsborough and Pasco Counties and connections to the surrounding Tampa Bay area. There is no existing bus service within the study corridor; however, the Tampa Bay Area Regional Transportation Authority (TBARTA) Regional Transit Development Plan (adopted June 2020) shows future Regional Commuter Express Bus Service north of the project from SR 56 to Zephyrhills.

Safety within the US 301 corridor is also projected to improve with an increase in capacity and a corresponding reduction in congestion, as well as with the provision of a median, thereby reducing potential vehicle conflicts.

1.3 Project Description

The proposed action involves widening US 301 from the existing two-lane undivided roadway to a four-lane divided roadway and includes pedestrian and bicycle accommodations. The project is located in both Hillsborough and Pasco Counties and is approximately 13.1 miles long. A project location map is provided in **Figure 1-1**.

The widening of the Hillsborough County portion of the study corridor (from Fowler Avenue to the County line) is not identified in the Hillsborough TPO's 2045 LRTP. The widening of the Pasco County portion of the study corridor (from the County line to SR 56) is not identified in the Pasco MPO's 2045 LRTP Cost Feasible Plan but is identified in the 2045 Needs Plan.

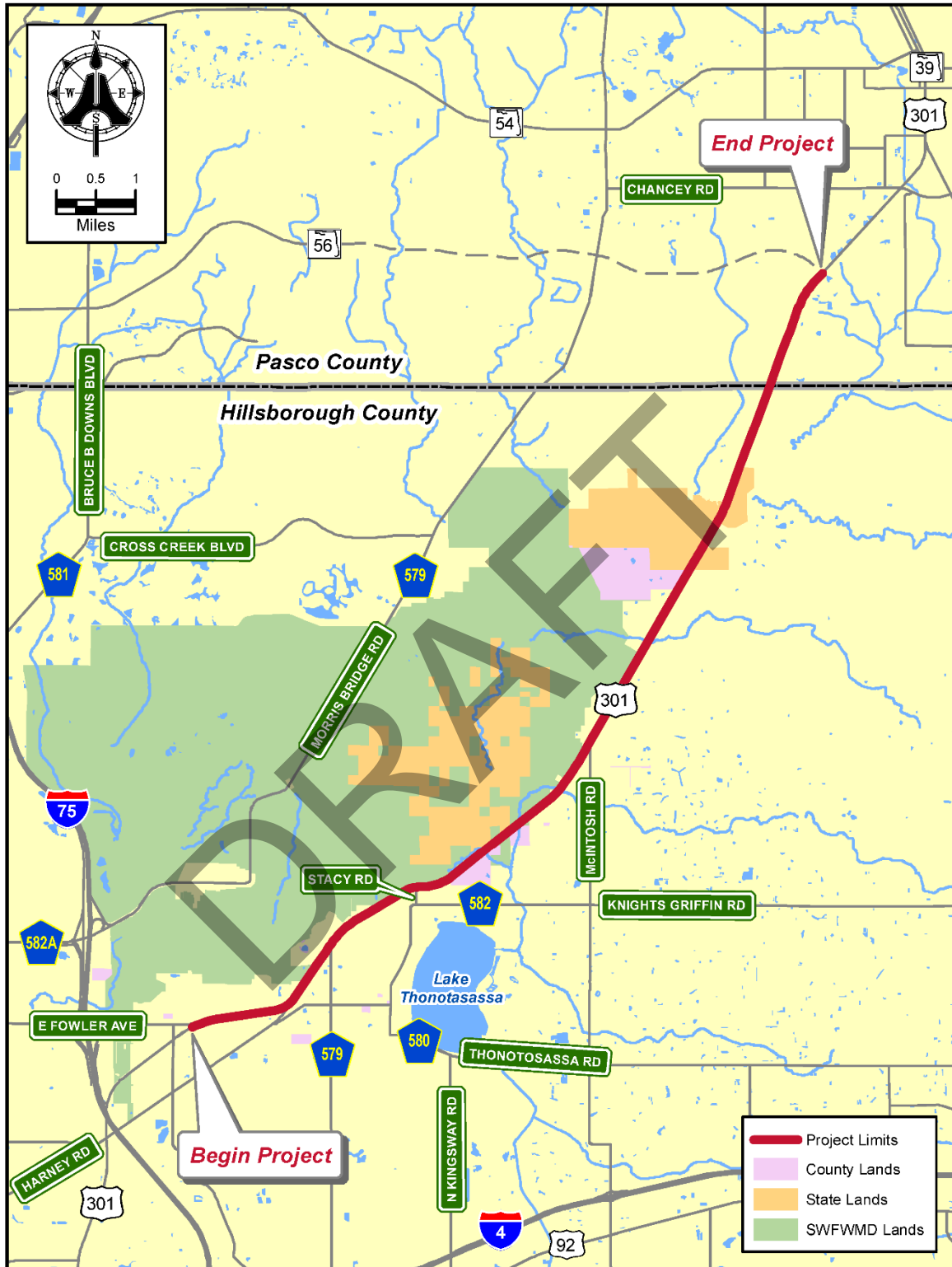


Figure 1-1 Project Location Map

1.4 Existing Facility and Proposed Improvements

1.4.1 Existing Facility

The existing US 301 roadway has a two-lane undivided rural typical section from Fowler Avenue to SR 56. The roadway is functionally classified by FDOT as an Urban Other Principal Arterial from Fowler Avenue to just north of CR 579 (Mango Road) and from the County line to SR 56. The remaining portion of the project is classified as a Rural Other Principal Arterial. The posted speed limits within the study corridor are 55 miles per hour (mph) from Fowler Avenue to Flint Creek and 60 mph from Flint Creek to SR 56.

The existing typical section consists of one 12-foot travel lane and a 5-foot paved shoulder in each direction and a 2.2-mile, variable width, shared-use path (known as the Old Fort King Trail) running along the east side of US 301 beginning just north of Stacy Road. The shared-use path crosses US 301 at two locations. Drainage is collected in roadside ditches and is ultimately conveyed to the Hillsborough River. The existing right-of-way (ROW) width ranges from 100 feet to 200 feet. The existing typical section is illustrated in **Figure 1-2**.

There are also eight structures located within the study corridor. Five of the structures are roadway bridges located over rivers/streams/creeks including Flint Creek, Flint Creek Relief, Holloman's Branch, Two Holes Branch and the Hillsborough River. The Old Fort King Trail also has three pedestrian bridges over Flint Creek, Flint Creek Relief and Holloman's Branch.

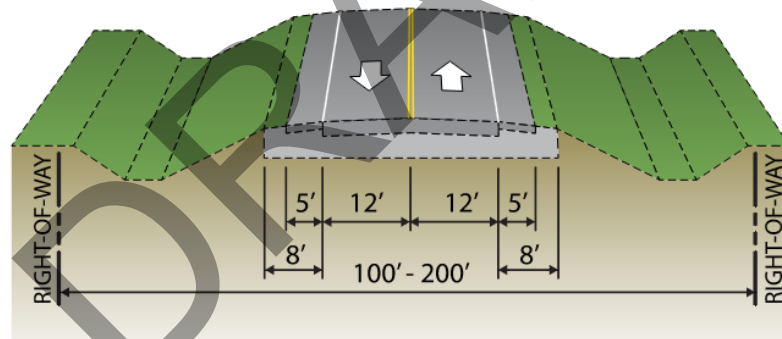
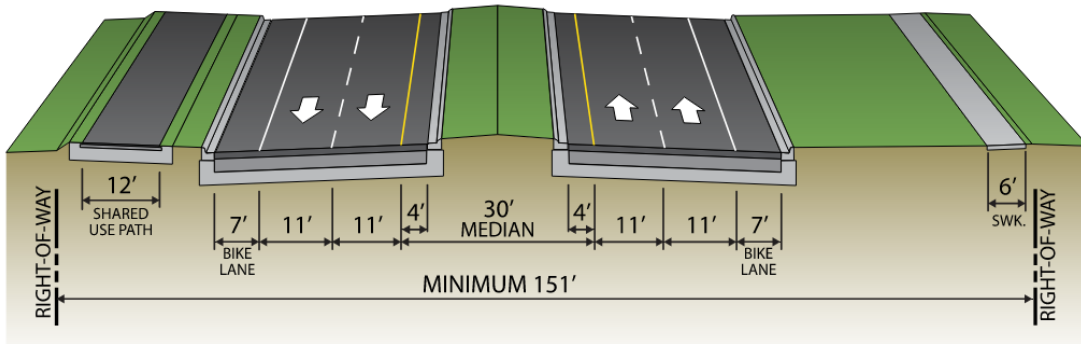


Figure 1-2 Existing Roadway Typical Section

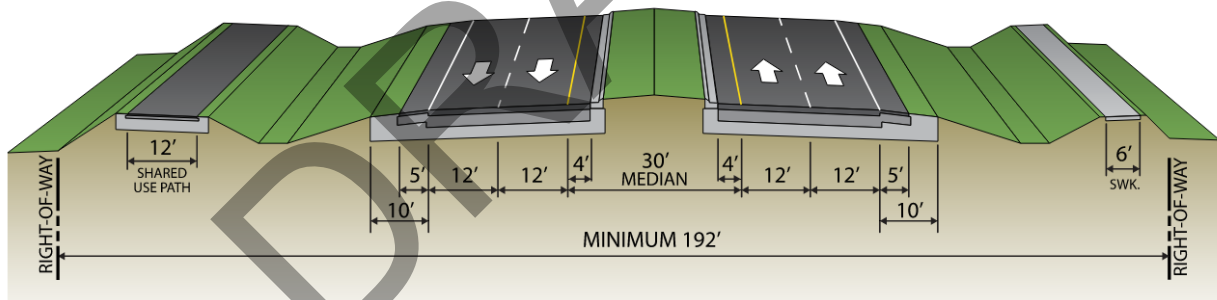
1.4.2 Proposed Improvements

The proposed Build Alternative is composed of two typical sections. An urban typical section with a target/design speed of 45 mph is proposed from Fowler Avenue to Stacy Road. This typical section has two 11-foot travel lanes in each direction, a 30-foot raised median including 4-foot paved inside shoulders, and 7-foot buffered bike lanes in each direction. There is a 6-foot sidewalk on the east side of the roadway and a 12-foot shared use path on the west side of the roadway, as illustrated in **Figure 1-3**. The proposed ROW width varies from 151 feet to 200 feet.



**Figure 1-3 Proposed Urban Typical Section
Fowler Ave to Stacy Road**

A suburban typical section with a target/design speed of 55 mph is proposed from Stacy Road to SR 56. This typical section has two 12-foot travel lanes in each direction, a 30-foot raised median including 4-foot paved inside shoulders, and 10-foot outside shoulders (5-foot paved). There is a 6-foot sidewalk on the east side of the roadway and a 12-foot shared use path on the west side of the roadway, as illustrated in Figure 1-4. The proposed ROW width varies from 192 feet to 230 feet. Where possible, pavement savings will be achieved by converting the existing two-lane roadway to southbound only operation.



**Figure 1-4 Proposed Suburban Typical Section
Stacy Road to SR 56**

1.5 Purpose of Report

The purpose of this report is to discuss, analyze, and identify the stormwater management plan for the proposed roadway improvements based on environmental, hydrology and hydraulics, and economic factors. Stormwater management for water quality treatment and runoff attenuation will be provided using wet detention and dry retention stormwater management facilities. The design of the drainage and stormwater facilities will comply with the standards set forth by the FDOT Drainage Manual and the SWFWMD Environmental Resource Permit (ERP) manual.

SECTION 2.0 DESIGN CRITERIA

The design of the stormwater management facilities for the project is governed by the rules set forth by the SWFWMD and FDOT. Water treatment and attenuation requirements will comply with the guidelines as defined in Chapter 62-330 of the Florida Administrative Code (F.A.C) and the SWFWMD ERP manual.

Wet detention and dry retention ponds will provide for water quality improvements as well as water quantity attenuation for the project runoff. The stormwater ponds are designed and sized for the most typical section for each segment. Please refer to the summary below for the water quality, water quantity, and detention pond facilities configuration criterion used for the project:

- **Water Quality** – Treatment will be provided for one inch (1”) over the Net New Directly Connected Impervious Areas (DCIA) or 0.5” over Net New DCIA for wet detention ponds and dry retention ponds, respectively, not including sidewalks or shared use path. An outfall control structure shall be designed to drawdown a maximum of one-half inch (0.5”) of the detention volume in 24 hours.
- The project traverses nine (9) WBIDs (1443B Hillsborough River, 1522A Flint Creek, 1520 Hollomans Branch, 1443C Hillsborough River, 1505 Clay Gully, 1489 Two Hole Branch, 1443D Hillsborough River, 1453 Indian Creek, and 1443A Hillsborough River), which are located in the Hillsborough River Watershed. A Total Maximum Daily Load (TMDL) has been adopted for Flint Creek (WBID 1522A - Nutrients). WBIDs 1443A and 1443B are impaired for Dissolved Oxygen, while WBIDs 1520 and 1505 were found to be impaired for Bacteria. WBID 1489 was found to be impaired for Fecal Coliform / Bacteria.

Although certain WBIDs within the project are not specifically impaired for nutrients, the study limits are within the Hillsborough River Watershed, which ultimately outfalls to Hillsborough Bay and is included in the Tampa Bay watershed. The Tampa Bay watershed is part of the Tampa Bay Nitrogen Management Consortium that evaluates nitrogen and phosphorus loadings into the bay. Furthermore, FDEP has adopted stormwater rule changes as part of SB 712 (Clean Waterways Act) that addresses nutrient loading requirements in the State and strengthens Florida’s overall water resource protections. Therefore, a pre versus post pollutant loading analysis has been performed for all basins and evaluated as a whole, for this study.

- **Water Quantity** – For a project or portion of a project located within an open drainage basin, the allowable discharge is:

- 1) Historic discharge, which is the peak rate at which runoff leaves the parcel of land by gravity under existing site conditions, or the legally allowable discharge at the time of permit application; or
 - 2) Amounts determined in previous District permit actions relevant to the project.
- **Recovery** – During the design phase stormwater management facilities shall be designed such that they recover their total treatment volume within 72 hours.

Offsite discharges and peak stages for the existing and proposed conditions shall be computed using the SWFWMD's 25-year/24-hour rainfall maps and the Natural Resources Conservation Service (NRCS) Type II Florida Modified 24-hour rainfall distribution with and antecedent moisture condition II.

For a project or portion of a project located within a closed drainage basin, the required retention volume shall be the post-development runoff volume less the predevelopment runoff volume computed using the SWFWMD's 100-year/24-hour rainfall map and the NRCS Type II Florida Modified 24-hour rainfall distribution with and antecedent moisture condition II. The total post development volume leaving the site shall be no more than the total pre-development volume leaving the site for the design 100-year storm event. The rate of runoff leaving the site shall not cause adverse offsite impacts. Maintenance of pre-development offsite low flow may be required in hydrologically sensitive areas.

- **Detention Pond Facilities Configuration** – The proposed ponds shall have a minimum area of 0.5 acre and 100 feet minimum width for linear areas in excess of 200 feet length (measured at the control elevation). The pond will include a 15-foot minimum maintenance berm width, minimum 1:4 (Vertical:Horizontal) for pond side slopes and tie up/down slope to existing ground, and a minimum 1-foot freeboard from the inside maintenance berm to the Design High Water (DHW) stage.

SECTION 3.0 DATA COLLECTION

The following data sources were used to prepare this report:

- FDOT Drainage Manual, January 2023
- FDOT Drainage Design Guide, January – January 2023
- SWFWMD Permit No. 32128 – US 301 South of Tampa Bypass Canal to North Fowler Avenue
- SWFWMD Permit No. 27321 – SR 41 from Old Harney to North Hollomans
- SWFWMD Permit No. 20875 – SR 41 US HWY 301 McIntosh Road
- SWFWMD Permit No. 27103 – Riverwood Intersection Improvement/US 301
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel Nos. 12057C0240H, 12057C0245H, 12057C0235H, 12057C0234H, 12057C0251H, 12057C0115H for Hillsborough County, Effective Date 8/28/2008
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel Nos. 12101C0465F, 12101C0461F, 12101C0462F for Hillsborough County, Effective Date 9/26/2014
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel Nos. 12057C0115H for Pasco County, Effective Date 8/28/2008
- Hillsborough River and Tampa Bypass Canal Stormwater Management Master Plan, Update No.1, August 2011
- New River/Upper Hillsborough River Watershed Model, 2014
- United State Geological Survey (USGS) Quadrangle Maps
- U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soils Survey of Hillsborough County, Florida, 1989
- U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soils Survey of Pasco County, Florida, 1982
- 1-foot contours from Hillsborough County, 2015
- 1-foot contours from Pasco County, 2015
- Hillsborough County Property Appraiser's Website (GIS parcel Lines), 2015
- Pasco County Property Appraiser's Website (GIS parcel Lines), 2015
- FDOT Straight Line Diagrams (SLD's) of road inventory for US 301
- Field Reconnaissance (August 2015)

SECTION 4.0 EXISTING DRAINAGE CONDITIONS

4.1 Topography & Hydrologic Features

The topography of the project area consists of rolling terrain and roadway elevations range from a high of 68 feet to a low of 37 feet NAVD 88. Please refer to the **USGS Quadrangle Map, Exhibit 2** in **Appendix A**. There are thirty-three (33) existing cross drains, four (4) existing bridges and one (1) existing bridge culvert within the project limits allowing for conveyance of offsite and onsite runoff to flow to the Hillsborough River. The size and geometry of all cross drains and bridges have been verified from the FDOT SLD's, 1-foot LiDAR contours, US 301 plans, as well as during field reconnaissance. Please refer to **Table 2** for a **Summary of Existing Cross Drains, Bridges and Bridge Culverts**.

Table 2 – Summary Existing Cross Drains, Bridges and Bridge Culverts

Structure No.	FDOT Milepost	Station	Description	Remarks
CD-1	5.162	1371+80	Single 18" RCP	
CD-2	5.400	1384+30	Single 18" RCP	
CD-3	5.693	1399+80	Single 18" RCP	
CD-4	0.422	1435+10	Single 30" RCP	
CD-5	0.656	1447+90	Single 30" RCP	
CD-6	1.066	1469+10	Single 30" RCP	
CD-7	1.844	1509+80	Single 30" RCP	
CD-8	2.453	1542+50	N/A	Unable to locate in field
CD-9	2.784	1559+70	Single 30" RCP	Unable to locate in field
CD-10	2.960	1568+70	Single 15" RCP	Unable to locate in field
Bridge-1 (#100951)	3.159-3.177	1580+00	95' Bridge	Flint Creek
CD-11	3.351	1589+80	Single 15" RCP	
CD-12	3.541	1599+80	Single 15" RCP	
Bridge-2 (#100052)	3.727-3.737	1609+60	52' Bridge	Flint Creek Relief
CD-13	3.919	1619+80	Single 15" RCP	
CD-14	4.089	1628+80	Single 15" RCP	
CD-15	4.176	1633+40	Single 30" RCP	
Bridge-3 (#100053)	4.403-4.421	1645+50	95' Bridge	Hollomans Branch
CD-16	4.932	1673+50	Single 4'x2' CBC	
CD-17	5.863	1722+60	Single 10'x6' CBC	

SECTION 4.0
EXISTING DRAINAGE CONDITIONS

Structure No.	FDOT Milepost	Station	Description	Remarks
CD-18	5.940	1726+60	Single 9'x6' CBC	
CD-19	6.302	1745+70	Single 6'x4' CBC	
Bridge Culvert-1 (#100504)	6.559-6.566	1759+70	36' Bridge	Two Hole Branch
CD-20	6.659	1763+75	Single 6'x4' CBC	
CD-21	7.109	1788+20	Single 4'x3' CBC	
CD-22	7.393	1803+20	Single 4'x3' CBC	
CD-23	7.595	1812+80	Single 30" RCP	
CD-24	7.724	1820+60	Single 4'x3' CBC	
CD-25	7.899	1829+80	Single 30" RCP	
CD-26	8.320	1853+20	Single 4'x3' CBC	
Bridge-4 (#100434)	8.539-8.624	1865+00	448' Bridge	Hillsborough River
CD-27	8.631	1868+70	Single 15" RCP	Shoulder gutter inlet
CD-28	8.712	1872+70	Single 15" RCP	Shoulder gutter inlet
CD-29	8.798	1877+20	Single 15" RCP	Shoulder gutter inlet
CD-30	9.330	1905+30	Single 30" RCP	
CD-31	9.532	1915+90	Single 30" RCP	
CD-32	9.911	1935+95	Single 30" RCP	
CD-33	1.146	2010+00	Single 4'x3' CBC	Unable to locate in field

4.2 Bridge Inspection Reports

The bridges over Flint Creek, Flint Creek Relief, and Hollomans Branch were constructed in 1972, while the bridge culvert for Two Hole Branch and the Bridge over the Hillsborough River were constructed in 1985. Please refer to the **Location Hydraulic Report** for additional information.

4.3 Soils Data and Geotechnical Investigations

The soil survey of Hillsborough County, Florida (dated 1989) and the soil survey of Pasco County, Florida (dated 1982) published by the USDA NRCS has been reviewed within the project vicinity. USDA SSURGO was also obtained from SWFWMD to create a soils map for the project limits using GIS ArcMap. SSURGO data was compared to the soil survey by USDA NRCS and found no deviation. The soil survey map for the project vicinity is illustrated in **Exhibit 3A** and **3B** of **Appendix A**.

SECTION 4.0
EXISTING DRAINAGE CONDITIONS

The soils encountered along the project limits are mostly Hydrologic Soil Group (HSG) A, A/D, B/D and C/D. Group A soils have low runoff potential and high infiltration rates even when thoroughly wetted. They consist chiefly of deep, well to excessively drained sand or gravel and have a high rate of water transmission. Group C soils have low infiltration rates when thoroughly wetted and consist chiefly of soils with a layer that impedes downward movement of water and soils with moderately fine to fine texture. Group D soils have high runoff potential. They have very low infiltration rates when thoroughly wetted and consist chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very low rate of water transmission. If a soil is assigned to a dual HSG, the first letter is for drained areas and the second is for un-drained areas. Only the soils that in their natural condition are in group D are assigned to dual classes. According to the Soil Survey, there are twenty-seven (27) different soil types located along the project limits within Hillsborough County and eleven (11) different soil types located along the project limits within Pasco County. **Table 3 – USDA NRCS Soil Survey Information: Hillsborough County** and **Table 4 – USDA NRCS Soil Survey Information: Pasco County** summarizes and lists the soil types and relevant information. The ground water depth varies from 0-1' to greater than 6' along the project.

Table 3 – USDA NRCS Soil Survey Information: Hillsborough County

Soil No.	USDA Soil Name	Seasonal High Ground Water		HSG	Soil Classification		
		Depth* (feet)	Duration (months)		Depth (inches)	Unified	AASHTO
3	Archbold fine sand	3.5-6.0	Jun-Nov	A	0-4	SP	A-3
					4-80	SP, SP-SM	A-3
4	Arents	2.3	---	B	>6.6	SP	A-3
5	Basinger	+2.0-1.0	Jun-Feb	D	0-7	SP	A-3
					7-28	SP, SP-SM	A-3, A-2-4
					28-42	SP, SP-SM	A-3, A-2-4
					42-80	SP, SP-SM	A-3, A-2-4
5	Holopaw	+2.0-1.0	Jun-Apr	D	0-6	SP, SP-SM	A-3
					6-52	SP, SP-SM	A-3
					52-80	SM, SM-SC	A-2-4
5	Samsula	+2.0-1.0	Jan-Dec	D	0-34	PT	A-3
					34-80	SP-SM, SM, SP	A-3, A-2-4
7	Candler fine sand	> 6.0	---	A	0-6	SP, SP-SM	A-3
					6-72	SP, SP-SM	A-3
					74-80	SP-SM	A-3, A-2-4
8	Candler fine sand	> 6.0	---	A	0-6	SP, SP-SM	A-3
					6-74	SP, SP-SM	A-3
					74-80	SP-SM	A-3, A-2-4

Continued on next page

SECTION 4.0
EXISTING DRAINAGE CONDITIONS

Soil No.	USDA Soil Name	Seasonal High Ground Water		HSG	Soil Classification		
		Depth* (feet)	Duration (months)		Depth (inches)	Unified	AASHTO
12	Chobee Sandy Loam	0-1.0	Feb-Jun	B/D	0-15	SP-SM, SM	A-2-4
					15-60	SC	A-2-6, A-2-7, A-6, A-7
					60-80	SP-SM, SM, SC, SM-SC	A-2-4, A-2-6, A-6, A-7
15	Felda Fine Sand	0-1.0	Jul-Mar	B/D	0-22	SP, SP-SM	A-3
					22-45	SM, SM-SC, SC	A-2-4, A-2-6
					45-80	SP, SP-SM	A-3, A-2-4
16	Felda fine sand	0-1.0	Jul-Mar	B/D	0-22	SP, SP-SM	A-3
					22-38	SM, SM-SC, SC	A-2-4, A-2-6
					38-80	SP, SP-SM	A-3, A-2-4
19	Gainesville loamy fine sand	>6.0	---	A	0-80	SM	A-2-4
21	Immokalee Fine Sand	0-1.0	Jun-Nov	B/D	0-8	SP, SP-SM	A-3
					8-36	SP, SP-SM	A-3
					36-80	SP-SM, SM	A-3, A-2-4
23	Kendrick Fine Sand	>6.0	---	A	0-35	SP-SM, SM	A-3, A-2-4
					35-68	SC, SM-SC	A-2-6, A-2-4
					68-80	SC	A-2-6, A-6
25	Lake fine sand	> 6.0	---	A	60-80	SP-SM	A-3, A-2-4
26	Lochloosa Fine Sands	2.5-5.0	Jul-Oct	C	0-28	SP-SM, SM	A-2-4, A-3
					28-35	SM, SM-SC	A-2-4
					35-69	SC, SM-SC	A-2, A-4, A-6
					69-80	SC, SM-SC	A-2, A-4, A-6
26	Miconopy Fine Sands	1.5-2.5	Jul-Nov	C	0-15	SM, SP-SM	A-2-4
					15-25	SC	A-2, A-6, A-7
					25-59	CH	A-7
					59-80	CH, SC	A-7, A-6
27	Malabar Fine Sand	0-1.0	Jun-Nov	B/D	0-12	SP, SP-SM	A-3
					12-30	SP, SP-SM	A-3, A-2-4
					30-50	SP, SP-SM	A-3
					50-66	SC, SM-SC, SM	A-2, A-4, A-6
					66-80	SP-SM, SM	A-3, A-2-4
29	Myakka fine sand	0-1.0	Jun-Nov	B/D	0-20	SP, SP-SM	A-3
					20-30	SM, SP-SM	A-3, A-2-4
					30-80	SP, SP-SM	A-3
33	Ona fine sand	0-1.0	Jun-Nov	B/D	0-4	SP-SM, SP	A-3
					4-22	SP-SM, SM	A-3, A-2-4
					22-80	SP-SM, SP	A-3
35	Orlando fine sand	> 6.0	---	A	0-20	SP, SP-SM	A-3, A-2-4
					20-80	SP, SP-SM	A-3, A-2-4
37	Paisley Fine Sand	+2-1.0	Jun-Feb	D	0-4	SP-SM	A-2-4, A-3
					4-80	CH, CL	A-7
43	Quartzsaments	> 6.6	---	A	>6.6	SP	A-3

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SECTION 4.0
EXISTING DRAINAGE CONDITIONS

Soil No.	USDA Soil Name	Seasonal High Ground Water		HSG	Soil Classification		
		Depth* (feet)	Duration (months)		Depth (inches)	Unified	AASHTO
46	St. Johns fine sand	0-1.0	Jun-Apr	B/D	0-12	SP, SP-SM	A-3
					12-29	SP, SP-SM	A-3
					29-46	SP-SM, SM	A-3, A-2-4
					46-80	SP, SP-SM	A-3
47	Seffner fine sand	1.5-3.5	Jun-Nov	C	0-13	SP-SM, SP	A-3, A-2-4
					13-21	SP-SM, SP	A-3, A-2-4
					21-80	SP-SM, SP	A-3, A-2-4
53	Tavares	3.5-6.0	Jun-Dec	A	0-6	SP, SP-SM	A-3
					6-80	SP, SP-SM	A-3
53	Millhopper	3.5-6.0	Aug-Feb	A	0-57	SP-SM, SM	A-3, A-2-4
					57-80	SM, SM-SC, SC	A-2-4, A-4
54	Tavares	3.5-6.0	Jun-Dec	A	0-3	SP, SP-S, M	A-3
					3-80	SP, SP-SM	A-3
54	Millhopper	3.5-6.0	Aug-Feb	A	0-54	SP-SM, SM	A-3, A-2-4
					54-68	SM	A-2-4
					68-80	SM, SM-SC, SC	A-2-4, A-4
57	Wabasso Fine Sand	0-1.0	Jun-Oct	B/D	0-29	SP, SP-SM	A-3
					29-38	SP, SP-SM	A-3
					38-60	SP, SP-SM	A-3
					60-80	SC, SM-SC	A-2-4, A-2-6
59	Winder Fine Sand	0-1.0	Jun-Dec	B/D	0-10	SP, SP-SM	A-3, A-2-4
					10-14	SM	A-2-4
					14-30	SC	A-2-4, A-2-6
					30-80	SM, SM-SC, SC	A-2-4
60	Winder Fine Sand	0-1.0	Jun-Dec	B/D	0-14	SP, SP-SM	A-3, A-2-4
					14-17	SM	A-2-4
					17-33	SM, SM-SC, SC, GM-GC	A-2-4, A-2-6, A-1-B
61	Zolfo fine sand	2.0-3.5	Jun-Nov	C	33-80	SP, SP-SM, SM	A-3, A-2-4, A-1-B
					0-3	SP-SM	A-3, A-2-4
					3-60	SP-SM, SM	A-3, A-2-4
					60-80	SP-SM, SM	A-3, A-2-4

Seasonal High Ground water table: Depth is referenced below existing grade, except where indicated as "+".

SECTION 4.0
EXISTING DRAINAGE CONDITIONS

Table 4 – USDA NRCS Soil Survey Information: Pasco County

Soil No.	USDA Soil Name	Seasonal High Ground Water		HSG	Soil Classification		
		Depth* (feet)	Duration (months)		Depth (inches)	Unified	AASHTO
1	Wauchula Fine Sand	0-1.0	Jun-Feb	B/D	0-8	SP-SM	A-3, A-2-4
					8-19	SP-SM, SM	A-3, A-2-4
					19-26	SP-SM, SM	A-3, A-2-4
					26-34	SP-SM, SM	A-3, A-2-4
					34-80	SM, SM-SC, SC	A-2-4, A-2-6, A-4, A-6
2	Pomona Fine Sand	0-1.0	Jul-Sep	B/D	0-6	SP, SP-SM	A-3, A-2-4
					6-22	SP, SP-SM, SM	A-3, A-2-4
					22-36	SP-SM, SM	A-3, A-2-4
					36-52	SP, SP-SM	A-3, A-2-4
					52-60	SC, SM-SC, SM	A-2-4, A-4, A-6
7	Sparr Fine Sand	1.5-3.5	Jul-Oct	C	0-6	SP-SM	A-3, A-2-4
					6-43	SP-SM	A-3, A-2-4,
					43-48	SM-SC, SC, SM	A-2
					48-59	SC, SC-SM	A-2, A-4, A-6
					59-80	SC, SM-SC, SM	A-2, A-4, A-6
16	Zephyr Muck	+2-1.0	Jun-Feb	D	13-0	Pt	A-8
					0-18	SP-SM, SM	A-3, A-2-4
					18-48	SM, SM-SC, SC	A-2-4, A-2-6
					48-67	SM, SM-SC, SC	A-2-4, A-4
18	Electra Variet Fine Sand	2.0-3.5	Jul-Oct	C	0-5	SP, SP-SM	A-3
					5-39	SP, SP-SM	A-3
					39-51	SP-SM, SM	A-3, A-2-4
					51-70	SP, SP-SM	A-3
					70-78	SM, SM-SC, SC	A-2-4, A-2-6
21	Smyrna Fine Sand	0-1.0	Jul-Oct	A/D	0-13	SP, SP-SM	A-3
					13-25	SM, SP-SM	A-3, A-2-4
					25-80	SP, SP-SM	A-3
23	Basinger Fine Sand	+2-1.0	Jun-Feb	A/D	0-10	SP	A-3
					10-30	SP, SP-SM	A-3, A-2-4
					30-80	SP, SP-SM	A-3, A-2-4
26	Narcoossee Fine Sand	2-3.5	Jun-Nov	C	0-3	SP-SM	A-3
					3-9	SP, SP-SM	A-3
					9-12	SP-SM, SM	A-3, A-2-4
					12-75	SP, SP-SM, SM	A-3

Continued on next page

SECTION 4.0
EXISTING DRAINAGE CONDITIONS

Soil No.	USDA Soil Name	Seasonal High Ground Water		HSG	Soil Classification		
		Depth* (feet)	Duration (months)		Depth (inches)	Unified	AASHTO
39	Chobee Soils	0-1.0	Jun-Feb	B/D	0-11	SP-SM, SM	A-2-4
					11-56	SC	A-2-6, A-2-7, A-6, A-7
					56-80	SP-SM, SM, SC, SM-SC	A-2-4, A-2-6, A-6, AA-7
46	Cassia Fine Sand	1.0-3.5	Jul-Jan	C	0-18	SP, SP-SM	A-3
					18-31	SP-SM, SM	A-3, A-2-4
					31-65	SP, SP-SM	A-3
60	Palmetto	+2-1.0	Jun-Feb	D	0-10	SP, SP-SM	A-3, A-2-4
					10-46	SP-SM	A-3, A-2-4
					46-80	SM, SM-SC, SC	A-2-4, A-4, A-6
60	Zephyr	+2-1.0	Jun-Feb	D	13-0	Pt	A-8
					0-18	SP-SM, SM	A-3, A-2-4
					18-48	SM, SM-SC, SC	A-2-4, A-2-6
					48-67	SM, SM-SC	A-2-4, A-4
60	Sellers	+2-0	Jun-Mar	B/D	0-5	SP-SM, SM	A-3, A-2-4
					5-28	SP-SM, SM	A-3, A-2-4
					28-80	SP-SM, SM	A-3, A-2-4

Seasonal High Ground water table: Depth is referenced below existing grade, except where indicated as "+".

4.4 Environmental Characteristics

4.4.1 Land Use Data

The project corridor is a mixture of residential, commercial, and public lands. Land uses on the southwest end of the project is mainly residential and commercial, while the northeast end of the project is mainly residential and open lands. The central portion of the project is made up of public lands and residential areas. Please see **Exhibit 4** for the **Future Land Use Map** in **Appendix A**. The widening of US 301 from Fowler Avenue to Proposed SR 56 does not alter the existing or future land uses in the area.

4.4.2 Cultural Features

A separate Cultural Resource Desktop Analysis has been prepared in conjunction with the undertaking of the PD&E Study. It was determined that the majority of SMF sites had low to low-moderate anticipated cultural resource impacts. FPC 1, SMF 3C, SMF 5A, SMF 5B, and FPC 4 have high potential impacts. It was concluded that no proposed SMF or FPC site should be avoided due to cultural resource involvement, however further surveys should be performed as the study progresses. Because this study is state funded, Section 4(f) impacts are not analyzed for this study. For additional information regarding cultural features please see the Cultural Resources Desktop Technical Memorandum from this study.

4.4.3 Natural and Biological Features

The SMF alternatives and FPC sites along the study corridor were evaluated for the presence of potentially occurring protected species as well as wetlands and other surface waters that may be impacted by the proposed improvements. Wetland and surface water communities comprise 235.92 acres (22.04%) of the project study area. Wetland and surface water habitats include natural rivers and creeks and manmade ditches classified as streams and waterways, reservoirs, stream and lake swamps, mixed wetland hardwoods, cypress, wetland forested mixed, wetland scrub, freshwater marshes, and emergent aquatic vegetation. A total of five natural waterway systems intersect the project study area, including the Hillsborough River, Two Holes Branch, Flint Creek, Flint Creek Relief, and Hollomans Branch. All five are within the Hillsborough River Watershed. The Hillsborough River is classified as Outstanding Florida Waters (OFW) pursuant to Chapter 62-302.700, F.A.C. Potential fauna species identified within the corridor include Gopher Tortoise, Eastern Indigo Snake, Florida Burrowing Owl, Florida Sandhill Crane, Wood Stork, Little Blue Heron, Tricolored Heron, Florida Pine Snake, Roseate spoonbill, Short-tailed snake, Southeastern American Kestrel, and Florida Black Bear. The environmental impacts anticipated from the preferred SMF alternatives and FPC sites range from low to high and are summarized in the Natural Resources Evaluation Report (NRE; 2022) and NRE Addendum (2023) that was performed as part of this study.

4.5 Floodplains/Floodways

According to the Federal Emergency Management Agency (FEMA) the relevant Flood Insurance Rate Map (FIRM) panel numbers are 12057C0240H, 12057C0245H, 12057C0235H, 12057C0234H, 12057C0251H, 12057C0115H for Hillsborough County, dated August 28, 2008; 12101C0465F, 12101C0461F, 12101C0462F for Hillsborough County, dated September 26, 2014; and 12057C0115H for Pasco County, dated August 28, 2008. In addition to the FEMA FIRMs, the Hillsborough River and Tampa Bypass Canal Stormwater Management Master plan and New River/Upper Hillsborough River Watershed Model have been reviewed for relevant flood elevations. According to all three sources, much of the project is within Zone AE of the 100-year floodplain which have a 1% probability of flooding every year, and where predicted flood water elevations have been established. There are five (5) federally regulated floodways within the project limits located at Flint Creek, Flint Creek Relief, Hollomans Branch, Two Hole Branch and the Hillsborough River. During design, a FEMA "No Rise" certification will have to be obtained for each of these crossings. Please refer to **Exhibit 5, Appendix A** for the **FEMA FIRM Map**.

Any floodplain impacts will be mitigated for in offsite floodplain compensation sites, or cut ditch sections on a cup for cup basis. From the available data, approximate Floodplain Impact Areas (FIA) have been determined based on areas in which the Zone AE 100-year floodplain lies within the proposed right-of-way. Within the project limits, six (6) FIA have been identified.

Floodplain impacts were quantified by cutting existing ground cross sections at critical junctures as well as 500-foot intervals along each FIA. Existing ground cross sections were

developed from the 1-ft LiDAR data. Then, the floodplain elevation was drawn upon the cross sections. Using the average end-area method, volumetric impacts were quantified conservatively as the average area between the 100-year flood elevation and the existing ground for two consecutive cross sections and then multiplied by the distance between the two cross sections. The analysis data indicate that approximately 123.32 ac-ft of 100-year floodplain volume is impacted within the project limits. The project has the potential to impact floodplains and their functions in the area.

During design, a more practical approach to floodplain impacts and compensation would be to utilize the existing floodplain models to model the proposed impacts and their effects on the existing flood elevations. This approach should be investigated during the design phase of this project, and it is consistent with SWFWMD guidelines.

The floodplain impact area was quantified based on the Hillsborough River and Tampa Bypass Canal Stormwater Management Master Plan, Update No. 1, August 2011 and the New River/Upper Hillsborough River Watershed Model, 2014, 100-year base flood elevation and the existing ground elevations from 1-foot LiDAR contours. To be conservative, it was assumed that any fill from the proposed roadway outside of the existing roadway was quantified as floodplain impacts.

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SECTION 4.0
EXISTING DRAINAGE CONDITIONS

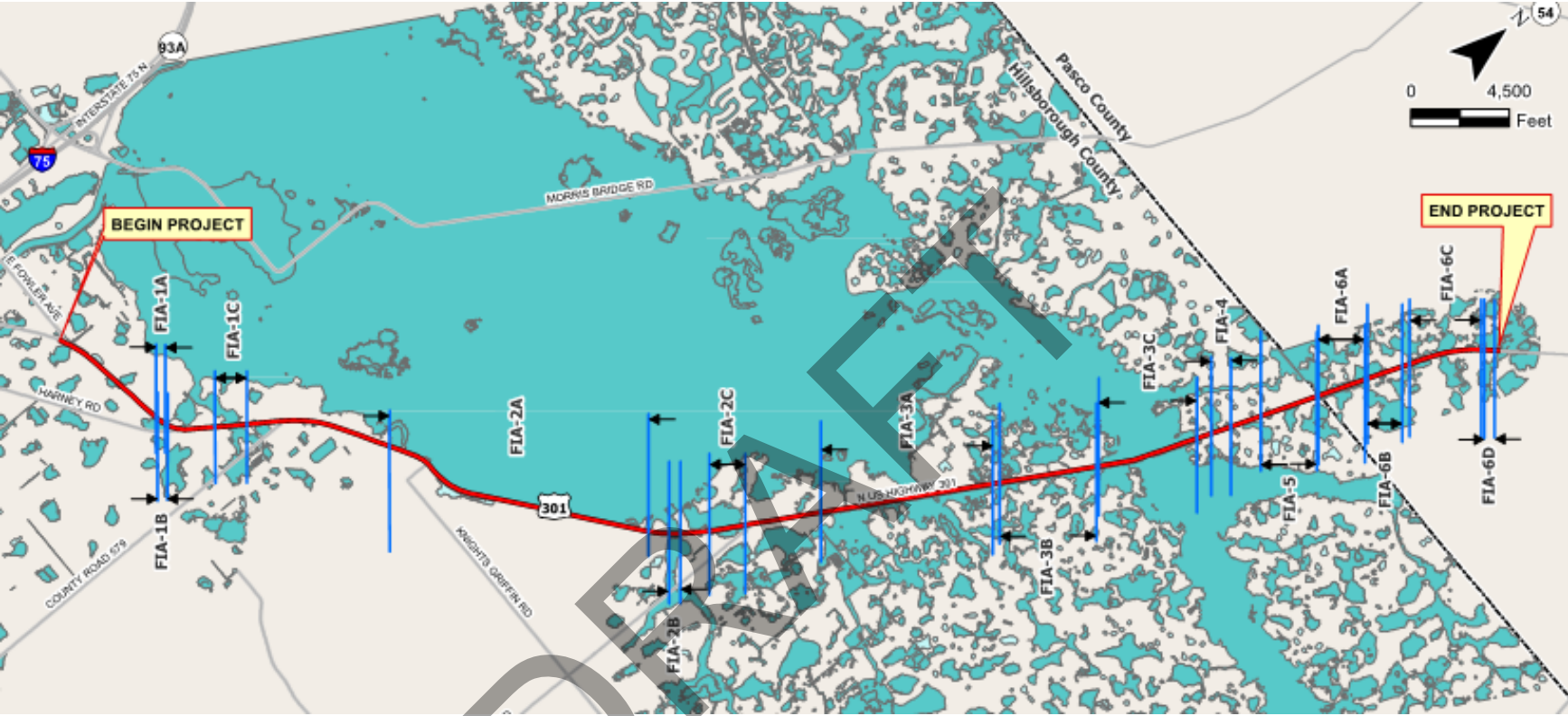


Figure 4-1 Floodplain Impact Areas (FIAs)

Table 5 – Summary of Floodplain Impact Areas (FIA)

FIA	From Station	To Station	Length of Impact (ft)	100-yr Flood Elevation	Impact Volume (ac-ft)
FIA - 1A	1397+00.00	1402+55.12	555	37.54	0.35
FIA - 1B	1398+13.90	1438+46.57	4,033	36.96	5.48
FIA - 1C	1425+83.65	1453+00.00	2,716	36.70	0.73
FIA - 2A	1507+68.32	1634+89.25	12,721	36.48	24.51
FIA - 2B	1644+24.97	1649+43.95	519	40.28	0.87
FIA - 2C	1655+00.00	1679+44.79	2,445	39.33	1.91
FIA - 3A	1714+59.82	1795+00.00	8,040	45.00	35.65
FIA - 3B	1797+42.66	1842+61.25	4,519	50.00	23.38
FIA - 3C	1843+58.09	1892+00.00	4,842	49.50	12.87
FIA - 4	1892+00.00	1913+00.00	2,100	52.28	1.39
FIA - 5	1921+54.72	1948+82.00	2,727	56.15	3.94
FIA - 6A	1949+31.85	1972+00.00	2,268	62.22	9.13
FIA - 6B	1973+20.00	1990+12.90	1,693	63.34	0.40
FIA - 6C	1993+86.00	2004+00.00	1,014	66.70	2.71
TOTAL					123.32

Note: Impact volumes obtained through average end-area volumetric calculations utilizing the 1-ft LiDAR contours to develop existing ground cross sections.

Detailed floodplain impacts and compensation calculations are included in Appendix D of the Preliminary Stormwater Management Facility Report prepared for this study.

4.5.1 Flooding History and Maintenance Concern

FDOT District 7 Maintenance offices in Hillsborough County and Pasco County were contacted to discuss any flooding history and maintenance concerns. Prior coordination with Hillsborough County Maintenance indicated there are a few known areas of historical flooding near the beginning of the project which occurred in January of 1998 and during Hurricane Frances in 2004. Please see **Exhibit 6** in **Appendix A** for these locations.

The study area in Pasco County is at the headwater of the Hillsborough River and is predominantly wet and can remain that way for extended periods of time. The Maintenance Office has not had a significant number of complaints, drainage concerns or pavement issues in this area.

4.6 Existing Drainage Permits

There are currently, four (4) stretches of US 301 which have been permitted by SWFWMD. The sections below briefly describe the permitted condition, the impacts to the permit associated with the proposed improvements and the action necessary to mitigate for said impacts.

4.6.1 Permit No. 32128

This permit covers the widening US 301 from South of the Tampa Bypass Canal to North of Fowler Avenue from two (2) to four (4) lanes. The permitted basin area affected by the proposed improvements in this PD&E Study consists of US 301 between station 1362+60 and station 1375+80. The permitted improvements in this area include partial reconstruction from the beginning of the basin through station 1364+40. Beyond this point the existing roadway was resurfaced with overbuild and widening on the north side. Five (5) foot paved and unpaved shoulders were also added on both sides of the roadway. The permitted improvements transition from the four (4) lane condition back to the existing roadway within the limits which overlap with the limits of this PD&E study. Water quality treatment and water quantity attenuation for the permitted project are provided within stormwater management swales adjacent to the roadway to account for the increase in the impervious area within this basin. The proposed improvements outlined in this PD&E Study will impact the existing SMF swales, which are located within the limits of the proposed Basin 1 between station 1360+00 and station 1373+80. The impacted swales provide a total volume of 0.536 acre-feet, which will be accounted for and provided within the SMF alternatives for Basin 1.

4.6.2 Permit No. 27321

This permit covers the left and right turn lanes from US 301 to Langshaw Drive. The permit does not provide treatment or attenuation for the increased impervious area. The proposed improvements outlined in this PD&E Study will not impact the turn lanes as they will be replaced. During design, treatment and attenuation will need to be provided for these turn lanes within the preferred SMF in Basin 3.

4.6.3 Permit No. 20875

This permit covers the left turn lane from southbound US 301 to McIntosh Road. The permit does not provide treatment or attenuation for the increased impervious area. The proposed improvements outlined in this PD&E Study will not impact the turn lane as it will be replaced. During design, treatment and attenuation will need to be provided for this turn lane within the preferred SMF in Basin 7.

4.6.4 Permit No. 27103

This permit covers the left and right turn lanes from US 301 to Rapid River Blvd at both entrances to the Riverwood sub-development. The proposed drainage improvements for the permit begin at the northern Rapid River Boulevard entrance at approximately Station 2005+00. The permitted project at this location provides treatment and attenuation for the increased impervious area within a dry retention swale located on the west side of US 301. The existing dry retention swale is located within the US 301 right-of-way. The proposed improvements outlined in this PD&E Study impact the existing 0.28 acre swale between Station 2005+50 and Station 2007+50, which is encompassed by Basin 13 of this PD&E study. The SMF alternatives for Basin 13 will provide treatment and attenuation volume for this basin and account for the impacted swale.

4.7 Existing Drainage Basins

4.7.1 Basin 1

Basin 1 begins at station 1360+00 near Tom Folsom Road and continues east to the roadway high point at station 1387+00. Roadway runoff from both sides of the roadway is collected in roadside swales and discharged through CD-1 and CD-2 to separate depressions on the south side of the roadway. These depressions have no outfall, therefore, this basin is a closed basin. This section of US 301 is currently permitted under permit No. 32128, which provides treatment and attenuation in dry linear roadside swales on the west side of the roadway.

4.7.2 Basin 2

Basin 2 begins at the roadway high point at station 1387+00 and continues northeast to station 1416+00. Roadway runoff from the northwest side of this basin is collected in roadside swales and conveyed to a lateral ditch at approximately station 1403+00, where the runoff is drained north to an existing wetland. Roadway runoff from the southeast side of this basin is collected in roadside swales and conveyed to CD-3 at station 1399+80 where it crosses beneath US 301 and continues to drain towards the lateral ditch at approximately station 1403+00. This wetland does not appear to have an outfall to allow it to drain north to the Hillsborough River, therefore this basin is a closed basin.

4.7.3 Basin 3

Basin 3 begins at station 1416+00 and continues northeast to station 1455+50 at CR 579. Between station 1417+25 and station 1446+70, stormwater runoff is collected in roadside swales and conveyed to CD-4 at station 1435+10 where it is discharged offsite and eventually flows to the Hillsborough River. Between station 1446+70 and station 1456+00, the roadway stormwater runoff is collected in roadside swales and conveyed to CD-5 at station 1447+90. This cross drain allows offsite runoff from the northwest side of US 301 to flow into a local depressional area on the southeast side of the roadway. This depressional area has a pop-over elevation of 36.00 ft to the southeast over Florence Avenue.

4.7.4 Basin 4

Basin 4 begins at station 1455+50 at CR 579 and continues northeast to the roadway highpoint at station 1492+00. Roadway stormwater runoff is collected in roadside swales and conveyed toward CD-6 at station 1469+10. CD-6 acts as an equalizer between two depressional areas on each side of US 301. These depressional areas do not have an outfall, therefore, this basin is considered a closed basin.

4.7.5 Basin 5

Basin 5 begins at a roadway high point at station 1492+00 and continues northeast to the bridge over Flint Creek at station 1580+00. There are four (4) cross drains that allow roadway stormwater runoff and offsite runoff to flow northwest beneath US 301 and eventually into the Hillsborough River. Flint Creek is a federally regulated floodway, therefore, a FEMA "No Rise" certification will be required for this crossing. Portions of this basin are located within a Sensitive Karst Area (SKA), therefore, stormwater management systems shall not be excavated to a depth that breaches an aquitard such that it would allow for lesser quality water to pass either way between the two systems. This basin is an open basin.

4.7.6 Basin 6

Basin 6 begins at the bridge over Flint Creek at station 1580+00 and continues northeast to the Hollomans Branch bridge at station 1645+50. The roadway stormwater runoff from the northwest side of US 301, sheet flows directly off the roadway into the adjacent wetlands, while the stormwater runoff from the southeast side of the road is collected in roadside swales and conveyed to one of five (5) cross drains within the basin limits (CD-11 at station 1589+80; CD-12, station 1599+80; CD-13, station 1619+80; CD-14, station 1628+80; CD-15, station 1633+40) and the Flint Creek Relief bridge at station 1609+60. The Flint Creek bridge, Flint Creek relief bridge, and the bridge over Holloman's Branch are all federally regulated floodways, therefore, a FEMA "No Rise" certification will be required for these crossings. Portions of this basin are located within a Sensitive Karst Area (SKA), therefore, stormwater management systems shall not be excavated to a depth that breaches an aquitard such that it would allow for lesser quality water to pass either way between the two systems. This basin is an open basin.

4.7.7 Basin 7

Basin 7 begins at the Hollomans Branch bridge at station 1645+50 and continues a roadway high point at station 1695+00. Between station 1645+50 and station 1652+50, the roadway runoff from both sides of the roadway are collected in roadside swales and conveyed toward the bridge over Hollomans Branch and eventually flows toward the Hillsborough River. Between station 1652+50 and station 1680+00 on the west side of the roadway and station 1681+50 on the east side of the roadway, stormwater runoff sheet flows directly off the roadway and into the adjacent wetlands. The roadway stormwater runoff from the northwest side of US 301, sheet flows directly off the roadway into the adjacent wetlands, while the stormwater runoff from the southeast side of the road is collected in roadside swales and conveyed to one (1) cross drain within the basin limits (CD-16 at station 1673+50). Hollomans Branch is a federally regulated floodway, therefore, a FEMA “No Rise” certification will be required for this crossings. This basin is an open basin.

4.7.8 Basin 8

Basin 8 begins at a localized roadway high point at station 1695+00 and continues northeast to station 1760+00 at Bridge Culvert -1 at Two Hold Branch. From the beginning of the basin to station 1722+60 stormwater runoff from both sides of the roadway is collected in roadside swales and conveyed toward CD-17 at station 1722+60 where it is discharged offsite and eventually flows to the wetlands adjacent to the basin. Stormwater runoff through the rest of the basin sheet flows directly into the adjacent wetlands, which lead to the Hillsborough River. The wetlands on the east side of the roadway flow west across US 301 via at two (2) cross drains (CD-18, station 1726+60; and CD-19, station 1745+70). Two Hole Branch is a federally regulated floodway, therefore a FEMA “No Rise” certification will be required for this crossing. Portions of this basin are located within a Sensitive Karst Area (SKA), therefore, stormwater management systems shall not be excavated to a depth that breaches an aquitard such that it would allow for lesser quality water to pass either way between the two systems. This basin is an open basin.

4.7.9 Basin 9

Basin 9 begins at Bridge Culvert – 1 (station 1760+00) at Two Hole Branch and continues northeast just north of CD-21 (station 1722+60) at station 1788+00. Stormwater runoff from both sides of the roadway are collected in roadside swales and conveyed toward one of two (2) cross drains (CD-20 at station 1763+75 and CD-21 at station 1722+60) where it is discharged offsite and eventually flows to the Hillsborough River. Two Hole Branch is a federally regulated floodway, therefore a FEMA “No Rise” certification will be required for this crossing. Portions of this basin are located within a Sensitive Karst Area (SKA), therefore, stormwater management systems shall not be excavated to a depth that breaches an aquitard such that it would allow for lesser quality water to pass either way between the two systems. This basin is an open basin.

4.7.10 Basin 10

Basin 10 begins north of CD-21 (1788+00) at station 1788+00 and continues northeast to station 1829+80 at CD-25. Stormwater runoff from both sides of the roadway sheet flows directly into the adjacent wetlands. The wetlands on the east side of the roadway are able to flow west across US 301 via two (2) box culverts (CD-22 at station 1803+20 and CD-24 at station 1820+60) and two (2) cross drains (CD-23 at station 1812+80 and CD-25 at station 1829+80) where it eventually flows into the Hillsborough River. Portions of this basin are located within a Sensitive Karst Area (SKA), therefore, stormwater management systems shall not be excavated to a depth that breaches an aquitard such that it would allow for lesser quality water to pass either way between the two systems. This basin is an open basin.

4.7.11 Basin 11

Basin 11 begins at station 1829+80 just north of CD-25 (station 1829+83) and continues northeast to the Hillsborough River Bridge at station 1866+00. Stormwater runoff from both sides of the roadway are collected in roadside swales and conveyed north towards the Hillsborough River. CD-26 at station 1853+27 allows onsite and offsite stormwater runoff to cross US 301 and continue to flow to the Hillsborough River. The existing bridge over the river drains via scuppers. Hillsborough River is a federally regulated floodway, therefore, a FEMA "No Rise" Certification will be required for this crossing. Portions of this basin are located within a Sensitive Karst Area (SKA), therefore, stormwater management systems shall not be excavated to a depth that breaches an aquitard such that it would allow for lesser quality water to pass either way between the two systems. This basin is an open basin.

4.7.12 Basin 12

Basin 12 begins at the Hillsborough River Bridge at station 1866+00 and continues north to station 1936+00 just north of CD-32 at station 1935+93. There are three (3) cross drains along the bridge approach which are actually shoulder gutter inlets. These inlets discharge west into the wetlands adjacent to the roadway. With the exception of the bridge approach area, the stormwater runoff from the roadway sheets flows directly into the adjacent wetlands or is collected in roadside swales and conveyed to one of three (3) additional cross drains within the basin north of the bridge. The cross drains allow stormwater runoff to flow from east to west within the adjacent wetlands which eventually flow to the Hillsborough River. Hillsborough River is a federally regulated floodway, therefore, a FEMA "No Rise" Certification will be required for this crossing. Portions of this basin are located within a Sensitive Karst Area (SKA), therefore, stormwater management systems shall not be excavated to a depth that breaches an aquitard such that it would allow for lesser quality water to pass either way between the two systems. This basin is an open basin.

4.7.13 Basin 13

Basin 13 begins at station 1936+00 just north of CD-32 (station 1935+95) and continues northeast to CD-33 at station 2010+00. Stormwater runoff from the west side of the roadway

is collected in a roadside swale and conveyed south toward CD-32. Small isolated wetlands exist on the west side of the roadway where stormwater runoff drains to prior to continuing south within the roadside swale. A portion of this basin is currently permitted to treat the roadway runoff between station 1963+50 and station 2010+00, in a dry retention swale. This swale discharges into the roadside conveyance swale via a concrete broad crested weir at station 1963+50. The discharge continues to flow south toward CD-32 along with the roadway runoff from the remainder of the basin. A lateral ditch at CD-32 conveys the roadway runoff west into an existing wetland system associated with the Hillsborough River. The aforementioned treatment swale is currently permitted under SWFWMD Permit No. 27103, which includes the construction of left and right turn lanes into the Riverwood sub-development. Note that the permit limits extend to station 2021+00. Portions of this basin are located within a Sensitive Karst Area (SKA), therefore, stormwater management systems shall not be excavated to a depth that breaches an aquitard such that it would allow for lesser quality water to pass either way between the two systems. This basin is an open basin.

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SECTION 5.0 PROPOSED DRAINAGE CONDITIONS

The stormwater runoff from the project limits will be collected and conveyed in both open and closed stormwater systems to the proposed offsite wet detention and dry retention SMFs. The SMFs will discharge at or near the same cross drains that carry the roadway runoff in the existing condition. The proposed SMFs have been sized to achieve the required water quality treatment and water quantity attenuation and serve as a budget tool for right-of-way estimation for the project to the Department.

5.1 Proposed SMFs

The stormwater runoff will be routed to proposed SMFs for water quality treatment and attenuation purposes. The ponds were sized to accommodate the road widening with the assumption that runoff from offsite areas would be drained separately from the onsite roadway runoff. However, during the design phase of this project, with more available data, survey and roadway profile, commingling of offsite and onsite runoff is likely to be investigated for potential reduction of roadway right-of-way acquisition needs. Options to accommodate offsite runoff within the conveyance swales include a deeper swale or a combination of a closed storm sewer system in conjunction with the swale conveyance system. If commingling onsite and offsite runoff within a single conveyance system is not hydraulically feasible, additional right-of-way may be necessary to accommodate a separate conveyance system for the offsite runoff in order to maintain existing drainage patterns.

There are a total of thirteen (13) roadway drainage basins within the project limits. SMF alternatives for each basin have been analyzed. Please refer to **Basin Maps** in **Appendix B** for the roadway drainage basin limits.

The SMFs have been sized to accommodate the increased attenuation volume due to the proposed increase in impervious area within the basin as well as any increase in basin size. **Table 6 – Summary of Proposed Drainage Basins** provides a summary of the proposed basin limits.

Table 6 – Summary of Proposed Drainage Basins

Basin Name	From Station	To Station
Basin 1	1360+00	1390+00
Basin 3	1390+00	1455+50
Basin 4	1455+50	1492+00
Basin 5	1492+00	1580+00
Basin 6	1580+00	1645+50
Basin 7	1645+50	1695+00
Basin 8	1695+00	1760+00
Basin 9	1760+00	1788+00
Basin 10	1788+00	1843+00

Basin Name	From Station	To Station
Basin 12	1843+00	1936+00
Basin 13	1936+00	2010+00

5.2 Methodology of SMF Determination

The SMF sizing analysis assumes that all ponds will be designed using wet detention and dry retention pond design criteria. The report focuses on the preliminary estimate of pond right-of-way areas necessary for each roadway drainage basin. A 20% upsize in the required pond right-of-way area has been applied for all the ponds to account for preliminary parameters such as the estimated seasonal high water elevations, ground elevations and potential natural contouring and/or softening of the side slopes to meet policies of the Highway Beautification Act. The following parameters were considered in the sizing of potential pond sites:

- Hydrologic and hydraulic factors such as existing ground elevations, soil types, estimated seasonal high water (ESHW), stormwater conveyance feasibility, allowable hydraulics grade line (HGL);
- Environmental resource impacts including wetlands and threatened or endangered species;
- Floodplain Impacts;
- Major utility conflict potential;
- Parcel descriptions and land usage;
- Impacts to cultural resources

5.3 SMF Evaluation

5.3.1 Basin 1

Basin 1 is located between stations 1360+00 and 1390+00 within the Hillsborough River Watershed, accounting for approximately 300 feet of Basin 2. Basin 1 is considered a closed basin because runoff from the surrounding area drains to a local depression which does not have an outfall. This basin is located within the Hillsborough River WBID 1443B, which is impaired for dissolved oxygen. As described in Section 2.0, a pollutant loading analysis has been provided for this basin. Three (3) SMF alternatives have been analyzed for the treatment and attenuation for Basin 1.

5.3.1.1 SMF 1A

Pond 1A will serve as the treatment and attenuation pond for Basin 1. SMF 1A is located west of US 301 at approximately station 1372+40 (LT.). This pond site sits within two (2) parcels (Parcel Nos. U-08-28-20-ZZZ-000001-99230.0 and U-08-28-20-ZZZ-000001-99180.0). The pond site has no impacts to wetlands or floodplains. Available soil survey data within the pond site show the soils to be HSG Type A. According to LIDAR data obtained for this pond site, the existing ground is at approximately 41.00 feet NAVD. With the available data compiled it

was determined that SMF 1A will be a wet pond with the normal water/control elevation set at elevation 33.00 feet. Preliminary pond sizing calculations indicate that this pond requires 2.22 acres of area and a 0.32 acre easement for a total of 2.54 acres. SMF 1A is the preferred pond for this basin.

5.3.1.2 SMF 1B

Pond 1B will serve as the treatment and attenuation pond for Basin 1. SMF 1B is located east of US 301 at approximately station 1375+00 (RT.). This pond site sits within three (3) parcels (Parcel Nos. U-08-28-20-ZZZ-000001-99360.0, U-08-28-20-ZZZ-000001-99340.0, and U-08-28-20-ZZZ-000001-99360.1). The pond site has no impacts to wetlands or floodplains. Available soil survey data within the pond site show the soils to be HSG Type A. According to LIDAR data obtained for this pond site, the existing ground is at approximately 43.00 feet NAVD. With the available data compiled it was determined that SMF 1B will be a wet pond with the normal water/control elevation set at elevation 33.00 feet. Preliminary pond sizing calculations indicate that this pond requires 2.01 acres of area, however the entirety of the three (3) impacted parcels will be utilized (2.56 acres).

5.3.1.3 SMF 1C

SMF 1C will serve as the treatment and attenuation pond for Basin 1. SMF 1C is located west of US 301 at approximately station 1376+00 (LT.). This pond site sits within one (1) parcel (Parcel No. U-08-28-20-ZZZ-000001-99420.0). The pond site is within the basin's localized depressional area. The pond site has no impacts to wetlands or floodplains. Available soil survey data within the pond site show the soils to be HSG Type A. According to LIDAR data obtained for this pond site, the existing ground is at approximately 38.00 feet NAVD. With the available data compiled it was determined that SMF 1C will be a wet pond with the normal water/control elevation set at elevation 33.00 feet. Preliminary pond sizing calculations indicate that this pond requires 2.52 acres of area and a 0.23 acre easement for a total of 2.75 acres.

5.3.2 Basin 2

Basin 2 is located between stations 1387+00 and 1416+00 within the Hillsborough River Watershed. Basin 2 is a closed basin because the runoff from the surrounding area drains to an existing wetland that appears to have no outfall to the Hillsborough River. Coordination with FDOT determined that Basin 2 would be accounted for in the treatment alternatives in Basins 1 and 3.

5.3.3 Basin 3

Basin 3 is located between stations 1390+00 and 1455+50, accounting for approximately 2,600 feet of Basin 2, within the Hillsborough River Watershed. Basin 3 is considered an open basin because the surrounding area drains to CD-4 at station 1435+10 and continues to drain north to the Hillsborough River, which is an Outstanding Florida Water (OFW). Therefore, an additional 50% treatment volume is required. This basin is located within the Hillsborough

River WBID 1443B, which is impaired for dissolved oxygen. As described in Section 2.0, a pollutant loading analysis has been provided for this basin.

5.3.3.1 SMF 3A

SMF 3A will serve as the treatment and attenuation pond for Basin 3. SMF 3A is located west of US 301 at approximately station 1420+00 (LT.). This pond site sits within one (1) parcel (Parcel No. U-09-28-20-ZZZ-000001-99680.1). The pond site has no impacts to wetlands or FEMA floodplains. Available soil survey data within the pond site show the soils to be HSG Type A. According to LIDAR data obtained for this pond site, the existing ground is at approximately 38.00 feet NAVD. With the available data compiled it was determined that SMF 3A will be a wet pond with the normal water/control elevation set at elevation 33.00 feet. Preliminary pond sizing calculations indicate that this pond requires 3.86 acres of area and 0.75 acres for an easement, for a total of 4.61 acres. SMF 3A is the preferred pond for this basin.

5.3.3.2 SMF 3B

SMF 3B will serve as the treatment and attenuation pond for Basin 3. SMF 3B is located west of US 301 at approximately station 1425+00 (LT.). This pond site sits within five (5) parcels (Parcel Nos. U-09-28-20-24J-000000-00002.0, U-09-28-20-24J-000000-00003.0, U-09-28-20-24J-000000-00004.0, U-09-28-20-24J-000000-00005.0, and U-09-28-20-ZZZ-000001-99530.0). The pond site has no impacts to wetlands or floodplains. Available soil survey data within the pond site show the soils to be HSG Type A. According to LIDAR data obtained for this pond site, the existing ground is at approximately 40.00 feet NAVD. With the available data compiled it was determined that SMF 3B will be a wet pond with the normal water/control elevation set at elevation 33.00 feet. Preliminary pond sizing calculations indicate that this pond requires 2.73 acres of area, however, the entirety of the five (5) impacted parcels will be utilized (2.81 acres).

5.3.3.3 SMF 3C

SMF 3C will serve as the treatment and attenuation pond for Basin 3. SMF 3C is located west of US 301 between stations 1438+00 (LT.) and 1445+50 (LT.). This pond site consists of three (3) cells that sit within nine (9) parcels (Parcel Nos. U-09-28-20-24F-00000-A0000.0, U-09-28-20-5HJ-000002-00001.0, U-09-28-20-5HJ-000002-00002.0, U-09-28-20-5HJ-000002-00003.0, U-09-28-20-5HJ-000002-00004.0, U-09-28-20-5HJ-00000-C0000.0, U-09-28-20-5HJ-000003-00010.0, U-09-28-20-5HJ-000003-00009.0, and U-09-28-20-5HJ-000003-00008.0). The pond site has no impacts to wetlands or floodplains. Available soil survey data within the pond site show the soils to be HSG Type A. According to LIDAR data obtained for this pond site, the existing ground is at approximately 39.00 feet NAVD. With the available data compiled it was determined that SMF 3C will be a wet pond with the normal water/control elevation set at elevation 33.00 feet. Preliminary pond sizing calculations indicate that this pond requires 5.31 acres of area, however, the entirety of the nine (9) impacted parcels will be utilized (5.72 acres).

5.3.4 Basin 4

Basin 4 is located between stations 1455+50 and 1492+00 within the Hillsborough River Watershed. Basin 4 is considered a closed basin because the surrounding area drains to an existing depression which does not appear to have an outfall to the Hillsborough River. This basin is located within the Hillsborough River WBID 1443B, which is impaired for dissolved oxygen. As described in Section 2.0, a pollutant loading analysis has been provided for this basin.

5.3.4.1 SMF 4A

SMF 4A will serve as the treatment and attenuation pond for Basin 4. SMF 4A is located north of US 301 at approximately station 1471+00 (LT.). This pond site sits within one (1) parcel (Parcel No. U-03-28-20-ZZZ-000001-95250.0). The pond site has no impacts to wetlands or floodplains. Available soil survey data within the pond site show the soils to be HSG Type A. According to LIDAR data obtained for this pond site, the existing ground is at approximately 40.00 feet NAVD. With the available data compiled it was determined that SMF 4A will be a dry pond with the bottom elevation set at elevation 36.00 feet. Preliminary pond sizing calculations indicate that this pond requires 3.11 acres of area. SMF 4A is the preferred pond for this basin.

5.3.4.2 SMF 4B

SMF 4B will serve as the treatment and attenuation pond for Basin 4. SMF 4B is located north of US 301 at approximately station 1477+00 (LT.). This pond site sits within two (2) parcels (Parcel Nos. U-03-28-20-ZZZ-000001-95250.0 and U-03-28-20-ZZZ-000001-95150.0). The pond site has no impacts to wetlands or floodplains. Available soil survey data within the pond site show the soils to be HSG Type A. According to LIDAR data obtained for this pond site, the existing ground is at approximately 41.00 feet NAVD. With the available data compiled it was determined that SMF 4B will be a wet pond with the normal water/control elevation set at elevation 33.00 feet. Preliminary pond sizing calculations indicate that this pond will require 2.31 acres of area, however, the entirety of the two impacted parcels will be utilized (2.88 acres.)

5.3.4.3 SMF 4C

SMF 4C is a proposed shared use treatment and attenuation option with an existing borrow pit that is permitted for expansion under SWFWMD Permit No. 43-43594-2. SMF 4C is located south of US 301 at approximately station 1480+50 (RT.). The proposed expansion will encompass three (3) parcels (Parcel No. U-03-28-20-ZZZ-000001-95260.0, U-03-28-20-ZZZ-000001-95340.0, and U-03-28-20-ZZZ-000001-95130.0). The pond site has no impacts to wetlands and will impact approximately 13.91 acres of floodplains. The permit information for the proposed borrow pit expansion show the surrounding berm at elevation 45.00 feet and a control elevation of 32.89 feet.

5.3.5 Basin 5

Basin 5 is located between stations 1492+00 and 1580+00 within the Hillsborough River Watershed. Basin 5 is considered an open basin because the surrounding area drains to the Hillsborough River. This basin will discharge to the Hillsborough River which is an Outstanding Florida Water (OFW), therefore, an additional 50% treatment volume is required. This basin traverses WBID 1522A and WBID 1443B. The Hillsborough River WBID 1443B is impaired for dissolved oxygen and a TMDL adopted for nutrients for Flint Creek WBID 1522A. As described in Section 2.0, a pollutant loading analysis has been provided for this basin.

5.3.5.1 SMF 5A

SMF 5A will serve as the treatment and attenuation pond for Basin 5. SMF 5A is located south of US 301 at approximately station 1545+00 (RT.). This pond site impacts two (2) parcels (Parcel Nos. U-02-28-20-ZZZ-000001-94500.0 and U-02-28-20-ZZZ-000001-94460.0). The pond site will impact 2.06 acres of wetlands and have 0.05 ac-ft floodplain impacts. Available soil survey data within the pond site show the soils to be HSG Type A and Type C/D. According to LIDAR data obtained for this pond site, the existing ground is at approximately 42.00 feet NAVD. With the available data compiled it was determined that SMF 5A will be a wet pond with the normal water/control elevation set at elevation 33.00 feet. Preliminary pond sizing calculations indicate that this pond will require 3.11 acres of area and 0.16 acres for an easement, for a total of 3.27 acres.

5.3.5.2 SMF 5B

SMF 5B will serve as the treatment and attenuation pond for Basin 5. SMF 5B is located south of US 301 at approximately station 1550+50 (RT.). This pond site impacts two (2) parcels (Parcel Nos. U-02-28-20-ZZZ-000001-94500.0 and U-02-28-20-ZZZ-000001-94410.0). The pond site will impact 0.68 acres of wetlands and have 0.04 ac-ft floodplain impacts. Available soil survey data within the pond site show the soils to be HSG Type A. According to LIDAR data obtained for this pond site, the existing ground is at approximately 39.00 feet NAVD. With the available data compiled it was determined that SMF 5B will be a wet pond with the normal water/control elevation set at elevation 33.00 feet. Preliminary pond sizing calculations indicate that this pond will 3.18 acres of area and 0.10 acres for an easement for a total of 3.28 acres. SMF 5B is the preferred pond for this basin.

5.3.5.3 SMF 5C

SMF 5C will serve as the treatment and attenuation pond for Basin 5. SMF 5C is located south of US 301 at approximately station 1566+00 (RT.). This pond site sits within two (2) parcels (Parcel Nos. U-02-28-20-ZZZ-000001-94480.0 and U-02-28-20-ZZZ-000001-94420.0). The pond site will impact 0.99 acres of wetlands and have 0.59 ac-ft floodplain impacts. Available soil survey data within the pond site show the soils to be HSG Type A. According to LIDAR data obtained for this pond site, the existing ground is at approximately 38.00 feet NAVD. With the available data compiled it was determined that SMF 5C will be a wet pond with the normal water/control elevation set at elevation 33.00 feet. Preliminary pond sizing calculations

indicate that this pond will require 3.20 acres. However, the pond access will abut the proposed roadway R/W totaling 3.56 acres of area for this pond.

5.3.6 Basin 6

Basin 6 is located between stations 1580+00 and 1645+50 within the Hillsborough River Watershed. Basin 6 is considered an open basin because the surrounding area drains to the Hillsborough River. This basin will discharge to the Hillsborough River which is an Outstanding Florida Water (OFW), therefore, an additional 50% treatment volume is required. This basin is located within WBID 1520 and WBID 1522A. The Flint Creek WBID 1522A has a TMDL adopted for nutrients. As described in Section 2.0, a pollutant loading analysis has been provided for this basin.

5.3.6.1 SMF 6A

SMF 6A will serve as the treatment and attenuation pond for Basin 6. SMF 6A is located south of US 301 at approximately station 1585+00 (RT.). This pond site sits within one (1) parcel (Parcel No. U-36-27-20-ZZZ-000001-93050.1). The pond site will impact 4.22 acres of wetlands and will not have any floodplain impacts. Available soil survey data within the pond site show the soils to be HSG Type C/D. According to LIDAR data obtained for this pond site, the existing ground is at approximately 30.00 feet NAVD. With the available data compiled it was determined that SMF 6A will be a wet pond with the normal water/control elevation set at elevation 30.00 feet. Preliminary pond sizing calculations indicate that this pond will require 4.22 acres of area with an easement of 0.22 acres, for a total of 4.44 acres.

5.3.6.2 SMF 6B

SMF 6B will serve as the treatment and attenuation pond for Basin 6. Pond 6B is located south of US 301 at approximately station 1601+50 (RT.). This pond site sits within one (1) parcel (Parcel No. U-36-27-20-ZZZ-000001-93050.1). The pond site will impact 4.19 acres of wetlands and have 0.04 ac-ft of floodplain impacts. Available soil survey data within the pond site show the soils to be HSG Type C/D. According to LIDAR data obtained for this pond site, the existing ground is at approximately 30.00 feet NAVD. With the available data compiled it was determined that SMF 6B will be a wet pond with the normal water/control elevation set at elevation 30.00 feet. Preliminary pond sizing calculations indicate that this pond will require 4.23 acres of area.

5.3.6.3 SMF 6C

SMF 6C will serve as the treatment and attenuation pond for Basin 6. SMF 6C is located south of US 301 at approximately station 1611+00 (RT.). This pond site sits within two (2) parcels (Parcel Nos. U-36-27-20-ZZZ-000001-93050.1 and U-02-28-20-ZZZ-000001-94480.0). The pond site will impact 2.20 acres of wetlands and have 0.01 ac-ft of floodplain impacts. Available soil survey data within the pond site show the soils to be HSG Type C/D. According to LIDAR data obtained for this pond site, the existing ground is at approximately 30.00 feet NAVD. With the available data compiled it was determined that SMF 6C will be a wet pond

with the normal water/control elevation set at elevation 30.00 feet. Preliminary pond sizing calculations indicate that this pond will require 5.24 acres of area with an easement of 0.17 acres, for a total of 5.41 acres. SMF 6C is the preferred pond for this basin.

5.3.7 Basin 7

Basin 7 is located between stations 1645+50 and 1695+00 within the Hillsborough River Watershed. Basin 7 is considered an open basin because the surrounding area drains to the Hillsborough River. This basin will discharge to the Hillsborough River which is an Outstanding Florida Water (OFW), therefore, an additional 50% treatment volume is required. This basin is located within WBID 1520 and WBID 1443C which are not impaired for nutrients. However, as described in Section 2.0, a pollutant loading analysis has been provided for this basin.

5.3.7.1 SMF 7A

SMF 7A will serve as the treatment and attenuation pond for Basin 7. SMF 7A is located south of US 301 at approximately station 1662+00 (RT.). This pond site sits within one (1) parcel (Parcel No. U-30-27-21-9D9-000000-00001.0). The pond site will impact 0.04 acres of wetlands and will not have any floodplain impacts. Available soil survey data within the pond site show the soils to be HSG Type A/D. According to LIDAR data obtained for this pond site, the existing ground is at approximately 44.00 feet NAVD. With the available data compiled it was determined that SMF 7A will be a wet pond with the normal water/control elevation set at elevation 39.00 feet. Preliminary pond sizing calculations indicate that this pond will require 2.54 acres of area. SMF 7A is the preferred pond for this basin.

5.3.7.2 SMF 7B

SMF 7B will serve as the treatment and attenuation pond for Basin 7. SMF 7B is located south of US 301 at approximately station 1672+50 (RT.). This pond site sits within three (3) parcels (Parcel Nos. U-30-27-21-ZZZ-000003-35370.0, U-30-27-21-ZZZ-000003-35380.0, and U-30-27-21-ZZZ-000003-35330.0). The pond site will impact 1.96 acres of wetlands and will not have any floodplain impacts. Available soil survey data within the pond site show the soils to be HSG Type A/D. According to LIDAR data obtained for this pond site, the existing ground is at approximately 40.00 feet NAVD. With the available data compiled it was determined that SMF 7B will be a wet pond with the normal water/control elevation set at elevation 39.00 feet. Preliminary pond sizing calculations indicate that this pond will require 3.72 acres of area. However, the entirety of the 3 parcels will be utilized totaling 4.29 acres.

5.3.7.3 SMF 7C

SMF 7C will serve as the treatment and attenuation pond for Basin 7. SMF 7C is located north of US 301 at approximately station 1683+50 (LT.). This pond site sits within three (3) parcels (Parcel Nos. U-30-27-21-ZZZ-000003-35560.0, U-30-27-21-ZZZ-000003-35570.0, and U-30-27-21-ZZZ-000003-35540.0). The pond site will not have any wetlands or floodplain impacts. Available soil survey data within the pond site show the soils to be HSG Type A. According to

LIDAR data obtained for this pond site, the existing ground is at approximately 42.00 feet NAVD. With the available data compiled it was determined that SMF 7C will be a wet pond with the normal water/control elevation set at elevation 40.00 feet. Preliminary pond sizing calculations indicate that this pond will require 4.18 acres of area, however, the entirety of the three (3) impacted parcels will be utilized for a total of 4.53 acres.

5.3.8 Basin 8

Basin 8 is located between stations 1695+00 and 1760+00 within the Hillsborough River Watershed. Basin 8 is considered an open basin because the surrounding area drains to the Hillsborough River. This basin will discharge to the Hillsborough River which is an Outstanding Florida Water (OFW), therefore, an additional 50% treatment volume is required. This basin is located within WBID 1505 which is impaired for bacteria. However, as described in Section 2.0, a pollutant loading analysis has been provided for this basin.

5.3.8.1 SMF 8A

SMF 8A will serve as the treatment and attenuation pond for Basin 8. SMF 8A is located south of US 301 at approximately station 1717+00 (RT.). This pond site sits within one (1) parcel (Parcel No. U-19-27-21-ZZZ-000003-28510.0). The pond site will not have any wetlands or floodplain impacts. Available soil survey data within the pond site show the soils to be HSG Type A. According to LIDAR data obtained for this pond site, the existing ground is at approximately 45.00 feet NAVD. With the available data compiled it was determined that SMF 8A will be a wet pond with the normal water/control elevation set at elevation 43.00 feet. Preliminary pond sizing calculations indicate that this pond will require 2.70 acres of area.

5.3.8.2 SMF 8B

SMF 8B will serve as the treatment and attenuation pond for Basin 8. SMF 8B is located north of US 301 at approximately station 1721+00 (LT.). This pond site sits within one (1) parcel (Parcel No. U-19-27-21-ZZZ-000003-28570.0). The pond site will not have any wetlands impacts and will have 0.01 ac-ft of floodplain impacts. Available soil survey data within the pond site show the soils to be HSG Type A. According to LIDAR data obtained for this pond site, the existing ground is at approximately 41.00 feet NAVD. With the available data compiled it was determined that SMF 8B will be a wet pond with the normal water/control elevation set at elevation 40.00 feet. Preliminary pond sizing calculations indicate that this pond will require 2.45 acres of area. SMF 8B is the preferred pond for this basin.

5.3.8.3 SMF 8C

SMF 8C will serve as the treatment and attenuation pond for Basin 8. SMF 8C is located south of US 301 at approximately station 1740+00 (RT.). This pond site sits within one (1) parcel (Parcel No. U-19-27-21-ZZZ-000003-28510.0). The pond site will have 0.14 acres of wetland impacts and will not have any floodplain impacts. Available soil survey data within the pond site show the soils to be HSG Type A. According to LIDAR data obtained for this pond site, the existing ground is at approximately 45.00 feet NAVD. With the available data compiled it

was determined that SMF 8C will be a wet pond with the normal water/control elevation set at elevation 43.00 feet. Preliminary pond sizing calculations indicate that this pond will require 2.56 acres of area.

5.3.9 Basin 9

Basin 9 is located between stations 1760+00 and 1788+00 within the Hillsborough River Watershed. Basin 9 is considered an open basin because the surrounding area drains to the Hillsborough River. This basin will discharge to the Hillsborough River which is an Outstanding Florida Water (OFW), therefore, an additional 50% treatment volume is required. This basin is located within Two Hole Branch WBID 1489 which is impaired for fecal coliform and bacteria. However, as described in Section 2.0, a pollutant loading analysis has been provided for this basin.

5.3.9.1 SMF 9A

SMF 9A will serve as the treatment and attenuation pond for Basin 9. SMF 9A is located west of US 301 at approximately station 1762+00 (LT.). This pond site sits within one (1) parcel (Parcel No. U-19-27-21-ZZZ-000003-28450.0). The pond site will have 2.42 acres of wetland impacts and will not have any floodplain impacts. Available soil survey data within the pond site show the soils to be HSG Type C/D. According to LIDAR data obtained for this pond site, the existing ground is at approximately 42.00 feet NAVD. With the available data compiled it was determined that SMF 9A will be a wet pond with the normal water/control elevation set at elevation 42.00 feet. Preliminary pond sizing calculations indicate that this pond will require 2.20 acres of area with an easement of 0.88 acres for a total area of 3.08 acres.

5.3.9.2 SMF 9B

SMF 9B will serve as the treatment and attenuation pond for Basin 9. SMF 9B is located west of US 301 at approximately station 1770+00 (LT.). This pond site sits within two (2) parcels (Parcel Nos. U-20-27-21-ZZZ-000003-28200.0 and U-19-27-21-ZZZ-000003-28510.0). The pond site will not have any wetland or floodplain impacts. Available soil survey data within the pond site show the soils to be HSG Type A/D. According to LIDAR data obtained for this pond site, the existing ground is at approximately 44.00 feet NAVD. With the available data compiled it was determined that SMF 9B will be a wet pond with the normal water/control elevation set at elevation 43.00 feet. Preliminary pond sizing calculations indicate that this pond will require 1.82 acres of area but will utilize the entirety of the two (2) impacted parcels (2.60 acres.)

5.3.9.3 SMF 9C

SMF 9C will serve as the treatment and attenuation pond for Basin 9. SMF 9C is located east of US 301 at approximately station 1770+00 (RT.). This pond site sits within one (1) parcel (Parcel No. U-19-27-21-ZZZ-000003-28510.0). The pond site will have 0.18 acres of wetland impacts and will not have any floodplain impacts. Available soil survey data within the pond site show the soils to be HSG Type C/D. According to LIDAR data obtained for this pond site,

the existing ground is at approximately 44.00 feet NAVD. With the available data compiled it was determined that SMF 9C will be a wet pond with the normal water/control elevation set at elevation 43.00 feet. Preliminary pond sizing calculations indicate that this pond will require 1.77 acres of area. SMF 9C is the preferred pond for this basin.

5.3.10 Basin 10

Basin 10 is located between stations 1788+00 and 1843+00 within the Hillsborough River Watershed. Basin 10 is considered an open basin because the surrounding area drains to the Hillsborough River. This basin discharge to the Hillsborough River which is an Outstanding Florida Water (OFW), therefore, an additional 50% treatment volume is required. This basin is located within Hillsborough River WBID 1443D which is not impaired and Two Hole Branch WBID 1489 which is impaired for fecal coliform and bacteria. However, as described in Section 2.0, a pollutant loading analysis has been provided for this basin. Coordination with FDOT has determined that the treatment alternatives for this basin will provide both treatment and attenuation for Basin 10 and compensatory treatment and attenuation for a portion of Basin 11.

5.3.10.1 SMF 10A

SMF 10A will serve as the treatment and attenuation pond for Basin 10. SMF 10A is located west of US 301 at approximately station 1791+00 (LT.). This pond site sits within one (1) parcel (Parcel No. U-17-27-21-ZZZ-000003-28140.0). The pond site will not have any wetland or floodplain impacts. Available soil survey data within the pond site show the soils to be HSG Type C/D. According to LIDAR data obtained for this pond site, the existing ground is at approximately 45.00 feet NAVD. With the available data compiled it was determined that SMF 10A will be a wet pond with the normal water/control elevation set at elevation 44.00 feet. Preliminary pond sizing calculations indicate that this pond will require 2.89 acres of area, however, the entirety of the impacted parcel will be utilized for a total of 2.96 acres.

5.3.10.2 SMF 10B

SMF 10B will serve as the treatment and attenuation pond for Basin 10. SMF 10B is located east of US 301 at approximately station 1815+00 (RT.). This pond site sits within one (1) parcel (Parcel No. U-17-27-21-ZZZ-000003-27910.0). The pond site will have 0.57 acres of wetland impacts and 0.06 ac-ft of floodplain impacts. Available soil survey data within the pond site show the soils to be HSG Type C/D. According to LIDAR data obtained for this pond site, the existing ground is at approximately 51.00 feet NAVD. With the available data compiled it was determined that SMF 10B will be a wet pond with the normal water/control elevation set at elevation 48.00 feet. Due to the elevation difference between the pond location and the begin basin limits, compensatory treatment will be necessary for the southern end of the basin. Preliminary pond sizing calculations indicate that this pond will require 4.42 acres of area. SMF 10B is the preferred pond for this basin.

5.3.11 Basin 11

Basin 11 is located between stations 1829+80 and 1866+00 within the Hillsborough River Watershed. Coordination with FDOT determined that Basin 11 would be compensated for in the treatment alternatives in Basins 10 and 12.

5.3.12 Basin 12

Basin 12 is located between stations 1843+00 and 1936+00 within the Hillsborough River Watershed. Basin 12 is considered an open basin because the surrounding area drains to the Hillsborough River, which is an Outstanding Florida Water (OFW). Therefore, an additional 50% treatment volume is required. This basin is located within Hillsborough River WBIDs 1443D which is not impaired and 1443A which is impaired for dissolved oxygen. As described in Section 2.0, a pollutant loading analysis has been provided for this basin. Coordination with FDOT has determined that the treatment alternatives for this basin will provide both treatment and attenuation for Basin 12 and compensatory treatment and attenuation for a portion of Basin 11.

5.3.12.1 SMF 12A

SMF 12A will serve as the treatment and attenuation pond for Basin 12. SMF 12A is located west of US 301 at approximately station 1894+00 (LT.). This pond site sits within one (1) parcel (Parcel No. U-04-27-21-ZZZ-000003-27460.0). The pond site will not have any wetland or floodplain impacts. Available soil survey data within the pond site show the soils to be HSG Type C/D. According to LIDAR data obtained for this pond site, the existing ground is at approximately 51.00 feet NAVD. With the available data compiled it was determined that SMF 12A will be a wet pond with the normal water/control elevation set at elevation 49.00 feet. Preliminary pond sizing calculations indicate that this pond will require 3.72 acres of area. SMF 12A is the preferred pond for this basin.

5.3.12.2 SMF 12B

SMF 12B will serve as the treatment and attenuation pond for Basin 12. SMF 12B is located east of US 301 at approximately station 1894+00 (RT.). This pond site sits within one (1) parcel (Parcel No. U-04-27-21-ZZZ-000003-27460.0). The pond site will not have any wetland impacts and will have 0.23 ac-ft of floodplain impacts. Available soil survey data within the pond site show the soils to be HSG Type C/D. According to LIDAR data obtained for this pond site, the existing ground is at approximately 51.00 feet NAVD. With the available data compiled it was determined that SMF 12B will be a wet pond with the normal water/control elevation set at elevation 49.00 feet. Preliminary pond sizing calculations indicate that this pond will require 3.56 acres of area.

5.3.13 Basin 13

Basin 13 is located between stations 1936+00 and 2010+00 within the Hillsborough River Watershed. Basin 13 is considered an open basin because the surrounding area drains to

the Hillsborough River. This basin discharges to the Hillsborough River which is an Outstanding Florida Water (OFW), therefore, an additional 50% treatment volume is required. This basin is located within Hillsborough River WBID 1443A which is impaired for dissolved oxygen. As described in Section 2.0, a pollutant loading analysis has been provided for this basin.

5.3.13.1 SMF 13A

SMF 13A will serve as the treatment and attenuation pond for Basin 13. SMF 13A is located west of US 301 at approximately station 1937+50 (LT.). This pond site sits within one (1) parcel (Parcel No. U-04-27-21-ZZZ-000003-27460.0). The pond site will not have any wetland impacts or floodplain impacts. Available soil survey data within the pond site show the soils to be HSG Type A/D. According to LIDAR data obtained for this pond site, the existing ground is at approximately 57.00 feet NAVD. With the available data compiled it was determined that SMF 13A will be a wet pond with the normal water/control elevation set at elevation 55.00 feet. Preliminary pond sizing calculations indicate that this pond will require 5.44 acres of area. SMF 13A is the preferred pond for this basin.

5.3.13.2 SMF 13B

SMF 13B will serve as the treatment and attenuation pond for Basin 13. SMF 13B is located east of US 301 at approximately station 1937+50 (RT.). This pond site sits within one (1) parcel (Parcel No. U-04-27-21-ZZZ-000003-27460.0). The pond site will impact 0.48 acres of wetlands and will not have any impacts to floodplains. Available soil survey data within the pond site show the soils to be HSG Type A/D and C/D. According to LIDAR data obtained for this pond site, the existing ground is at approximately 59.00 feet NAVD. With the available data compiled it was determined that SMF 13B will be a wet pond with the normal water/control elevation set at elevation 55.00 feet. Preliminary pond sizing calculations indicate that this pond will require 5.11 acres of area.

5.3.13.3 SMF 13C

SMF 13C will serve as the treatment and attenuation pond for Basin 13. SMF 13C is located east of US 301 at approximately station 1928+50 (RT.). This pond site sits within one (1) parcel (Parcel No. U-04-27-21-ZZZ-000003-27460.0). The pond site will not have any wetland impacts and will abut FPC 6. Available soil survey data within the pond site show the soils to be HSG Type A/D and C/D. According to LIDAR data obtained for this pond site, the existing ground is at approximately 57.00 feet NAVD. With the available data compiled it was determined that SMF 13C will be a wet pond with the normal water/control elevation set at elevation 55.00 feet. Preliminary pond sizing calculations indicate that this pond will require 6.70 acres of area.

5.4 FPC Evaluation

5.4.1 FPC1

FPC1 will serve as the floodplain compensation site for FIA1. FPC1 is located north of US 301 at approximately station 1374+00 (LT) and abuts up against the impacted floodplain. The

site sits within one (1) parcel (Parcel No. U-08-28-20-ZZZ-000001-98300.0) and will encompass the entire 5.45-acre parcel and provide 7.83 ac-ft of storage. Available soil survey data within the pond site show the soils to be HSG Type A and A/D. According to LIDAR data obtained for this pond site, the existing ground ranges from approximately 44.00 feet NAVD to 33.00 feet NAVD. Compensation will be provided by excavating the site to the 100-year floodplain elevation.

5.4.2 FPC2

FPC2 will serve as partial floodplain compensation site for FIA2. FPC2 is located east of US 301 at approximately station 1653+00 (RT) and abuts up against the impacted floodplain. The site sits within one (1) parcel (Parcel No. U-30-27-21-9D9-000000-00001.0) and will encompass 7.45-acres of the parcel and provide 27.56 ac-ft of storage. Available soil survey data within the pond site show the soils to be HSG Type A. According to LIDAR data obtained for this pond site, the existing ground ranges from approximately 50.00 feet NAVD to 38.00 feet NAVD. Compensation will be provided by excavating the site to the 100-year floodplain elevation.

5.4.3 FPC3

FPC3 will serve as partial floodplain compensation site for FIA2. FPC3 is located west of US 301 at approximately station 1640+00 (LT) and abuts up against the impacted floodplain. The site sits within one (1) parcel (Parcel No. U-36-27-20-ZZZ-000001-92890.0) and will encompass the entire 3.49-acres of the parcel and provide 2.19 ac-ft of storage. Available soil survey data within the pond site show the soils to be HSG Type A. According to LIDAR data obtained for this pond site, the existing ground ranges from approximately 51.00 feet NAVD to 42.00 feet NAVD. Compensation will be provided by excavating the site to the 100-year floodplain elevation.

5.4.4 FPC5

FPC5 will serve as partial floodplain compensation site for FIA3. FPC5 is located west of US 301 at approximately station 1715+00 (LT) and abuts up against the impacted floodplain. The site sits within two (2) parcels (Parcel Nos. U-19-27-21-ZZZ-000003-28580.0 and U-19-27-21-ZZZ-000003-28570.0) and will encompass 25.47 acres within both parcels, providing 72.69 ac-ft of storage. Available soil survey data within the pond site show the soils to be HSG Type A/D and C/D. According to LIDAR data obtained for this pond site, the existing ground ranges from approximately 45.00 feet NAVD to 39.00 feet NAVD. Compensation will be provided by excavating the site to the 100-year floodplain elevation.

5.4.5 FPC6

FPC6 will serve as partial floodplain compensation site for FIA4. FPC6 is located west of US 301 at approximately station 1897+00 (LT) and abuts up against the impacted floodplain. The site sits within one (1) parcels (Parcel No. U-04-27-21-ZZZ-000003-27460.0). The 2.15 acre site will provide 1.76 ac-ft of storage. Available soil survey data within the pond site show the soils to be HSG Type A and C/D. According to LIDAR data obtained for this pond site, the existing ground ranges from approximately 52.00 feet NAVD to 51.00 feet NAVD. Compensation will be provided by excavating the site to the 100-year floodplain elevation.

5.4.6 FPC7

FPC7 will serve as partial floodplain compensation site for FIA5. FPC7 is located east of US 301 at approximately station 1931+00 (RT) and abuts up against the impacted floodplain. The site sits within one (1) parcels (Parcel No. U-04-27-21-ZZZ-000003-27460.0). The 5.66 acre site will provide 4.47 ac-ft of storage. Available soil survey data within the pond site show the soils to be HSG Type A/D and C/D. According to LIDAR data obtained for this pond site, the existing ground ranges from approximately 58.00 feet NAVD to 57.00 feet NAVD. Compensation will be provided by excavating the site to the 100-year floodplain elevation.

5.4.7 FPC8

FPC8 will serve as partial floodplain compensation site for FIA6. FPC8 is located west of US 301 at approximately station 1960+00 (LT) and abuts up against the impacted floodplain. The site sits within one (1) parcels (Parcel No. U-04-27-21-ZZZ-000003-27460.0). The 8.47 acre site will provide 13.61 ac-ft of storage. Available soil survey data within the pond site show the soils to be HSG Type A/D and C/D. According to LIDAR data obtained for this pond site, the existing ground ranges from approximately 62.00 feet NAVD to 58.00 feet NAVD. Compensation will be provided by excavating the site to the 100-year floodplain elevation.

5.5 Environmental Look Arouds (ELAs)

Environmental Look Arouds (ELAs) provide a unique opportunity to team up with regional stakeholders to explore watershed wide stormwater needs and alternative permitting approaches for the project. Areas of potential cooperation are documented in this report for future follow up as the design moves forward.

Dr. Su from the Engineering and Construction Service Section of the Hillsborough County Public Works Department was contacted in January 2015 regarding any future county stormwater projects near the US 301 project corridor. A map of future stormwater projects was provided by Dr. Su at the time of the coordination meeting. The map indicated that there is a potential future stormwater project in the Vicinity of Campground Road and US 301. The proximity to US 301 may provide an excellent joint use opportunity.

Stormwater management facility 4C consists of a joint use option for Basin 4 in which a shared use pond with the expansion of the existing borrow pit will provide treatment and attenuation for the basin. At this time, this alternative is not the preferred option.

5.6 Nutrient Loading Analysis

The project traverses nine (9) WBIDs (1443B Hillsborough River, 1522A Flint Creek, 1520 Hollomans Branch, 1443C Hillsborough River, 1505 Clay Gully, 1489 Two Hole Branch, 1443D Hillsborough River, 1453 Indian Creek, and 1443A Hillsborough River), which are located in the Hillsborough River Watershed.

A Total Maximum Daily Load (TMDL) has been adopted for Flint Creek (WBID 1522A - Nutrients). WBIDs 1443A and 1443B are impaired for Dissolved Oxygen, while WBIDs 1520

and 1505 were found to be impaired for Bacteria. WBID 1489 was found to be impaired for Fecal Coliform / Bacteria.

As described in Section 2.0, a pre versus post pollutant loading analysis has been performed for all basins and evaluated as a whole, for this study. Preliminary analysis found that the nutrient loading criteria was not able to be met for Total Nitrogen (TN) for a few individual basins, as depicted in **Table 7 - Summary of Nutrient Loading**. The use of treatment in series is recommended for the basins that can accommodate an open swale. Utilizing the roadside swales as part of the suburban typical will provide additional nutrient removal and increase the overall removal efficiency of the basins. Preliminary calculations were performed using typical parameters for the soils found in the basins. It was found that the treatment in series approach will increase the removal efficiency, meeting the required nutrient removal criteria for project as a whole, within the Hillsborough River Watershed. The BMPTRAINS analysis of the treatment in series is provided in the **Appendix C**.

Table 7 – Summary of Nutrient Loading

Basin Name	Pre-Loading Nitrogen (kg/yr)	Pre- Loading Phosphorus (kg/yr)	Post- Loading Nitrogen (kg/yr)	Post- Loading Phosphorus (kg/yr)
1	16.43	2.16	27.60	2.11
3	35.81	4.71	58.77	3.79
4	19.76	2.60	0.41	0.05
5	46.16	6.07	78.21	3.47
6	113.63	14.95	81.30	1.73
7	69.55	9.15	30.26	2.05
8	84.31	11.17	72.58	2.74
9	38.59	5.08	31.83	1.05
10	74.93	9.86	62.95	1.14
12	87.36	11.50	108.48	4.89
13	100.91	13.28	85.21	2.51
Total	687.44	90.53	637.60	25.53

SECTION 6.0 CONCLUSIONS AND RECOMMENDATIONS

Potential ponds site alternatives have been identified along the project limits for this PD&E study. The analysis estimates right-of-way needs using a volumetric analysis, which accounts for water quality treatment and water quantity for runoff attenuation. Please note that the estimated right-of-way areas for the ponds were based on pond sizes determined from preliminary data calculations, reasonable engineering judgment, and assumptions. Pond sizes may change during final design as more detailed information on SHWT, wetland normal pool elevation, final roadway profile design, etc. become available. Please refer to **Table 8** for **Recommended Stormwater Pond Sizes** for the preferred alternative.

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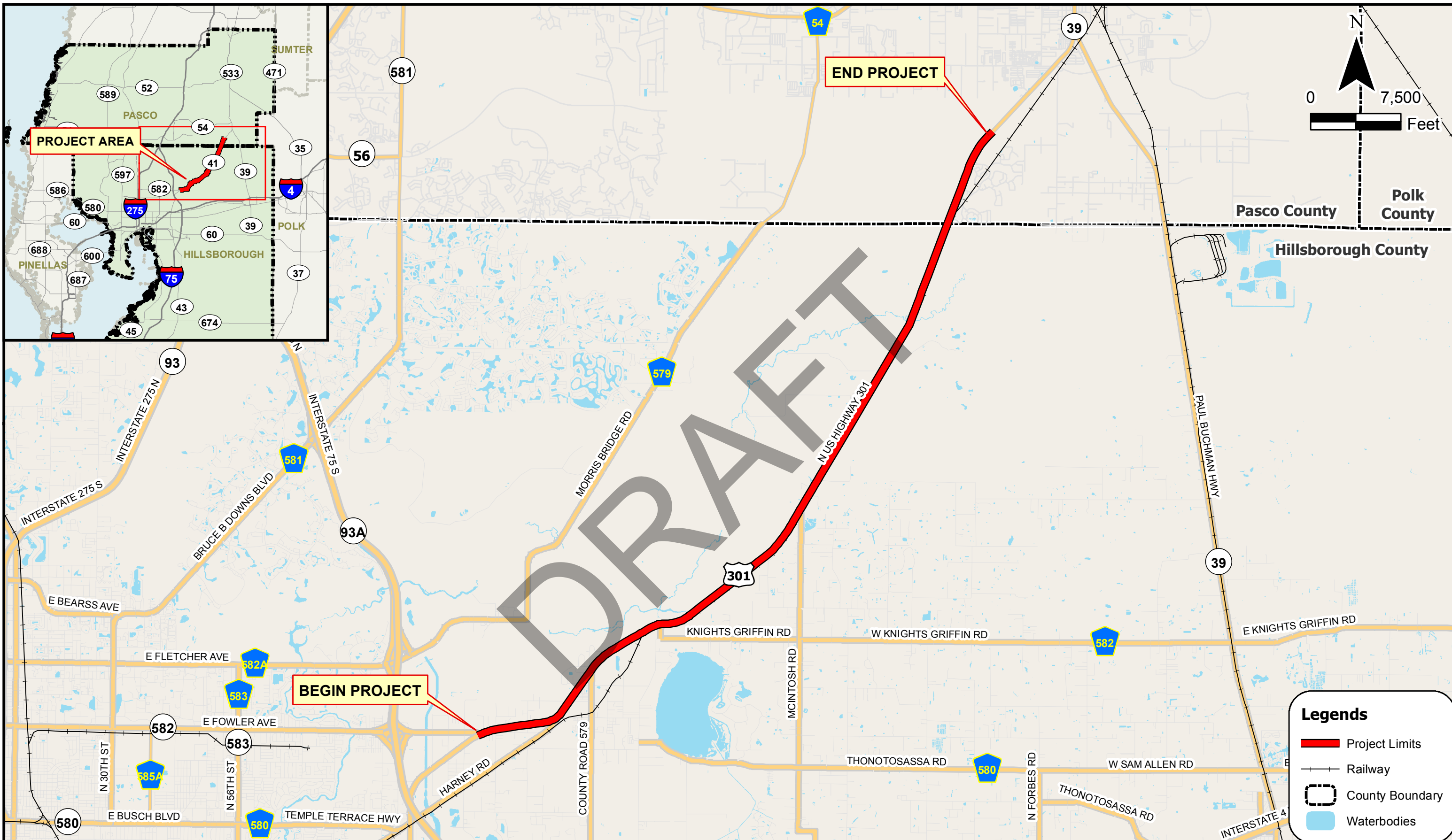
Table 8 – Recommended Stormwater Pond Sizes

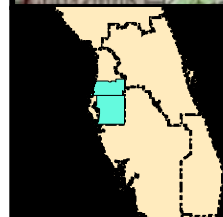
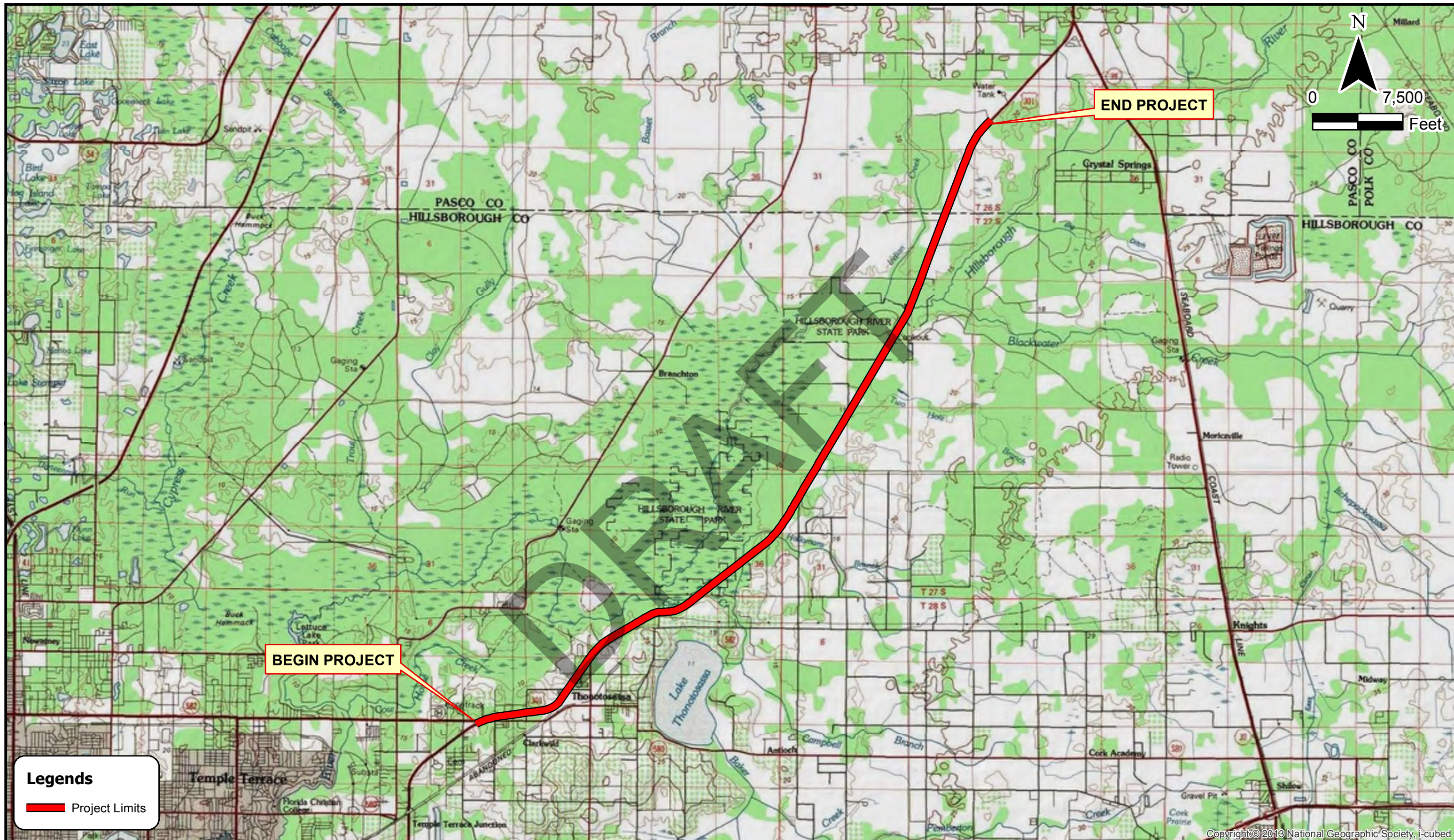
SMF Name	From Station	To Station	Type (Dry/Wet)	Req'd Treatment + Attenuation (ac-ft)	Provided Treatment + Attenuation (ac-ft)	Pond Right-of-Way Area (ac) (including access easement)
1A	1360+00	1390+00	Wet	5.33	5.69	2.54
3A	1390+00	1455+50	Wet	4.65	6.78	4.61
4A	1455+50	1492+00	Dry	5.47	5.71	3.11
5B	1492+00	1580+00	Wet	8.20	8.71	3.28
6C	1580+00	1645+50	Wet	2.36	2.97	5.41
7A	1645+50	1695+00	Wet	3.28	4.07	2.54
8B	1695+00	1760+00	Wet	1.98	2.24	2.45
9C	1760+00	1788+00	Wet	1.01	1.14	1.77
10B	1788+00	1843+00	Wet	2.16	2.78	4.42
11	Basin 11 is compensated for in the stormwater alternatives in Basin 10 and 12					
12A	1843+00	1936+00	Wet	5.17	5.66	3.72
13A	1936+00	2010+00	Wet	7.24	8.09	5.44
Total				46.85	53.84	39.29

APPENDIX A

Exhibits

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Florida Department of Transportation
 District 7

US 301 PD&E Study
 from Fowler Avenue to Proposed SR 56
 Hillsborough and Pasco Counties, Florida
 Financial Project ID: 255796-1-22-01

USGS QUADRANGLE MAP

**EXHIBIT
 2**

SOIL NAMES

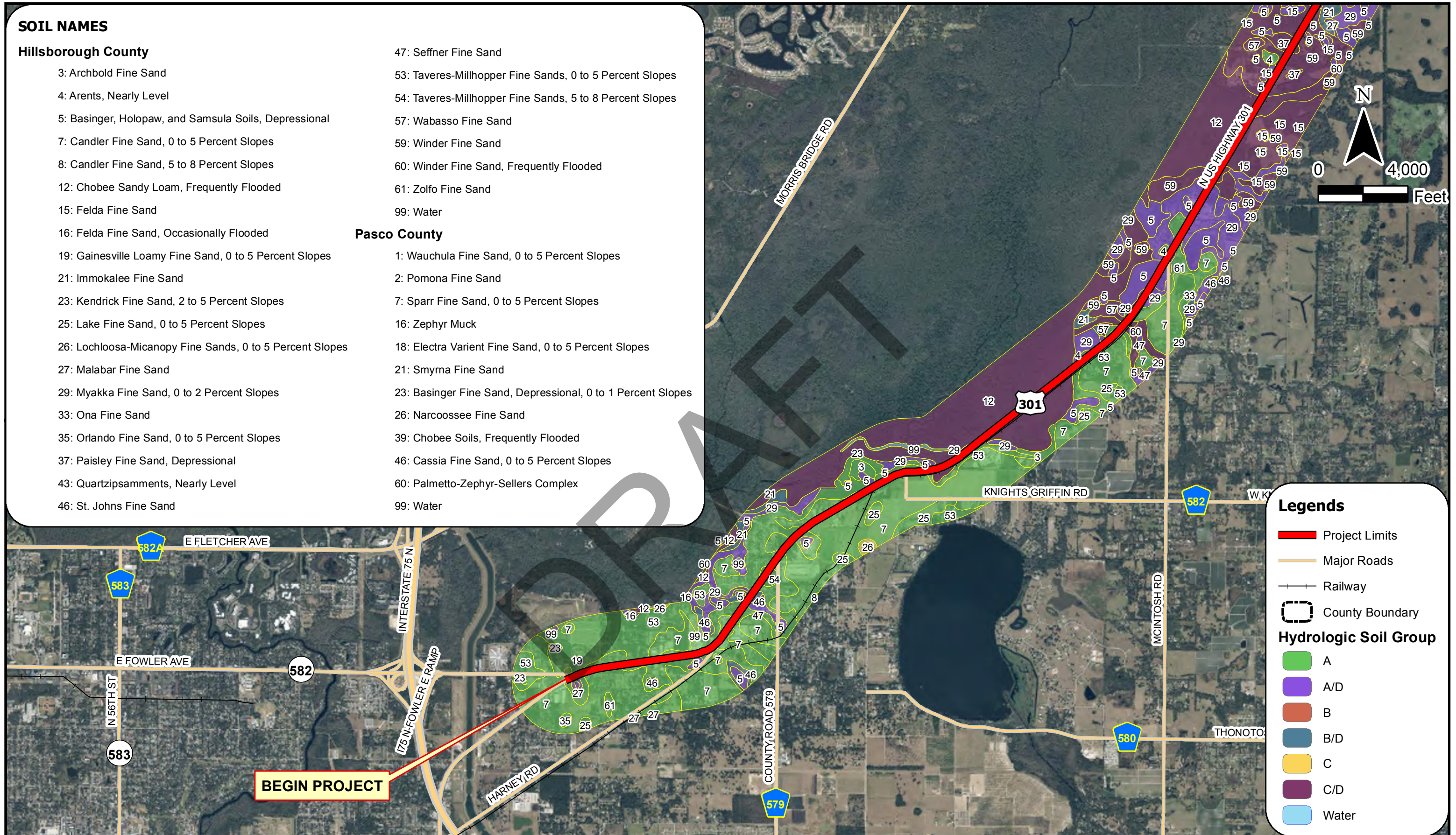
Hillsborough County

- 3: Archbold Fine Sand
- 4: Arents, Nearly Level
- 5: Basinger, Holopaw, and Samsula Soils, Depressional
- 7: Candler Fine Sand, 0 to 5 Percent Slopes
- 8: Candler Fine Sand, 5 to 8 Percent Slopes
- 12: Chobee Sandy Loam, Frequently Flooded
- 15: Felda Fine Sand
- 16: Felda Fine Sand, Occasionally Flooded
- 19: Gainesville Loamy Fine Sand, 0 to 5 Percent Slopes
- 21: Immokalee Fine Sand
- 23: Kendrick Fine Sand, 2 to 5 Percent Slopes
- 25: Lake Fine Sand, 0 to 5 Percent Slopes
- 26: Lochloosa-Micanopy Fine Sands, 0 to 5 Percent Slopes
- 27: Malabar Fine Sand
- 29: Myakka Fine Sand, 0 to 2 Percent Slopes
- 33: Ona Fine Sand
- 35: Orlando Fine Sand, 0 to 5 Percent Slopes
- 37: Paisley Fine Sand, Depressional
- 43: Quartzipsamments, Nearly Level
- 46: St. Johns Fine Sand

- 47: Seffner Fine Sand
- 53: Taveres-Millhopper Fine Sands, 0 to 5 Percent Slopes
- 54: Taveres-Millhopper Fine Sands, 5 to 8 Percent Slopes
- 57: Wabasso Fine Sand
- 59: Winder Fine Sand
- 60: Winder Fine Sand, Frequently Flooded
- 61: Zolfo Fine Sand
- 99: Water

Pasco County

- 1: Wauchula Fine Sand, 0 to 5 Percent Slopes
- 2: Pomona Fine Sand
- 7: Sparr Fine Sand, 0 to 5 Percent Slopes
- 16: Zephyr Muck
- 18: Electra Variet Fine Sand, 0 to 5 Percent Slopes
- 21: Smyrna Fine Sand
- 23: Basinger Fine Sand, Depressional, 0 to 1 Percent Slopes
- 26: Narcoossee Fine Sand
- 39: Chobee Soils, Frequently Flooded
- 46: Cassia Fine Sand, 0 to 5 Percent Slopes
- 60: Palmetto-Zephyr-Sellers Complex
- 99: Water

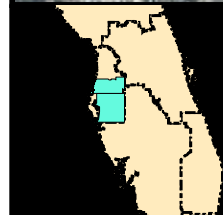


Legends

- █ Project Limits
- █ Major Roads
- Railway
- County Boundary

Hydrologic Soil Group

- █ A
- █ A/D
- █ B
- █ B/D
- █ C
- █ C/D
- █ Water



SOIL NAMES

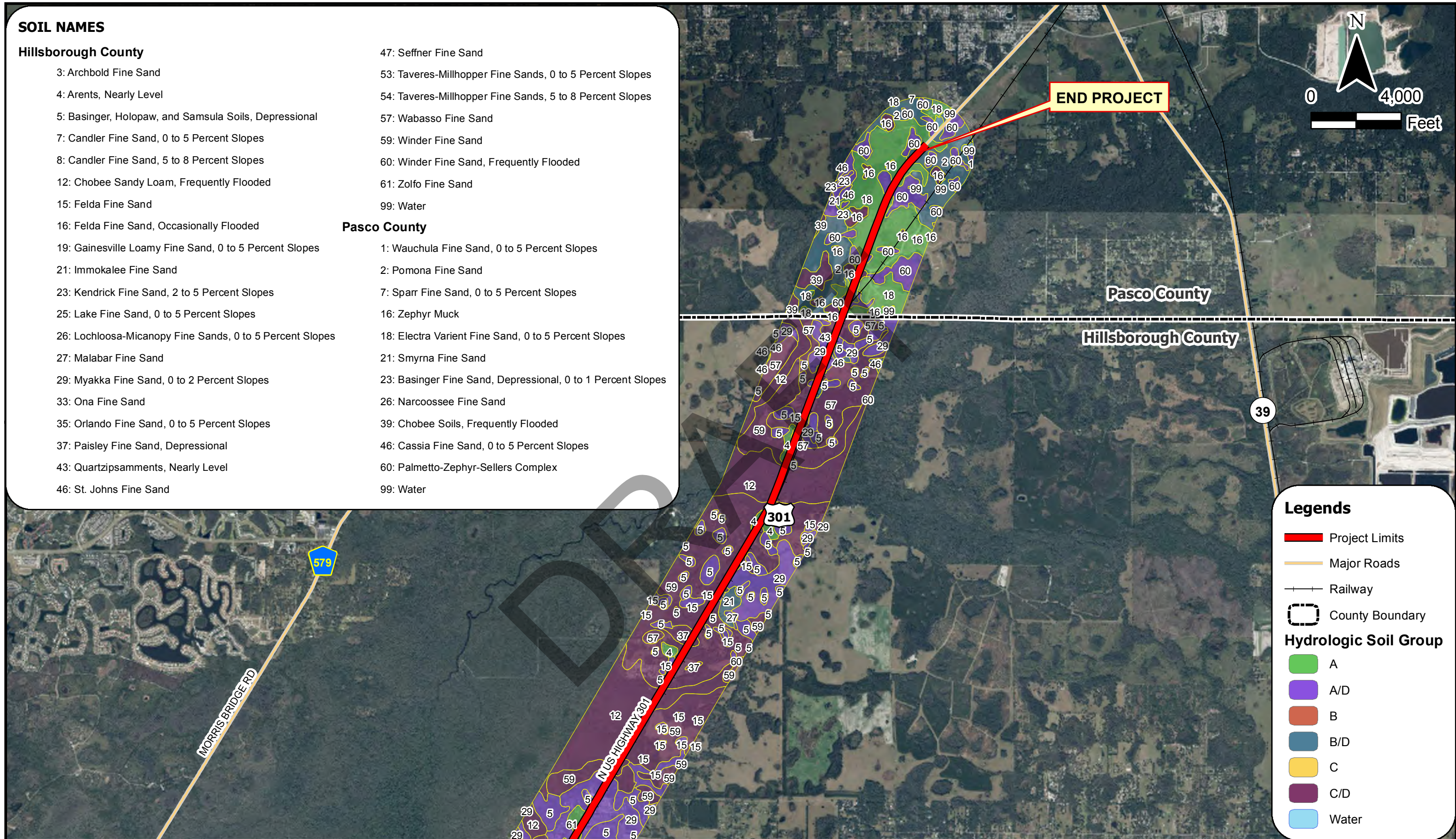
Hillsborough County

- 3: Archbold Fine Sand
- 4: Arents, Nearly Level
- 5: Basinger, Holopaw, and Samsula Soils, Depressional
- 7: Candler Fine Sand, 0 to 5 Percent Slopes
- 8: Candler Fine Sand, 5 to 8 Percent Slopes
- 12: Chobee Sandy Loam, Frequently Flooded
- 15: Felda Fine Sand
- 16: Felda Fine Sand, Occasionally Flooded
- 19: Gainesville Loamy Fine Sand, 0 to 5 Percent Slopes
- 21: Immokalee Fine Sand
- 23: Kendrick Fine Sand, 2 to 5 Percent Slopes
- 25: Lake Fine Sand, 0 to 5 Percent Slopes
- 26: Lochloosa-Micanopy Fine Sands, 0 to 5 Percent Slopes
- 27: Malabar Fine Sand
- 29: Myakka Fine Sand, 0 to 2 Percent Slopes
- 33: Ona Fine Sand
- 35: Orlando Fine Sand, 0 to 5 Percent Slopes
- 37: Paisley Fine Sand, Depressional
- 43: Quartzipsamments, Nearly Level
- 46: St. Johns Fine Sand

- 47: Seffner Fine Sand
- 53: Taveres-Millhopper Fine Sands, 0 to 5 Percent Slopes
- 54: Taveres-Millhopper Fine Sands, 5 to 8 Percent Slopes
- 57: Wabasso Fine Sand
- 59: Winder Fine Sand
- 60: Winder Fine Sand, Frequently Flooded
- 61: Zolfo Fine Sand
- 99: Water

Pasco County

- 1: Wauchula Fine Sand, 0 to 5 Percent Slopes
- 2: Pomona Fine Sand
- 7: Sparr Fine Sand, 0 to 5 Percent Slopes
- 16: Zephyr Muck
- 18: Electra Variet Fine Sand, 0 to 5 Percent Slopes
- 21: Smyrna Fine Sand
- 23: Basinger Fine Sand, Depressional, 0 to 1 Percent Slopes
- 26: Narcoossee Fine Sand
- 39: Chobee Soils, Frequently Flooded
- 46: Cassia Fine Sand, 0 to 5 Percent Slopes
- 60: Palmetto-Zephyr-Sellers Complex
- 99: Water

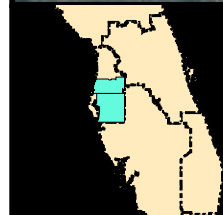


Legends

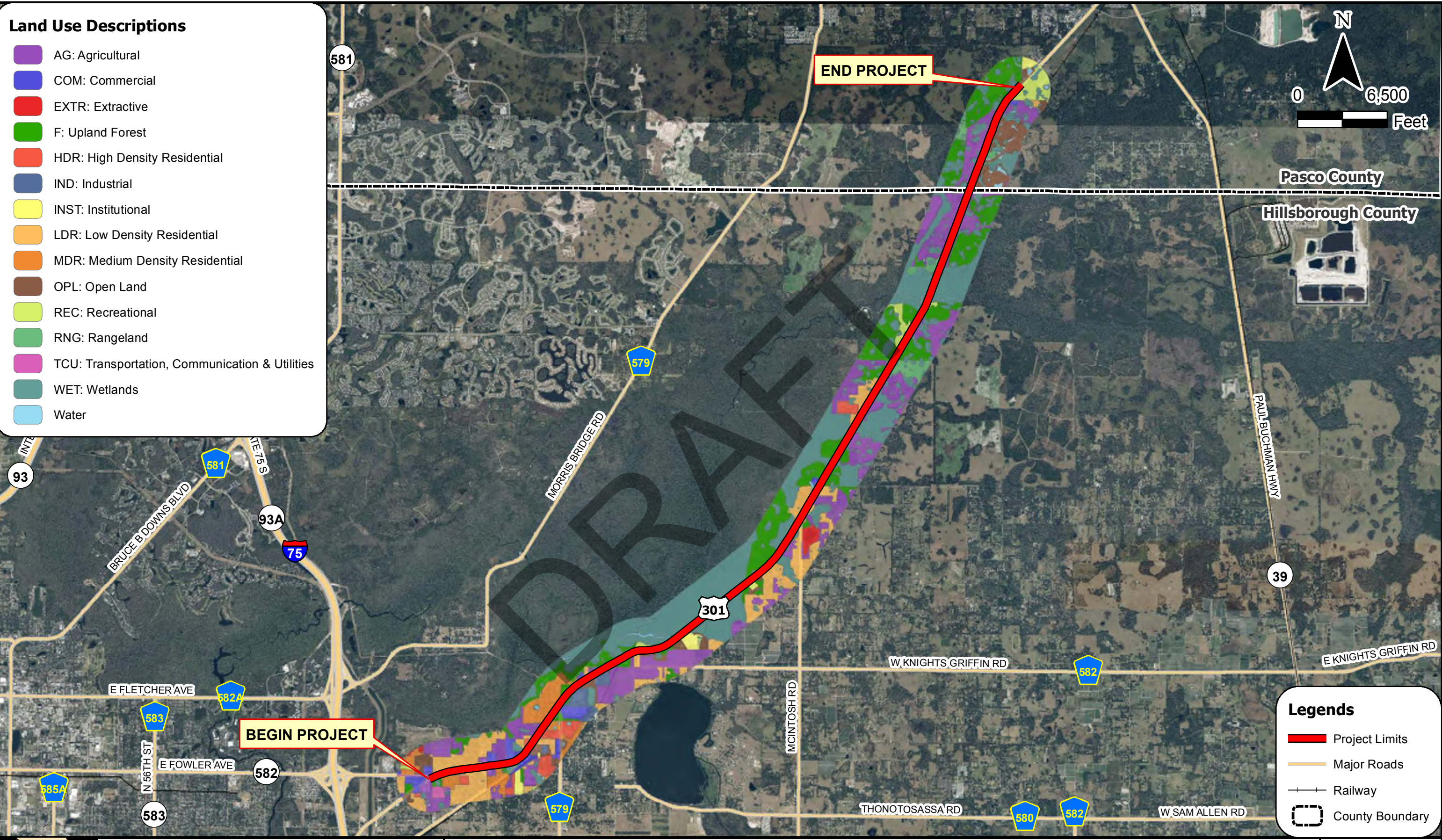
- █ Project Limits
- █ Major Roads
- Railway
- County Boundary

Hydrologic Soil Group

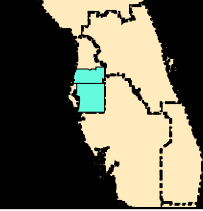
- █ A
- █ A/D
- █ B
- █ B/D
- █ C
- █ C/D
- █ Water

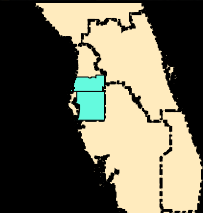
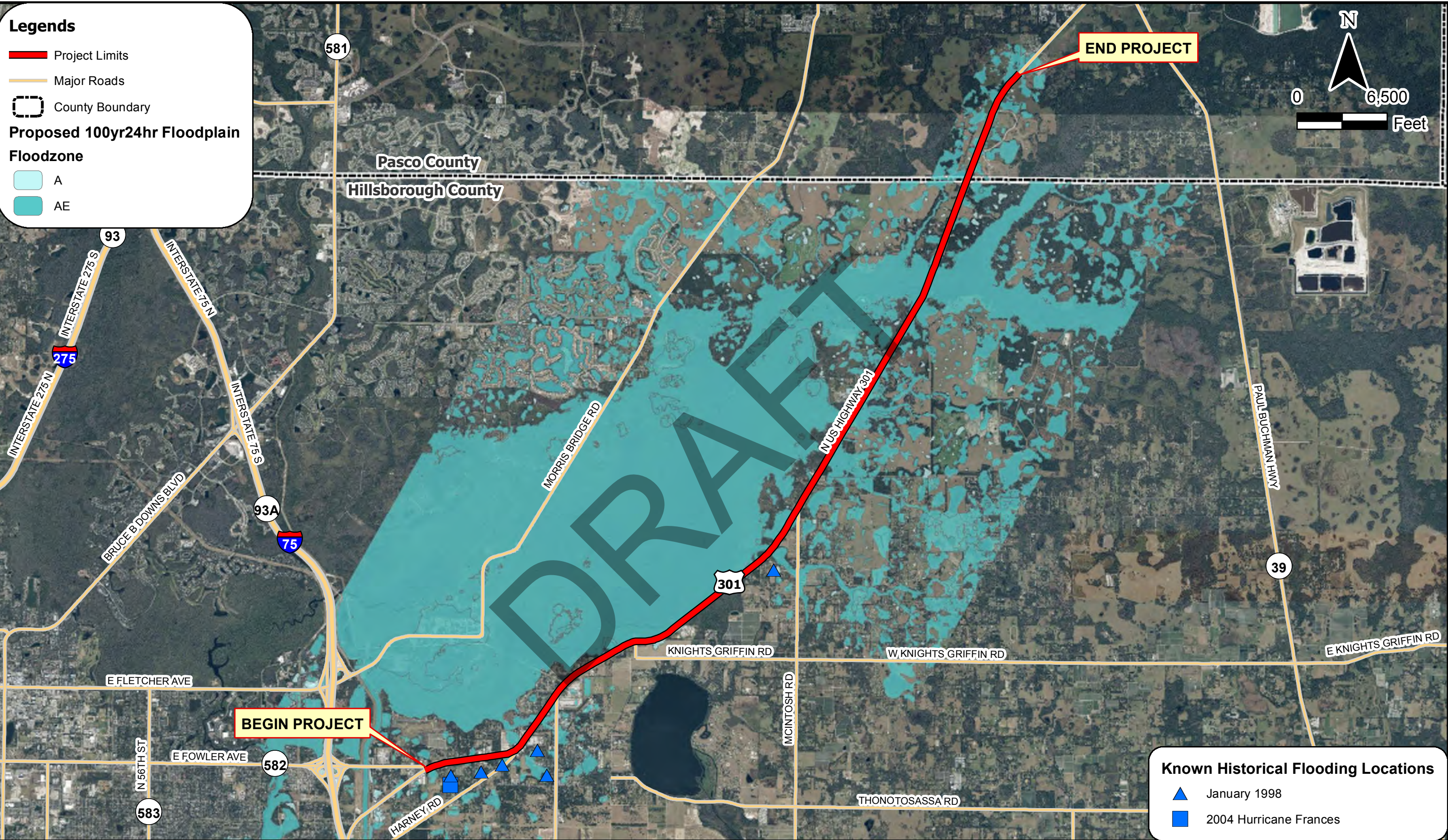


- Land Use Descriptions**
- AG: Agricultural
 - COM: Commercial
 - EXTR: Extractive
 - F: Upland Forest
 - HDR: High Density Residential
 - IND: Industrial
 - INST: Institutional
 - LDR: Low Density Residential
 - MDR: Medium Density Residential
 - OPL: Open Land
 - REC: Recreational
 - RNG: Rangeland
 - TCU: Transportation, Communication & Utilities
 - WET: Wetlands
 - Water



- Legends**
- Project Limits
 - Major Roads
 - Railway
 - County Boundary

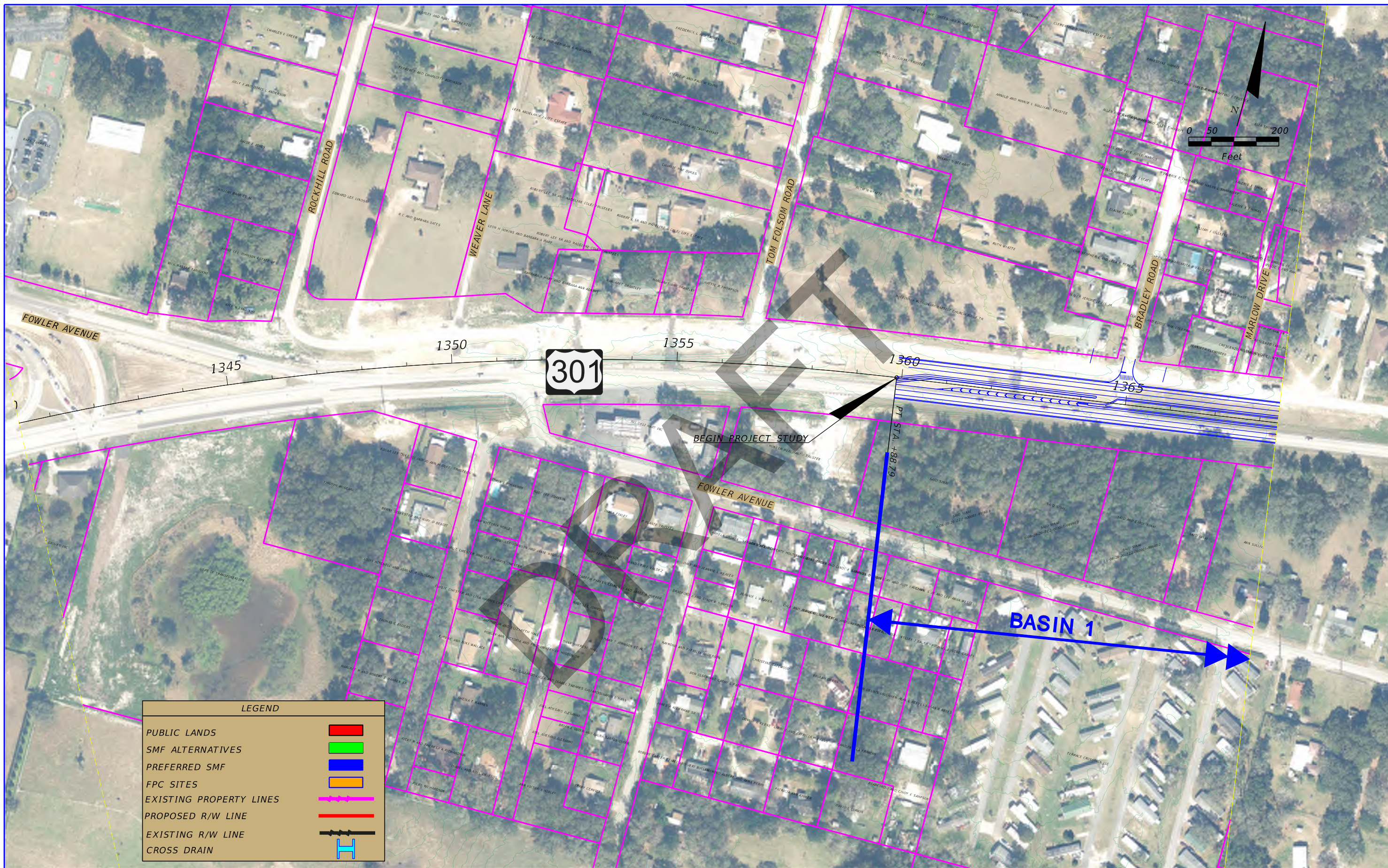




APPENDIX B

Basin Maps

DRAFT



LEGEND	
PUBLIC LANDS	
SMF ALTERNATIVES	
PREFERRED SMF	
FPC SITES	
EXISTING PROPERTY LINES	
PROPOSED R/W LINE	
EXISTING R/W LINE	
CROSS DRAIN	

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

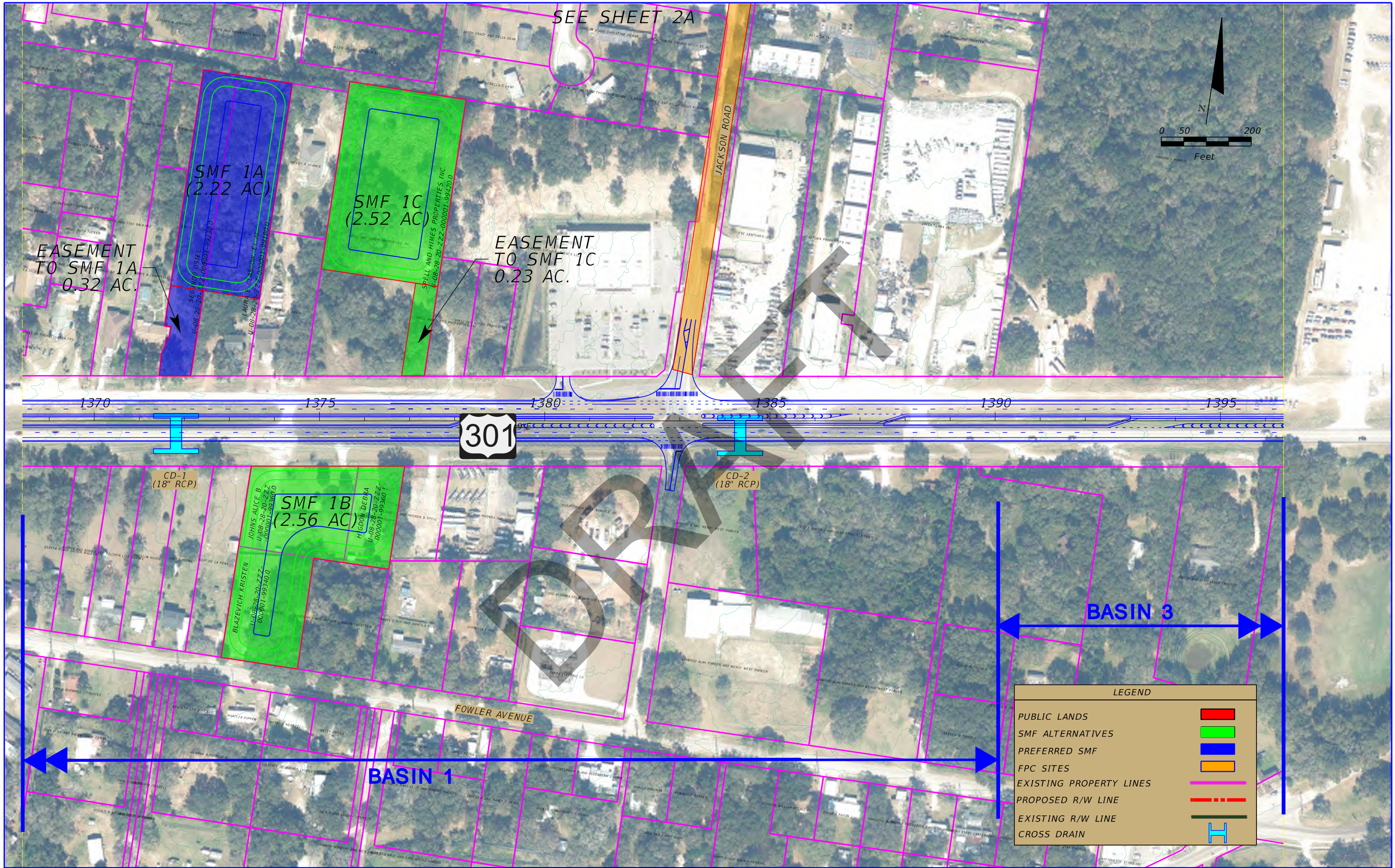
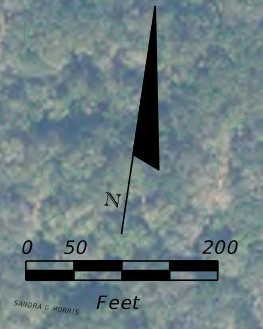
Inwood Consulting Engineers, Inc.
 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765
 P 407.971.8850

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
301	HILLSBOROUGH PASCO	255796-1

BASIN MAPS

SHEET NO.
1

SEE SHEET 2A



LEGEND	
PUBLIC LANDS	
SMF ALTERNATIVES	
PREFERRED SMF	
FPC SITES	
EXISTING PROPERTY LINES	
PROPOSED R/W LINE	
EXISTING R/W LINE	
CROSS DRAIN	

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765 P 407.971.8850		
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
301	HILLSBOROUGH PASCO	255796-1

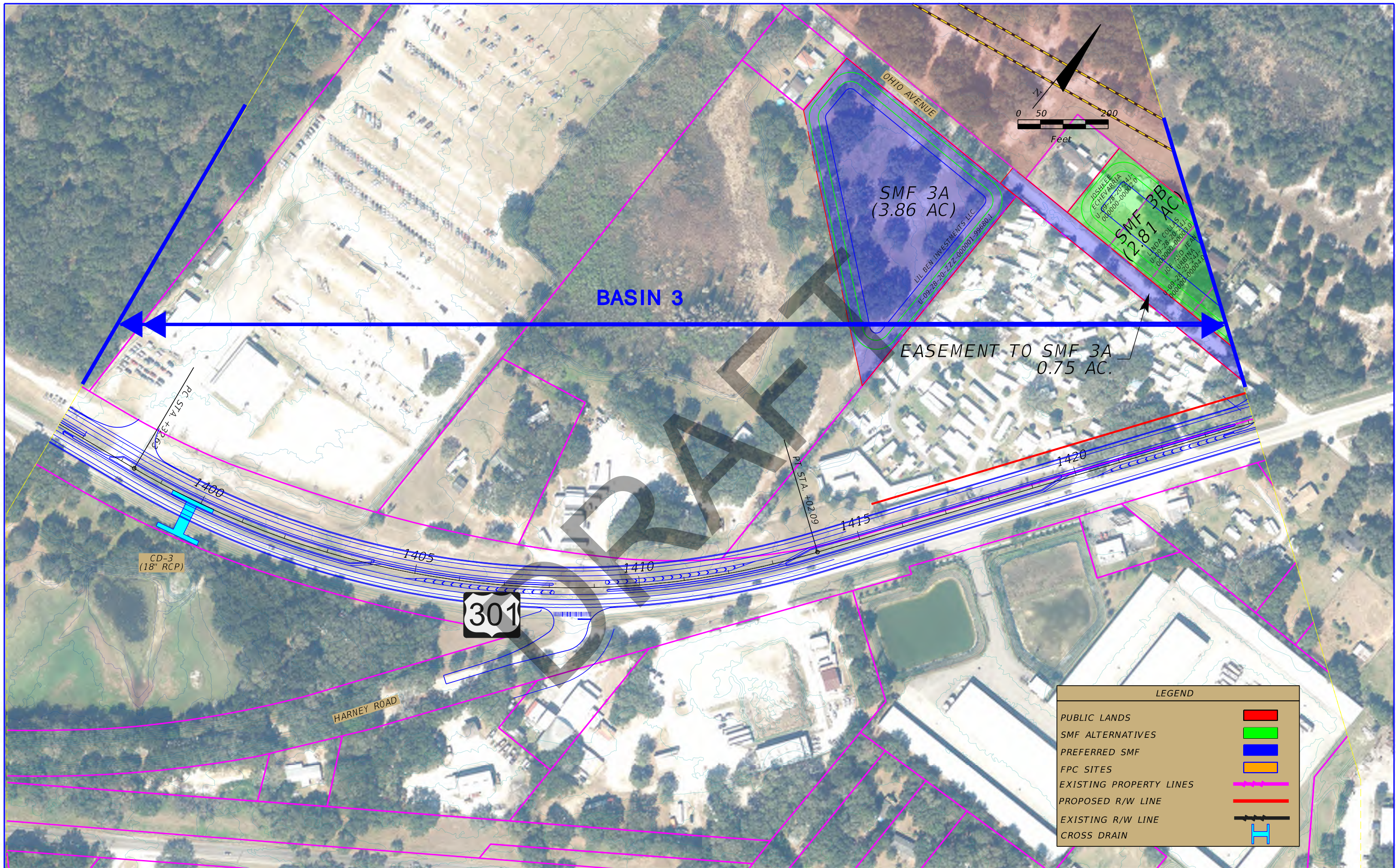
<h2>BASIN MAPS</h2>	SHEET NO. 2
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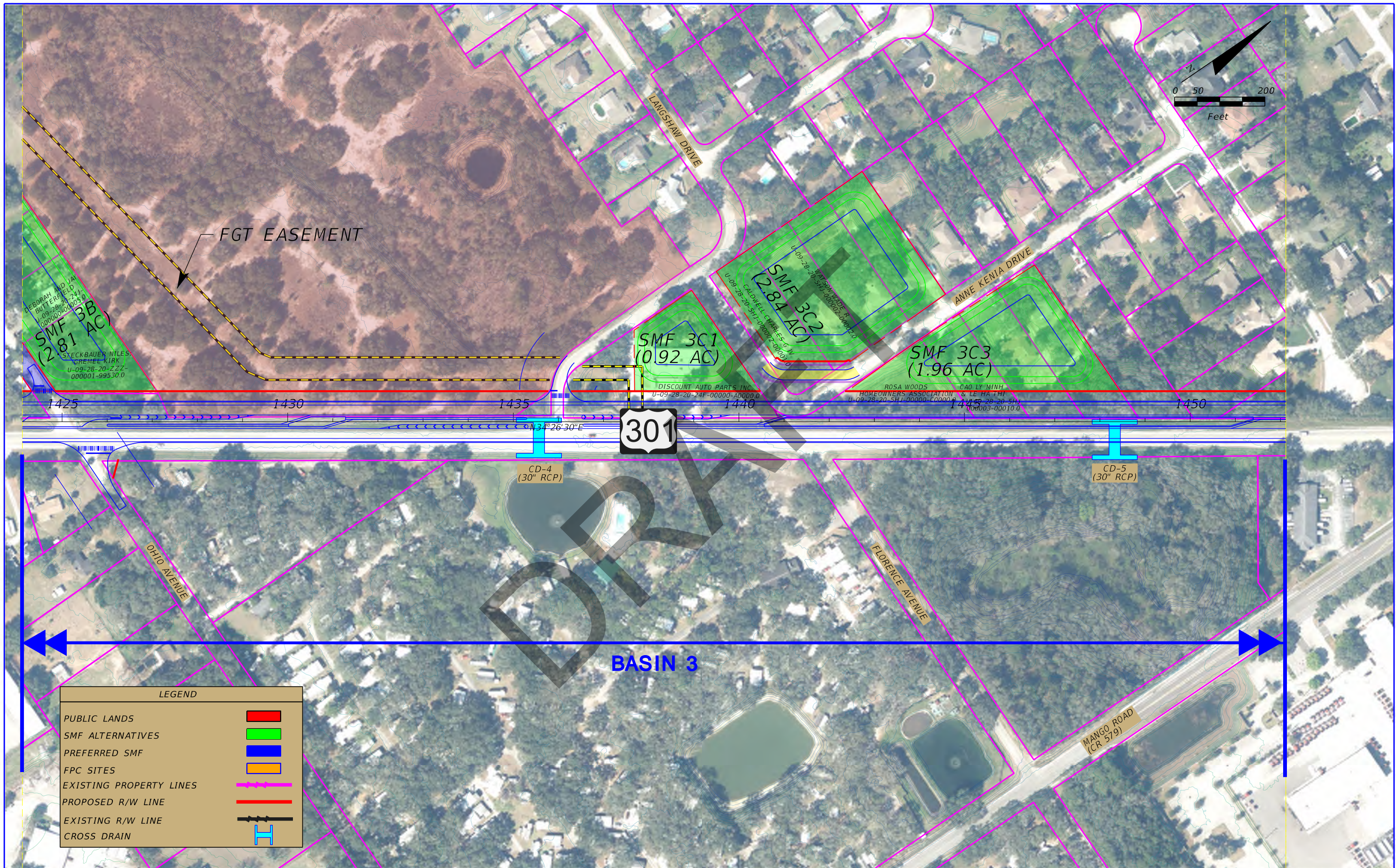
REVISIONS				STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
				301	HILLSBOROUGH PASCO	255796-1	2A

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BASIN MAPS

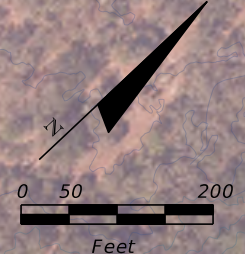
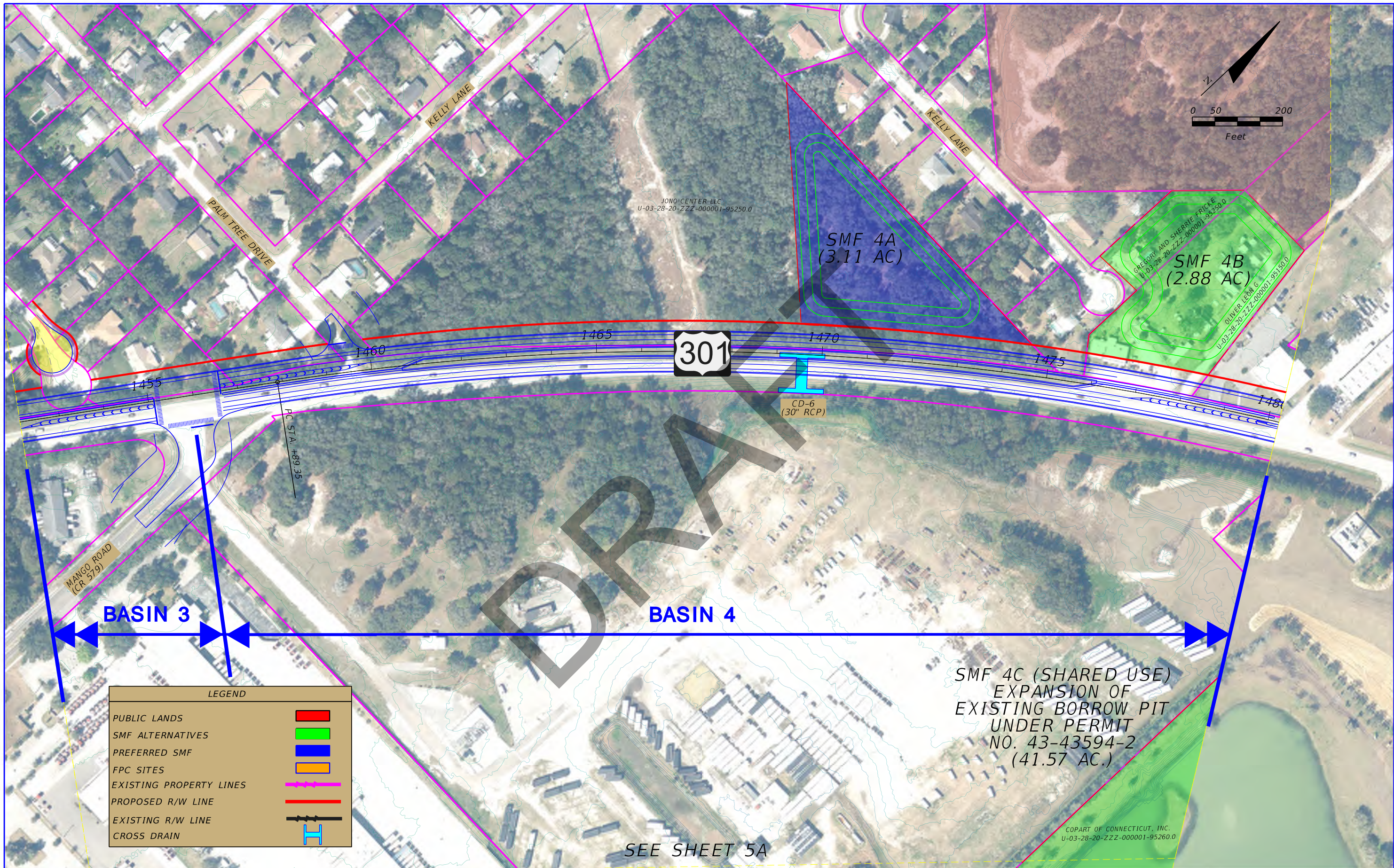


REVISIONS				Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765 P 407.971.8850	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO. 3
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					301	HILLSBOROUGH PASCO	255796-1	



REVISIONS		DATE		DESCRIPTION	
DATE	DESCRIPTION	DATE	DESCRIPTION		

Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765 P 407.971.8850						STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			BASIN MAPS	SHEET NO. 4
ROAD NO.		COUNTY		FINANCIAL PROJECT ID						
301		HILLSBOROUGH PASCO		255796-1						



REVISIONS				STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO. 5
DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
				301	HILLSBOROUGH PASCO	255796-1	

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P 407.971.8850

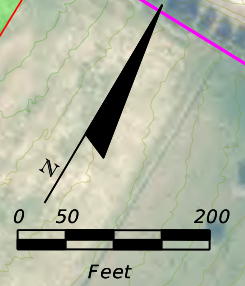
SEE SHEET 6

SEE SHEET 5

SMF 4C (SHARED USE)
EXPANSION OF
EXISTING BORROW PIT
UNDER PERMIT
NO. 43-43594-2
(41.57 AC.)

COPART OF CONNECTICUT, INC.
U-03-28-20-ZZZ-000001-95260.0

COPART OF CONNECTICUT, INC.
U-03-28-20-ZZZ-000001-95340.0

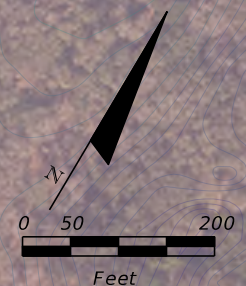
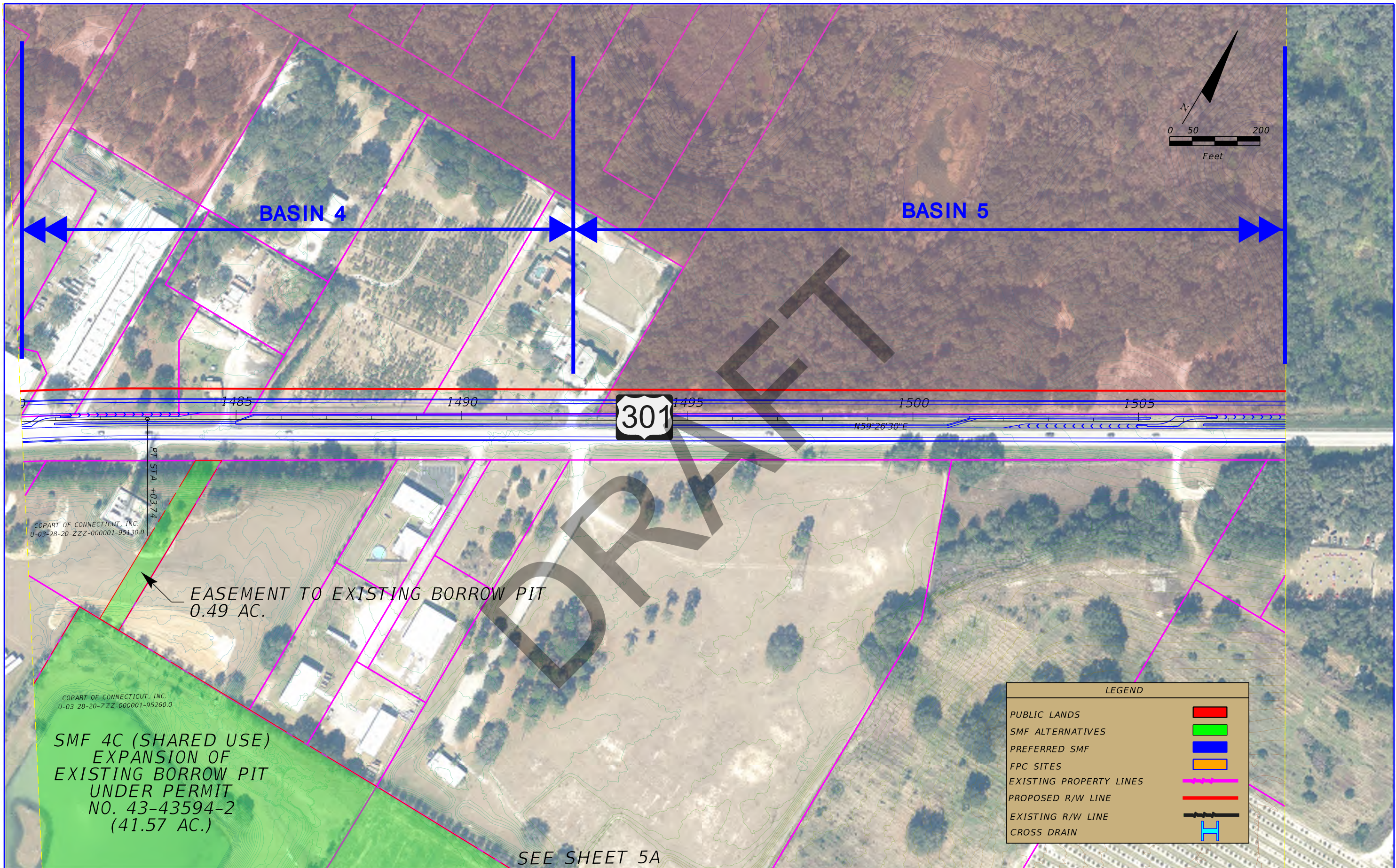


DRAFT

LEGEND	
PUBLIC LANDS	
SMF ALTERNATIVES	
PREFERRED SMF	
FPC SITES	
EXISTING PROPERTY LINES	
PROPOSED R/W LINE	
EXISTING R/W LINE	
CROSS DRAIN	

REVISIONS				Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765 P 407.971.8850	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO. 5A
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					301	HILLSBOROUGH PASCO	255796-1	

BASIN MAPS



DRAFT

COPART OF CONNECTICUT, INC.
U-03-28-20-ZZZ-000001-95130.0

EASEMENT TO EXISTING BORROW PIT
0.49 AC.

COPART OF CONNECTICUT, INC.
U-03-28-20-ZZZ-000001-95260.0

SMF 4C (SHARED USE)
EXPANSION OF
EXISTING BORROW PIT
UNDER PERMIT
NO. 43-43594-2
(41.57 AC.)

SEE SHEET 5A

LEGEND	
PUBLIC LANDS	
SMF ALTERNATIVES	
PREFERRED SMF	
FPC SITES	
EXISTING PROPERTY LINES	
PROPOSED R/W LINE	
EXISTING R/W LINE	
CROSS DRAIN	

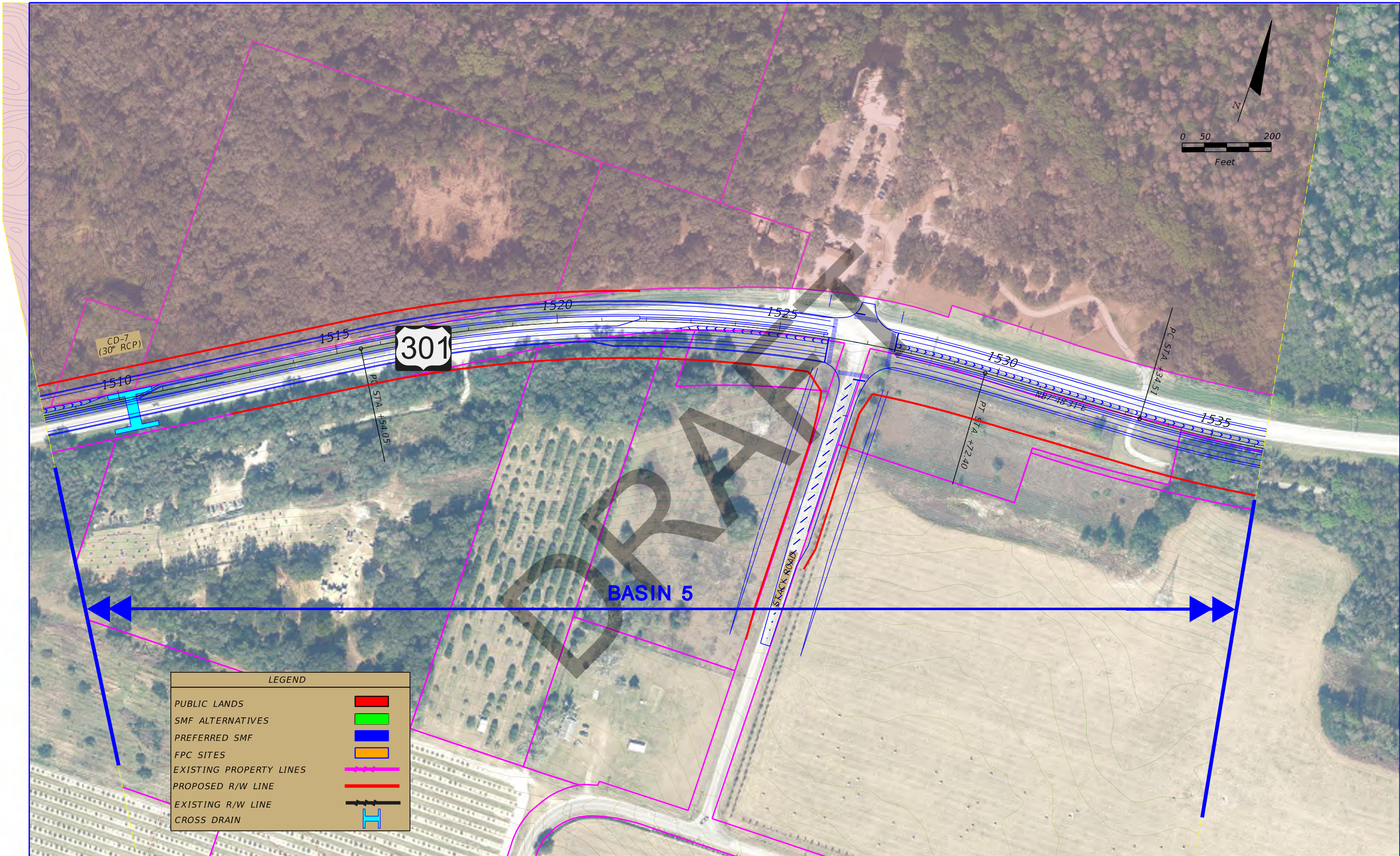
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Inwood Consulting Engineers, Inc.
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P 407.971.8850

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
301	HILLSBOROUGH PASCO	255796-1

BASIN MAPS

SHEET NO.
6



LEGEND	
PUBLIC LANDS	
SMF ALTERNATIVES	
PREFERRED SMF	
FPC SITES	
EXISTING PROPERTY LINES	
PROPOSED R/W LINE	
EXISTING R/W LINE	
CROSS DRAIN	

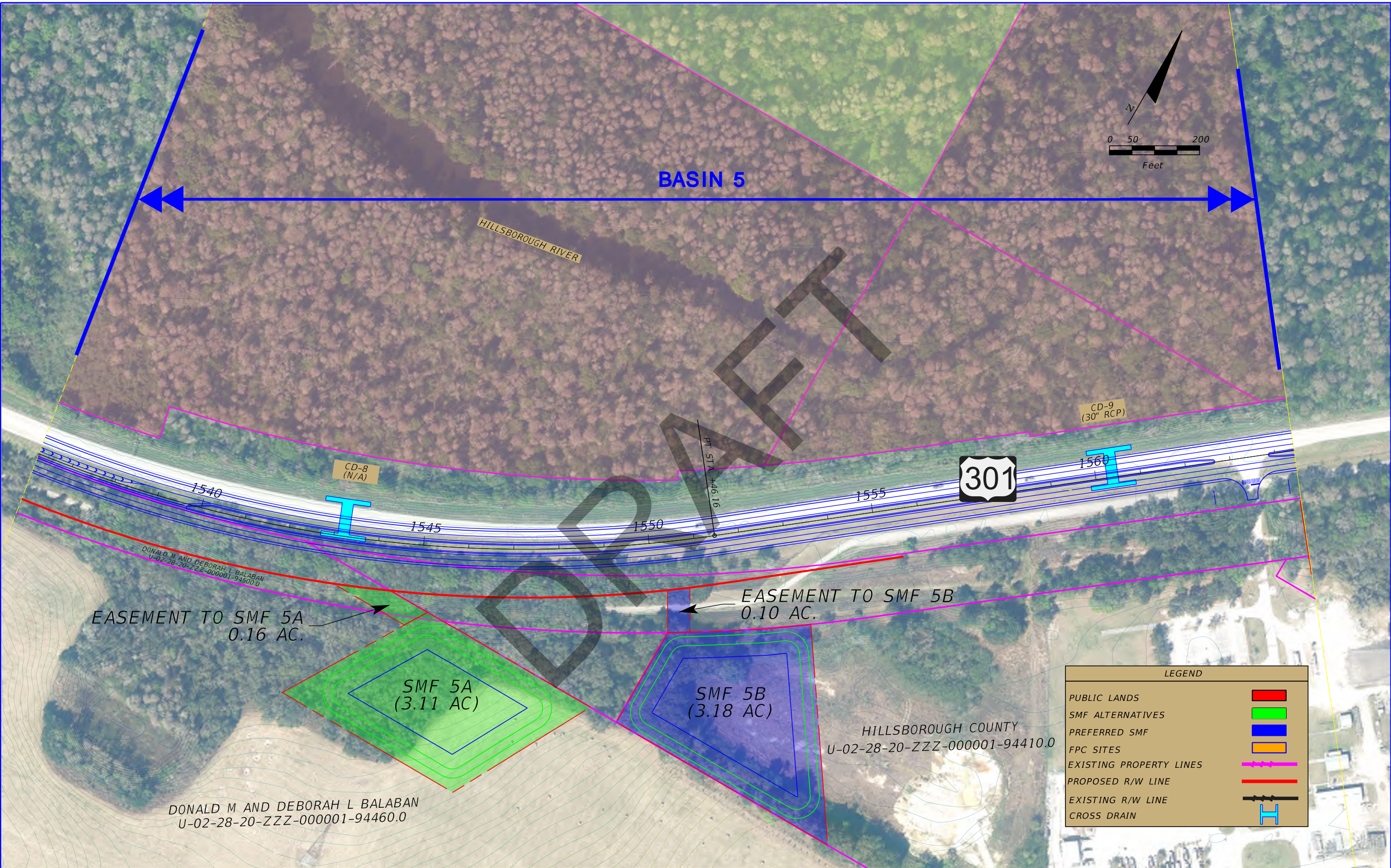
REVISIONS	
DATE	DESCRIPTION

Inwood Consulting Engineers, Inc.
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
301	HILLSBOROUGH PASCO	255796-1

BASIN MAPS

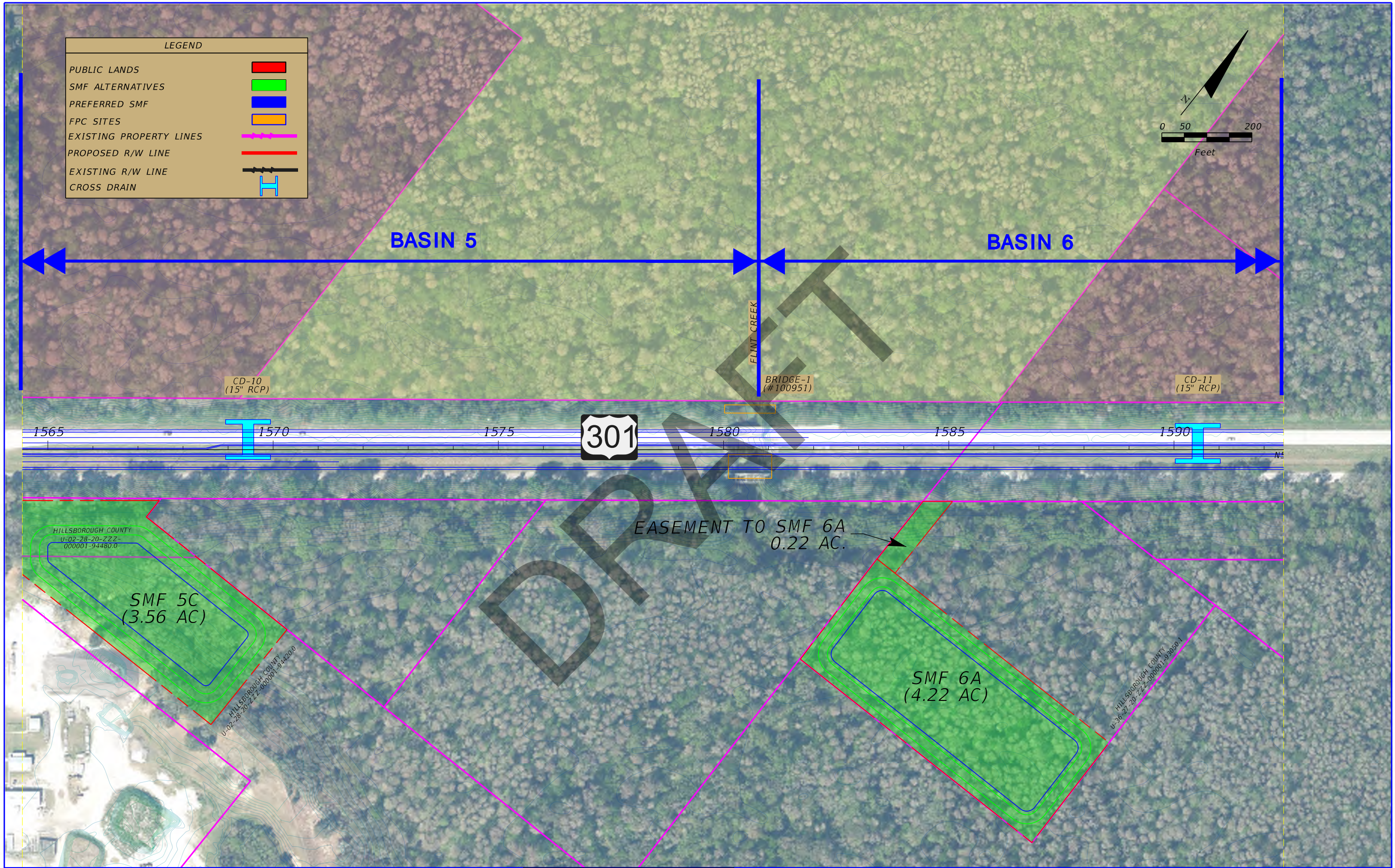
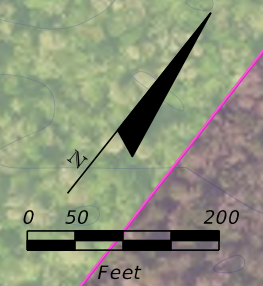
SHEET NO.
7



REVISIONS				Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765 P 407.971.8850	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO. 8
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					301	HILLSBOROUGH PASCO	255796-1	

BASIN MAPS

LEGEND	
PUBLIC LANDS	
SMF ALTERNATIVES	
PREFERRED SMF	
FPC SITES	
EXISTING PROPERTY LINES	
PROPOSED R/W LINE	
EXISTING R/W LINE	
CROSS DRAIN	











REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

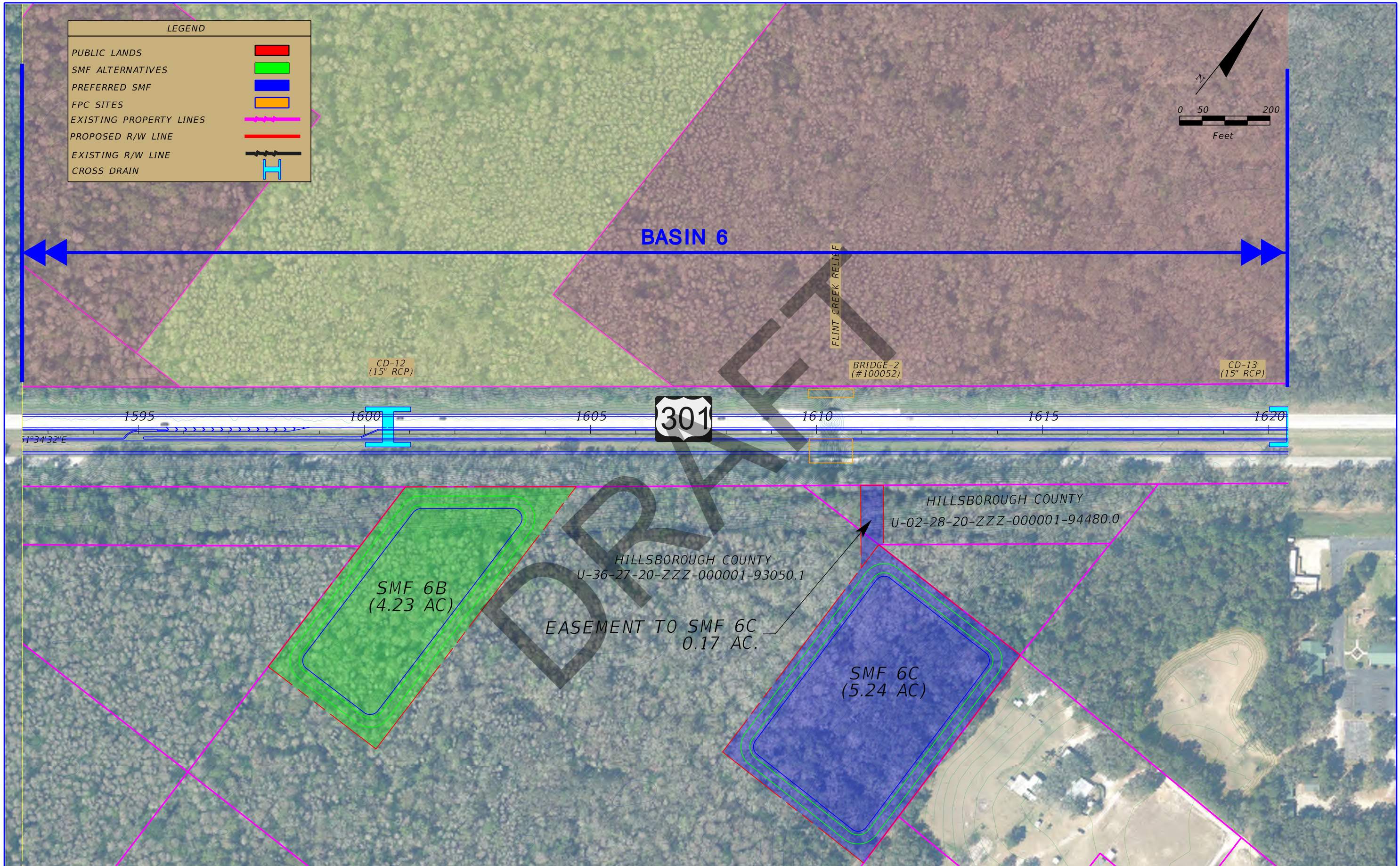
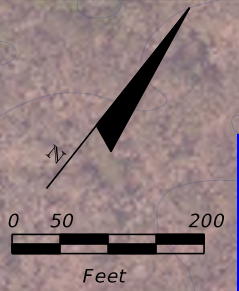
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 P 407.971.8850

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
301	HILLSBOROUGH PASCO	255796-1

BASIN MAPS

SHEET NO.
9

LEGEND	
PUBLIC LANDS	
SMF ALTERNATIVES	
PREFERRED SMF	
FPC SITES	
EXISTING PROPERTY LINES	
PROPOSED R/W LINE	
EXISTING R/W LINE	
CROSS DRAIN	



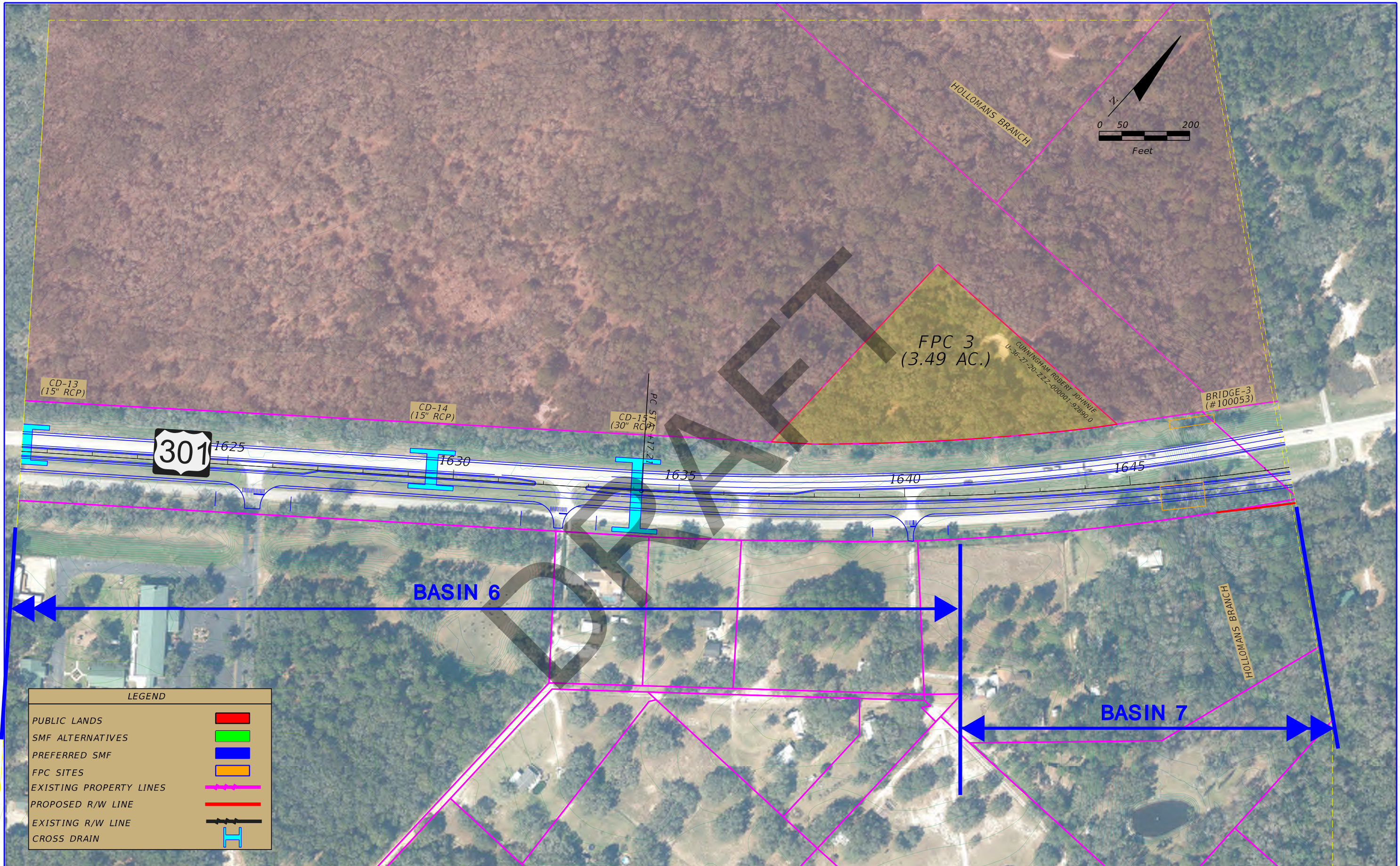
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Inwood Consulting Engineers, Inc.
 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765
 P 407.971.8850

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
301	HILLSBOROUGH PASCO	255796-1

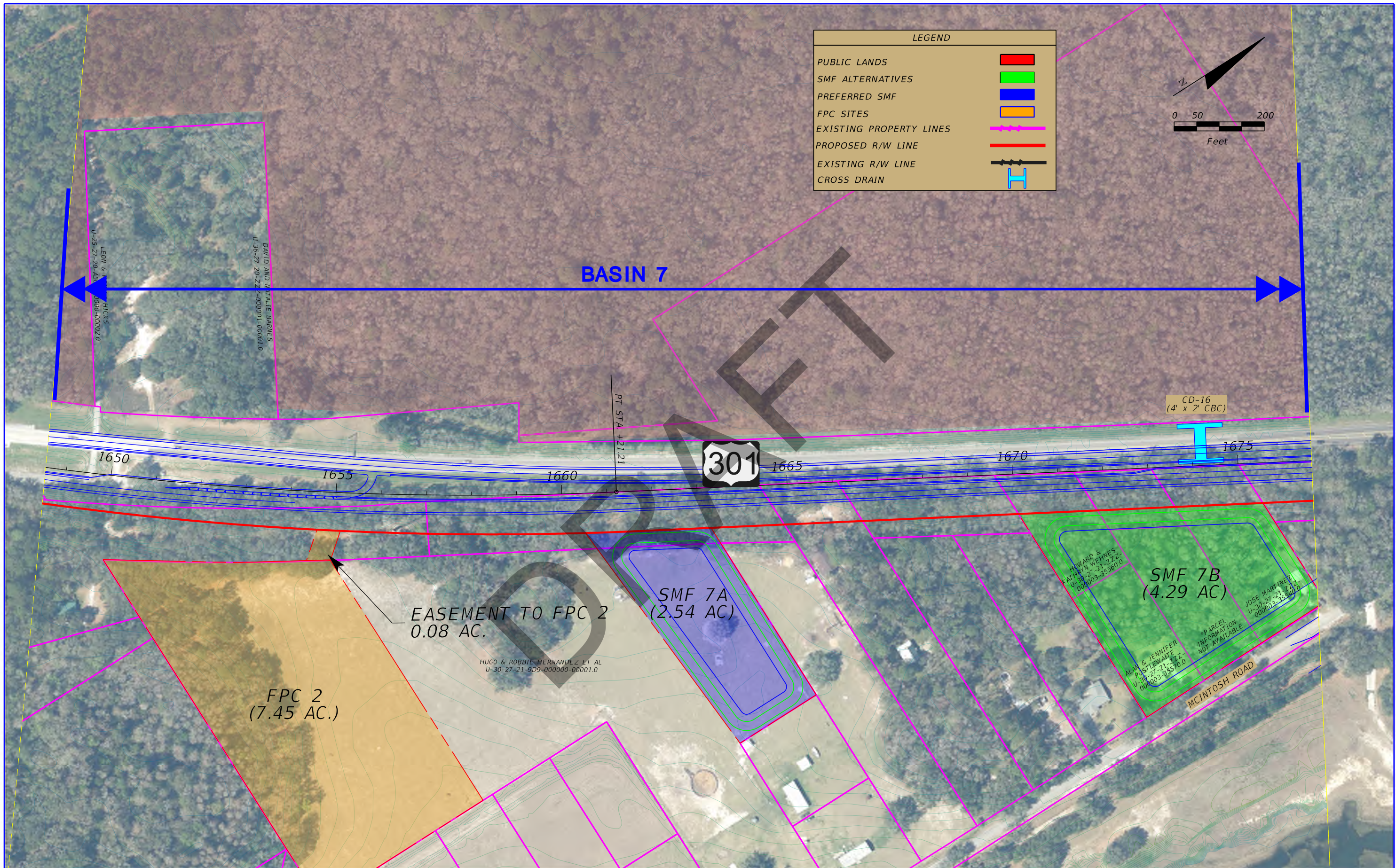
BASIN MAPS

SHEET NO.
10



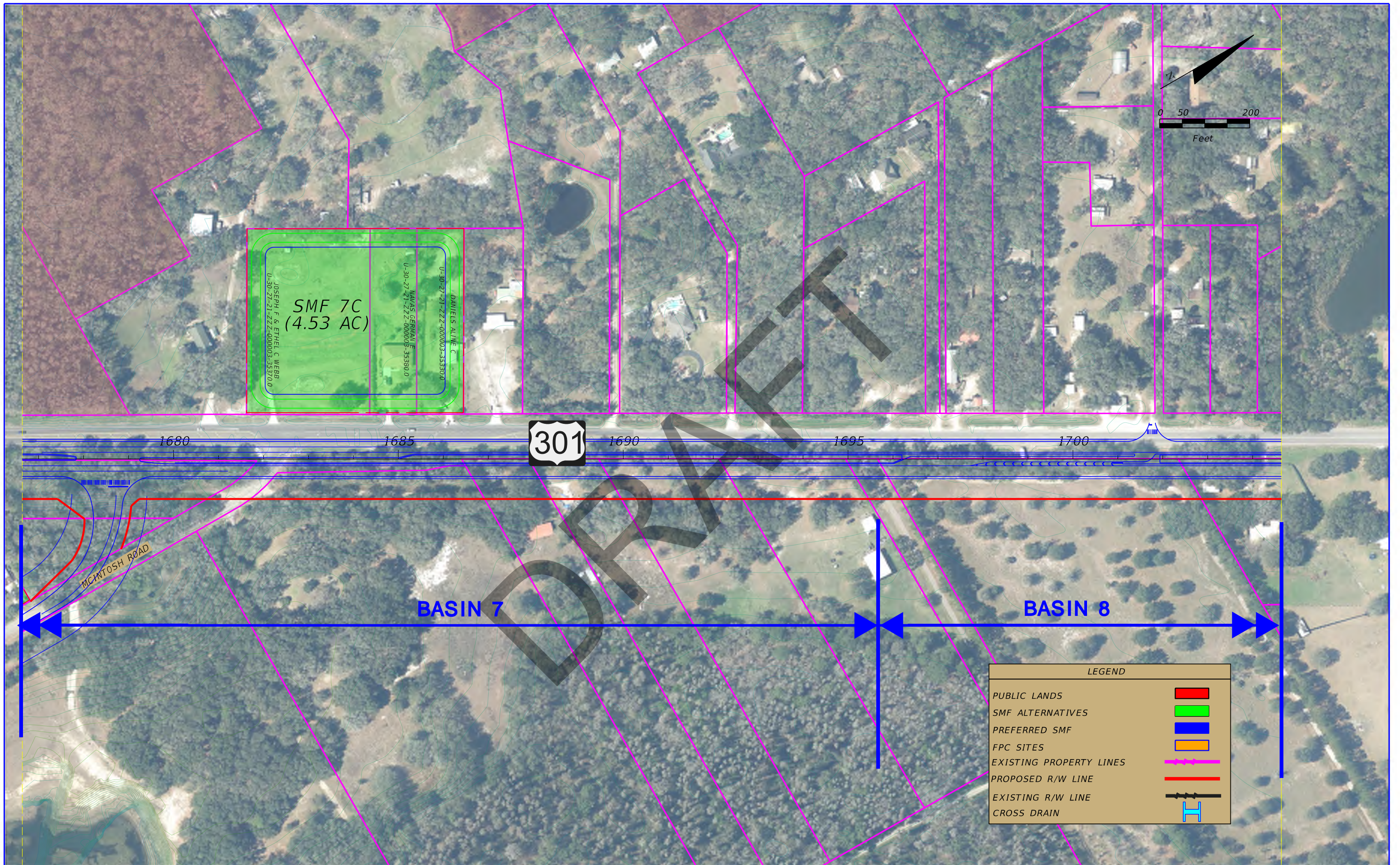
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PUBLIC LANDS	
SMF ALTERNATIVES	
PREFERRED SMF	
FPC SITES	
EXISTING PROPERTY LINES	
PROPOSED R/W LINE	
EXISTING R/W LINE	
CROSS DRAIN	

REVISIONS				Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765 P 407.971.8850	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					301	HILLSBOROUGH PASCO	255796-1	



REVISIONS				Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765 P 407.971.8850	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO. 12
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					301	HILLSBOROUGH PASCO	255796-1	

BASIN MAPS



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
301	HILLSBOROUGH PASCO	255796-1

BASIN MAPS

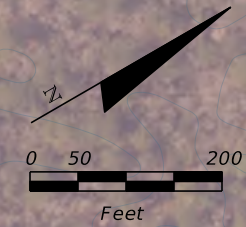
SHEET NO.
13

TUGGLE MARGARET LIFE ESTATE
U-19-27-21-ZZZ-000003-28580.0

FPC 5
(25.47 AC.)

EDWARD D COSGROVE
U-19-27-21-ZZZ-000003-28570.0

SEE SHEET 14A



BASIN 8

SMF 8B
(2.45 AC)

CD-17
(10' x 6' CBC)

CD-18
(9' x 6' CBC)

1705 1710 1715 1720 1725 1730



SMF 8A
(2.70 AC)

BROWN HAMMOCK LTD LLLP
U-19-27-21-ZZZ-000003-28510.0

LEGEND

- PUBLIC LANDS
- SMF ALTERNATIVES
- PREFERRED SMF
- FPC SITES
- EXISTING PROPERTY LINES
- PROPOSED R/W LINE
- EXISTING R/W LINE
- CROSS DRAIN






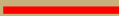


REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

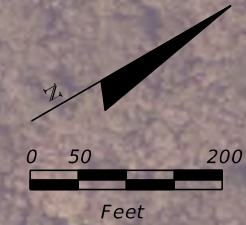
Inwood Consulting Engineers, Inc.
3000 Dovera Drive, Suite 200, Oviedo, Florida 32765
P 407.971.8850

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
301	HILLSBOROUGH PASCO	255796-1

BASIN MAPS

SHEET NO.
14

LEGEND	
PUBLIC LANDS	
SMF ALTERNATIVES	
PREFERRED SMF	
FPC SITES	
EXISTING PROPERTY LINES	
PROPOSED R/W LINE	
EXISTING R/W LINE	
CROSS DRAIN	



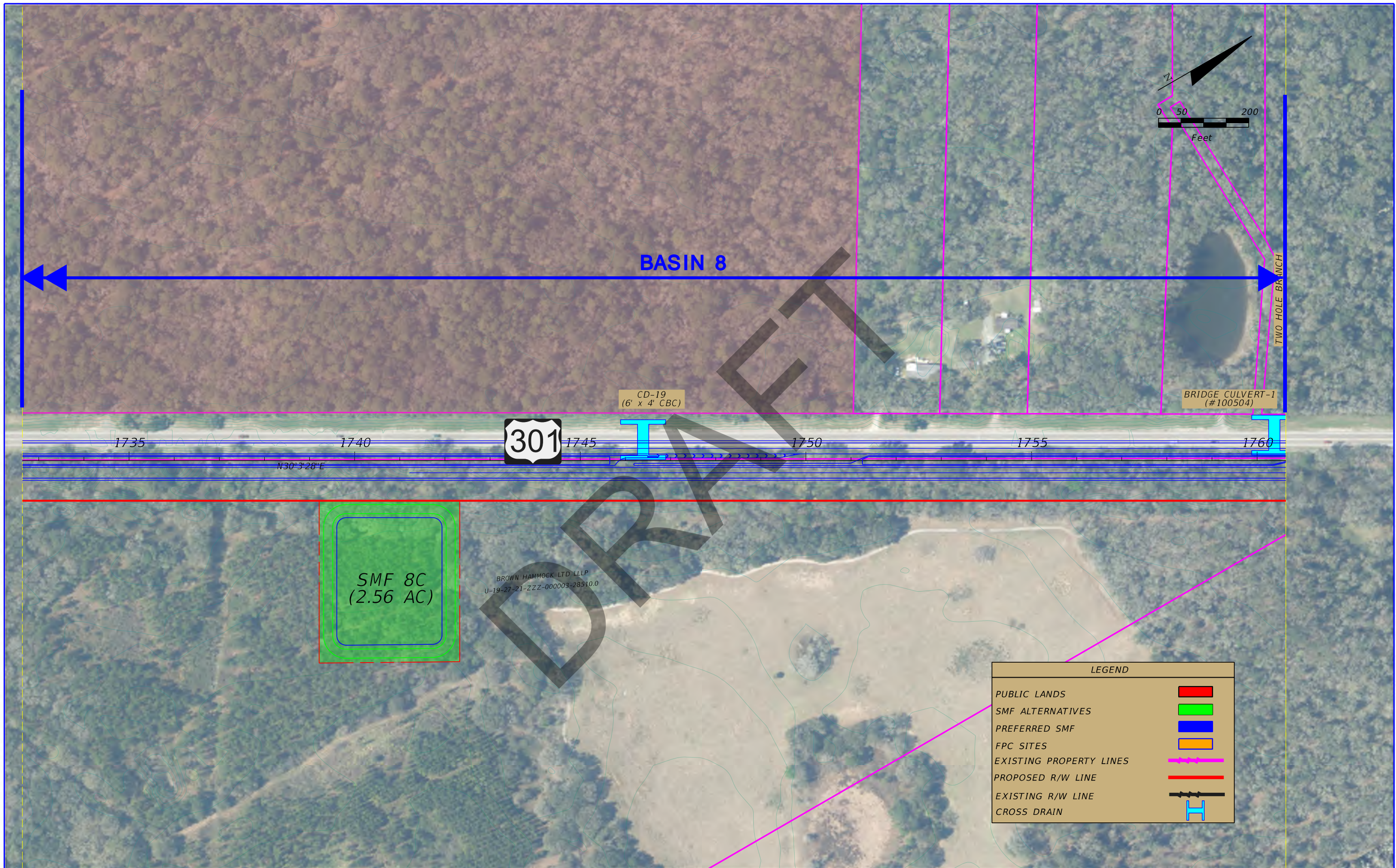
DRAFT

FPC 5
(25.47 AC.)

EDWARD D. COSGROVE
U-19-27-21-ZZZ-000003-28570.0

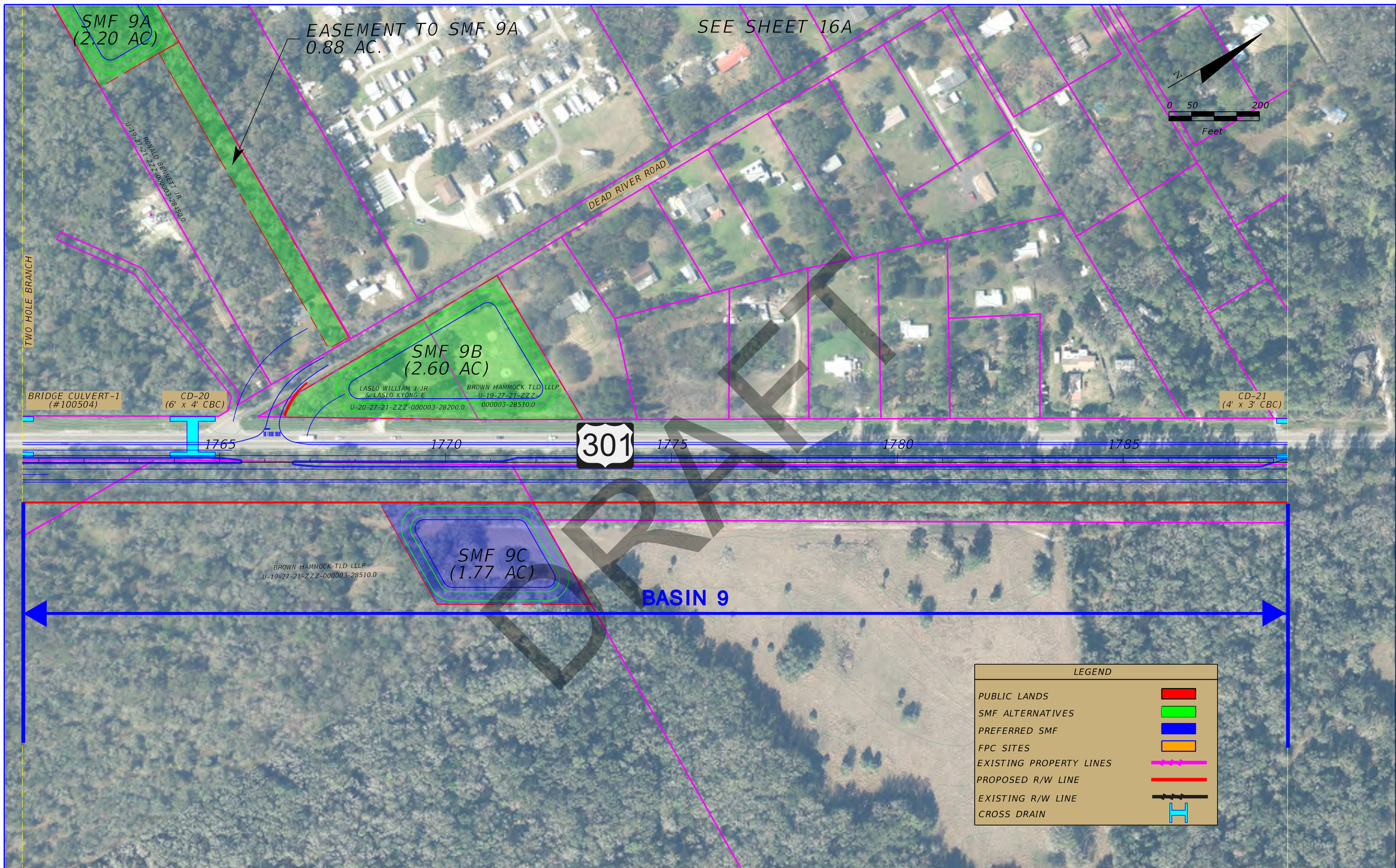
SEE SHEET 14

REVISIONS				Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765 P 407.971.8850	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			BASIN MAPS	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		14A
						301	HILLSBOROUGH PASCO		255796-1











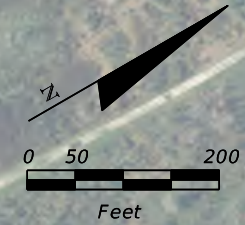
REVISIONS				Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765 P 407.971.8850	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO. 15
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					301	HILLSBOROUGH PASCO	255796-1	

BASIN MAPS



REVISIONS				Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765 P 407.971.8850	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO. 16
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					301	HILLSBOROUGH PASCO	255796-1	

LEGEND	
PUBLIC LANDS	
SMF ALTERNATIVES	
PREFERRED SMF	
FPC SITES	
EXISTING PROPERTY LINES	
PROPOSED R/W LINE	
EXISTING R/W LINE	
CROSS DRAIN	



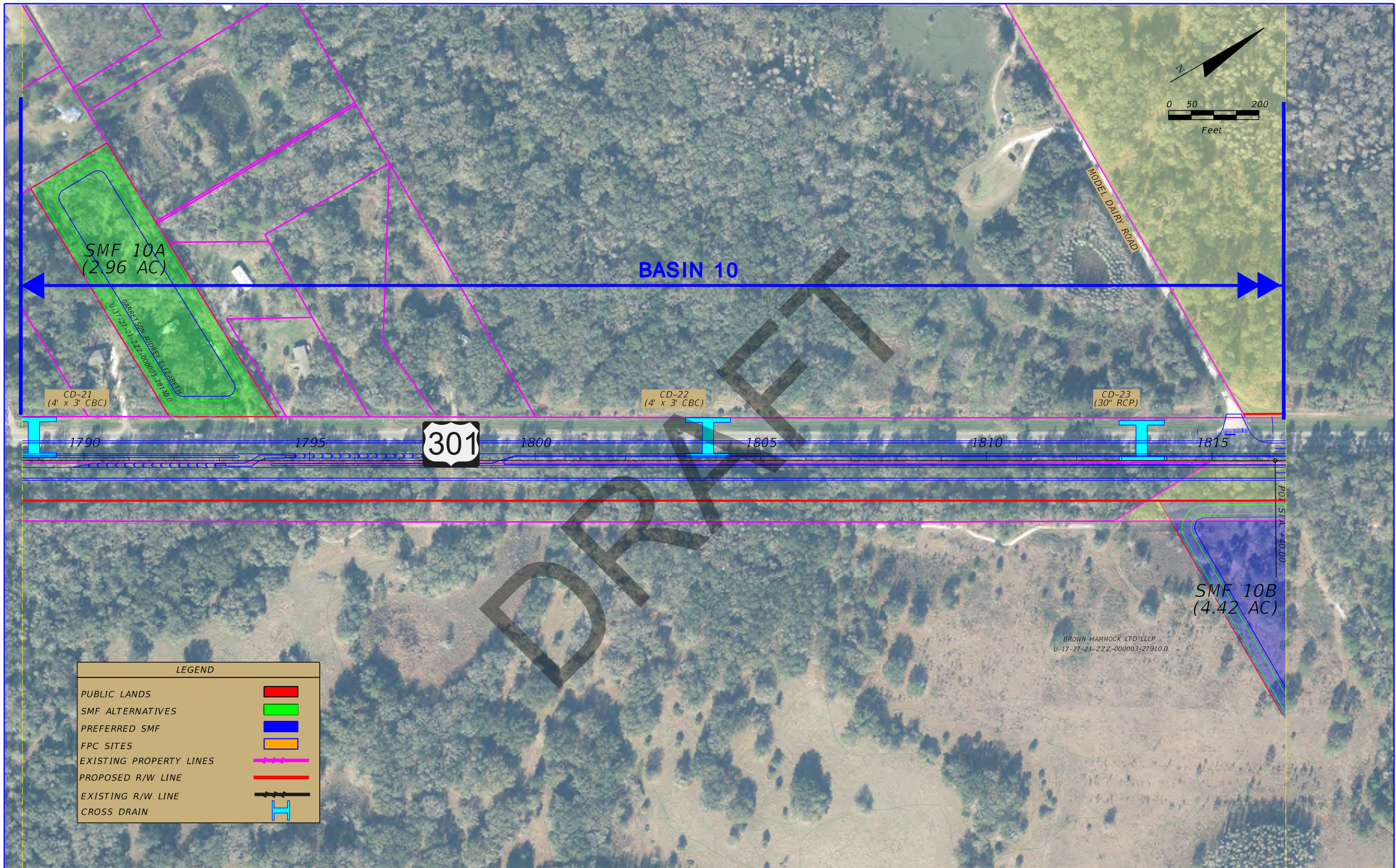
DRAFT

U-19-27-21-22-000003-284500
 RONALD BENNETT JR.
 SMF 9A
 (2.20 AC)

SEE SHEET 16

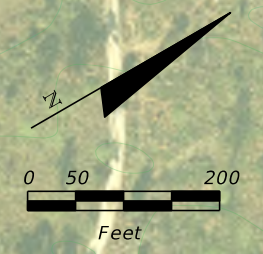
REVISIONS				STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
				301	HILLSBOROUGH PASCO	255796-1	16

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REVISIONS				STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
				301	HILLSBOROUGH PASCO	255796-0-1	17

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 P 407.971.8850



BASIN 10

BASIN 11

CD-24
(4' x 3' CBC)

CD-25
(30" RCP)



1820

1825

1830

1835

1840

POI STA +31.86

U-08-27-21

SMF 10B
(4.42 AC)

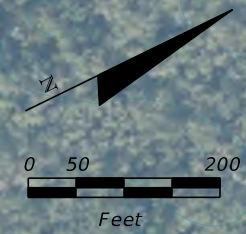
BROWN HAMMOCK LTD LLLP
U-17-27-21-ZZZ-000003-27910.0

DRAFT

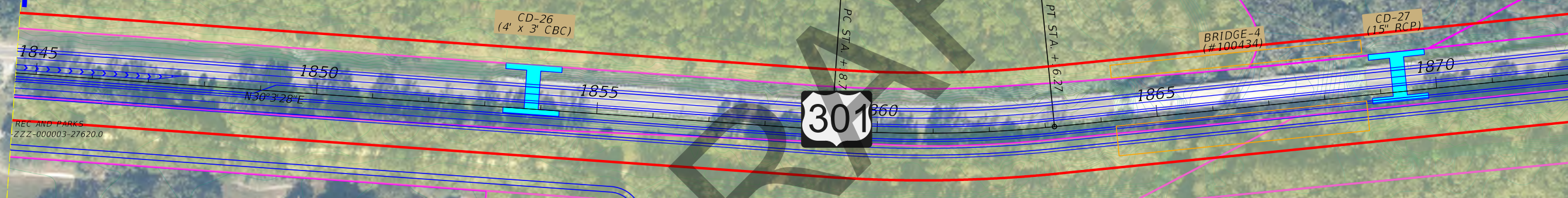
LEGEND	
PUBLIC LANDS	
SMF ALTERNATIVES	
PREFERRED SMF	
FPC SITES	
EXISTING PROPERTY LINES	
PROPOSED R/W LINE	
EXISTING R/W LINE	
CROSS DRAIN	

REVISIONS				Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765 P 407.971.8850	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO. 18
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					301	HILLSBOROUGH PASCO	255796-1	

BASIN 12



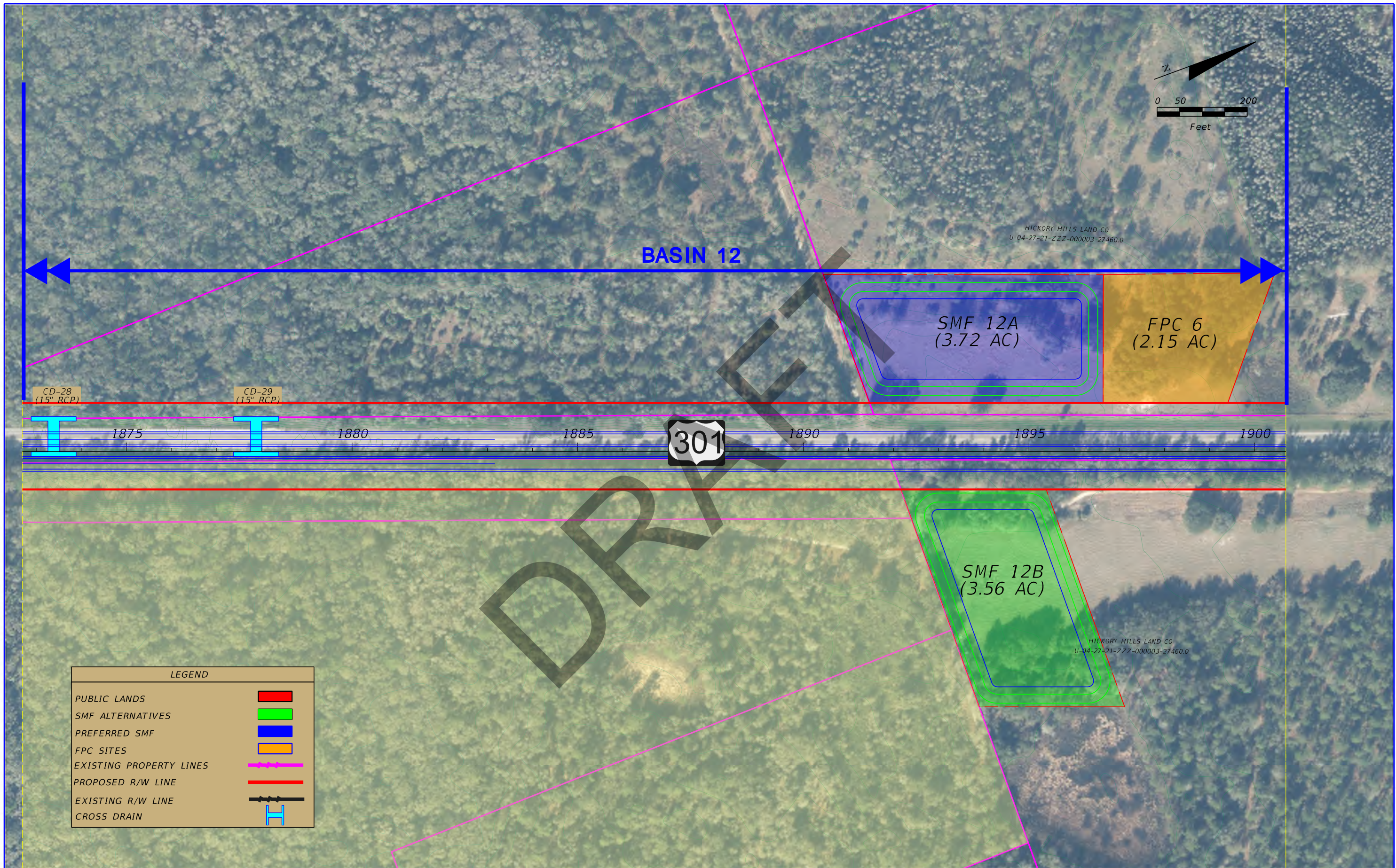
DRAFT



REC AND PARKS
ZZZ-000003-27620.0

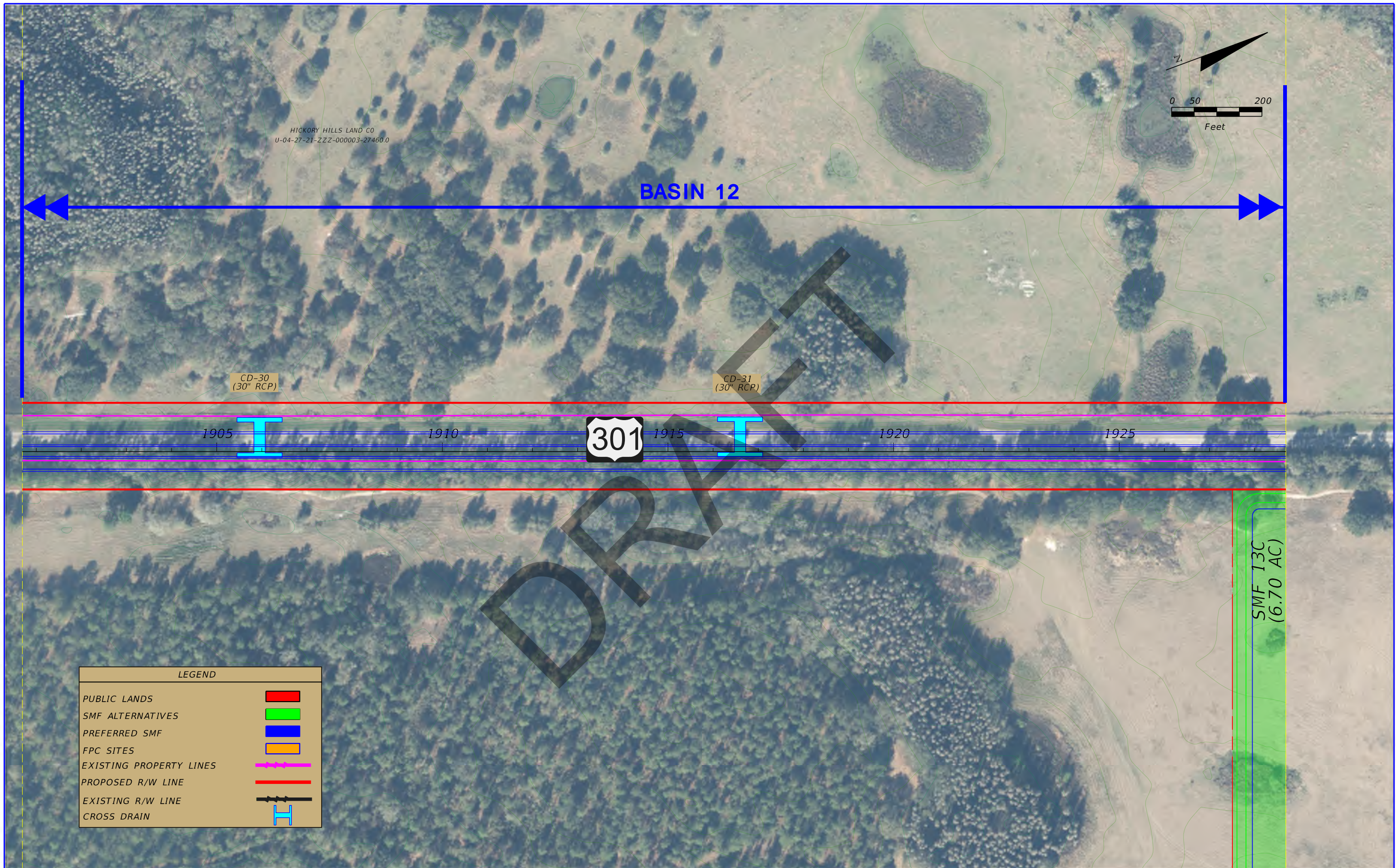
LEGEND	
PUBLIC LANDS	
SMF ALTERNATIVES	
PREFERRED SMF	
FPC SITES	
EXISTING PROPERTY LINES	
PROPOSED R/W LINE	
EXISTING R/W LINE	
CROSS DRAIN	

REVISIONS				Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765 P 407.971.8850	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO. 19
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					301	HILLSBOROUGH PASCO	255796-1	



REVISIONS				STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
				301	HILLSBOROUGH PASCO	255796-1	20

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P 407.971.8850



HICKORY HILLS LAND CO
U-04-27-21-ZZZ-000003-27460.0

BASIN 12

CD-30
(30" RCP)

CD-31
(30" RCP)

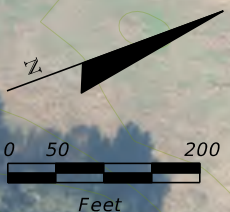
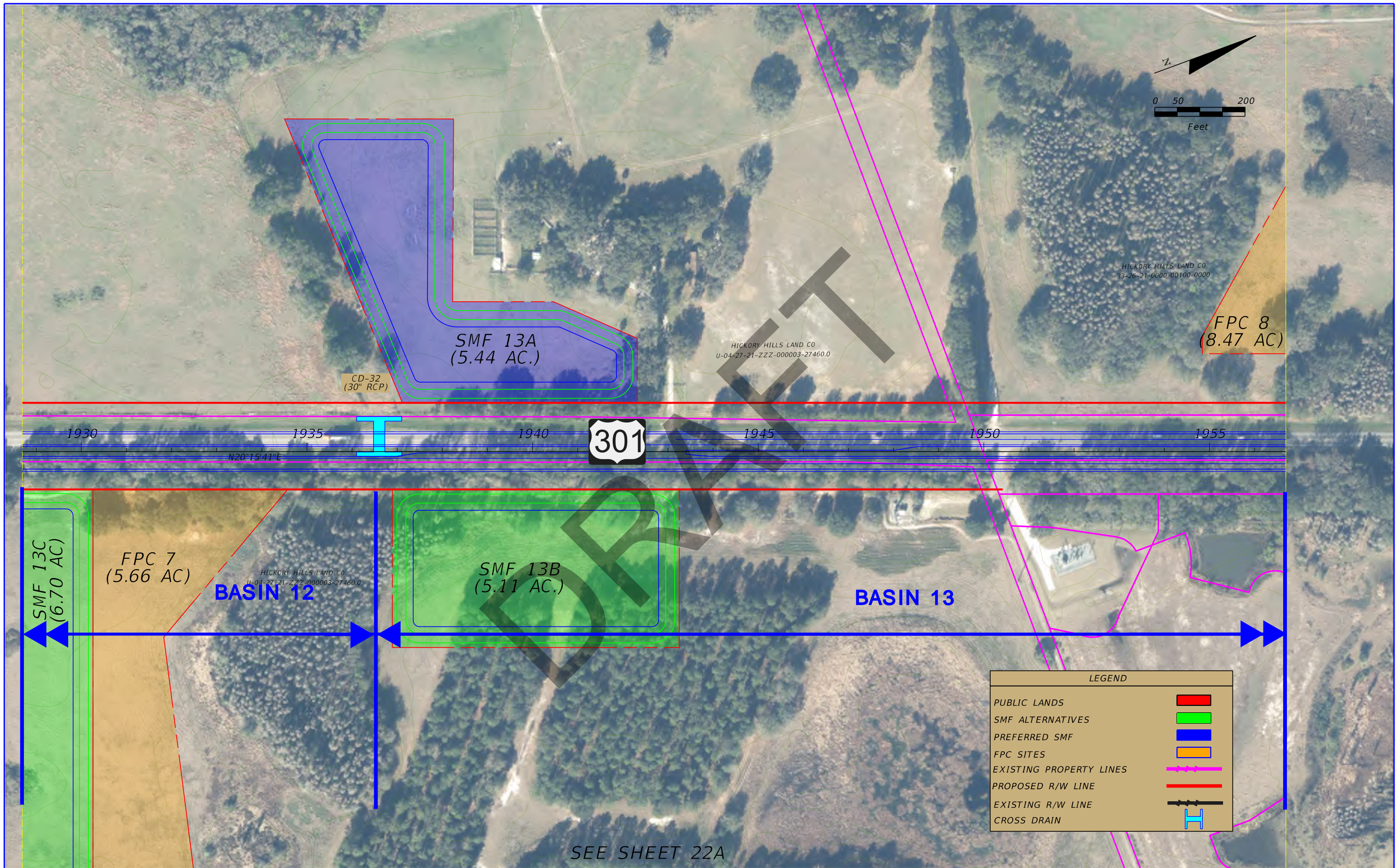
301

SMF 13C
(6.70 AC)

LEGEND	
PUBLIC LANDS	
SMF ALTERNATIVES	
PREFERRED SMF	
FPC SITES	
EXISTING PROPERTY LINES	
PROPOSED R/W LINE	
EXISTING R/W LINE	
CROSS DRAIN	

REVISIONS				Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765 P 407.971.8850	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO. 21
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					301	HILLSBOROUGH PASCO	255796-1	

BASIN MAPS



301

LEGEND	
PUBLIC LANDS	
SMF ALTERNATIVES	
PREFERRED SMF	
FPC SITES	
EXISTING PROPERTY LINES	
PROPOSED R/W LINE	
EXISTING R/W LINE	
CROSS DRAIN	

SEE SHEET 22A

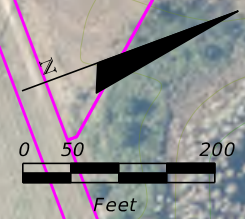
REVISIONS				Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765 P 407.971.8850	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			BASIN MAPS SHEET NO. 22
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					301	HILLSBOROUGH PASCO	255796-1	

SEE SHEET 22

SMF 13C
(6.70 AC)

FPC 7
(5.66 AC)

HICKORY HILLS LAND CO
U-04-27-21-ZZZ-000003-27460.0



DRAFT

LEGEND	
PUBLIC LANDS	
SMF ALTERNATIVES	
PREFERRED SMF	
FPC SITES	
EXISTING PROPERTY LINES	
PROPOSED R/W LINE	
EXISTING R/W LINE	
CROSS DRAIN	

REVISIONS		DATE	DESCRIPTION	Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765 P 407.971.8850	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO. 22A
DATE	DESCRIPTION				ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					301	HILLSBOROUGH PASCO	255796-1	

BASIN MAPS



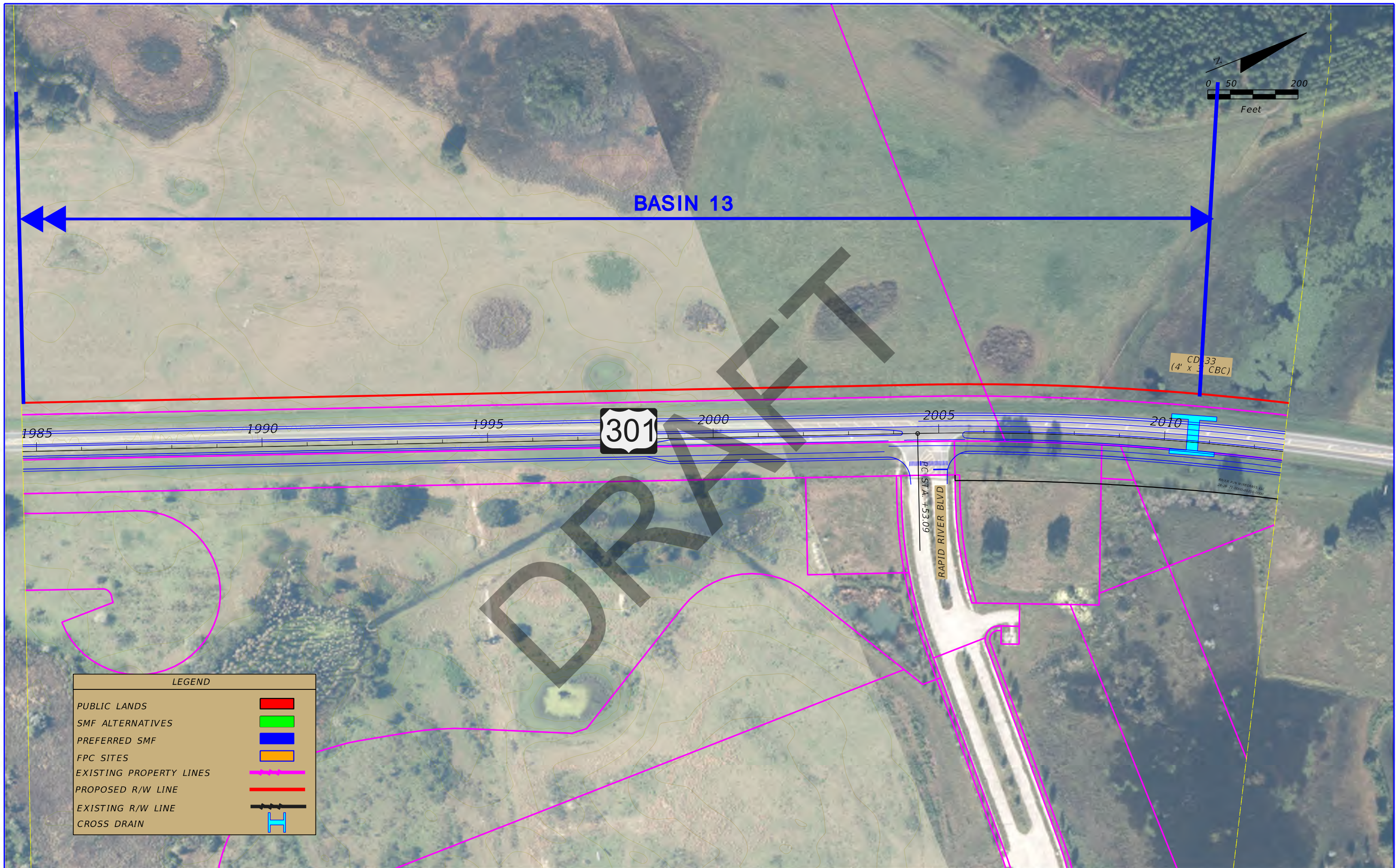
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Inwood Consulting Engineers, Inc.
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
301	HILLSBOROUGH PASCO	255796-1

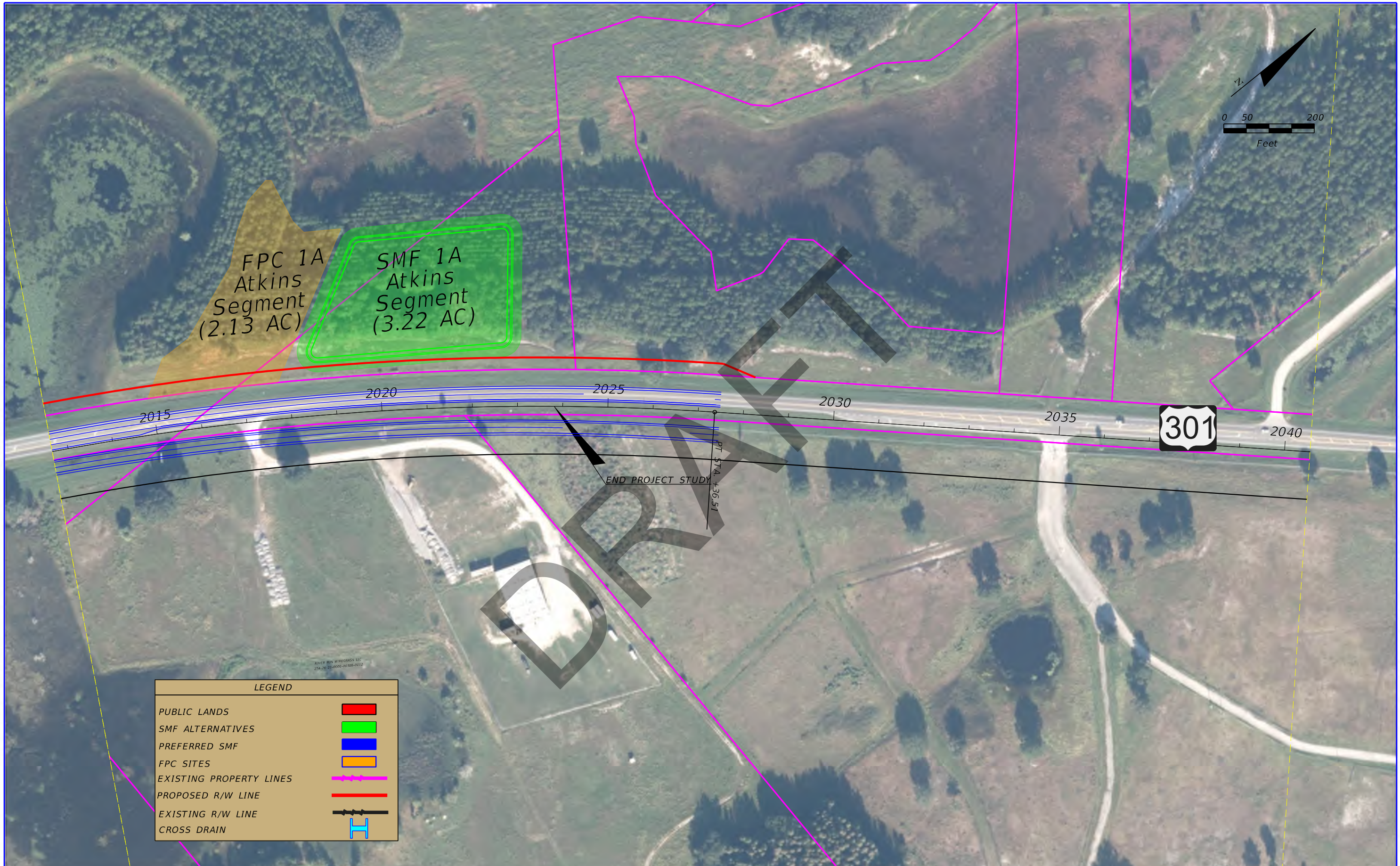
BASIN MAPS

SHEET NO.
23



REVISIONS				STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
				301	HILLSBOROUGH PASCO	255796-1	24

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LEGEND	
PUBLIC LANDS	
SMF ALTERNATIVES	
PREFERRED SMF	
FPC SITES	
EXISTING PROPERTY LINES	
PROPOSED R/W LINE	
EXISTING R/W LINE	
CROSS DRAIN	

REVISIONS				Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200, Oviedo, Florida 32765 P 407.971.8850	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO. 25
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					301	HILLSBOROUGH PASCO	255796-1	

APPENDIX C

Pond Design Calculations

DRAFT



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 (407) 971-8850 (phone)
 (407) 971-8955 (fax)

Made by: ZKE
 Checked by: REC

DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **1**
 POND NAME : **1A**

Station Limits: From: **1360+00** Roadway Length = 3000 ft
 To: **1390+00** R/W Width = 200 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 2.34 ac
 Pervious Roadway Area: 11.43 ac
 Total Roadway Area: 13.77 ac

Pond Area: Pervious Pond Area = 1.74 ac

Total Area: Impervious Area: 2.34 ac
 Pervious Area: 13.17 ac
 Total Area: 15.51 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.34 ac	229.5
Open Space (lawns, parks, golf courses, cemeteries,	A	39	11.43 ac	445.9
Residential Areas (2.0 acre, 12% Impervious)	A	46	1.74 ac	79.8
Pasture, grassland or range; Good condition (> 75%	D	80		0.0
Total:			15.51 ac	755.2

CN = Total CN*Area / Total Area = **48.7**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **10.54 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Precipitation (P) =

8.19 in	11.60 in	18.40 in	4.95 in
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Runoff (Q) =

2.23 in	4.50 in	9.89 in	0.60 in
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Permitting Agency Event	FDOT 100yr/24hr	FDOT 100yr/240hr	Storm Sewer Design



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Made by: ZKE
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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **1**
 POND NAME : **1A**

Station Limits: From: **1360+00** Roadway Length = 3000 ft
 To: **1390+00** R/W Width = 200 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	11.0 ft	6	66 ft
Paved Shoulder			0 ft
Imperv. Median			0 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	4	9 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			93 ft

Impervious Roadway Area: 6.42 ac
 Pervious Roadway Area: 7.36 ac
 Total Roadway Area: 13.77 ac

Pond Area: Pervious Pond Area : 1.21 ac
 Water Surface Area: 0.53 ac Wet Pond
 Total Pond Area: 1.74 ac

Total Area: Impervious Area: 6.42 ac
 Pervious Area: 8.56 ac
 Water Surface Area: 0.53 ac
 Total Area: 15.51 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	6.42 ac	629.0
Open Space (lawns, parks, golf courses, cemeteries,	A	39	7.36 ac	286.9
Open Space (lawns, parks, golf courses, cemeteries,	D	80	1.21 ac	96.6
Proposed Ponds (Water Surface)	D	100	0.53 ac	52.7
Total:			15.51 ac	1065.3

CN = Total CN*Area / Total Area = **68.7**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **4.56 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Precipitation (P) = **8.19 in** **11.60 in** **18.40 in** **4.95 in**

Runoff (Q) = **4.48 in** **7.49 in** **13.87 in** **1.90 in**

Permitting Agency Event	FDOT 100yr/24hr	FDOT 100yr/240hr	Storm Sewer Design
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Made by: ZKE
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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **1**
 POND NAME : **1A**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/No
Open/Closed Basin	Closed

Note: Proposed pond alternative accounts for impacted existing swale volume (0.536 ac-ft) per Permit No. 32128

Net New Contr DCIA	2.20 ac
Wet Detention	1.00 in

x Net New DCIA = 0.18 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = **0.18 ac-ft**

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD	FDOT 100yr/24hr	FDOT 100yr/240hr	Storm Sewer Design
Q_{pre} =	2.88 ac-ft	5.81 ac-ft	12.79 ac-ft	0.78 ac-ft
Q_{post} =	5.78 ac-ft	9.68 ac-ft	17.93 ac-ft	2.45 ac-ft
ΔQ =	2.91 ac-ft	3.87 ac-ft	5.14 ac-ft	1.67 ac-ft

Attenuation V_{req} = **5.14 ac-ft** (use largest value)



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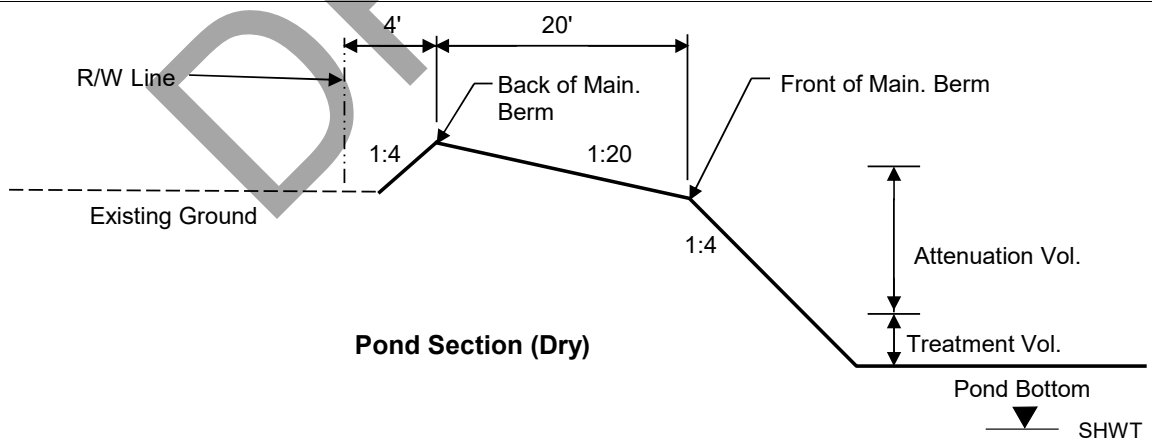
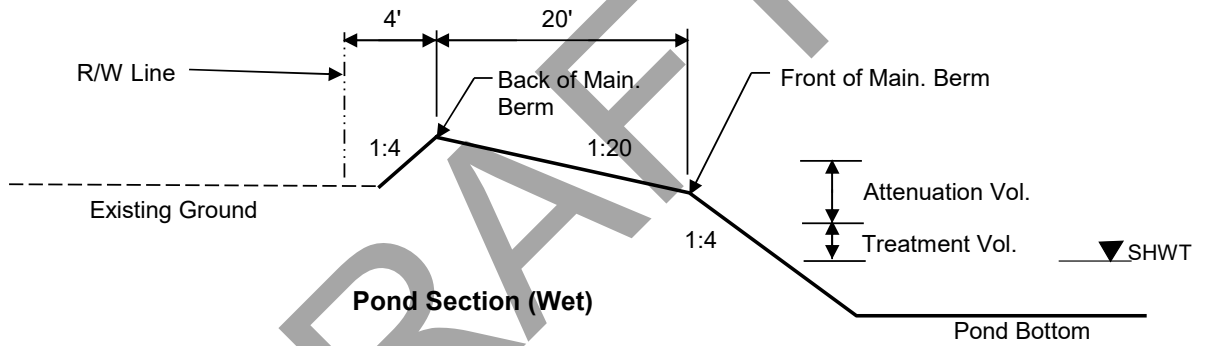
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **1**
 POND NAME : **1A**

Maintenance Area Width =	<u>20.0 ft</u>	@ 1:20	Existing Ground Elevation =	<u>41.00</u>
Pond Tie-In Width =	<u>4.0 ft</u>	@ 1:4	Normal Water Elevation =	<u>33.00</u>
Maximum Storage Depth (SD) =	<u>8.00 ft</u>	with 1.0 ft freeboard	Lowest EOP Elevation =	<u>43.00</u>

Hydraulic Grade Line (HGL) check

HGL Slope =	<u>0.100%</u>	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	<u>2000 ft</u>	
Estimated Energy Losses =	<u>2.0 ft</u>	
HGL Clearance =	<u>1.0 ft</u>	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	<u>40.0 ft</u>	





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Made by: ZKE
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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **1**
 POND NAME : **1A**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
41.00	Pond R/W	1.85 ac	445.0 ft	181.0 ft	
42.00	Back of Main. Berm	1.74 ac	437.0 ft	173.0 ft	8.32 ac-ft
41.00		1.21 ac	397.0 ft	133.0 ft	6.85 ac-ft
41.00	Front of Main. Berm	1.21 ac	397.0 ft	133.0 ft	6.85 ac-ft
40.00	Provided Treat.Vol.+Att.Vol	1.12 ac	389.0 ft	125.0 ft	5.69 ac-ft
39.80	Req'd Treat.Vol+Att. Vol	1.10 ac	387.4 ft	123.4 ft	5.47 ac-ft
36.00	Estimated Storm Sewer TW	0.76 ac	357.0 ft	93.0 ft	1.93 ac-ft
33.40	Top of Treatment Vol.	0.56 ac	336.2 ft	72.2 ft	0.22 ac-ft
33.00	Normal Water Level	0.53 ac	333.0 ft	69.0 ft	0.00 ac-ft
31.00		0.39 ac	317.0 ft	53.0 ft	
27.00	Pond Bottom	0.15 ac	309.0 ft	21.0 ft	

Required Treatment+Attenuation Vol.= 5.33 ac-ft
 Required Treatment+Attenuation Stage= 39.80 ft

Provided Treatment+Attenuation Vol.= 5.69 ac-ft
 Provided Treatment+Attenuation Stage= 40.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.85 ac-ft
 Estimated Storm Sewer TW EL.= 36.00 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.22 ac



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **1**
 POND NAME : **1B**

Station Limits: From: **1360+00** Roadway Length = 3000 ft
 To: **1390+00** R/W Width = 200 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 2.34 ac
 Pervious Roadway Area: 11.43 ac
 Total Roadway Area: 13.77 ac

Pond Area: Pervious Pond Area = 1.58 ac

Total Area: Impervious Area: 2.34 ac
 Pervious Area: 13.01 ac
 Total Area: 15.35 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.34 ac	229.5
Open Space (lawns, parks, golf courses, cemeteries,	A	39	11.43 ac	445.9
Residential Areas (2.0 acre, 12% Impervious)	A	46	1.58 ac	72.6
Pasture, grassland or range; Good condition (> 75%	D	80		0.0
Total:			15.35 ac	748.0

CN = Total CN*Area / Total Area = **48.7**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **10.53 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Permitting Agency Event	FDOT 100yr/24hr	FDOT 100yr/240hr	Storm Sewer Design
Precipitation (P) =	8.19 in	11.60 in	4.95 in

Runoff (Q) =	2.23 in	4.50 in	9.90 in	0.61 in
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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **1**
 POND NAME : **1B**

Station Limits: From: **1360+00** Roadway Length = 3000 ft
 To: **1390+00** R/W Width = 200 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	11.0 ft	6	66 ft
Paved Shoulder			0 ft
Imperv. Median			0 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	4	9 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			93 ft

Impervious Roadway Area: 6.42 ac
 Pervious Roadway Area: 7.36 ac
 Total Roadway Area: 13.77 ac

Pond Area: Pervious Pond Area : 1.03 ac
 Water Surface Area: 0.55 ac **Wet Pond**
 Total Pond Area: 1.58 ac

Total Area: Impervious Area: 6.42 ac
 Pervious Area: 8.38 ac
 Water Surface Area: 0.55 ac
 Total Area: 15.35 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	6.42 ac	629.0
Open Space (lawns, parks, golf courses, cemeteries,	A	39	7.36 ac	286.9
Open Space (lawns, parks, golf courses, cemeteries,	D	80	1.03 ac	82.1
Proposed Ponds (Water Surface)	D	100	0.55 ac	55.3
Total:			15.35 ac	1053.3

CN = Total CN*Area / Total Area = **68.6**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **4.58 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Precipitation (P) = **8.19 in** **11.60 in** **18.40 in** **4.95 in**

Runoff (Q) = **4.47 in** **7.48 in** **13.86 in** **1.89 in**

Permitting Agency Event	FDOT 100yr/24hr	FDOT 100yr/240hr	Storm Sewer Design
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Made by: ZKE
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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **1**
 POND NAME : **1B**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/No
Open/Closed Basin	Closed

Note: Proposed pond alternative accounts for impacted existing swale volume (0.536 ac-ft) per Permit No. 32128

Net New Contr DCIA	2.20 ac
Wet Detention	1.00 in

x Impervious Areas = 0.18 ac-ft		

Treatment V_{req} = Largest of Trt. Vol. = **0.18 ac-ft**

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD	FDOT 100yr/24hr	FDOT 100yr/240hr	Storm Sewer Design
Q_{pre} =	2.85 ac-ft	5.76 ac-ft	12.67 ac-ft	0.77 ac-ft
Q_{post} =	5.71 ac-ft	9.57 ac-ft	17.73 ac-ft	2.42 ac-ft
ΔQ =	2.86 ac-ft	3.81 ac-ft	5.06 ac-ft	1.64 ac-ft

Attenuation V_{req} = **5.06 ac-ft** (use largest value)



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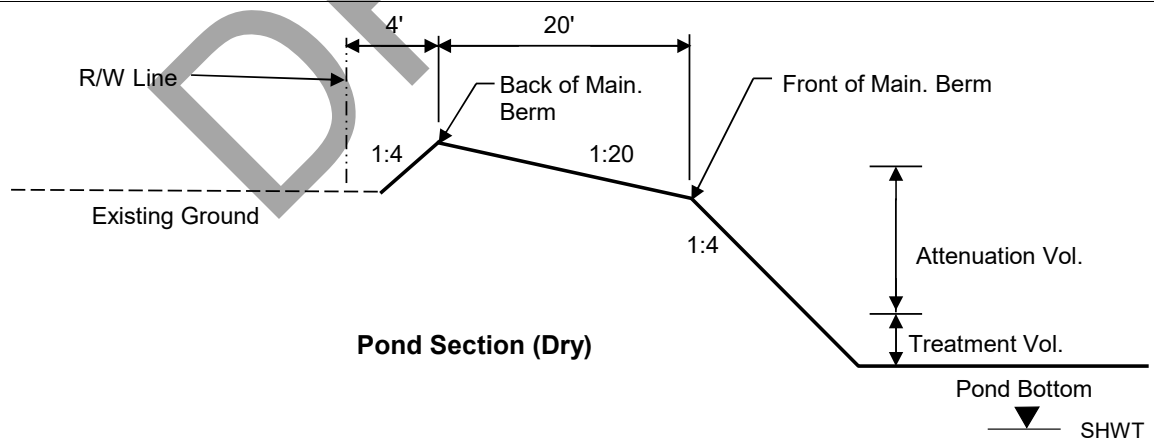
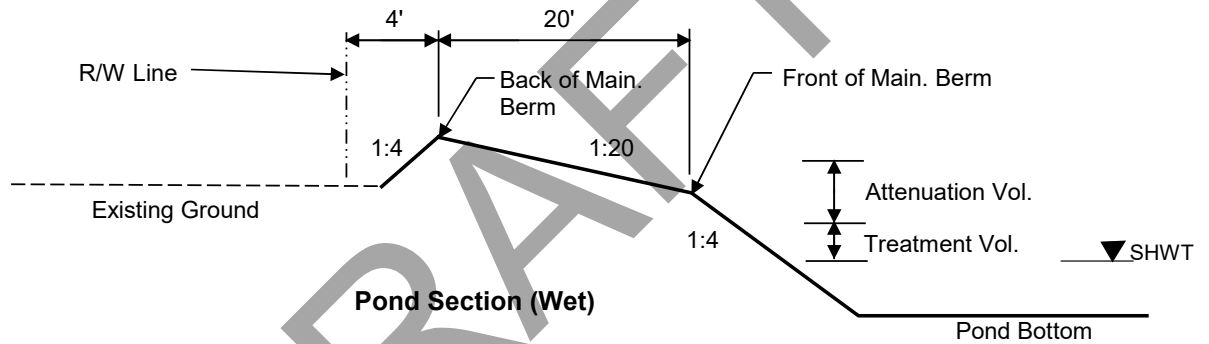
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **1**
 POND NAME : **1B**

Maintenance Area Width =	<u>20.0 ft</u>	@ 1:20	Existing Ground Elevation =	<u>43.00</u>
Pond Tie-In Width =	<u>4.0 ft</u>	@ 1:4	Normal Water Elevation =	<u>33.00</u>
Maximum Storage Depth (SD) =	<u>8.00 ft</u>	with 1.0 ft freeboard	Lowest EOP Elevation =	<u>43.00</u>

Hydraulic Grade Line (HGL) check

HGL Slope =	<u>0.100%</u>	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	<u>2000 ft</u>	
Estimated Energy Losses =	<u>2.0 ft</u>	
HGL Clearance =	<u>1.0 ft</u>	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	<u>40.0 ft</u>	





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Made by: ZKE
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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **1**
 POND NAME : **1B**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
43.00	Pond R/W	1.68 ac	325.0 ft	225.0 ft	
42.00	Back of Main. Berm	1.58 ac	317.0 ft	217.0 ft	7.95 ac-ft
41.50		1.34 ac	297.0 ft	197.0 ft	7.22 ac-ft
41.00	Front of Main. Berm	1.13 ac	277.0 ft	177.0 ft	6.61 ac-ft
40.00	Provided Treat.Vol.+Att.Vol	1.04 ac	269.0 ft	169.0 ft	5.52 ac-ft
39.80	Req'd Treat.Vol+Att. Vol	1.03 ac	267.4 ft	167.4 ft	5.31 ac-ft
35.90	Estimated Storm Sewer TW	0.74 ac	236.2 ft	136.2 ft	1.87 ac-ft
33.40	Top of Treatment Vol.	0.58 ac	216.2 ft	116.2 ft	0.23 ac-ft
33.00	Normal Water Level	0.55 ac	213.0 ft	113.0 ft	0.00 ac-ft
31.00		0.44 ac	197.0 ft	97.0 ft	
27.00	Pond Bottom	0.28 ac	189.0 ft	65.0 ft	

Required Treatment+Attenuation Vol.= 5.25 ac-ft
 Required Treatment+Attenuation Stage= 39.80 ft

Provided Treatment+Attenuation Vol.= 5.52 ac-ft
 Provided Treatment+Attenuation Stage= 40.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.83 ac-ft
 Estimated Storm Sewer TW EL.= 35.90 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.01 ac



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 (407) 971-8850 (phone)
 (407) 971-8955 (fax)

Made by: ZKE
 Checked by: REC

DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **1**
 POND NAME : **1C**

Station Limits: From: **1360+00** Roadway Length = 3000 ft
 To: **1390+00** R/W Width = 200 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 2.34 ac
 Pervious Roadway Area: 11.43 ac
 Total Roadway Area: 13.77 ac

Pond Area: Pervious Pond Area = 1.88 ac

Total Area: Impervious Area: 2.34 ac
 Pervious Area: 13.31 ac
 Total Area: 15.65 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.34 ac	229.5
Open Space (lawns, parks, golf courses, cemeteries,	A	39	11.43 ac	445.9
Residential Areas (2.0 acre, 12% Impervious)	A	46	1.88 ac	86.3
Pasture, grassland or range; Good condition (> 75%	D	80		0.0
Total:			15.65 ac	761.7

CN = Total CN*Area / Total Area = **48.7**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **10.55 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Permitting Agency Event	FDOT 100yr/24hr	FDOT 100yr/240hr	Storm Sewer Design
Precipitation (P) =	8.19 in	11.60 in	4.95 in

Runoff (Q) =	2.22 in	4.49 in	9.89 in	0.60 in
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Made by: ZKE
 Checked by: REC

DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **1**
 POND NAME : **1C**

Station Limits: From: **1360+00** Roadway Length = 3000 ft
 To: **1390+00** R/W Width = 200 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	11.0 ft	6	66 ft
Paved Shoulder			0 ft
Imperv. Median			0 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	4	9 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			93 ft

Impervious Roadway Area: 6.42 ac
 Pervious Roadway Area: 7.36 ac
 Total Roadway Area: 13.77 ac

Pond Area: Pervious Pond Area : 0.92 ac
 Water Surface Area: 0.96 ac **Wet Pond**
 Total Pond Area: 1.88 ac

Total Area: Impervious Area: 6.42 ac
 Pervious Area: 8.27 ac
 Water Surface Area: 0.96 ac
 Total Area: 15.65 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	6.42 ac	629.0
Open Space (lawns, parks, golf courses, cemeteries,	A	39	7.36 ac	286.9
Open Space (lawns, parks, golf courses, cemeteries,	D	80	0.92 ac	73.2
Proposed Ponds (Water Surface)	D	100	0.96 ac	96.2
Total:			15.65 ac	1085.3

CN = Total CN*Area / Total Area = **69.3**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **4.42 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Permitting Agency Event	FDOT 100yr/24hr	FDOT 100yr/240hr	Storm Sewer Design
Precipitation (P) =	8.19 in	11.60 in	4.95 in
Runoff (Q) =	4.55 in	7.59 in	1.95 in



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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **1**
 POND NAME : **1C**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/No
Open/Closed Basin	Closed

Note: Proposed pond alternative accounts for impacted existing swale volume (0.536 ac-ft) per Permit No. 32128

Net New Contr DCIA	2.20 ac
Wet Detention	1.00 in

x Impervious Areas = 0.18 ac-ft			

Treatment V_{req} = Largest of Trt. Vol. = **0.18 ac-ft**

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD	FDOT 100yr/24hr	FDOT 100yr/240hr	Storm Sewer Design
Q_{pre} =	2.90 ac-ft	5.86 ac-ft	12.90 ac-ft	0.79 ac-ft
Q_{post} =	5.94 ac-ft	9.89 ac-ft	18.24 ac-ft	2.54 ac-ft
ΔQ =	3.04 ac-ft	4.03 ac-ft	5.34 ac-ft	1.75 ac-ft

Attenuation V_{req} = **5.34 ac-ft** (use largest value)



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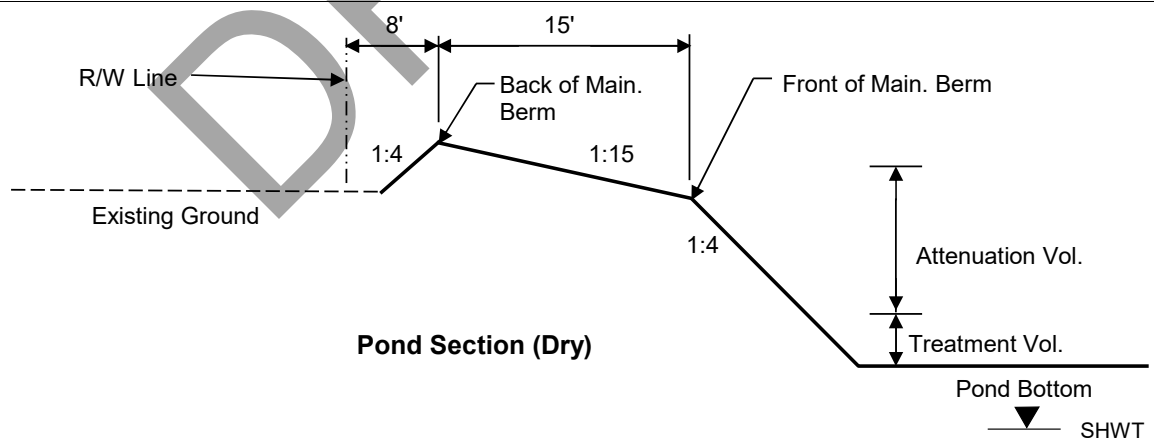
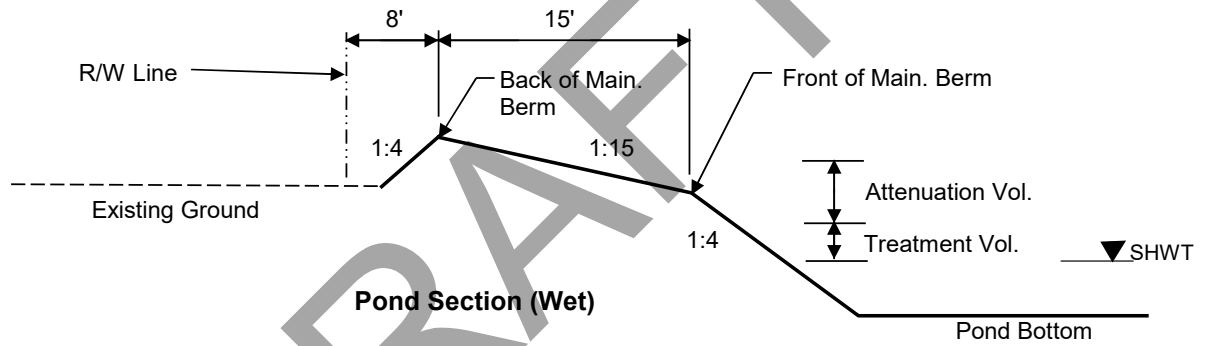
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **1**
 POND NAME : **1C**

Maintenance Area Width =	15.0 ft	@ 1:15	Existing Ground Elevation =	38.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	33.00
Maximum Storage Depth (SD) =	6.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	43.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	2000 ft	
Estimated Energy Losses =	2.0 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	40.0 ft	





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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **1**
 POND NAME : **1C**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
38.00	Pond R/W	2.10 ac	381.0 ft	240.0 ft	
40.00	Back of Main. Berm	1.88 ac	365.0 ft	224.0 ft	9.00 ac-ft
39.50		1.68 ac	350.0 ft	209.0 ft	8.11 ac-ft
39.00	Front of Main. Berm	1.49 ac	335.0 ft	194.0 ft	7.32 ac-ft
38.00	Provided Treat.Vol.+Att.Vol	1.40 ac	327.0 ft	186.0 ft	5.87 ac-ft
37.80	Req'd Treat.Vol+Att. Vol	1.38 ac	325.4 ft	184.4 ft	5.59 ac-ft
34.90	Estimated Storm Sewer TW	1.12 ac	302.2 ft	161.2 ft	1.98 ac-ft
33.20	Top of Treatment Vol.	0.98 ac	288.6 ft	147.6 ft	0.19 ac-ft
33.00	Normal Water Level	0.96 ac	287.0 ft	146.0 ft	0.00 ac-ft
31.00		0.81 ac	271.0 ft	130.0 ft	
27.00	Pond Bottom	0.59 ac	263.0 ft	98.0 ft	

Required Treatment+Attenuation Vol.= 5.53 ac-ft
 Required Treatment+Attenuation Stage= 37.80 ft

Provided Treatment+Attenuation Vol.= 5.87 ac-ft
 Provided Treatment+Attenuation Stage= 38.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.94 ac-ft
 Estimated Storm Sewer TW EL.= 34.90 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.52 ac

Complete Report (not including cost) Ver 4.3.5

Project: US 301 PD_E

Date: 3/13/2023 5:36:55 PM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	Basin 1
Rainfall Zone	Florida Zone 4
Annual Mean Rainfall	51.00
Pre-Condition Landuse Information	
Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	15.48
Rational Coefficient (0-1)	0.13
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	15.13
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	8.766
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	16.429
Phosphorus Loading (kg/yr)	2.162
Post-Condition Landuse Information	
Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	15.48
Rational Coefficient (0-1)	0.37
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	44.77
Wet Pond Area (ac)	0.51
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	23.779
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	44.566
Phosphorus Loading (kg/yr)	5.864

Catchment Number: 1 Name: Basin 1

Project: US 301 PD_E

Date: 3/13/2023

Wet Detention Design

Permanent Pool Volume (ac-ft)	1.910
Permanent Pool Volume (ac-ft) for 31 days residence	2.020
Annual Residence Time (days)	29
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

Watershed Characteristics

Catchment Area (acres)	15.48
Contributing Area (acres)	14.970
Non-DCIA Curve Number	39.00
DCIA Percent	44.77
Rainfall Zone	Florida Zone 4
Rainfall (in)	51.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	63
Provided TN Treatment Efficiency (%)	38
Required TP Treatment Efficiency (%)	63
Provided TP Treatment Efficiency (%)	64

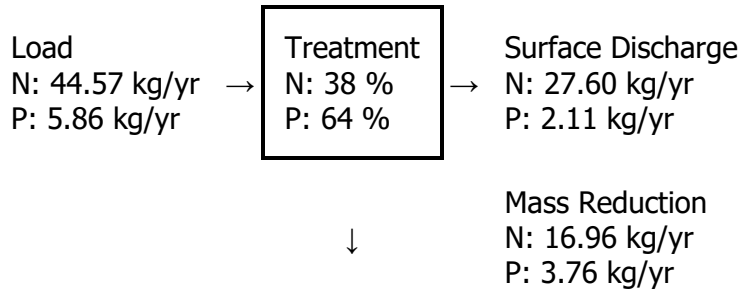
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

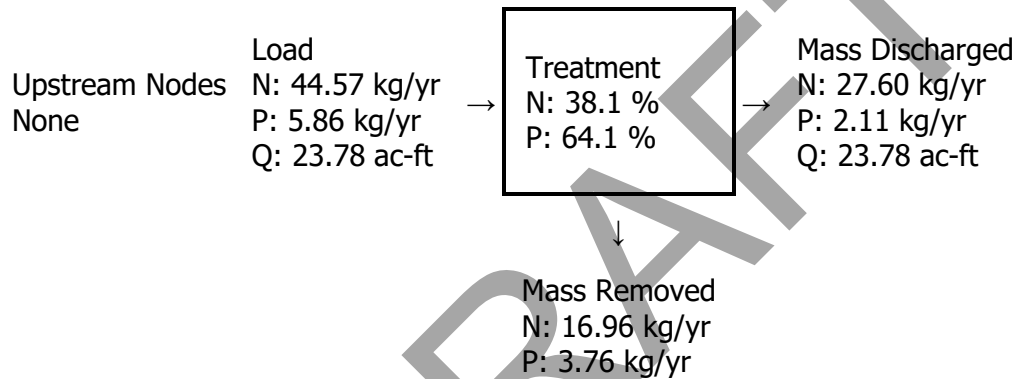
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	0.000
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.000
TP Concentration (mg/L)	0.000

Load Diagram for Wet Detention (stand-alone)



Load Diagram for Wet Detention (As Used In Routing)



Summary Treatment Report Version: 4.3.5

Project: US 301 PD_E

Analysis Type: Net Improvement

Date:3/13/2023

BMP Types:

Catchment 1 - (Basin 1) Wet Detention
Based on % removal values to the nearest percent

Routing Summary

Catchment 1 Routed to Outlet

Total nitrogen target removal met? **No**

Total phosphorus target removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	16.43 kg/yr	
Total N post load	44.57 kg/yr	
Target N load reduction	63 %	
Target N discharge load	16.43 kg/yr	
Percent N load reduction	38 %	
Provided N discharge load	27.6 kg/yr	60.86 lb/yr
Provided N load removed	16.96 kg/yr	37.4 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	2.162 kg/yr	
Total P post load	5.864 kg/yr	
Target P load reduction	63 %	
Target P discharge load	2.162 kg/yr	
Percent P load reduction	64 %	
Provided P discharge load	2.106 kg/yr	4.64 lb/yr
Provided P load removed	3.758 kg/yr	8.286 lb/yr

DRAFT



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **3**
 POND NAME : **3A**

Station Limits: From: **1390+00** Roadway Length = 6550 ft
 To: **1455+50** R/W Width = 200 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 5.11 ac
 Pervious Roadway Area: 24.96 ac
 Total Roadway Area: 30.07 ac

Pond Area: Pervious Pond Area = 3.22 ac

Total Area: Impervious Area: 5.11 ac
 Pervious Area: 28.18 ac
 Total Area: 33.29 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	0.41 ac	40.2
Impervious areas; Streets & roads	A	98	4.70 ac	460.9
Open Space (lawns, parks, golf courses, cemeteries,	D	89	0.80 ac	70.8
Open Space (lawns, parks, golf courses, cemeteries,	A	68	9.13 ac	620.8
Woods; Good condition (Woods are protected from	D	77	1.21 ac	92.8
Woods; Good condition (Woods are protected from	A	30	11.36 ac	340.9
Residential Areas (1/2 acre, 25% Impervious)	A	54	2.47 ac	133.3
Residential Areas (2.0 acre, 12% Impervious)	A	46	3.22 ac	148.0
Pasture, grassland or range; Good condition (> 75%	D	80		0.0
Total:			33.29 ac	1907.6

CN = Total CN*Area / Total Area = **57.3**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **7.45 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **3.17 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			4.95 in
--	--	--	---------

			1.10 in
--	--	--	---------



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **3**
 POND NAME : **3A**

Station Limits: From: 1390+00 Roadway Length = 6550 ft
 To: 1455+50 R/W Width = 200 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	<u>11.0 ft</u>	<u>6</u>	66 ft
Paved Shoulder			0 ft
Imperv. Median			0 ft
Sidewalk or Trail	<u>6.0 ft</u>	<u>1</u>	6 ft
Curb&Gutter	<u>2.3 ft</u>	<u>4</u>	9 ft
Shared Use Path	<u>12.0 ft</u>	<u>1</u>	12 ft
Barrier Wall			0 ft
Total Impervious Width:			93 ft

Impervious Roadway Area: 14.01 ac
 Pervious Roadway Area: 16.06 ac
 Total Roadway Area: 30.07 ac

Pond Area: Pervious Pond Area : 1.13 ac
 Water Surface Area: 2.09 ac Wet Pond
 Total Pond Area: 3.22 ac

Total Area: Impervious Area: 14.01 ac
 Pervious Area: 17.19 ac
 Water Surface Area: 2.09 ac
 Total Area: 33.29 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	12.89 ac	1263.3
Impervious areas; Streets & roads	D	98	1.12 ac	110.1
Open Space (lawns, parks, golf courses, cemeteries,	A	39	14.77 ac	576.1
Open Space (lawns, parks, golf courses, cemeteries,	D	80	1.29 ac	103.0
Open Space (lawns, parks, golf courses, cemeteries,	D	80	1.13 ac	90.4
Proposed Ponds (Water Surface)	D	100	2.09 ac	208.8
Total:			33.29 ac	2351.7

CN = Total CN*Area / Total Area = 70.6

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ 4.16 in

Precipitation (P) = 8.19 in

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = 4.70 in

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			<u>4.95 in</u>
--	--	--	----------------

			<u>2.05 in</u>
--	--	--	----------------



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **3**
 POND NAME : **3A**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	4.81 ac
Wet Detention	1.00 in

x Impervious Areas = 0.40 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = **0.40 ac-ft**
 OFW Requirement, provide 50% more TV = **0.60 ac-ft**

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q_{pre} =	8.80 ac-ft		3.04 ac-ft
Q_{post} =	13.05 ac-ft		5.69 ac-ft
ΔQ =	4.25 ac-ft		2.64 ac-ft

Attenuation V_{req} = **4.25 ac-ft** (use largest value)



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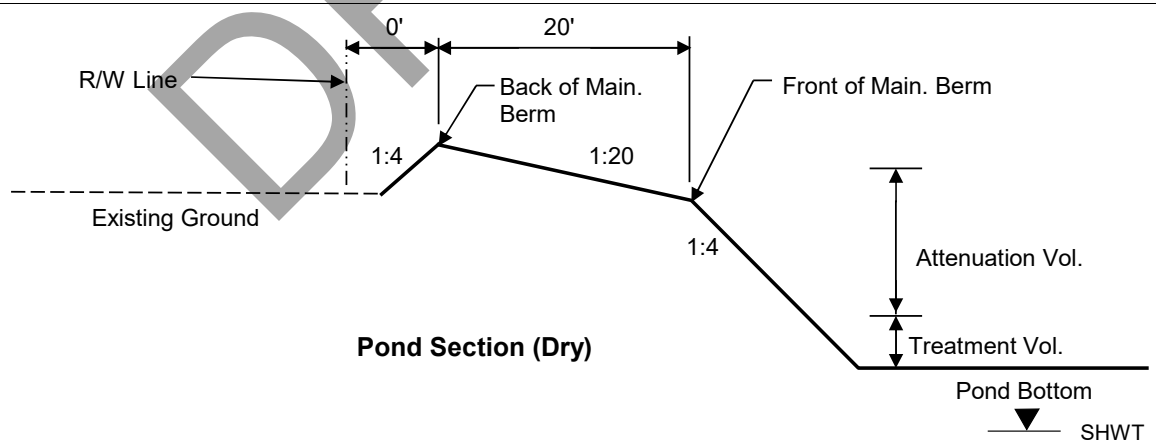
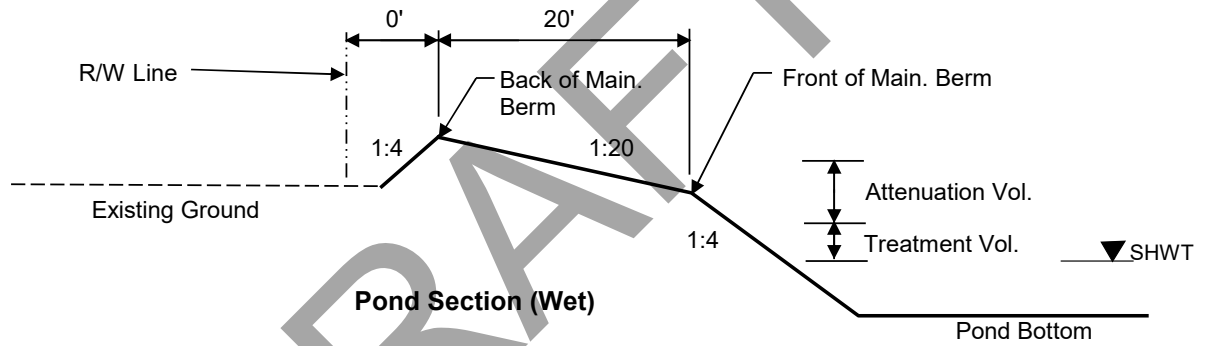
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **3**
 POND NAME : **3A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	38.00
Pond Tie-In Width =	0.0 ft	@ 1:4	Normal Water Elevation =	33.00
Maximum Storage Depth (SD) =	4.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	38.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	2500 ft	
Estimated Energy Losses =	2.5 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	34.5 ft	





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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **3**
 POND NAME : **3A**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
38.00	Pond R/W	3.22 ac	430.0 ft	326.0 ft	
38.00	Back of Main. Berm	3.22 ac	430.0 ft	326.0 ft	12.17 ac-ft
37.50		2.88 ac	410.0 ft	306.0 ft	10.64 ac-ft
37.00	Front of Main. Berm	2.56 ac	390.0 ft	286.0 ft	9.28 ac-ft
36.00	Provided Treat.Vol.+Att.Vol	2.44 ac	382.0 ft	278.0 ft	6.78 ac-ft
35.20	Req'd Treat.Vol+Att. Vol	2.34 ac	375.6 ft	271.6 ft	4.87 ac-ft
34.41	Estimated Storm Sewer TW	2.25 ac	369.2 ft	265.2 ft	3.05 ac-ft
33.30	Top of Treatment Vol.	2.12 ac	360.4 ft	256.4 ft	0.63 ac-ft
33.00	Normal Water Level	2.09 ac	358.0 ft	254.0 ft	0.00 ac-ft
31.00		1.87 ac	342.0 ft	238.0 ft	
27.00	Pond Bottom	1.58 ac	334.0 ft	206.0 ft	

Required Treatment+Attenuation Vol.= 4.65 ac-ft
 Required Treatment+Attenuation Stage= 35.20 ft

Provided Treatment+Attenuation Vol.= 6.78 ac-ft
 Provided Treatment+Attenuation Stage= 36.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 3.05 ac-ft
 Estimated Storm Sewer TW EL.= 34.41 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 3.86 ac



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **3**
 POND NAME : **3B**

Station Limits: From: **1390+00** Roadway Length = 6550 ft
 To: **1455+50** R/W Width = 200 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 5.11 ac
 Pervious Roadway Area: 24.96 ac
 Total Roadway Area: 30.07 ac

Pond Area: Pervious Pond Area = 2.28 ac

Total Area: Impervious Area: 5.11 ac
 Pervious Area: 27.24 ac
 Total Area: 32.35 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	0.41 ac	40.2
Impervious areas; Streets & roads	A	98	4.70 ac	460.9
Open Space (lawns, parks, golf courses, cemeteries,	D	89	0.80 ac	70.8
Open Space (lawns, parks, golf courses, cemeteries,	A	68	9.13 ac	620.8
Woods; Good condition (Woods are protected from	D	77	1.21 ac	92.8
Woods; Good condition (Woods are protected from	A	30	11.36 ac	340.9
Residential Areas (1/2 acre, 25% Impervious)	A	54	2.47 ac	133.3
Residential Areas (1/2 acre, 25% Impervious)	A	54	2.28 ac	123.0
Pasture, grassland or range; Good condition (> 75%	D	80		0.0
Total:			32.35 ac	1882.5

CN = Total CN*Area / Total Area = **58.2**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **7.18 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **3.27 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			4.95 in
--	--	--	---------

			1.15 in
--	--	--	---------



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Made by: ZKE
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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **3**
 POND NAME : **3B**

Station Limits: From: **1390+00** Roadway Length = 6550 ft
 To: **1455+50** R/W Width = 200 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	11.0 ft	6	66 ft
Paved Shoulder			0 ft
Imperv. Median			0 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	4	9 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			93 ft

Impervious Roadway Area: 14.01 ac
 Pervious Roadway Area: 16.06 ac
 Total Roadway Area: 30.07 ac

Pond Area: Pervious Pond Area : 1.29 ac
 Water Surface Area: 0.99 ac Wet Pond
 Total Pond Area: 2.28 ac

Total Area: Impervious Area: 14.01 ac
 Pervious Area: 17.35 ac
 Water Surface Area: 0.99 ac
 Total Area: 32.35 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	12.89 ac	1263.3
Impervious areas; Streets & roads	D	98	1.12 ac	110.1
Open Space (lawns, parks, golf courses, cemeteries,	A	39	14.77 ac	576.1
Open Space (lawns, parks, golf courses, cemeteries,	D	80	1.29 ac	103.0
Open Space (lawns, parks, golf courses, cemeteries,	D	80	1.29 ac	102.9
Proposed Ponds (Water Surface)	D	100	0.99 ac	99.0
Total:			32.35 ac	2254.4

CN = Total CN*Area / Total Area = **69.7**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **4.35 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Precipitation (P) = **8.19 in**

Runoff (Q) = **4.59 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			4.95 in
--	--	--	---------

			1.97 in
--	--	--	---------



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Made by: ZKE
 Checked by: REC

DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **3**
 POND NAME : **3B**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	4.81 ac
Wet Detention	1.00 in

x Impervious Areas = 0.40 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = **0.40 ac-ft**
 OFW Requirement, provide 50% more TV = **0.60 ac-ft**

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q_{pre} =	8.82 ac-ft		3.11 ac-ft
Q_{post} =	12.38 ac-ft		5.32 ac-ft
ΔQ =	3.56 ac-ft		2.21 ac-ft

Attenuation V_{req} = **3.56 ac-ft** (use largest value)



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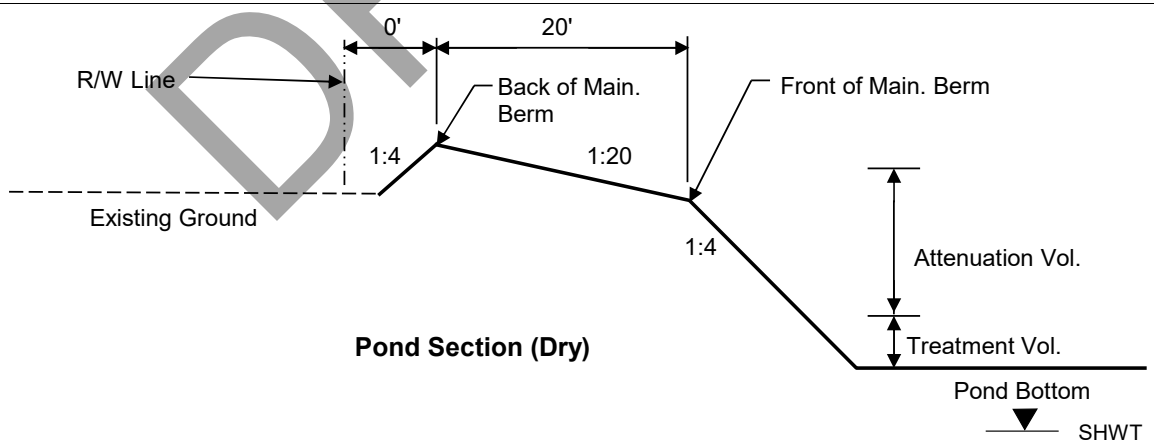
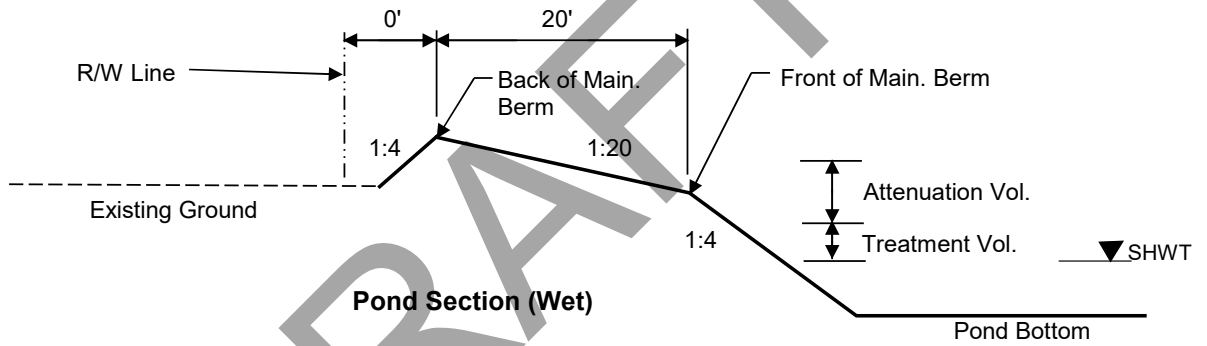
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **3**
 POND NAME : **3B**

Maintenance Area Width =	<u>20.0 ft</u>	@ 1:20	Existing Ground Elevation =	<u>40.00</u>
Pond Tie-In Width =	<u>0.0 ft</u>	@ 1:4	Normal Water Elevation =	<u>33.00</u>
Maximum Storage Depth (SD) =	<u>6.00 ft</u>	with 1.0 ft freeboard	Lowest EOP Elevation =	<u>38.00</u>

Hydraulic Grade Line (HGL) check

HGL Slope =	<u>0.100%</u>	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	<u>1600 ft</u>	
Estimated Energy Losses =	<u>1.6 ft</u>	
HGL Clearance =	<u>1.0 ft</u>	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	<u>35.4 ft</u>	





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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **3**
 POND NAME : **3B**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
40.00	Pond R/W	2.28 ac	542.0 ft	183.0 ft	
40.00	Back of Main. Berm	2.28 ac	542.0 ft	183.0 ft	9.82 ac-ft
39.50		1.95 ac	522.0 ft	163.0 ft	8.76 ac-ft
39.00	Front of Main. Berm	1.65 ac	502.0 ft	143.0 ft	7.86 ac-ft
38.00	Provided Treat.Vol.+Att.Vol	1.53 ac	494.0 ft	135.0 ft	6.27 ac-ft
36.55	Req'd Treat.Vol+Att. Vol	1.37 ac	482.4 ft	123.4 ft	4.17 ac-ft
35.35	Estimated Storm Sewer TW	1.24 ac	472.8 ft	113.8 ft	2.61 ac-ft
33.60	Top of Treatment Vol.	1.05 ac	458.8 ft	99.8 ft	0.61 ac-ft
33.00	Normal Water Level	0.99 ac	454.0 ft	95.0 ft	0.00 ac-ft
31.00		0.79 ac	438.0 ft	79.0 ft	
27.00	Pond Bottom	0.46 ac	430.0 ft	47.0 ft	

Required Treatment+Attenuation Vol.= 3.96 ac-ft
 Required Treatment+Attenuation Stage= 36.55 ft

Provided Treatment+Attenuation Vol.= 6.27 ac-ft
 Provided Treatment+Attenuation Stage= 38.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.61 ac-ft
 Estimated Storm Sewer TW EL.= 35.35 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.73 ac



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **3**
 POND NAME : **3C**

Station Limits: From: **1390+00** Roadway Length = 6550 ft
 To: **1455+50** R/W Width = 200 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 5.11 ac
 Pervious Roadway Area: 24.96 ac
 Total Roadway Area: 30.07 ac

Pond Area: Pervious Pond Area = 0.54 ac

Total Area: Impervious Area: 5.11 ac
 Pervious Area: 25.51 ac
 Total Area: 30.62 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	0.41 ac	40.2
Impervious areas; Streets & roads	A	98	4.70 ac	460.9
Open Space (lawns, parks, golf courses, cemeteries,	D	89	0.80 ac	70.8
Open Space (lawns, parks, golf courses, cemeteries,	A	68	9.13 ac	620.8
Woods; Good condition (Woods are protected from	D	77	1.21 ac	92.8
Woods; Good condition (Woods are protected from	A	30	11.36 ac	340.9
Residential Areas (1/2 acre, 25% Impervious)	A	54	2.47 ac	133.3
Residential Areas (1/2 acre, 25% Impervious)	A	54	0.54 ac	29.4
Total:			30.62 ac	1789.0

CN = Total CN*Area / Total Area = **58.4**

Runoff:

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **7.11 in**

Precipitation (P) = **8.19 in** **4.95 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **3.30 in** **1.17 in**



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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **3**
 POND NAME : **3C**

Station Limits: From: **1390+00** Roadway Length = 6550 ft
 To: **1455+50** R/W Width = 200 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	11.0 ft	6	66 ft
Paved Shoulder			0 ft
Imperv. Median			0 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	4	9 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			93 ft

Impervious Roadway Area: 14.01 ac
 Pervious Roadway Area: 16.06 ac
 Total Roadway Area: 30.07 ac

Pond Area: Pervious Pond Area : 0.41 ac
 Water Surface Area: 0.13 ac Wet Pond
 Total Pond Area: 0.54 ac

Total Area: Impervious Area: 14.01 ac
 Pervious Area: 16.47 ac
 Water Surface Area: 0.13 ac
 Total Area: 30.62 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	12.89 ac	1263.3
Impervious areas; Streets & roads	D	98	1.12 ac	110.1
Open Space (lawns, parks, golf courses, cemeteries,	A	39	14.77 ac	576.1
Open Space (lawns, parks, golf courses, cemeteries,	D	80	1.29 ac	103.0
Open Space (lawns, parks, golf courses, cemeteries,	D	80	0.41 ac	33.1
Proposed Ponds (Water Surface)	D	100	0.13 ac	13.1
Total:			30.62 ac	2098.6

CN = Total CN*Area / Total Area = **68.5**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **4.59 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Precipitation (P) = **8.19 in**

Runoff (Q) = **4.46 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			4.95 in
--	--	--	---------

			1.89 in
--	--	--	---------



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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **3**
 POND NAME : **3C**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	4.81 ac
Wet Detention	1.00 in

x Impervious Areas = 0.40 ac-ft

--

Treatment V_{req} = Largest of Trt. Vol. = **0.40 ac-ft**

OFW Requirement, provide 50% more TV = **0.60 ac-ft**

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q_{pre} =	8.42 ac-ft		2.98 ac-ft
Q_{post} =	11.38 ac-ft		4.81 ac-ft
ΔQ =	2.96 ac-ft		1.83 ac-ft

Attenuation V_{req} = **2.96 ac-ft** (use largest value)



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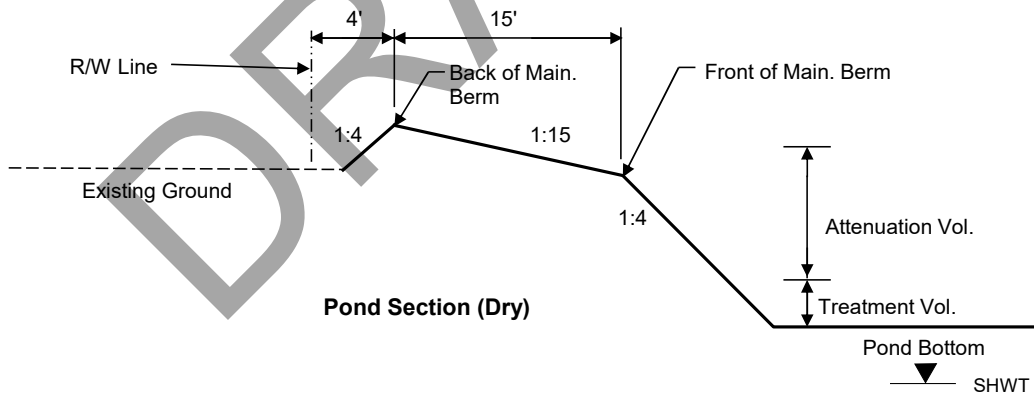
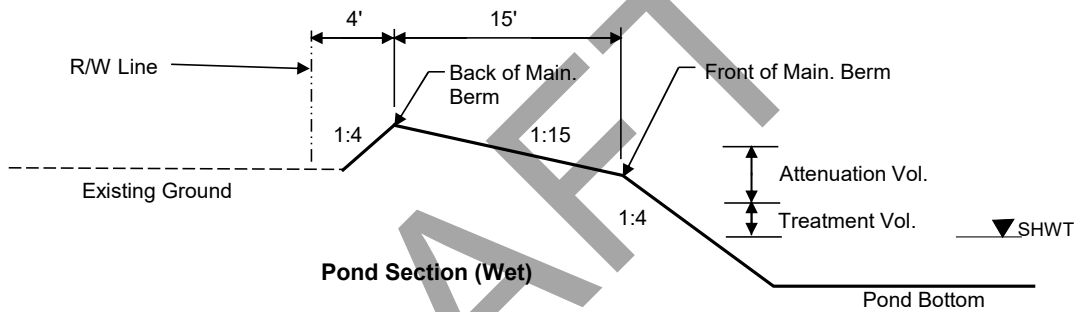
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **3**
 POND NAME : **3C**

Maintenance Area Width =	<u>15.0 ft</u>	@ 1:15	Existing Ground Elevation =	<u>39.00</u>
Pond Tie-In Width =	<u>4.0 ft</u>	@ 1:4	Normal Water Elevation =	<u>33.00</u>
Maximum Storage Depth (SD) =	<u>6.00 ft</u>	with 1.0 ft freeboard	Lowest EOP Elevation =	<u>38.00</u>

Hydraulic Grade Line (HGL) check

HGL Slope =	<u>0.100%</u>	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	<u>2800 ft</u>	
Estimated Energy Losses =	<u>2.8 ft</u>	
HGL Clearance =	<u>1.0 ft</u>	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	<u>34.2 ft</u>	





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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **3**
 POND NAME : **3C**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
39.00	Pond R/W	0.60 ac	175.0 ft	150.0 ft	
40.00	Back of Main. Berm	0.54 ac	167.0 ft	142.0 ft	1.85 ac-ft
39.50		0.44 ac	152.0 ft	127.0 ft	1.60 ac-ft
39.00	Front of Main. Berm	0.35 ac	137.0 ft	112.0 ft	1.41 ac-ft
38.00	Provided Treat.Vol.+Att.Vol	0.31 ac	129.0 ft	104.0 ft	1.08 ac-ft
34.70	Req'd Treat.Vol+Att. Vol	0.18 ac	102.6 ft	77.6 ft	0.27 ac-ft
34.05	Estimated Storm Sewer TW	0.16 ac	97.4 ft	72.4 ft	0.15 ac-ft
33.35	Top of Treatment Vol.	0.14 ac	91.8 ft	66.8 ft	0.05 ac-ft
33.00	Normal Water Level	0.13 ac	89.0 ft	64.0 ft	0.00 ac-ft
31.00		0.08 ac	73.0 ft	48.0 ft	
27.00	Pond Bottom	0.02 ac	65.0 ft	16.0 ft	

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
45.00	Pond R/W	2.27 ac	330.0 ft	300.0 ft	
40.00	Back of Main. Berm	2.16 ac	322.0 ft	292.0 ft	10.88 ac-ft
39.50		2.16 ac	322.0 ft	292.0 ft	9.80 ac-ft
39.00	Front of Main. Berm	1.76 ac	292.0 ft	262.0 ft	8.82 ac-ft
38.00	Provided Treat.Vol.+Att.Vol	1.66 ac	284.0 ft	254.0 ft	7.12 ac-ft
34.70	Req'd Treat.Vol+Att. Vol	1.35 ac	257.6 ft	227.6 ft	2.16 ac-ft
34.05	Estimated Storm Sewer TW	1.29 ac	252.4 ft	222.4 ft	1.31 ac-ft
33.35	Top of Treatment Vol.	1.23 ac	246.8 ft	216.8 ft	0.42 ac-ft
33.00	Normal Water Level	1.20 ac	244.0 ft	214.0 ft	0.00 ac-ft
31.00		1.04 ac	228.0 ft	198.0 ft	
27.00	Pond Bottom	0.84 ac	220.0 ft	166.0 ft	

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
39.00	Pond R/W	1.55 ac	450.0 ft	300.0 ft	
40.00	Back of Main. Berm	1.55 ac	450.0 ft	300.0 ft	7.25 ac-ft
39.50		1.55 ac	450.0 ft	300.0 ft	6.47 ac-ft
39.00	Front of Main. Berm	0.43 ac	420.0 ft	90.0 ft	5.98 ac-ft
38.00	Provided Treat.Vol.+Att.Vol	1.20 ac	412.0 ft	254.0 ft	5.16 ac-ft
34.70	Req'd Treat.Vol+Att. Vol	1.01 ac	385.6 ft	227.6 ft	1.51 ac-ft
34.05	Estimated Storm Sewer TW	0.97 ac	380.4 ft	222.4 ft	0.87 ac-ft
33.35	Top of Treatment Vol.	0.93 ac	374.8 ft	216.8 ft	0.20 ac-ft
33.00	Normal Water Level	0.23 ac	372.0 ft	55.0 ft	0.00 ac-ft
31.00		0.16 ac	356.0 ft	39.0 ft	
27.00	Pond Bottom	0.03 ac	348.0 ft	7.0 ft	

Required Treatment+Attenuation Vol.= 3.36 ac-ft
 Required Treatment+Attenuation Stage= 34.70 ft

Provided Treatment+Attenuation Vol.= 13.35 ac-ft
 Provided Treatment+Attenuation Stage= 38.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.23 ac-ft
 Estimated Storm Sewer TW EL.= 34.05 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 5.31 ac

Complete Report (not including cost) Ver 4.3.5

Project: US 301 PD_E

Date: 3/14/2023 8:11:54 AM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	Basin 3
Rainfall Zone	Florida Zone 4
Annual Mean Rainfall	51.00
Pre-Condition Landuse Information	
Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	33.20
Rational Coefficient (0-1)	0.14
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	15.40
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	19.107
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	35.810
Phosphorus Loading (kg/yr)	4.712
Post-Condition Landuse Information	
Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	33.20
Rational Coefficient (0-1)	0.40
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	48.27
Wet Pond Area (ac)	2.01
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	53.343
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	99.973
Phosphorus Loading (kg/yr)	13.154

Catchment Number: 1 Name: Basin 3

Project: US 301 PD_E

Date: 3/14/2023

Wet Detention Design

Permanent Pool Volume (ac-ft)	10.420
Permanent Pool Volume (ac-ft) for 31 days residence	4.531
Annual Residence Time (days)	71
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

Watershed Characteristics

Catchment Area (acres)	33.20
Contributing Area (acres)	31.190
Non-DCIA Curve Number	39.00
DCIA Percent	48.27
Rainfall Zone	Florida Zone 4
Rainfall (in)	51.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	64
Provided TN Treatment Efficiency (%)	41
Required TP Treatment Efficiency (%)	64
Provided TP Treatment Efficiency (%)	71

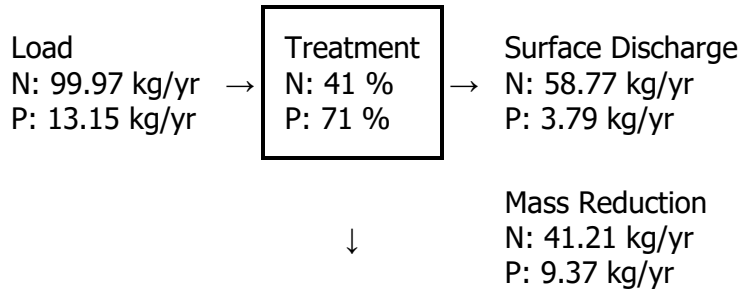
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

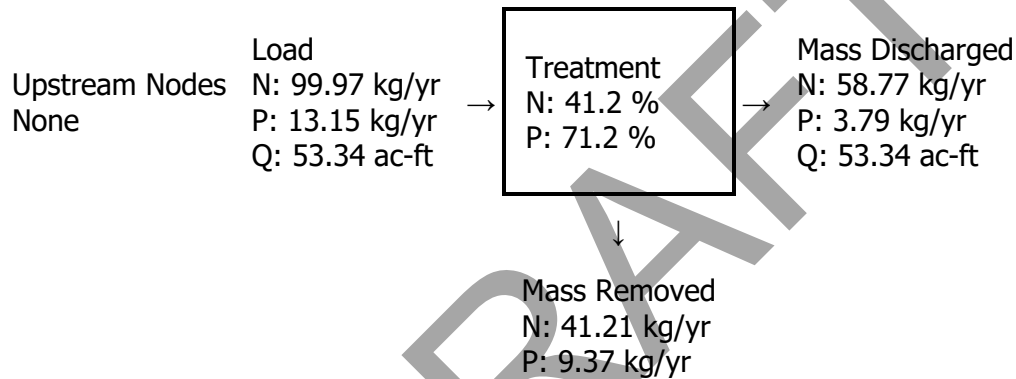
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	0.000
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.000
TP Concentration (mg/L)	0.000

Load Diagram for Wet Detention (stand-alone)



Load Diagram for Wet Detention (As Used In Routing)



Summary Treatment Report Version: 4.3.5

Project: US 301 PD_E

Analysis Type: Net Improvement

Date:3/14/2023

BMP Types:

Catchment 1 - (Basin 3) Wet Detention
Based on % removal values to the nearest percent

Routing Summary

Catchment 1 Routed to Outlet

Total nitrogen target removal met? **No**

Total phosphorus target removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load 35.81 kg/yr

Total N post load	99.97 kg/yr	
Target N load reduction	64 %	
Target N discharge load	35.81 kg/yr	
Percent N load reduction	41 %	
Provided N discharge load	58.77 kg/yr	129.58 lb/yr
Provided N load removed	41.21 kg/yr	90.86 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	4.712 kg/yr	
Total P post load	13.154 kg/yr	
Target P load reduction	64 %	
Target P discharge load	4.712 kg/yr	
Percent P load reduction	71 %	
Provided P discharge load	3.789 kg/yr	8.35 lb/yr
Provided P load removed	9.365 kg/yr	20.651 lb/yr

DRAFT



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DATE: May 31, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **4**
 POND NAME : **4A**

Station Limits: From: **1455+50** Roadway Length = 3650 ft
 To: **1492+00** R/W Width = 165 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 2.85 ac
 Pervious Roadway Area: 10.98 ac
 Total Roadway Area: 13.83 ac

Pond Area: Pervious Pond Area = 2.50 ac

Total Area: Impervious Area: 2.85 ac
 Pervious Area: 13.48 ac
 Total Area: 16.33 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.85 ac	279.2
Open Space (lawns, parks, golf courses, cemeteries,	A	39	5.53 ac	215.7
Woods; Good condition (Woods are protected from	A	30	3.95 ac	118.6
Residential Areas (1/4 acre, 38% Impervious)	A	61	1.49 ac	91.0
Woods; Good condition (Woods are protected from	A	30	2.50 ac	75.1
Total:			16.33 ac	779.6

CN = Total CN*Area / Total Area = **47.7**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **10.94 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Precipitation (P) = **8.19 in** **11.60 in** **18.40 in** **4.95 in**

Runoff (Q) = **2.13 in** **4.35 in** **9.68 in** **0.56 in**

Permitting Agency Event	FDOT 100yr/24hr	FDOT 100yr/240hr	Storm Sewer Design
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DATE: May 31, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **4**
 POND NAME : **4A**

Station Limits: From: **1455+50** Roadway Length = 3650 ft
 To: **1492+00** R/W Width = 165 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	11.0 ft	6	66 ft
Paved Shoulder			0 ft
Imperv. Median			0 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	4	9 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			93 ft

Impervious Roadway Area: 7.81 ac
 Pervious Roadway Area: 6.02 ac
 Total Roadway Area: 13.83 ac

Pond Area: Pervious Pond Area : 2.50 ac Dry Pond
 Water Surface Area: 0.00 ac
 Total Pond Area: 2.50 ac

Total Area: Impervious Area: 7.81 ac
 Pervious Area: 8.52 ac
 Water Surface Area: 0.00 ac
 Total Area: 16.33 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	7.81 ac	765.3
Open Space (lawns, parks, golf courses, cemeteries,	A	39	6.02 ac	234.6
Open Space (lawns, parks, golf courses, cemeteries,	A	39	2.50 ac	97.6
Open Space (lawns, parks, golf courses, cemeteries,	A	39	0.00 ac	0.0
Total:			16.33 ac	1097.6

CN = Total CN*Area / Total Area = **67.2**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 = 4.88$ in

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Permitting Agency Event	FDOT 100yr/24hr	FDOT 100yr/240hr	Storm Sewer Design
Precipitation (P) = 8.19 in	11.60 in	18.40 in	4.95 in
Runoff (Q) = 4.30 in	7.28 in	13.61 in	1.78 in



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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **4**
 POND NAME : **4A**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Dry Retention
Online/Offline	Online
Impaired/OFW	Yes/No
Open/Closed Basin	Closed

Net New Contr DCIA	2.68 ac
Dry Retention	0.50 in

x DCIA (Net New) = 0.11 ac-ft

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Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.11 ac-ft

--

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD	FDOT 100yr/24hr	FDOT 100yr/240hr	Storm Sewer Design
Q _{pre} =	2.89 ac-ft	5.92 ac-ft	13.17 ac-ft	0.76 ac-ft
Q _{post} =	5.86 ac-ft	9.91 ac-ft	18.53 ac-ft	2.43 ac-ft
ΔQ =	2.97 ac-ft	3.99 ac-ft	5.36 ac-ft	1.67 ac-ft

Attenuation V_{req} = 5.36 ac-ft (use largest value)



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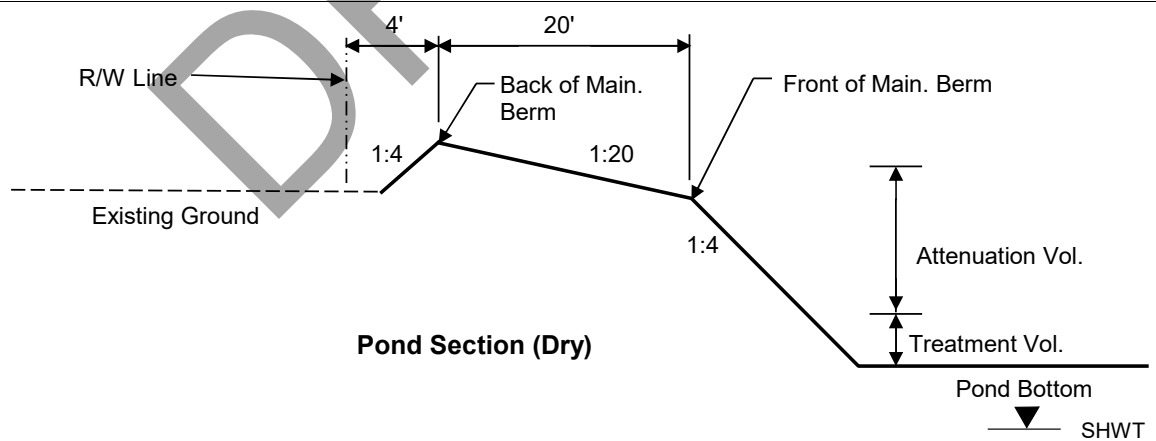
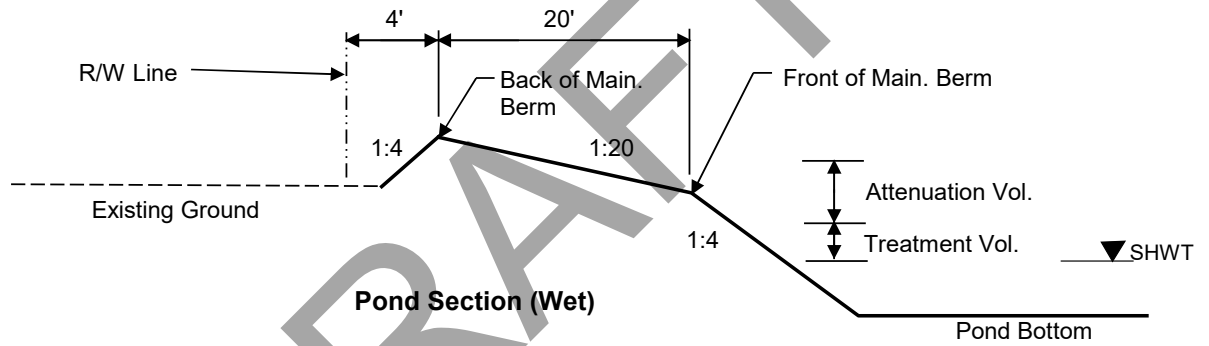
DATE: May 31, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **4**
 POND NAME : **4A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	40.00
Pond Tie-In Width =	4.0 ft	@ 1:4	Normal Water Elevation =	35.00
Maximum Storage Depth (SD) =	5.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	43.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.050%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	100 ft	
Estimated Energy Losses =	0.1 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	42.0 ft	





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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **4**
 POND NAME : **4A**

Pond Stage / Storage Calculations

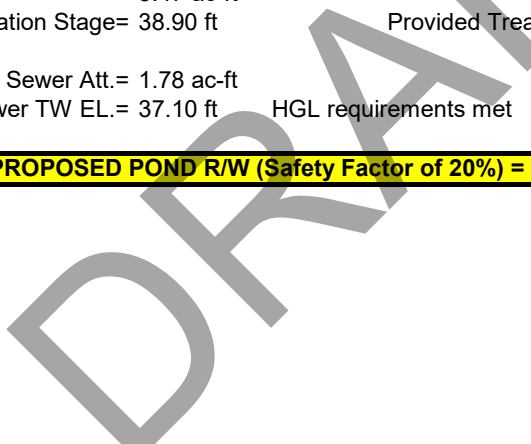
ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
40.00	Pond R/W	2.59 ac	475.0 ft	475.0 ft	
41.00	Back of Main. Berm	2.50 ac	467.0 ft	467.0 ft	10.06 ac-ft
40.50		2.29 ac	447.0 ft	447.0 ft	8.86 ac-ft
40.00	Front of Main. Berm	2.09 ac	427.0 ft	427.0 ft	7.76 ac-ft
39.00	Provided Treat.Vol.+Att.Vol	2.02 ac	419.0 ft	419.0 ft	5.71 ac-ft
38.90	Req'd Treat.Vol+Att. Vol	2.01 ac	418.2 ft	418.2 ft	5.51 ac-ft
37.10	Estimated Storm Sewer TW	1.87 ac	403.8 ft	403.8 ft	2.01 ac-ft
36.10	Top of Treatment Vol.	1.80 ac	395.8 ft	395.8 ft	0.18 ac-ft
36.00	Pond Bottom	1.79 ac	395.0 ft	395.0 ft	0.00 ac-ft

Required Treatment+Attenuation Vol.= 5.47 ac-ft
 Required Treatment+Attenuation Stage= 38.90 ft

Provided Treatment+Attenuation Vol.= 5.71 ac-ft
 Provided Treatment+Attenuation Stage= 39.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.78 ac-ft
 Estimated Storm Sewer TW EL.= 37.10 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 3.11 ac





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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **4**
 POND NAME : **4B**

Station Limits: From: **1455+50** Roadway Length = 3650 ft
 To: **1492+00** R/W Width = 165 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 2.85 ac
 Pervious Roadway Area: 10.98 ac
 Total Roadway Area: 13.83 ac

Pond Area: Pervious Pond Area = 1.77 ac

Total Area: Impervious Area: 2.85 ac
 Pervious Area: 12.75 ac
 Total Area: 15.59 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.85 ac	279.2
Open Space (lawns, parks, golf courses, cemeteries,	A	39	5.53 ac	215.7
Woods; Good condition (Woods are protected from	A	30	3.95 ac	118.6
Residential Areas (1/4 acre, 38% Impervious)	A	61	1.49 ac	91.0
Woods; Good condition (Woods are protected from	A	30	1.77 ac	53.1
Total:			15.59 ac	757.6

CN = Total CN*Area / Total Area = **48.6**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **10.58 in**

Precipitation (P) =

Permitting Agency Event	FDOT 100yr/24hr	FDOT 100yr/240hr	Storm Sewer Design
8.19 in	11.60 in	18.40 in	4.95 in

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) =

2.21 in	4.48 in	9.87 in	0.60 in
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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **4**
 POND NAME : **4B**

Station Limits: From: **1455+50** Roadway Length = 3650 ft
 To: **1492+00** R/W Width = 165 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	11.0 ft	6	66 ft
Paved Shoulder			0 ft
Imperv. Median			0 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	4	9 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			93 ft

Impervious Roadway Area: 7.81 ac
 Pervious Roadway Area: 6.02 ac
 Total Roadway Area: 13.83 ac

Pond Area: Pervious Pond Area : 1.07 ac
 Water Surface Area: 0.70 ac **Wet Pond**
 Total Pond Area: 1.77 ac

Total Area: Impervious Area: 7.81 ac
 Pervious Area: 7.09 ac
 Water Surface Area: 0.70 ac
 Total Area: 15.59 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	7.81 ac	765.3
Open Space (lawns, parks, golf courses, cemeteries,	A	39	6.02 ac	234.6
Open Space (lawns, parks, golf courses, cemeteries,	A	39	1.07 ac	41.7
Proposed Ponds (Water Surface)	A	100	0.70 ac	69.9
Total:			15.59 ac	1111.6

CN = Total CN*Area / Total Area = **71.3**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **4.03 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Permitting Agency Event	FDOT 100yr/24hr	FDOT 100yr/240hr	Storm Sewer Design
Precipitation (P) =	8.19 in	11.60 in	4.95 in
Runoff (Q) =	4.78 in	7.86 in	2.10 in



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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **4**
 POND NAME : **4B**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/No
Open/Closed Basin	Closed

Net New Contr DCIA	2.68 ac
Wet Detention	1.00 in

x DCIA (Net New) = 0.22 ac-ft

--

Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.22 ac-ft

--

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD	FDOT 100yr/24hr	FDOT 100yr/240hr	Storm Sewer Design
Q _{pre} =	2.88 ac-ft	5.82 ac-ft	12.82 ac-ft	0.78 ac-ft
Q _{post} =	6.21 ac-ft	10.22 ac-ft	18.60 ac-ft	2.73 ac-ft
ΔQ =	3.33 ac-ft	4.39 ac-ft	5.78 ac-ft	1.95 ac-ft

Attenuation V_{req} = 5.78 ac-ft (use largest value)



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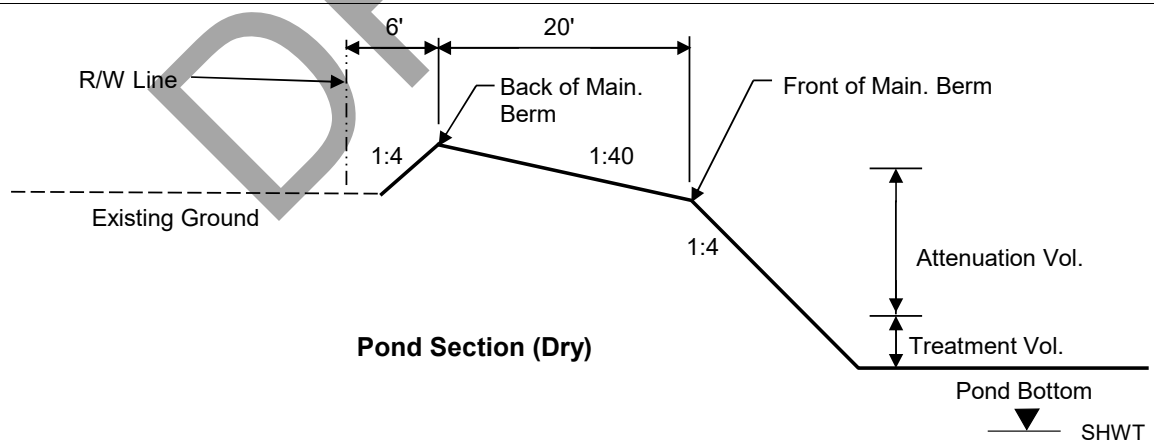
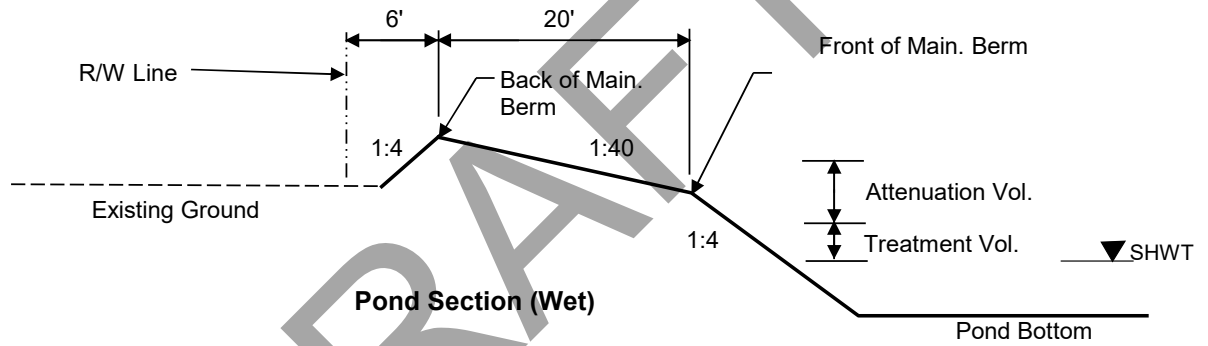
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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **4**
 POND NAME : **4B**

Maintenance Area Width =	<u>20.0 ft</u>	@ 1:40	Existing Ground Elevation =	<u>41.00</u>
Pond Tie-In Width =	<u>6.0 ft</u>	@ 1:4	Normal Water Elevation =	<u>33.00</u>
Maximum Storage Depth (SD) =	<u>8.50 ft</u>	with 1.0 ft freeboard	Lowest EOP Elevation =	<u>43.00</u>

Hydraulic Grade Line (HGL) check

HGL Slope =	<u>0.100%</u>	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	<u>1000 ft</u>	
Estimated Energy Losses =	<u>1.0 ft</u>	
HGL Clearance =	<u>1.0 ft</u>	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	<u>41.0 ft</u>	





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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **4**
 POND NAME : **4B**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
41.00	Pond R/W	1.93 ac	350.0 ft	240.0 ft	
42.50	Back of Main. Berm	1.77 ac	338.0 ft	228.0 ft	8.12 ac-ft
42.25		1.52 ac	318.0 ft	208.0 ft	7.71 ac-ft
42.00	Front of Main. Berm	1.29 ac	298.0 ft	188.0 ft	7.36 ac-ft
41.00	Provided Treat.Vol.+Att.Vol	1.20 ac	290.0 ft	180.0 ft	6.12 ac-ft
40.90	Req'd Treat.Vol+Att. Vol	1.19 ac	289.2 ft	179.2 ft	6.00 ac-ft
37.25	Estimated Storm Sewer TW	0.90 ac	260.0 ft	150.0 ft	2.19 ac-ft
34.85	Top of Treatment Vol.	0.72 ac	240.8 ft	130.8 ft	0.25 ac-ft
34.50	Normal Water Level	0.70 ac	238.0 ft	128.0 ft	0.00 ac-ft
32.50		0.57 ac	222.0 ft	112.0 ft	
28.50	Pond Bottom	0.39 ac	214.0 ft	80.0 ft	

Required Treatment+Attenuation Vol.= 6.00 ac-ft
 Required Treatment+Attenuation Stage= 40.90 ft

Provided Treatment+Attenuation Vol.= 6.12 ac-ft
 Provided Treatment+Attenuation Stage= 41.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.18 ac-ft
 Estimated Storm Sewer TW EL.= 37.25 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.31 ac



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 Job Number: **AIM-010-01**

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **4**
 POND NAME : **4C**

Station Limits: From: **1455+50** Roadway Length = 3650 ft
 To: **1492+00** R/W Width = 165 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 2.85 ac
 Pervious Roadway Area: 10.98 ac
 Total Roadway Area: 13.83 ac

Pond Area: Pervious Pond Area = 31.03 ac

Total Area: Impervious Area: 2.85 ac
 Pervious Area: 42.01 ac
 Total Area: 44.86 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.85 ac	279.2
Impervious areas; Streets & roads	A	98		0.0
Open Space (lawns, parks, golf courses, cemeteries,	A	39		0.0
Open Space (lawns, parks, golf courses, cemeteries,	A	39	5.53 ac	215.7
Woods; Good condition (Woods are protected from	A	30	3.95 ac	118.6
Residential Areas (1/4 acre, 38% Impervious)	A	61	1.49 ac	91.0
Depressional areas & existing storage	A	87		0.0
Woods; Good condition (Woods are protected from	A	30	4.43 ac	132.9
Proposed Ponds (Water Surface)	A	100	26.60 ac	2660.0
Total:			44.86 ac	3497.4

CN = Total CN*Area / Total Area = **78.0**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **2.83 in**

Precipitation (P) = **8.19 in** | **11.60 in** | **18.40 in** | **4.95 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **5.56 in** | **8.79 in** | **15.40 in** | **2.67 in**

Permitting Agency Event	FDOT 100yr/24hr	FDOT 100yr/240hr	Storm Sewer Design



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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **4**
 POND NAME : **4C**

Station Limits: From: **1455+50** Roadway Length = 3650 ft
 To: **1492+00** R/W Width = 165 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	11.0 ft	6	66 ft
Paved Shoulder			0 ft
Imperv. Median			0 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	4	9 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			93 ft

Impervious Roadway Area: 7.81 ac
 Pervious Roadway Area: 6.02 ac
 Total Roadway Area: 13.83 ac

Pond Area: Pervious Pond Area : 4.43 ac
 Water Surface Area: 26.60 ac Wet Pond
 Total Pond Area: 31.03 ac

Total Area: Impervious Area: 7.81 ac
 Pervious Area: 10.45 ac
 Water Surface Area: 26.60 ac
 Total Area: 44.86 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	0.00 ac	0.0
Impervious areas; Streets & roads	A	98	7.81 ac	765.3
Open Space (lawns, parks, golf courses, cemeteries,	A	39	0.00 ac	0.0
Open Space (lawns, parks, golf courses, cemeteries,	A	39	6.02 ac	234.6
Open Space (lawns, parks, golf courses, cemeteries,	A	39	4.43 ac	172.8
Proposed Ponds (Water Surface)	A	100	26.60 ac	2660.0
Total:			44.86 ac	3832.7

CN = Total CN*Area / Total Area = **85.4**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 = 1.70 \text{ in}$

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Precipitation (P) = **8.19 in 11.60 in 18.40 in 4.95 in**

Runoff (Q) = **6.45 in 9.78 in 16.50 in 3.37 in**

Permitting Agency Event	FDOT 100yr/24hr	FDOT 100yr/240hr	Storm Sewer Design
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8.19 in	11.60 in	18.40 in	4.95 in
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6.45 in	9.78 in	16.50 in	3.37 in
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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **4**
 POND NAME : **4C**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/No
Open/Closed Basin	Closed

Net New Contr DCIA	2.68 ac
Wet Detention	1.00 in

$2.68 \text{ ac} \times 1.00 \text{ in} \times \text{DCIA (Net New)} = 0.22 \text{ ac-ft}$

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Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.22 ac-ft

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Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD	FDOT 100yr/24hr	FDOT 100yr/240hr	Storm Sewer Design
$Q_{pre} =$	20.80 ac-ft	32.84 ac-ft	57.55 ac-ft	9.97 ac-ft
$Q_{post} =$	24.11 ac-ft	36.56 ac-ft	61.69 ac-ft	12.58 ac-ft
$\Delta Q =$	3.31 ac-ft	3.72 ac-ft	4.14 ac-ft	2.61 ac-ft

Attenuation $V_{req} = 4.14 \text{ ac-ft}$ (use largest value)



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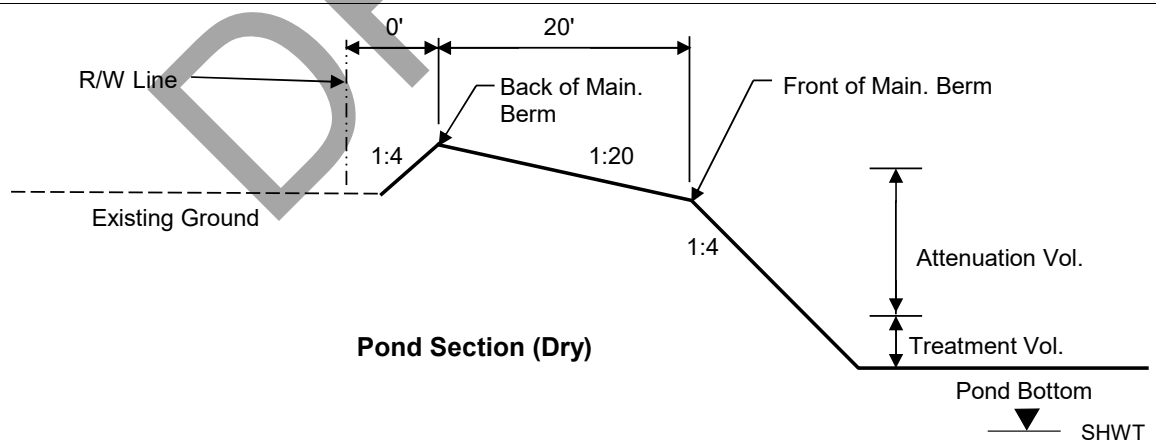
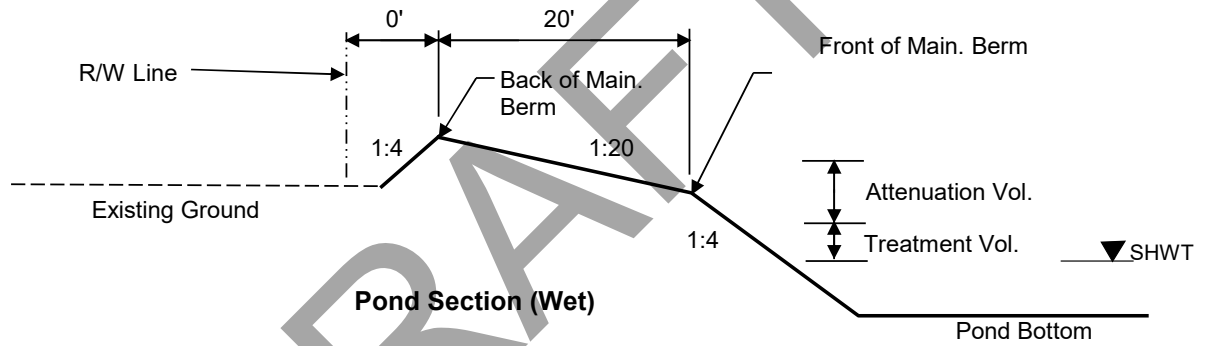
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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **4**
 POND NAME : **4C**

Maintenance Area Width =	<u>20.0 ft</u>	@ 1:20	Existing Ground Elevation =	<u>41.00</u>
Pond Tie-In Width =	<u>0.0 ft</u>	@ 1:4	Normal Water Elevation =	<u>32.00</u>
Maximum Storage Depth (SD) =	<u>8.00 ft</u>	with 1.0 ft freeboard	Lowest EOP Elevation =	<u>43.00</u>

Hydraulic Grade Line (HGL) check

HGL Slope =	<u>0.100%</u>	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	<u>2100 ft</u>	
Estimated Energy Losses =	<u>2.1 ft</u>	
HGL Clearance =	<u>1.0 ft</u>	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	<u>39.9 ft</u>	





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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **4**
 POND NAME : **4C**

Pond Stage / Storage Calculations

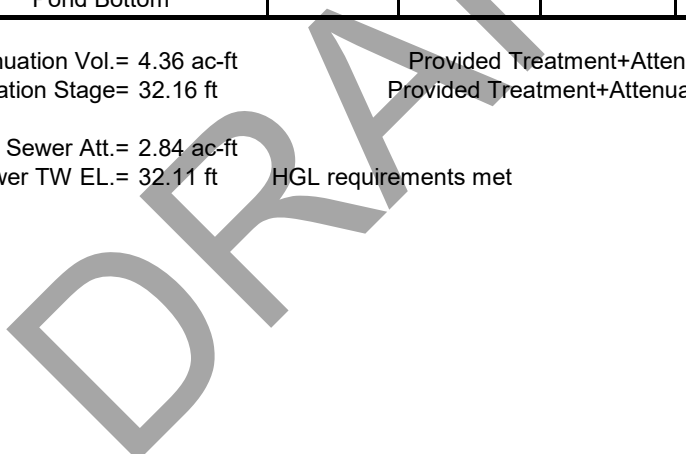
Pond information from Borrow Pit Expansion under SWFWMD Permit No. 43-43594-2

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
41.00	Pond R/W	31.03 ac			
41.00	Back of Main. Berm	31.03 ac			259.17 ac-ft
40.00		30.53 ac			228.39 ac-ft
39.00	Front of Main. Berm	30.03 ac			198.11 ac-ft
35.85	Permitted DHW	29.53 ac			108.05 ac-ft
32.16	Req'd Treat.Vol+Att. Vol	28.62 ac			4.42 ac-ft
32.11	Estimated Storm Sewer TW	28.50 ac			3.03 ac-ft
32.01	Top of Treatment Vol.	26.61 ac			0.27 ac-ft
32.00	Normal Water Level	26.60 ac			0.00 ac-ft
31.00	Pond Bottom				

Required Treatment+Attenuation Vol.= 4.36 ac-ft
 Required Treatment+Attenuation Stage= 32.16 ft

Provided Treatment+Attenuation Vol.= 108.05 ac-ft
 Provided Treatment+Attenuation Stage= 35.85 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.84 ac-ft
 Estimated Storm Sewer TW EL.= 32.11 ft HGL requirements met



Complete Report (not including cost) Ver 4.3.5

Project: US 301 PD_E

Date: 4/6/2023 8:16:45 AM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	Basin 4
Rainfall Zone	Florida Zone 4
Annual Mean Rainfall	51.00
Pre-Condition Landuse Information	
Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	16.33
Rational Coefficient (0-1)	0.15
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	17.45
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	10.542
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	19.758
Phosphorus Loading (kg/yr)	2.600
Post-Condition Landuse Information	
Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	16.33
Rational Coefficient (0-1)	0.40
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	47.83
Wet Pond Area (ac)	0.00
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	27.678
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	51.873
Phosphorus Loading (kg/yr)	6.825

Catchment Number: 1 Name: Basin 4

Project: US 301 PD_E

Date: 4/6/2023

Retention Design

Retention Depth (in) 4.200

Retention Volume (ac-ft) 5.716

Watershed Characteristics

Catchment Area (acres) 16.33

Contributing Area (acres) 16.330

Non-DCIA Curve Number 39.00

DCIA Percent 47.83

Rainfall Zone Florida Zone 4

Rainfall (in) 51.00

Surface Water Discharge

Required TN Treatment Efficiency (%) 62

Provided TN Treatment Efficiency (%) 99

Required TP Treatment Efficiency (%) 62

Provided TP Treatment Efficiency (%) 99

Media Mix Information

Type of Media Mix Not Specified

Media N Reduction (%)

Media P Reduction (%)

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr) 0.000

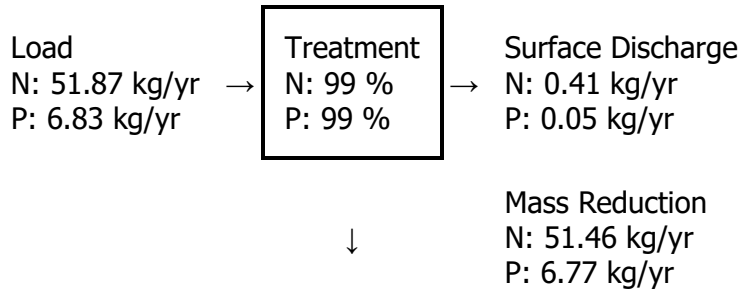
TN Mass Load (kg/yr) 51.462

TN Concentration (mg/L) 0.000

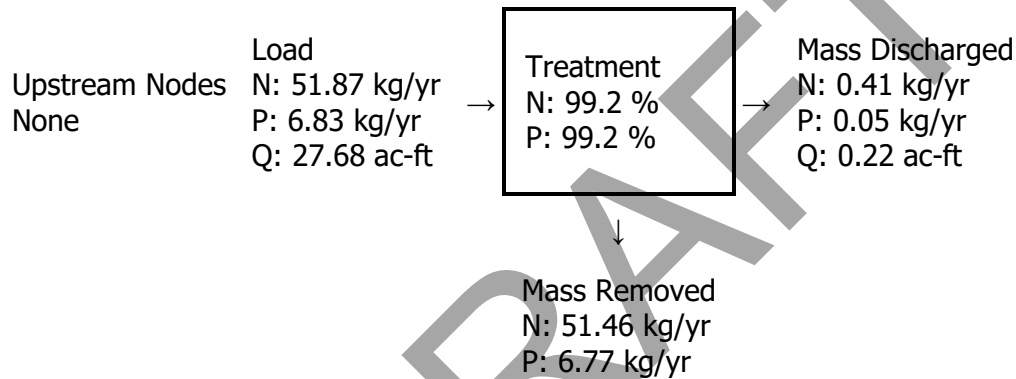
TP Mass Load (kg/yr) 6.771

TP Concentration (mg/L) 0.000

Load Diagram for Retention (stand-alone)



Load Diagram for Retention (As Used In Routing)



Summary Treatment Report Version: 4.3.5

Project: US 301 PD_E

Date:4/6/2023

Analysis Type: Net Improvement

BMP Types:

Catchment 1 - (Basin 4) Retention
Based on % removal values to the
nearest percent

Routing Summary

Catchment 1 Routed to Outlet

Total nitrogen target removal met? **Yes**

Total phosphorus target removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load 19.76 kg/yr

Total N post load 51.87 kg/yr

Target N load reduction	62 %	
Target N discharge load	19.76 kg/yr	
Percent N load reduction	99 %	
Provided N discharge load	.41 kg/yr	.91 lb/yr
Provided N load removed	51.46 kg/yr	113.47 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	2.6 kg/yr	
Total P post load	6.825 kg/yr	
Target P load reduction	62 %	
Target P discharge load	2.6 kg/yr	
Percent P load reduction	99 %	
Provided P discharge load	.054 kg/yr	.12 lb/yr
Provided P load removed	6.771 kg/yr	14.931 lb/yr

DRAFT



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 (407) 971-8850 (phone)
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Made by: **ZKE**
 Checked by: **REC**

DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **5**
 POND NAME : **5A**

Station Limits: From: **1492+00** Roadway Length = 8800 ft
 To: **1580+00** R/W Width = 230 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 6.87 ac
 Pervious Roadway Area: 39.60 ac
 Total Roadway Area: 46.46 ac

Pond Area: Pervious Pond Area = 2.29 ac

Total Area: Impervious Area: 6.87 ac
 Pervious Area: 41.89 ac
 Total Area: 48.76 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	3.59 ac	351.9
Impervious areas; Streets & roads	D	98	3.28 ac	321.3
Open Space (lawns, parks, golf courses, cemeteries,	A	39	6.97 ac	271.8
Open Space (lawns, parks, golf courses, cemeteries,	D	80	6.36 ac	509.1
Woods; Good condition (Woods are protected from	A	30	13.73 ac	411.8
Depressional areas & existing storage	D	90	12.53 ac	1128.1
Pasture, grassland or range; Good condition (> 75%	A	39	2.29 ac	89.4
Total:			48.76 ac	3083.4

CN = Total CN*Area / Total Area = **63.2**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **5.81 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **3.85 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	---------

			2.52 in
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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **5**
 POND NAME : **5A**

Station Limits: From: 1492+00 Roadway Length = 8800 ft
 To: 1580+00 R/W Width = 230 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	<u>12.0 ft</u>	<u>6</u>	72 ft
Paved Shoulder	<u>5.0 ft</u>	<u>2</u>	10 ft
Median Shoulder	<u>4.0 ft</u>	<u>2</u>	8 ft
Sidewalk or Trail	<u>6.0 ft</u>	<u>1</u>	6 ft
Curb&Gutter	<u>2.3 ft</u>	<u>2</u>	5 ft
Shared Use Path	<u>12.0 ft</u>	<u>1</u>	12 ft
Barrier Wall			0 ft
Total Impervious Width:			<u>113 ft</u>

Impervious Roadway Area: 22.73 ac
 Pervious Roadway Area: 23.74 ac
 Total Roadway Area: 46.46 ac

Pond Area: Pervious Pond Area : 1.22 ac
 Water Surface Area: 1.07 ac Wet Pond
 Total Pond Area: 2.29 ac

Total Area: Impervious Area: 22.73 ac
 Pervious Area: 24.96 ac
 Water Surface Area: 1.07 ac
 Total Area: 48.76 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	10.85 ac	1063.0
Impervious areas; Streets & roads	A	98	11.88 ac	1164.3
Open Space (lawns, parks, golf courses, cemeteries,	D	80	11.33 ac	906.3
Open Space (lawns, parks, golf courses, cemeteries,	A	39	12.41 ac	483.9
Open Space (lawns, parks, golf courses, cemeteries,	A	39	1.22 ac	47.6
Proposed Ponds (Water Surface)	A	100	1.07 ac	107.1
Total:			<u>48.76 ac</u>	<u>3772.3</u>

CN = Total CN*Area / Total Area = 77.4

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = 2.93 in

Precipitation (P) = 8.19 in

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = 5.49 in

Permitting Agency Event			Storm Sewer Design
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			<u>6.45 in</u>
--	--	--	----------------

			<u>3.91 in</u>
--	--	--	----------------



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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **5**
 POND NAME : **5A**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	9.70 ac
Wet Detention	1.00 in

x DCIA (Net New) = 0.81 ac-ft

--	--

Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.81 ac-ft
OFW Requirement, provide 50% more TV = 1.21 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q _{pre} =	15.63 ac-ft		10.23 ac-ft
Q _{post} =	22.32 ac-ft		15.90 ac-ft
ΔQ =	6.69 ac-ft		5.67 ac-ft

Attenuation V_{req} = 6.69 ac-ft (use largest value)



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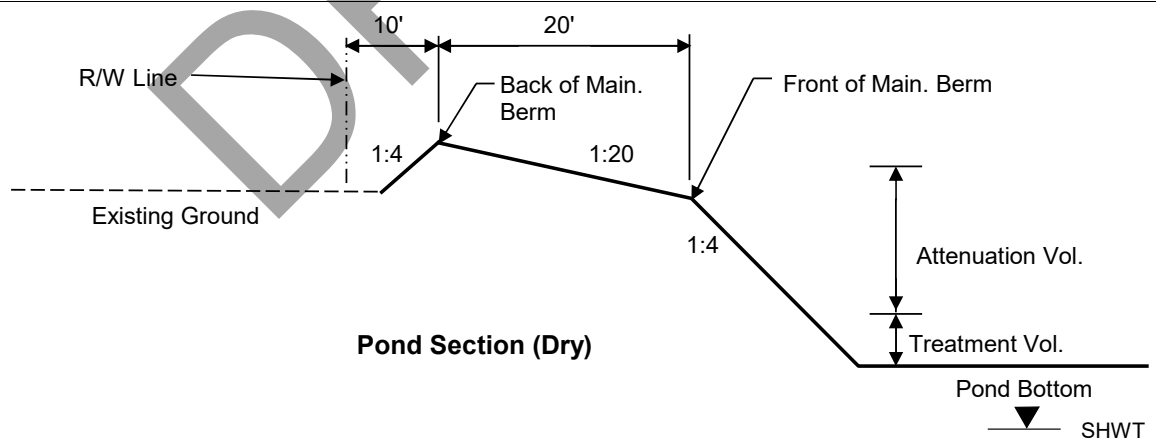
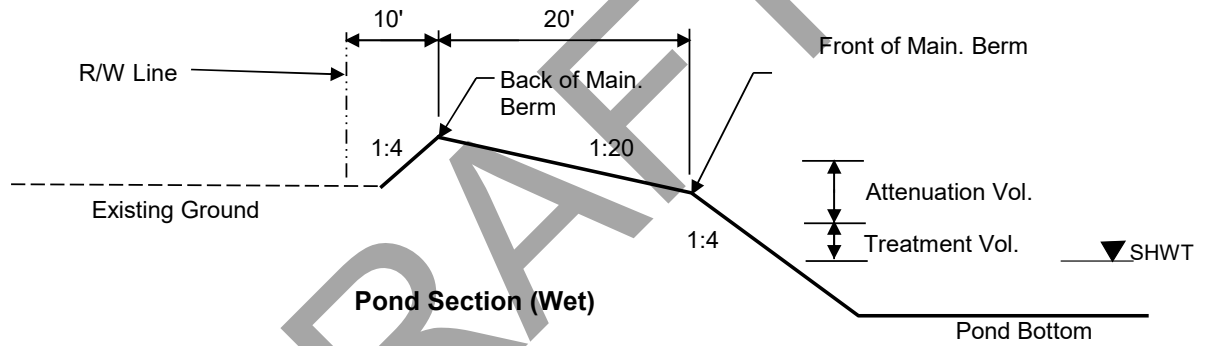
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **5**
 POND NAME : **5A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	42.00
Pond Tie-In Width =	10.0 ft	@ 1:4	Normal Water Elevation =	33.00
Maximum Storage Depth (SD) =	7.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	41.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1000 ft	
Estimated Energy Losses =	1.0 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	39.0 ft	





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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **5**
 POND NAME : **5A**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
44.00	Pond R/W	2.59 ac	338.0 ft	334.0 ft	
41.50	Back of Main. Berm	2.29 ac	318.0 ft	314.0 ft	12.50 ac-ft
41.00		2.01 ac	298.0 ft	294.0 ft	11.43 ac-ft
40.50	Front of Main. Berm	1.75 ac	278.0 ft	274.0 ft	10.49 ac-ft
39.50	Provided Treat.Vol.+Att.Vol	1.65 ac	270.0 ft	266.0 ft	8.79 ac-ft
39.20	Req'd Treat.Vol+Att. Vol	1.62 ac	267.6 ft	263.6 ft	8.30 ac-ft
38.03	Estimated Storm Sewer TW	1.51 ac	258.2 ft	254.2 ft	6.47 ac-ft
34.20	Top of Treatment Vol.	1.17 ac	227.6 ft	223.6 ft	1.34 ac-ft
33.00	Normal Water Level	1.07 ac	218.0 ft	214.0 ft	0.00 ac-ft
31.00		0.92 ac	202.0 ft	198.0 ft	
27.00	Pond Bottom	0.74 ac	194.0 ft	166.0 ft	

Required Treatment+Attenuation Vol.= 7.90 ac-ft
 Required Treatment+Attenuation Stage= 39.20 ft

Provided Treatment+Attenuation Vol.= 8.79 ac-ft
 Provided Treatment+Attenuation Stage= 39.50 ft

Estimated Treat. Vol.+Storm Sewer Att.= 6.47 ac-ft
 Estimated Storm Sewer TW EL.= 38.03 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 3.11 ac



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **5**
 POND NAME : **5B**

Station Limits: From: **1492+00** Roadway Length = 8800 ft
 To: **1580+00** R/W Width = 192 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 6.87 ac
 Pervious Roadway Area: 31.92 ac
 Total Roadway Area: 38.79 ac

Pond Area: Pervious Pond Area = 2.41 ac

Total Area: Impervious Area: 6.87 ac
 Pervious Area: 34.32 ac
 Total Area: 41.19 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	3.59 ac	351.9
Impervious areas; Streets & roads	D	98	3.28 ac	321.3
Open Space (lawns, parks, golf courses, cemeteries,	A	39	6.97 ac	271.8
Open Space (lawns, parks, golf courses, cemeteries,	D	80	6.36 ac	509.1
Woods; Good condition (Woods are protected from	A	30	9.72 ac	291.5
Depressional areas & existing storage	D	90	8.87 ac	798.3
Brush-weed-grass mixture; Good condition (> 75%	A	30	2.41 ac	72.2
Total:			41.19 ac	2616.0

CN = Total CN*Area / Total Area = **63.5**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **5.75 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **3.88 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	---------

			2.54 in
--	--	--	---------



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DATE: May 30, 2023
 Job Number: **AIM-010-01**

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **5**
 POND NAME : **5B**

Station Limits: From: **1492+00** Roadway Length = 8800 ft
 To: **1580+00** R/W Width = **192 ft**

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	6	72 ft
Paved Shoulder	5.0 ft	2	10 ft
Median Shoulder	4.0 ft	2	8 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	2	5 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			113 ft

Impervious Roadway Area: 22.73 ac
 Pervious Roadway Area: 16.06 ac
 Total Roadway Area: 38.79 ac

Pond Area: Pervious Pond Area : 1.23 ac
 Water Surface Area: 1.18 ac **Wet Pond**
 Total Pond Area: 2.41 ac

Total Area: Impervious Area: 22.73 ac
 Pervious Area: 17.29 ac
 Water Surface Area: 1.18 ac
 Total Area: 41.19 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	10.85 ac	1063.0
Impervious areas; Streets & roads	A	98	11.88 ac	1164.3
Open Space (lawns, parks, golf courses, cemeteries,	D	80	7.67 ac	613.2
Open Space (lawns, parks, golf courses, cemeteries,	A	39	8.40 ac	327.4
Open Space (lawns, parks, golf courses, cemeteries,	A	39	1.23 ac	47.9
Proposed Ponds (Water Surface)	A	100	1.18 ac	117.8
Total:			41.19 ac	3333.6

CN = Total CN*Area / Total Area = **80.9**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **2.36 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Precipitation (P) = **8.19 in**

Runoff (Q) = **5.91 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	----------------

			4.29 in
--	--	--	----------------



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **5**
 POND NAME : **5B**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	9.70 ac
Wet Detention	1.00 in

x DCIA (Net New) = 0.81 ac-ft

--	--

Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.81 ac-ft
OFW Requirement, provide 50% more TV = 1.21 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
$Q_{pre} =$	13.31 ac-ft		8.73 ac-ft
$Q_{post} =$	20.30 ac-ft		14.72 ac-ft
$\Delta Q =$	6.99 ac-ft		5.99 ac-ft

Attenuation $V_{req} = 6.99 ac-ft$ (use largest value)



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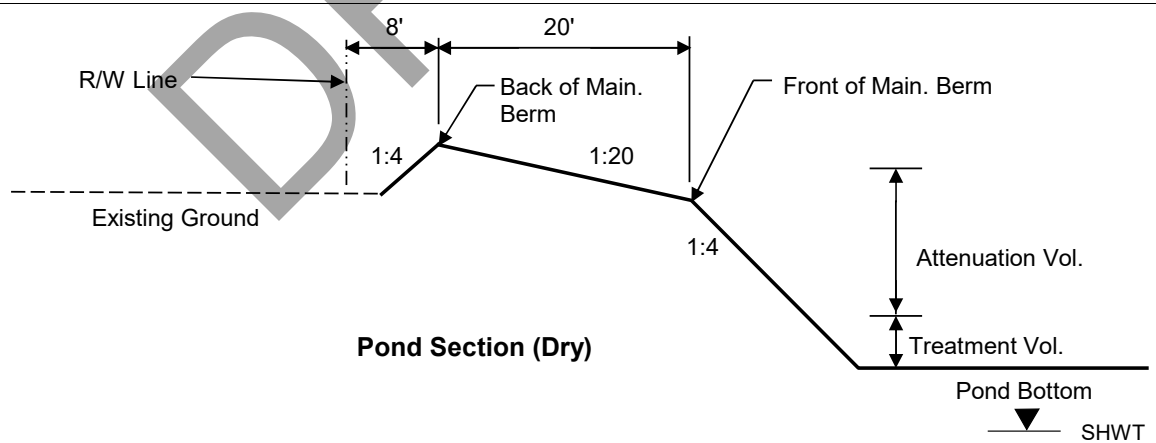
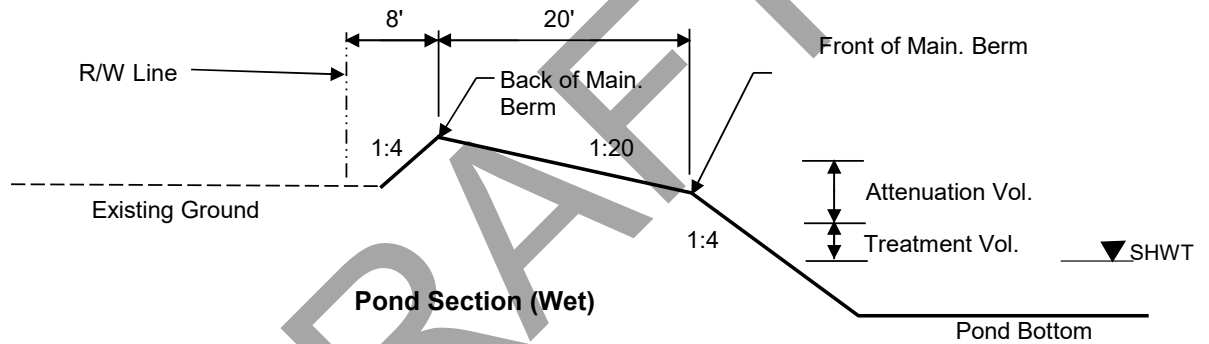
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **5**
 POND NAME : **5B**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	39.00
Pond Tie-In Width =	8.0 ft	@ 1:4	Normal Water Elevation =	33.00
Maximum Storage Depth (SD) =	7.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	41.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1000 ft	
Estimated Energy Losses =	1.0 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	39.0 ft	





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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **5**
 POND NAME : **5B**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
39.00	Pond R/W	2.65 ac	385.0 ft	300.0 ft	
41.00	Back of Main. Berm	2.41 ac	369.0 ft	284.0 ft	12.62 ac-ft
40.50		2.12 ac	349.0 ft	264.0 ft	11.49 ac-ft
40.00	Front of Main. Berm	1.84 ac	329.0 ft	244.0 ft	10.50 ac-ft
39.00	Provided Treat.Vol.+Att.Vol	1.74 ac	321.0 ft	236.0 ft	8.71 ac-ft
38.75	Req'd Treat.Vol+Att. Vol	1.71 ac	319.0 ft	234.0 ft	8.28 ac-ft
37.86	Estimated Storm Sewer TW	1.62 ac	311.9 ft	226.9 ft	6.80 ac-ft
34.10	Top of Treatment Vol.	1.27 ac	281.8 ft	196.8 ft	1.35 ac-ft
33.00	Normal Water Level	1.18 ac	273.0 ft	188.0 ft	0.00 ac-ft
31.00		1.01 ac	257.0 ft	172.0 ft	
23.00	Pond Bottom	0.58 ac	233.0 ft	108.0 ft	

Required Treatment+Attenuation Vol.= 8.20 ac-ft
 Required Treatment+Attenuation Stage= 38.75 ft

Provided Treatment+Attenuation Vol.= 8.71 ac-ft
 Provided Treatment+Attenuation Stage= 39.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 6.80 ac-ft
 Estimated Storm Sewer TW EL.= 37.86 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 3.18 ac



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **5**
 POND NAME : **5C**

Station Limits: From: **1492+00** Roadway Length = 8800 ft
 To: **1580+00** R/W Width = **192 ft**

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 6.87 ac
 Pervious Roadway Area: 31.92 ac
 Total Roadway Area: 38.79 ac

Pond Area: Pervious Pond Area = 2.41 ac

Total Area: Impervious Area: 6.87 ac
 Pervious Area: 34.33 ac
 Total Area: 41.20 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	3.59 ac	351.9
Impervious areas; Streets & roads	D	98	3.28 ac	321.3
Open Space (lawns, parks, golf courses, cemeteries,	A	39	6.97 ac	271.8
Open Space (lawns, parks, golf courses, cemeteries,	D	80	6.36 ac	509.1
Woods; Good condition (Woods are protected from	A	30	9.72 ac	291.5
Depressional areas & existing storage	D	90	8.87 ac	798.3
Depressional areas & existing storage	D	90	2.41 ac	217.3
Total:			41.20 ac	2761.1

CN = Total CN*Area / Total Area = **67.0**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **4.92 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **4.28 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	---------

			2.88 in
--	--	--	---------



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Made by: ZKE
 Checked by: REC

DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **5**
 POND NAME : **5C**

Station Limits: From: 1492+00 Roadway Length = 8800 ft
 To: 1580+00 R/W Width = 192 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	<u>12.0 ft</u>	<u>6</u>	72 ft
Paved Shoulder	<u>5.0 ft</u>	<u>2</u>	10 ft
Median Shoulder	<u>4.0 ft</u>	<u>2</u>	8 ft
Sidewalk or Trail	<u>6.0 ft</u>	<u>1</u>	6 ft
Curb&Gutter	<u>2.3 ft</u>	<u>2</u>	5 ft
Shared Use Path	<u>12.0 ft</u>	<u>1</u>	12 ft
Barrier Wall			0 ft
Total Impervious Width:			<u>113 ft</u>

Impervious Roadway Area: 22.73 ac
 Pervious Roadway Area: 16.06 ac
 Total Roadway Area: 38.79 ac

Pond Area: Pervious Pond Area : 1.17 ac
 Water Surface Area: 1.24 ac Wet Pond
 Total Pond Area: 2.41 ac

Total Area: Impervious Area: 22.73 ac
 Pervious Area: 17.23 ac
 Water Surface Area: 1.24 ac
 Total Area: 41.20 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	10.85 ac	1063.0
Impervious areas; Streets & roads	A	98	11.88 ac	1164.3
Open Space (lawns, parks, golf courses, cemeteries,	D	80	7.67 ac	613.2
Open Space (lawns, parks, golf courses, cemeteries,	A	39	8.40 ac	327.4
Open Space (lawns, parks, golf courses, cemeteries,	A	39	1.17 ac	45.7
Proposed Ponds (Water Surface)	A	100	1.24 ac	124.2
Total:			<u>41.20 ac</u>	<u>3337.8</u>

CN = Total CN*Area / Total Area = 81.0

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ 2.34 in

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Precipitation (P) = 8.19 in

Runoff (Q) = 5.92 in

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			<u>6.45 in</u>
--	--	--	----------------

			<u>4.30 in</u>
--	--	--	----------------



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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **5**
 POND NAME : **5C**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	9.70 ac
Wet Detention	1.00 in

x DCIA (Net New) = 0.81 ac-ft

--	--

Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.81 ac-ft
OFW Requirement, provide 50% more TV = 1.21 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q _{pre} =	14.70 ac-ft		9.87 ac-ft
Q _{post} =	20.34 ac-ft		14.75 ac-ft
ΔQ =	5.64 ac-ft		4.88 ac-ft

Attenuation V_{req} = 5.64 ac-ft (use largest value)



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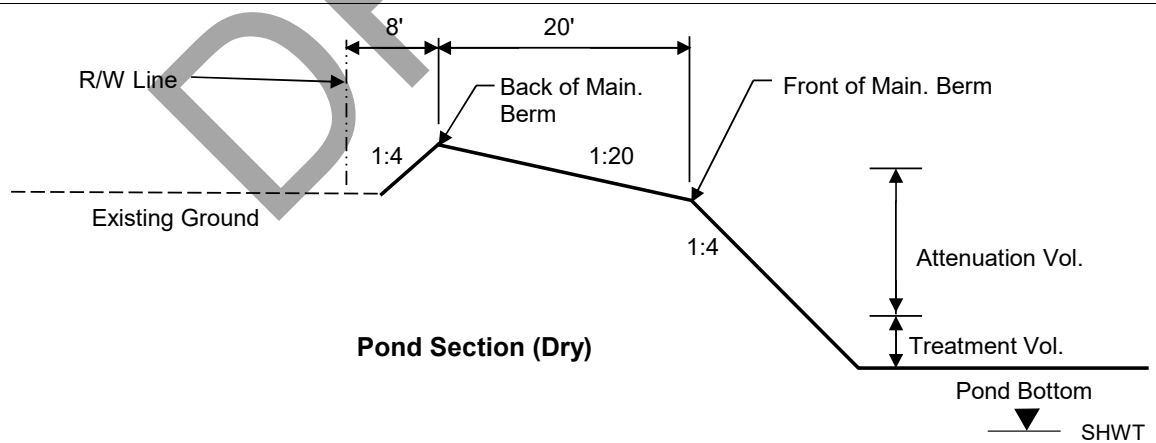
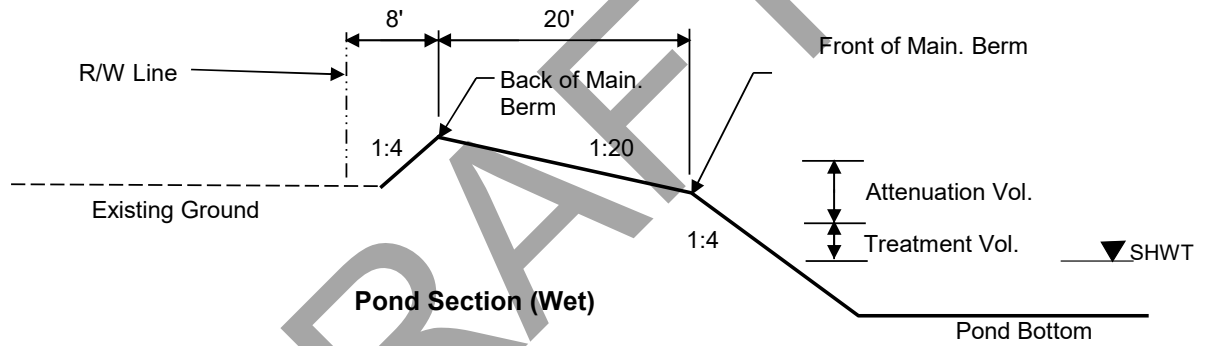
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **5**
 POND NAME : **5C**

Maintenance Area Width =	<u>20.0 ft</u>	@ 1:20	Existing Ground Elevation =	<u>38.00</u>
Pond Tie-In Width =	<u>8.0 ft</u>	@ 1:4	Normal Water Elevation =	<u>33.00</u>
Maximum Storage Depth (SD) =	<u>6.00 ft</u>	with 1.0 ft freeboard	Lowest EOP Elevation =	<u>41.00</u>

Hydraulic Grade Line (HGL) check

HGL Slope =	<u>0.100%</u>	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	<u>1000 ft</u>	
Estimated Energy Losses =	<u>1.0 ft</u>	
HGL Clearance =	<u>1.0 ft</u>	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	<u>39.0 ft</u>	





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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **5**
 POND NAME : **5C**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
38.00	Pond R/W	2.67 ac	430.0 ft	270.0 ft	
40.00	Back of Main. Berm	2.41 ac	414.0 ft	254.0 ft	11.31 ac-ft
39.50		2.12 ac	394.0 ft	234.0 ft	10.18 ac-ft
39.00	Front of Main. Berm	1.84 ac	374.0 ft	214.0 ft	9.19 ac-ft
38.00	Provided Treat.Vol.+Att.Vol	1.73 ac	366.0 ft	206.0 ft	7.41 ac-ft
37.80	Req'd Treat.Vol+Att. Vol	1.71 ac	364.4 ft	204.4 ft	7.07 ac-ft
36.98	Estimated Storm Sewer TW	1.62 ac	357.8 ft	197.8 ft	5.69 ac-ft
34.00	Top of Treatment Vol.	1.33 ac	334.0 ft	174.0 ft	1.29 ac-ft
33.00	Normal Water Level	1.24 ac	326.0 ft	166.0 ft	0.00 ac-ft
31.00		1.07 ac	310.0 ft	150.0 ft	
23.00	Pond Bottom	0.56 ac	286.0 ft	86.0 ft	

Required Treatment+Attenuation Vol.= 6.85 ac-ft
 Required Treatment+Attenuation Stage= 37.80 ft

Provided Treatment+Attenuation Vol.= 7.41 ac-ft
 Provided Treatment+Attenuation Stage= 38.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 5.69 ac-ft
 Estimated Storm Sewer TW EL.= 36.98 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 3.20 ac

Complete Report (not including cost) Ver 4.3.5

Project: US 301 PD_E

Date: 4/6/2023 11:36:29 AM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	Basin 5
Rainfall Zone	Florida Zone 4
Annual Mean Rainfall	51.00
Pre-Condition Landuse Information	
Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	41.19
Rational Coefficient (0-1)	0.14
Non DCIA Curve Number	30.00
DCIA Percent (0-100)	16.67
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	24.630
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	46.160
Phosphorus Loading (kg/yr)	6.074
Post-Condition Landuse Information	
Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	41.19
Rational Coefficient (0-1)	0.48
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	58.03
Wet Pond Area (ac)	1.18
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	81.954
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	153.595
Phosphorus Loading (kg/yr)	20.210

Catchment Number: 1 Name: Basin 5

Project: US 301 PD_E

Date: 4/6/2023

Multiple BMP in Series Design Parameters

BMP in Series Number: 1

BMP Type: Swale

Swale Top Width for Flood Conditions - W (ft)	23.000
Swale Bottom Width - B (ft)	5.000
Swale Length - L (ft)	8,800.000
Average Impervious Length (ft)	8,800.000
Average Impervious Width (ft)	94.000
Average Pervious Width (ft)	144.000
Swale Slope (foot drop/foot length) - S	0.001
Mannings N	0.060
Soil Infiltration Rate (in/hr)	0.400
Side Slope of Swale horizontal/vertical - Z	6.000
Average Height of Swale Block - H	0.500
Length of Berm Upstream of Crest - L_b	0.000
Runoff Area (acres)	48.081
Number of Swale Blocks	

BMP in Series Number: 2

BMP Type: Wet Detention

Permanent Pool Volume (ac-ft)	7.880
Permanent Pool Volume (ac-ft) for 31 days residence	6.960
Annual Residence Time (days)	35
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

BMP in Series Number: 3

BMP Type: None

BMP in Series Number: 4

BMP Type: None

Watershed Characteristics

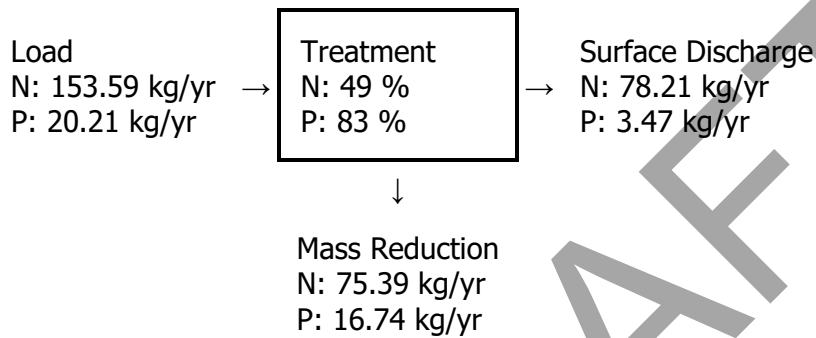
Catchment Area (acres)	41.19
Contributing Area (acres)	40.010
Non-DCIA Curve Number	39.00
DCIA Percent	58.03

Rainfall Zone Florida Zone 4
Rainfall (in) 51.00

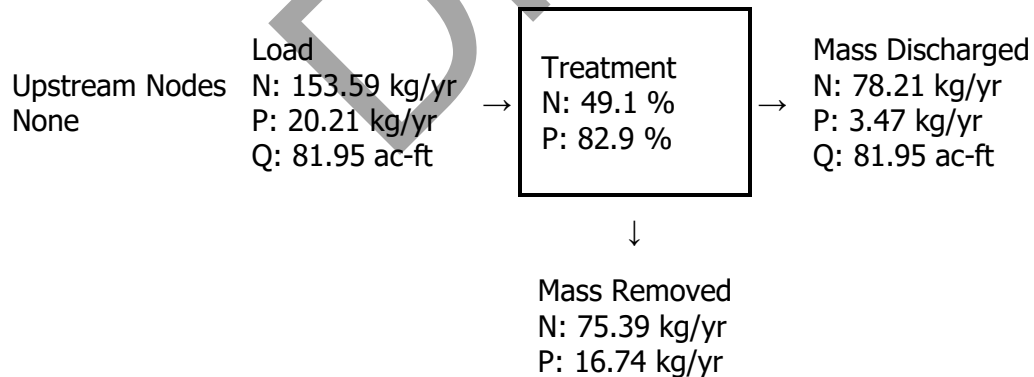
Surface Water Discharge

Required TN Treatment Efficiency (%) 70
Provided TN Treatment Efficiency (%) 49
Required TP Treatment Efficiency (%) 70
Provided TP Treatment Efficiency (%) 83

Load for Multiple BMP in Series



Load Diagram for Multiple BMP (As Used In Routing)



Summary Treatment Report Version: 4.3.5

Project: US 301 PD_E

Analysis Type: Net Improvement

Date:4/6/2023

BMP Types:

Catchment 1 - (Basin 5) Multiple
BMP

Routing Summary

Catchment 1 Routed to Outlet

Based on % removal values to the
nearest percent

Total nitrogen target removal met? **No**

Total phosphorus target removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	46.16 kg/yr	
Total N post load	153.59 kg/yr	
Target N load reduction	70 %	
Target N discharge load	46.16 kg/yr	
Percent N load reduction	49 %	
Provided N discharge load	78.21 kg/yr	172.45 lb/yr
Provided N load removed	75.39 kg/yr	166.23 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	6.074 kg/yr	
Total P post load	20.21 kg/yr	
Target P load reduction	70 %	
Target P discharge load	6.074 kg/yr	
Percent P load reduction	83 %	
Provided P discharge load	3.466 kg/yr	7.64 lb/yr
Provided P load removed	16.744 kg/yr	36.921 lb/yr



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **6**
 POND NAME : **6A**

Station Limits: From: **1580+00** Roadway Length = 6550 ft
 To: **1645+50** R/W Width = 235 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Access Road	20.0 ft	1	20 ft
Total Impervious Width:			54 ft

Impervious Roadway Area: 8.12 ac
 Pervious Roadway Area: 27.22 ac
 Total Roadway Area: 35.34 ac

Pond Area: Pervious Pond Area = 3.05 ac

Total Area: Impervious Area: 8.12 ac
 Pervious Area: 30.27 ac
 Total Area: 38.39 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	3.47 ac	340.2
Impervious areas; Streets & roads	D	98	4.65 ac	455.6
Open Space (lawns, parks, golf courses, cemeteries,	A	68	9.38 ac	638.2
Open Space (lawns, parks, golf courses, cemeteries,	D	89	12.57 ac	1118.6
Depressional areas & existing storage	A	87	2.25 ac	195.7
Depressional areas & existing storage	D	90	0.00 ac	0.0
Depressional areas & existing storage	D	90	3.01 ac	271.2
Depressional areas & existing storage	D	90	3.05 ac	274.5
Pasture, grassland or range; Good condition (> 75%	D	80		0.0
Total:			38.39 ac	3294.0

CN = Total CN*Area / Total Area = **85.8**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **1.65 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **6.49 in**

Permitting Agency Event			Storm Sewer Design
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			6.45 in
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			4.82 in
--	--	--	---------



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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **6**
 POND NAME : **6A**

Station Limits: From: **1580+00** Roadway Length = 6550 ft
 To: **1645+50** R/W Width = 235 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	6	72 ft
Paved Shoulder	5.0 ft	2	10 ft
Median Shoulder	4.0 ft	2	8 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	2	5 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			113 ft

Impervious Roadway Area: 16.92 ac
 Pervious Roadway Area: 18.42 ac
 Total Roadway Area: 35.34 ac

Pond Area: Pervious Pond Area : 1.01 ac
 Water Surface Area: 2.04 ac **Wet Pond**
 Total Pond Area: 3.05 ac

Total Area: Impervious Area: 16.92 ac
 Pervious Area: 19.43 ac
 Water Surface Area: 2.04 ac
 Total Area: 38.39 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	7.23 ac	708.7
Impervious areas; Streets & roads	D	98	9.68 ac	949.1
Open Space (lawns, parks, golf courses, cemeteries,	A	68	7.87 ac	535.4
Open Space (lawns, parks, golf courses, cemeteries,	D	89	10.55 ac	938.6
Open Space (lawns, parks, golf courses, cemeteries,	D	89	1.01 ac	90.2
Proposed Ponds (Water Surface)	D	100	2.04 ac	203.7
Total:			38.39 ac	3425.7

CN = Total CN*Area / Total Area = **89.2**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **1.21 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **6.90 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	---------

			5.20 in
--	--	--	---------



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **6**
 POND NAME : **6A**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	7.22 ac
Wet Detention	1.00 in

x DCIA (Net New) = 0.60 ac-ft

Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.60 ac-ft
OFW Requirement, provide 50% more TV = 0.90 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q _{pre} =	20.77 ac-ft		15.41 ac-ft
Q _{post} =	22.08 ac-ft		16.63 ac-ft
ΔQ =	1.31 ac-ft		1.22 ac-ft

Attenuation V_{req} = 1.31 ac-ft (use largest value)



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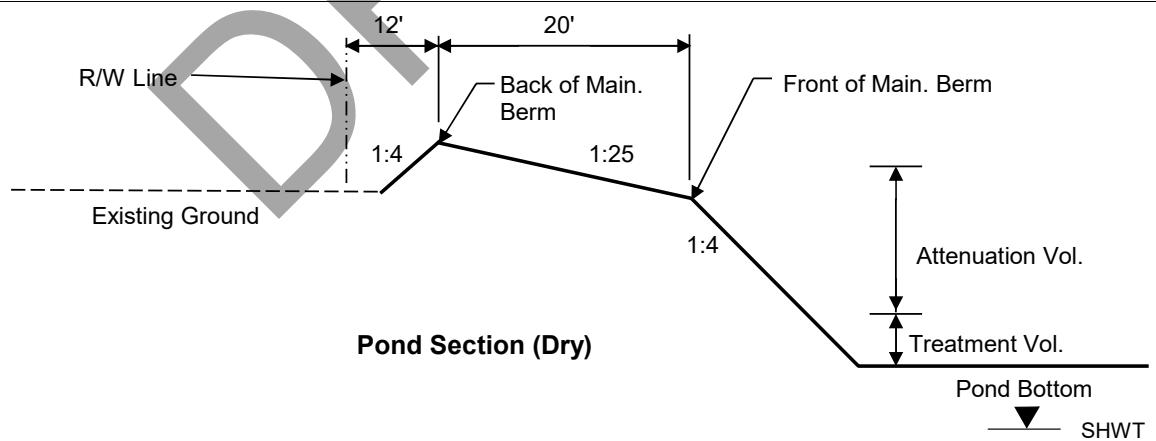
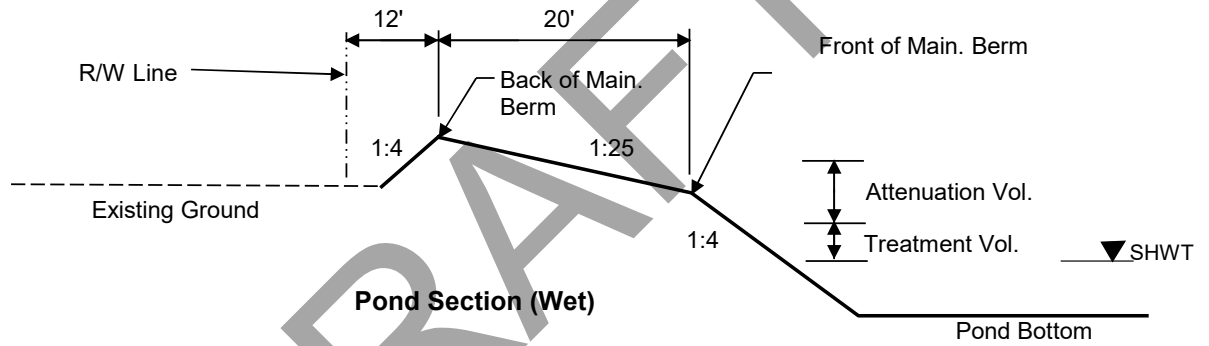
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **6**
 POND NAME : **6A**

Maintenance Area Width =	<u>20.0 ft</u>	@ 1:25	Existing Ground Elevation =	<u>30.00</u>
Pond Tie-In Width =	<u>12.0 ft</u>	@ 1:4	Normal Water Elevation =	<u>30.00</u>
Maximum Storage Depth (SD) =	<u>2.00 ft</u>	with 1.0 ft freeboard	Lowest EOP Elevation =	<u>41.00</u>

Hydraulic Grade Line (HGL) check

HGL Slope =	<u>0.050%</u>	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	<u>1000 ft</u>	
Estimated Energy Losses =	<u>0.5 ft</u>	
HGL Clearance =	<u>1.0 ft</u>	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	<u>39.5 ft</u>	





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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **6**
 POND NAME : **6A**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
30.00	Pond R/W	3.52 ac	628.0 ft	244.0 ft	
33.00	Back of Main. Berm	3.05 ac	604.0 ft	220.0 ft	6.95 ac-ft
32.60		2.68 ac	584.0 ft	200.0 ft	5.80 ac-ft
32.20	Front of Main. Berm	2.33 ac	564.0 ft	180.0 ft	4.80 ac-ft
31.20	Provided Treat.Vol.+Att.Vol	2.20 ac	556.0 ft	172.0 ft	2.54 ac-ft
31.05	Req'd Treat.Vol+Att. Vol	2.18 ac	554.8 ft	170.8 ft	2.21 ac-ft
30.87	Estimated Storm Sewer TW	2.15 ac	553.4 ft	169.4 ft	1.82 ac-ft
30.45	Top of Treatment Vol.	2.10 ac	550.0 ft	166.0 ft	0.93 ac-ft
30.00	Normal Water Level	2.04 ac	546.4 ft	162.4 ft	0.00 ac-ft
28.00		1.78 ac	530.4 ft	146.4 ft	
24.00	Pond Bottom	1.37 ac	522.4 ft	114.4 ft	

Required Treatment+Attenuation Vol.= 2.21 ac-ft
 Required Treatment+Attenuation Stage= 31.05 ft

Provided Treatment+Attenuation Vol.= 2.54 ac-ft
 Provided Treatment+Attenuation Stage= 31.20 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.82 ac-ft
 Estimated Storm Sewer TW EL.= 30.87 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 4.22 ac



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **6**
 POND NAME : **6B**

Station Limits: From: **1580+00** Roadway Length = 6550 ft
 To: **1645+50** R/W Width = 235 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Access Road	20.0 ft	1	20 ft
Total Impervious Width:			54 ft

Impervious Roadway Area: 8.12 ac
 Pervious Roadway Area: 27.22 ac
 Total Roadway Area: 35.34 ac

Pond Area: Pervious Pond Area = 3.09 ac

Total Area: Impervious Area: 8.12 ac
 Pervious Area: 30.31 ac
 Total Area: 38.43 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	3.47 ac	340.2
Impervious areas; Streets & roads	D	98	4.65 ac	455.6
Open Space (lawns, parks, golf courses, cemeteries,	A	68	9.38 ac	638.2
Open Space (lawns, parks, golf courses, cemeteries,	D	89	12.57 ac	1118.6
Depressional areas & existing storage	A	87	2.25 ac	195.7
Depressional areas & existing storage	D	90	0.00 ac	0.0
Depressional areas & existing storage	D	90	3.01 ac	271.2
Depressional areas & existing storage	D	90	3.09 ac	278.3
Pasture, grassland or range; Good condition (> 75%	D	80		0.0
Total:			38.43 ac	3297.7

CN = Total CN*Area / Total Area = **85.8**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **1.65 in**

Precipitation (P) = **8.19 in** Storm Sewer Design

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **6.49 in** **4.82 in**



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Made by: **ZKE**
 Checked by: **REC**

DATE: May 30, 2023
 Job Number: **AIM-010-01**

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **6**
 POND NAME : **6B**

Station Limits: From: **1580+00** Roadway Length = 6550 ft
 To: **1645+50** R/W Width = 235 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	6	72 ft
Paved Shoulder	5.0 ft	2	10 ft
Median Shoulder	4.0 ft	2	8 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	2	5 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			113 ft

Impervious Roadway Area: 16.92 ac
 Pervious Roadway Area: 18.42 ac
 Total Roadway Area: 35.34 ac

Pond Area: Pervious Pond Area : 0.93 ac
 Water Surface Area: 2.16 ac Wet Pond
 Total Pond Area: 3.09 ac

Total Area: Impervious Area: 16.92 ac
 Pervious Area: 19.35 ac
 Water Surface Area: 2.16 ac
 Total Area: 38.43 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	7.23 ac	708.7
Impervious areas; Streets & roads	D	98	9.68 ac	949.1
Open Space (lawns, parks, golf courses, cemeteries,	A	68	7.87 ac	535.4
Open Space (lawns, parks, golf courses, cemeteries,	D	89	10.55 ac	938.6
Open Space (lawns, parks, golf courses, cemeteries,	D	89	0.93 ac	82.8
Proposed Ponds (Water Surface)	D	100	2.16 ac	216.2
Total:			38.43 ac	3430.8

CN = Total CN*Area / Total Area = **89.3**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **1.20 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **6.91 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	---------

			5.20 in
--	--	--	---------



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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **6**
 POND NAME : **6B**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	7.22 ac
Wet Detention	1.00 in

x DCIA (Net New) = 0.60 ac-ft

Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.60 ac-ft
OFW Requirement, provide 50% more TV = 0.90 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q _{pre} =	20.79 ac-ft		15.43 ac-ft
Q _{post} =	22.12 ac-ft		16.66 ac-ft
ΔQ =	1.32 ac-ft		1.23 ac-ft

Attenuation V_{req} = 1.32 ac-ft (use largest value)



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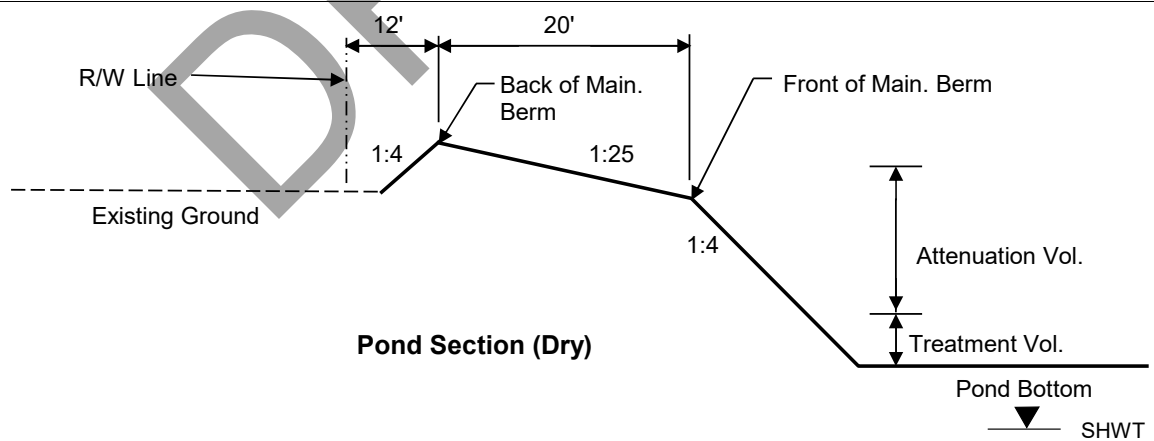
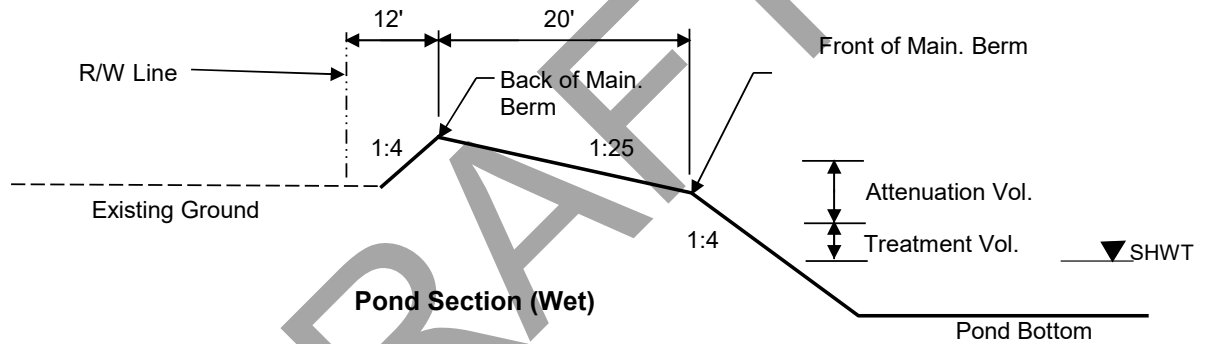
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **6**
 POND NAME : **6B**

Maintenance Area Width =	<u>20.0 ft</u>	@ 1:25	Existing Ground Elevation =	<u>30.00</u>
Pond Tie-In Width =	<u>12.0 ft</u>	@ 1:4	Normal Water Elevation =	<u>30.00</u>
Maximum Storage Depth (SD) =	<u>2.00 ft</u>	with 1.0 ft freeboard	Lowest EOP Elevation =	<u>41.00</u>

Hydraulic Grade Line (HGL) check

HGL Slope =	<u>0.050%</u>	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	<u>1000 ft</u>	
Estimated Energy Losses =	<u>0.5 ft</u>	
HGL Clearance =	<u>1.0 ft</u>	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	<u>39.5 ft</u>	





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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **6**
 POND NAME : **6B**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
30.00	Pond R/W	3.52 ac	505.0 ft	304.0 ft	
33.00	Back of Main. Berm	3.09 ac	481.0 ft	280.0 ft	7.25 ac-ft
32.60		2.75 ac	461.0 ft	260.0 ft	6.08 ac-ft
32.20	Front of Main. Berm	2.43 ac	441.0 ft	240.0 ft	5.05 ac-ft
31.20	Provided Treat.Vol.+Att.Vol	2.31 ac	433.0 ft	232.0 ft	2.68 ac-ft
31.05	Req'd Treat.Vol+Att. Vol	2.29 ac	431.8 ft	230.8 ft	2.34 ac-ft
30.83	Estimated Storm Sewer TW	2.26 ac	430.0 ft	229.0 ft	1.84 ac-ft
30.45	Top of Treatment Vol.	2.22 ac	427.0 ft	226.0 ft	0.98 ac-ft
30.00	Normal Water Level	2.16 ac	423.4 ft	222.4 ft	0.00 ac-ft
28.00		1.93 ac	407.4 ft	206.4 ft	
24.00	Pond Bottom	1.60 ac	399.4 ft	174.4 ft	

Required Treatment+Attenuation Vol.= 2.22 ac-ft
 Required Treatment+Attenuation Stage= 31.05 ft

Provided Treatment+Attenuation Vol.= 2.68 ac-ft
 Provided Treatment+Attenuation Stage= 31.20 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.84 ac-ft
 Estimated Storm Sewer TW EL.= 30.83 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 4.23 ac



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **6**
 POND NAME : **6C**

Station Limits: From: **1580+00** Roadway Length = 6550 ft
 To: **1645+50** R/W Width = 230 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Access Road	20.0 ft	1	20 ft
Total Impervious Width:			54 ft

Impervious Roadway Area: 8.12 ac
 Pervious Roadway Area: 26.46 ac
 Total Roadway Area: 34.58 ac

Pond Area: Pervious Pond Area = 3.90 ac

Total Area: Impervious Area: 8.12 ac
 Pervious Area: 30.36 ac
 Total Area: 38.48 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	3.47 ac	340.2
Impervious areas; Streets & roads	D	98	4.65 ac	455.6
Open Space (lawns, parks, golf courses, cemeteries,	A	68	9.38 ac	638.2
Open Space (lawns, parks, golf courses, cemeteries,	D	89	12.57 ac	1118.6
Depressional areas & existing storage	A	87	1.93 ac	167.8
Depressional areas & existing storage	D	90	2.58 ac	232.4
Depressional areas & existing storage	D	90	3.90 ac	350.8
Total:			38.48 ac	3303.6

CN = Total CN*Area / Total Area = **85.8**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **1.65 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **6.50 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

8.19 in			6.45 in
---------	--	--	---------

6.50 in			4.82 in
---------	--	--	---------



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **6**
 POND NAME : **6C**

Station Limits: From: **1580+00** Roadway Length = 6550 ft
 To: **1645+50** R/W Width = 230 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	6	72 ft
Paved Shoulder	5.0 ft	2	10 ft
Median Shoulder	4.0 ft	2	8 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	2	5 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			113 ft

Impervious Roadway Area: 16.92 ac
 Pervious Roadway Area: 17.67 ac
 Total Roadway Area: 34.58 ac

Pond Area: Pervious Pond Area : 0.99 ac
 Water Surface Area: 2.91 ac Wet Pond
 Total Pond Area: 3.90 ac

Total Area: Impervious Area: 16.92 ac
 Pervious Area: 18.66 ac
 Water Surface Area: 2.91 ac
 Total Area: 38.48 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	7.23 ac	708.7
Impervious areas; Streets & roads	D	98	9.68 ac	949.1
Open Space (lawns, parks, golf courses, cemeteries,	A	68	7.55 ac	513.6
Open Space (lawns, parks, golf courses, cemeteries,	D	89	10.12 ac	900.3
Open Space (lawns, parks, golf courses, cemeteries,	D	89	0.99 ac	88.3
Proposed Ponds (Water Surface)	D	100	2.91 ac	290.6
Total:			38.48 ac	3450.6

CN = Total CN*Area / Total Area = **89.7**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 = 1.15 \text{ in}$

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **6.95 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	---------

			5.25 in
--	--	--	---------



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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **6**
 POND NAME : **6C**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	7.22 ac
Wet Detention	1.00 in

x DCIA (Net New) = 0.60 ac-ft

--	--

Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.60 ac-ft
OFW Requirement, provide 50% more TV = 0.90 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q _{pre} =	20.84 ac-ft		15.46 ac-ft
Q _{post} =	22.30 ac-ft		16.83 ac-ft
ΔQ =	1.46 ac-ft		1.37 ac-ft

Attenuation V_{req} = 1.46 ac-ft (use largest value)



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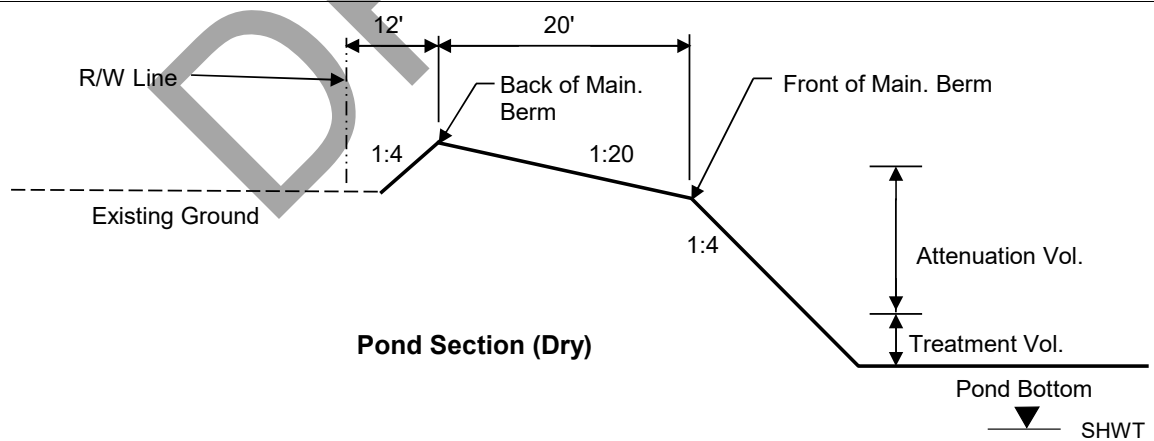
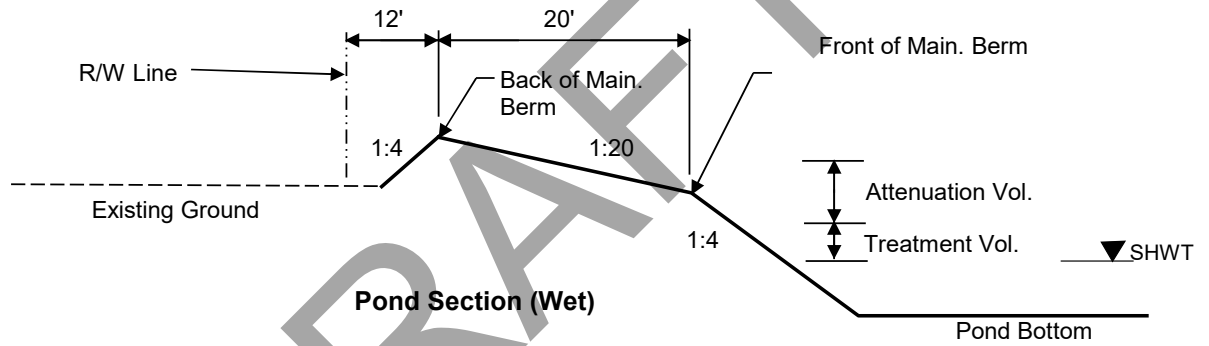
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **6**
 POND NAME : **6C**

Maintenance Area Width =	<u>20.0 ft</u>	@ 1:20	Existing Ground Elevation =	<u>30.00</u>
Pond Tie-In Width =	<u>12.0 ft</u>	@ 1:4	Normal Water Elevation =	<u>30.00</u>
Maximum Storage Depth (SD) =	<u>2.00 ft</u>	with 1.0 ft freeboard	Lowest EOP Elevation =	<u>41.00</u>

Hydraulic Grade Line (HGL) check

HGL Slope =	<u>0.050%</u>	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	<u>1000 ft</u>	
Estimated Energy Losses =	<u>0.5 ft</u>	
HGL Clearance =	<u>1.0 ft</u>	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	<u>39.5 ft</u>	





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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **6**
 POND NAME : **6C**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
30.00	Pond R/W	4.37 ac	400.5 ft	475.0 ft	
33.00	Back of Main. Berm	3.90 ac	376.5 ft	451.0 ft	9.61 ac-ft
32.50		3.53 ac	356.5 ft	431.0 ft	7.76 ac-ft
32.00	Front of Main. Berm	3.17 ac	336.5 ft	411.0 ft	6.08 ac-ft
31.00	Provided Treat.Vol.+Att.Vol	3.04 ac	328.5 ft	403.0 ft	2.97 ac-ft
30.80	Req'd Treat.Vol+Att. Vol	3.01 ac	326.9 ft	401.4 ft	2.37 ac-ft
30.67	Estimated Storm Sewer TW	2.99 ac	325.8 ft	400.3 ft	1.97 ac-ft
30.35	Top of Treatment Vol.	2.95 ac	323.3 ft	397.8 ft	1.03 ac-ft
30.00	Normal Water Level	2.91 ac	320.5 ft	395.0 ft	0.00 ac-ft
28.00		2.65 ac	304.5 ft	379.0 ft	
24.00	Pond Bottom	2.36 ac	296.5 ft	347.0 ft	

Required Treatment+Attenuation Vol.= 2.36 ac-ft
 Required Treatment+Attenuation Stage= 30.80 ft

Provided Treatment+Attenuation Vol.= 2.97 ac-ft
 Provided Treatment+Attenuation Stage= 31.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.97 ac-ft
 Estimated Storm Sewer TW EL.= 30.67 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 5.24 ac

Complete Report (not including cost) Ver 4.3.5

Project: US 301 PD_E

Date: 4/10/2023 4:49:11 PM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	Basin 6
Rainfall Zone	Florida Zone 4
Annual Mean Rainfall	51.00
Pre-Condition Landuse Information	
Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	38.48
Rational Coefficient (0-1)	0.37
Non DCIA Curve Number	89.00
DCIA Percent (0-100)	21.10
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	60.630
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	113.631
Phosphorus Loading (kg/yr)	14.951
Post-Condition Landuse Information	
Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	38.48
Rational Coefficient (0-1)	0.55
Non DCIA Curve Number	89.00
DCIA Percent (0-100)	51.51
Wet Pond Area (ac)	2.90
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	82.427
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	154.481
Phosphorus Loading (kg/yr)	20.326

Catchment Number: 1 Name: Basin 6

Project: US 301 PD_E

Date: 4/10/2023

Multiple BMP in Series Design Parameters

BMP in Series Number: 1

BMP Type: Swale

Swale Top Width for Flood Conditions - W (ft)	45.000
Swale Bottom Width - B (ft)	5.000
Swale Length - L (ft)	6,550.000
Average Impervious Length (ft)	6,550.000
Average Impervious Width (ft)	112.000
Average Pervious Width (ft)	141.500
Swale Slope (foot drop/foot length) - S	0.001
Mannings N	0.060
Soil Infiltration Rate (in/hr)	0.400
Side Slope of Swale horizontal/vertical - Z	6.000
Average Height of Swale Block - H	0.500
Length of Berm Upstream of Crest - L_b	0.000
Runoff Area (acres)	38.118
Number of Swale Blocks	

BMP in Series Number: 2

BMP Type: Wet Detention

Permanent Pool Volume (ac-ft)	15.550
Permanent Pool Volume (ac-ft) for 31 days residence	7.001
Annual Residence Time (days)	69
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

BMP in Series Number: 3

BMP Type: None

BMP in Series Number: 4

BMP Type: None

Watershed Characteristics

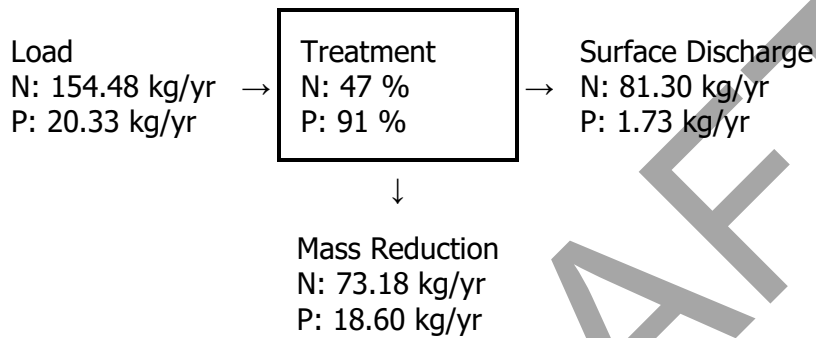
Catchment Area (acres)	38.48
Contributing Area (acres)	35.580
Non-DCIA Curve Number	89.00
DCIA Percent	51.51

Rainfall Zone	Florida Zone 4
Rainfall (in)	51.00

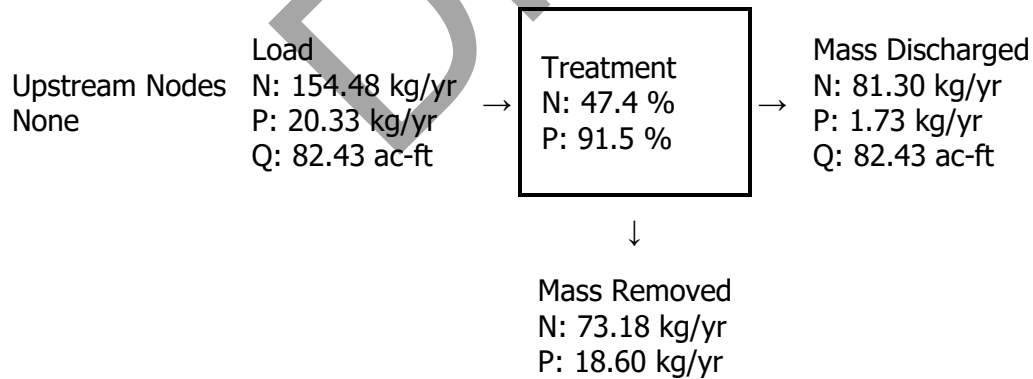
Surface Water Discharge

Required TN Treatment Efficiency (%) 26
 Provided TN Treatment Efficiency (%) 47
 Required TP Treatment Efficiency (%) 26
 Provided TP Treatment Efficiency (%) 91

Load for Multiple BMP in Series



Load Diagram for Multiple BMP (As Used In Routing)



Summary Treatment Report Version: 4.3.5

Project: US 301 PD_E

Analysis Type: Net Improvement

Date:4/10/2023

BMP Types:

Catchment 1 - (Basin 6) Multiple
BMP

Routing Summary

Catchment 1 Routed to Outlet

Based on % removal values to the
nearest percent

Total nitrogen target removal met? **Yes**

Total phosphorus target removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	113.63 kg/yr	
Total N post load	154.48 kg/yr	
Target N load reduction	26 %	
Target N discharge load	113.63 kg/yr	
Percent N load reduction	47 %	
Provided N discharge load	81.3 kg/yr	179.26 lb/yr
Provided N load removed	73.18 kg/yr	161.37 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	14.951 kg/yr	
Total P post load	20.326 kg/yr	
Target P load reduction	26 %	
Target P discharge load	14.951 kg/yr	
Percent P load reduction	91 %	
Provided P discharge load	1.729 kg/yr	3.81 lb/yr
Provided P load removed	18.597 kg/yr	41.007 lb/yr



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **7**
 POND NAME : **7A**

Station Limits: From: **1645+50** Roadway Length = 4950 ft
 To: **1695+00** R/W Width = 192 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 3.86 ac
 Pervious Roadway Area: 17.95 ac
 Total Roadway Area: 21.82 ac

Pond Area: Pervious Pond Area = 2.12 ac

Total Area: Impervious Area: 3.86 ac
 Pervious Area: 20.07 ac
 Total Area: 23.94 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.09 ac	107.1
Impervious areas; Streets & roads	D	98	2.77 ac	271.5
Open Space (lawns, parks, golf courses, cemeteries,	A	68	2.12 ac	144.2
Open Space (lawns, parks, golf courses, cemeteries,	D	89	5.38 ac	478.7
Woods; Good condition (Woods are protected from	A	30	2.96 ac	88.7
Depressional areas & existing storage	D	90	7.50 ac	674.8
Pasture, grassland or range; Fair condition (50% to	D	84	2.12 ac	177.8
Total:			23.94 ac	1942.9

CN = Total CN*Area / Total Area = **81.2**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **2.32 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **5.94 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	---------

			4.31 in
--	--	--	---------



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **7**
 POND NAME : **7A**

Station Limits: From: **1645+50** Roadway Length = 4950 ft
 To: **1695+00** R/W Width = 192 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	6	72 ft
Paved Shoulder	5.0 ft	2	10 ft
Median Shoulder	4.0 ft	2	8 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	2	5 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			113 ft

Impervious Roadway Area: 12.78 ac
 Pervious Roadway Area: 9.03 ac
 Total Roadway Area: 21.82 ac

Pond Area: Pervious Pond Area : 0.90 ac
 Water Surface Area: 1.22 ac Wet Pond
 Total Pond Area: 2.12 ac

Total Area: Impervious Area: 12.78 ac
 Pervious Area: 9.93 ac
 Water Surface Area: 1.22 ac
 Total Area: 23.94 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	3.62 ac	354.3
Impervious areas; Streets & roads	D	98	9.17 ac	898.5
Open Space (lawns, parks, golf courses, cemeteries,	A	68	2.56 ac	173.7
Open Space (lawns, parks, golf courses, cemeteries,	D	89	6.48 ac	576.6
Open Space (lawns, parks, golf courses, cemeteries,	D	89	0.90 ac	79.7
Proposed Ponds (Water Surface)	D	100	1.22 ac	122.1
Total:			23.94 ac	2205.1

CN = Total CN*Area / Total Area = **92.1**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 = 0.85 \text{ in}$

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **7.25 in**

Permitting Agency Event			Storm Sewer Design
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			6.45 in
--	--	--	---------

			5.53 in
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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **7**
 POND NAME : **7A**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	5.45 ac
Wet Detention	1.00 in

x DCIA (Net New) = 0.45 ac-ft

--	--

Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.45 ac-ft
OFW Requirement, provide 50% more TV = 0.68 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q _{pre} =	11.85 ac-ft		8.61 ac-ft
Q _{post} =	14.45 ac-ft		11.02 ac-ft
ΔQ =	2.60 ac-ft		2.42 ac-ft

Attenuation V_{req} = 2.60 ac-ft (use largest value)



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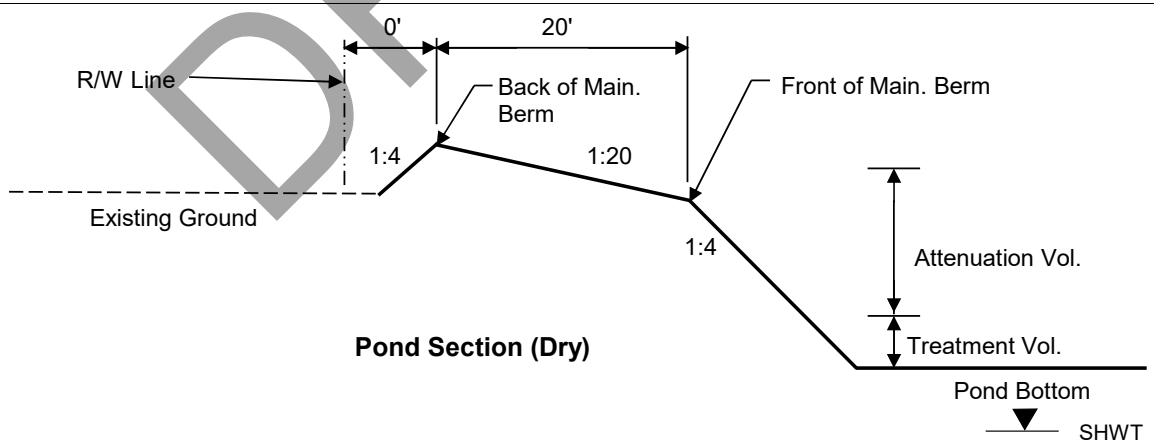
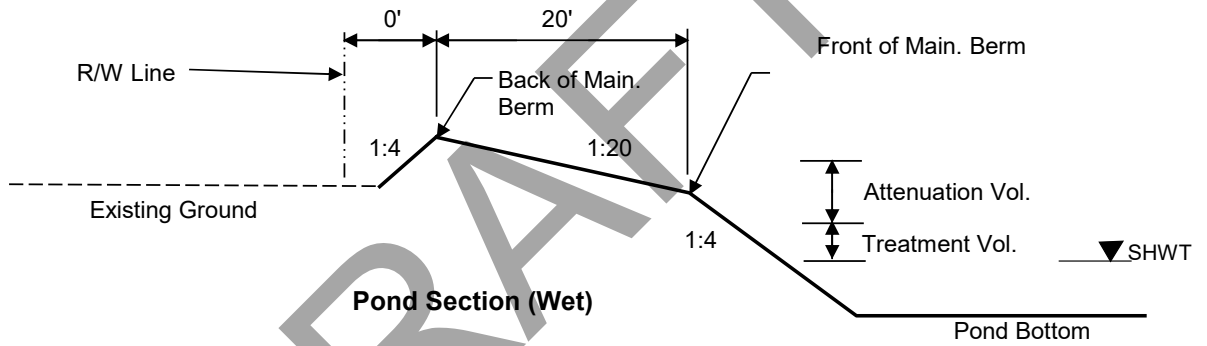
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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **7**
 POND NAME : **7A**

Maintenance Area Width =	<u>20.0 ft</u>	@ 1:20	Existing Ground Elevation =	<u>44.00</u>
Pond Tie-In Width =	<u>0.0 ft</u>	@ 1:4	Normal Water Elevation =	<u>39.00</u>
Maximum Storage Depth (SD) =	<u>4.00 ft</u>	with 1.0 ft freeboard	Lowest EOP Elevation =	<u>43.00</u>

Hydraulic Grade Line (HGL) check

HGL Slope =	<u>0.050%</u>	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	<u>1000 ft</u>	
Estimated Energy Losses =	<u>0.5 ft</u>	
HGL Clearance =	<u>1.0 ft</u>	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	<u>41.5 ft</u>	





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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **7**
 POND NAME : **7A**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
44.00	Pond R/W	2.12 ac	352.0 ft	262.0 ft	
44.00	Back of Main. Berm	2.12 ac	352.0 ft	262.0 ft	7.46 ac-ft
43.50		1.84 ac	332.0 ft	242.0 ft	6.47 ac-ft
43.00	Front of Main. Berm	1.59 ac	312.0 ft	222.0 ft	5.61 ac-ft
42.00	Provided Treat.Vol.+Att.Vol	1.49 ac	304.0 ft	214.0 ft	4.07 ac-ft
41.70	Req'd Treat.Vol+Att. Vol	1.47 ac	301.6 ft	211.6 ft	3.62 ac-ft
41.18	Estimated Storm Sewer TW	1.42 ac	297.4 ft	207.4 ft	2.87 ac-ft
39.57	Top of Treatment Vol.	1.27 ac	284.6 ft	194.6 ft	0.71 ac-ft
39.00	Normal Water Level	1.22 ac	280.0 ft	190.0 ft	0.00 ac-ft
37.00		1.05 ac	264.0 ft	174.0 ft	
29.00	Pond Bottom	0.61 ac	240.0 ft	110.0 ft	

Required Treatment+Attenuation Vol.= 3.28 ac-ft
 Required Treatment+Attenuation Stage= 41.70 ft

Provided Treatment+Attenuation Vol.= 4.07 ac-ft
 Provided Treatment+Attenuation Stage= 42.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.87 ac-ft
 Estimated Storm Sewer TW EL.= 41.18 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.54 ac



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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **7**
 POND NAME : **7B**

Station Limits: From: **1645+50** Roadway Length = 4950 ft
 To: **1695+00** R/W Width = 192 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 3.86 ac
 Pervious Roadway Area: 17.95 ac
 Total Roadway Area: 21.82 ac

Pond Area: Pervious Pond Area = 2.70 ac

Total Area: Impervious Area: 3.86 ac
 Pervious Area: 20.65 ac
 Total Area: 24.52 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.09 ac	107.1
Impervious areas; Streets & roads	D	98	2.77 ac	271.5
Open Space (lawns, parks, golf courses, cemeteries,	A	68	2.12 ac	144.2
Open Space (lawns, parks, golf courses, cemeteries,	D	89	5.38 ac	478.7
Woods; Good condition (Woods are protected from	A	30	2.96 ac	88.7
Depressional areas & existing storage	D	90	7.50 ac	674.8
Depressional areas & existing storage	D	90	2.70 ac	242.9
Pasture, grassland or range; Good condition (> 75%	D	80		0.0
Total:			24.52 ac	2008.0

CN = Total CN*Area / Total Area = **81.9**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **2.21 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Precipitation (P) = **8.19 in**

Runoff (Q) = **6.03 in**

Permitting Agency Event			Storm Sewer Design
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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **7**
 POND NAME : **7B**

Station Limits: From: **1645+50** Roadway Length = 4950 ft
 To: **1695+00** R/W Width = 192 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	6	72 ft
Paved Shoulder	5.0 ft	2	10 ft
Median Shoulder	4.0 ft	2	8 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	2	5 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			113 ft

Impervious Roadway Area: 12.78 ac
 Pervious Roadway Area: 9.03 ac
 Total Roadway Area: 21.82 ac

Pond Area: Pervious Pond Area : 0.94 ac
 Water Surface Area: 1.76 ac Wet Pond
 Total Pond Area: 2.70 ac

Total Area: Impervious Area: 12.78 ac
 Pervious Area: 9.97 ac
 Water Surface Area: 1.76 ac
 Total Area: 24.52 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	3.62 ac	354.3
Impervious areas; Streets & roads	D	98	9.17 ac	898.5
Open Space (lawns, parks, golf courses, cemeteries,	A	68	2.56 ac	173.7
Open Space (lawns, parks, golf courses, cemeteries,	D	89	6.48 ac	576.6
Open Space (lawns, parks, golf courses, cemeteries,	D	89	0.94 ac	83.4
Proposed Ponds (Water Surface)	D	100	1.76 ac	176.2
Total:			24.52 ac	2262.8

CN = Total CN*Area / Total Area = **92.3**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **0.83 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **7.27 in**

Permitting Agency Event			Storm Sewer Design
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			6.45 in
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			5.55 in
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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **7**
 POND NAME : **7B**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	5.45 ac
Wet Detention	1.00 in

$5.45 \text{ ac} \times 1.00 \text{ in DCIA (Net New)} = 0.45 \text{ ac-ft}$

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Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.45 ac-ft
OFW Requirement, provide 50% more TV = 0.68 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
$Q_{pre} =$	12.32 ac-ft		8.97 ac-ft
$Q_{post} =$	14.85 ac-ft		11.33 ac-ft
$\Delta Q =$	2.53 ac-ft		2.36 ac-ft

Attenuation $V_{req} = 2.53 \text{ ac-ft}$ (use largest value)



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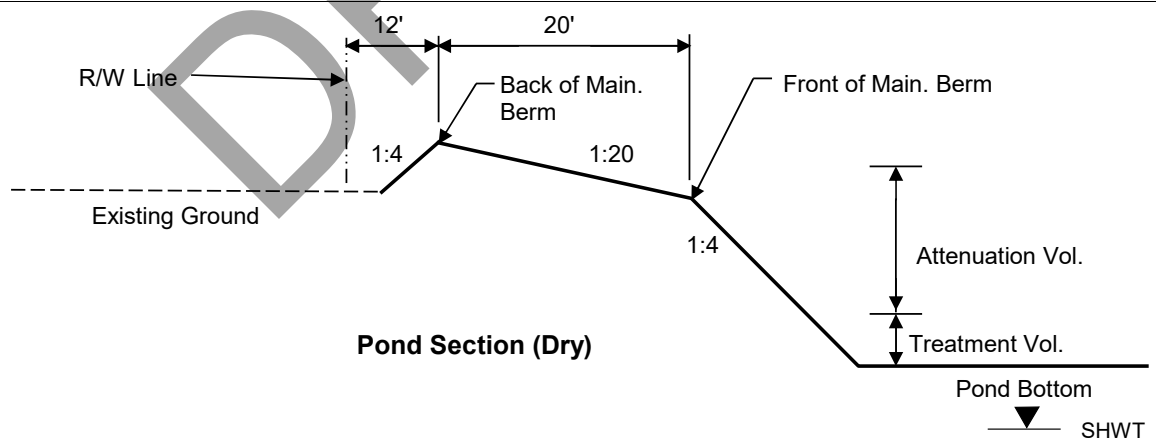
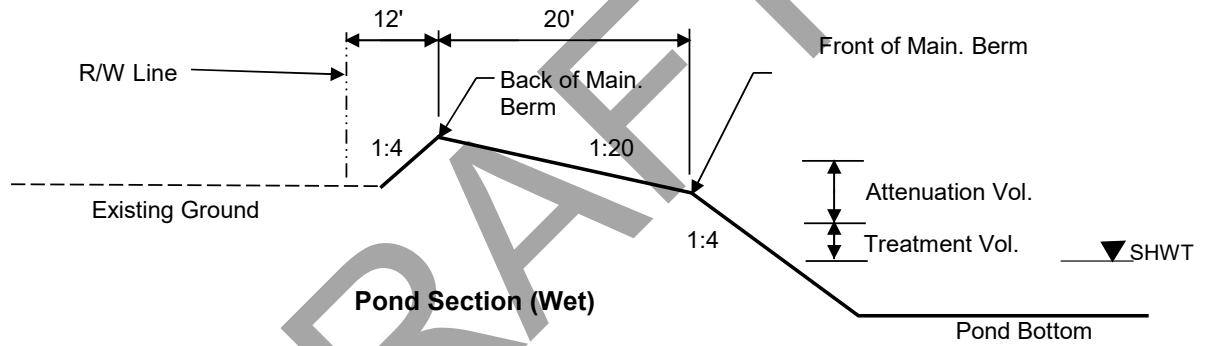
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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **7**
 POND NAME : **7B**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	40.00
Pond Tie-In Width =	12.0 ft	@ 1:4	Normal Water Elevation =	39.00
Maximum Storage Depth (SD) =	3.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	43.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.050%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	250 ft	
Estimated Energy Losses =	0.1 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	41.9 ft	





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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **7**
 POND NAME : **7B**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
40.00	Pond R/W	3.10 ac	450.0 ft	300.0 ft	
43.00	Back of Main. Berm	2.70 ac	426.0 ft	276.0 ft	8.16 ac-ft
42.50		2.39 ac	406.0 ft	256.0 ft	6.89 ac-ft
42.00	Front of Main. Berm	2.09 ac	386.0 ft	236.0 ft	5.77 ac-ft
41.00	Provided Treat.Vol.+Att.Vol	1.98 ac	378.0 ft	228.0 ft	3.74 ac-ft
40.80	Req'd Treat.Vol+Att. Vol	1.96 ac	376.4 ft	226.4 ft	3.35 ac-ft
40.53	Estimated Storm Sewer TW	1.93 ac	374.2 ft	224.2 ft	2.81 ac-ft
39.47	Top of Treatment Vol.	1.81 ac	365.8 ft	215.8 ft	0.84 ac-ft
39.00	Normal Water Level	1.76 ac	362.0 ft	212.0 ft	0.00 ac-ft
37.00		1.56 ac	346.0 ft	196.0 ft	
33.00	Pond Bottom	1.27 ac	338.0 ft	164.0 ft	

Required Treatment+Attenuation Vol.= 3.21 ac-ft
 Required Treatment+Attenuation Stage= 40.80 ft

Provided Treatment+Attenuation Vol.= 3.74 ac-ft
 Provided Treatment+Attenuation Stage= 41.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 2.81 ac-ft
 Estimated Storm Sewer TW EL.= 40.53 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 3.72 ac



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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **7**
 POND NAME : **7C**

Station Limits: From: **1645+50** Roadway Length = 4950 ft
 To: **1695+00** R/W Width = 192 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 3.86 ac
 Pervious Roadway Area: 17.95 ac
 Total Roadway Area: 21.82 ac

Pond Area: Pervious Pond Area = 3.24 ac

Total Area: Impervious Area: 3.86 ac
 Pervious Area: 21.19 ac
 Total Area: 25.06 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	1.09 ac	107.1
Impervious areas; Streets & roads	D	98	2.77 ac	271.5
Open Space (lawns, parks, golf courses, cemeteries,	A	68	2.12 ac	144.2
Open Space (lawns, parks, golf courses, cemeteries,	D	89	5.38 ac	478.7
Woods; Good condition (Woods are protected from	A	30	2.96 ac	88.7
Depressional areas & existing storage	D	90	7.50 ac	674.8
Residential Areas (2.0 acre, 12% Impervious)	D	82	3.24 ac	265.7
Total:			25.06 ac	2030.8

CN = Total CN*Area / Total Area = **81.0**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **2.34 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **5.93 in**

Permitting Agency Event			Storm Sewer Design
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8.19 in			6.45 in
---------	--	--	---------

5.93 in			4.30 in
---------	--	--	---------



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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **7**
 POND NAME : **7C**

Station Limits: From: **1645+50** Roadway Length = 4950 ft
 To: **1695+00** R/W Width = 192 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	6	72 ft
Paved Shoulder	5.0 ft	2	10 ft
Median Shoulder	4.0 ft	2	8 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	2	5 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			113 ft

Impervious Roadway Area: 12.78 ac
 Pervious Roadway Area: 9.03 ac
 Total Roadway Area: 21.82 ac

Pond Area: Pervious Pond Area : 0.98 ac
 Water Surface Area: 2.26 ac Wet Pond
 Total Pond Area: 3.24 ac

Total Area: Impervious Area: 12.78 ac
 Pervious Area: 10.02 ac
 Water Surface Area: 2.26 ac
 Total Area: 25.06 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	3.62 ac	354.3
Impervious areas; Streets & roads	D	98	9.17 ac	898.5
Open Space (lawns, parks, golf courses, cemeteries,	A	68	2.56 ac	173.7
Open Space (lawns, parks, golf courses, cemeteries,	D	89	6.48 ac	576.6
Open Space (lawns, parks, golf courses, cemeteries,	D	89	0.98 ac	87.4
Proposed Ponds (Water Surface)	D	100	2.26 ac	225.8
Total:			25.06 ac	2316.5

CN = Total CN*Area / Total Area = **92.4**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **0.82 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Precipitation (P) = **8.19 in**

Runoff (Q) = **7.28 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	---------

			5.56 in
--	--	--	---------



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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **7**
 POND NAME : **7C**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	5.45 ac
Wet Detention	1.00 in

x DCIA (Net New) = 0.45 ac-ft

--	--

Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.45 ac-ft
OFW Requirement, provide 50% more TV = 0.68 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q _{pre} =	12.38 ac-ft		8.98 ac-ft
Q _{post} =	15.21 ac-ft		11.62 ac-ft
ΔQ =	2.84 ac-ft		2.64 ac-ft

Attenuation V_{req} = 2.84 ac-ft (use largest value)



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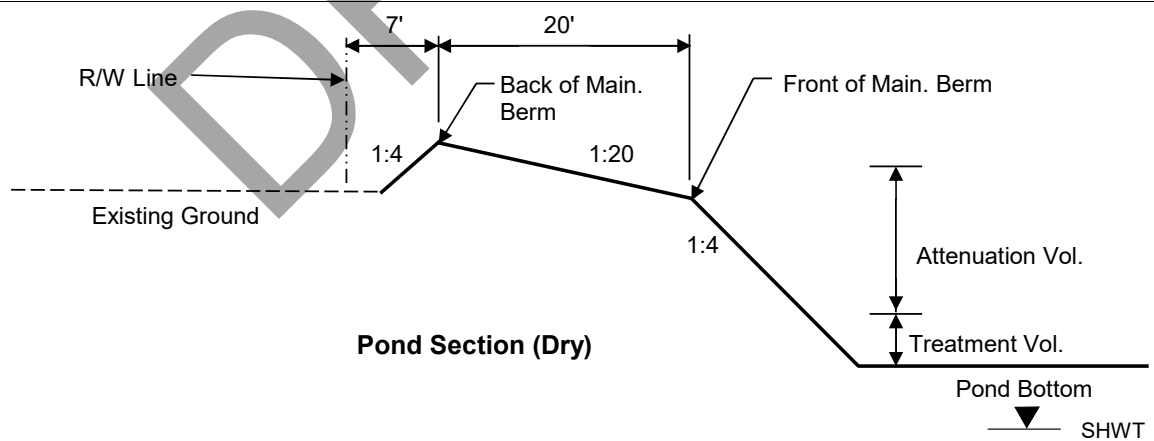
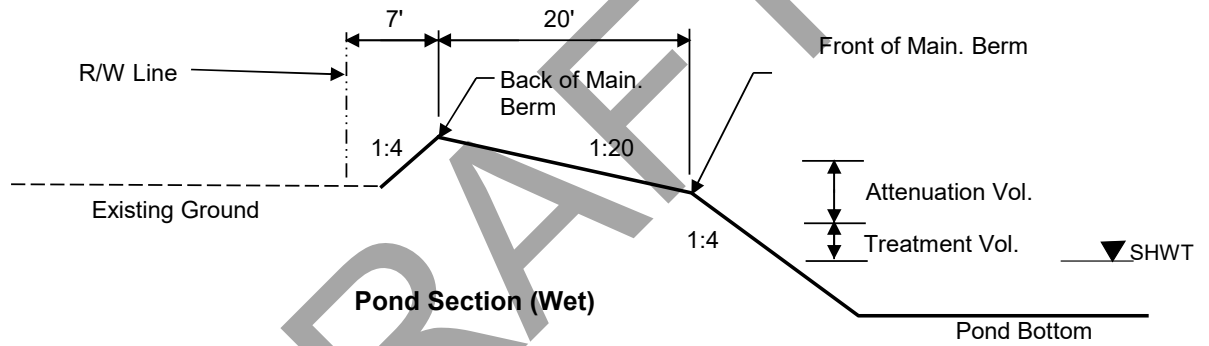
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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **7**
 POND NAME : **7C**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	42.00
Pond Tie-In Width =	7.0 ft	@ 1:4	Normal Water Elevation =	40.00
Maximum Storage Depth (SD) =	2.75 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	43.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.050%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1000 ft	
Estimated Energy Losses =	0.5 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	41.5 ft	





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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **7**
 POND NAME : **7C**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
42.00	Pond R/W	3.49 ac	375.0 ft	405.0 ft	
43.75	Back of Main. Berm	3.24 ac	361.0 ft	391.0 ft	9.57 ac-ft
43.25		2.90 ac	341.0 ft	371.0 ft	8.03 ac-ft
42.75	Front of Main. Berm	2.59 ac	321.0 ft	351.0 ft	6.66 ac-ft
41.75	Provided Treat.Vol.+Att.Vol	2.46 ac	313.0 ft	343.0 ft	4.13 ac-ft
41.55	Req'd Treat.Vol+Att. Vol	2.44 ac	311.4 ft	341.4 ft	3.64 ac-ft
41.32	Estimated Storm Sewer TW	2.41 ac	309.6 ft	339.6 ft	3.09 ac-ft
40.33	Top of Treatment Vol.	2.30 ac	301.6 ft	331.6 ft	0.75 ac-ft
40.00	Normal Water Level	2.26 ac	299.0 ft	329.0 ft	0.00 ac-ft
38.00		2.03 ac	283.0 ft	313.0 ft	
34.00	Pond Bottom	1.77 ac	275.0 ft	281.0 ft	

Required Treatment+Attenuation Vol.= 3.52 ac-ft
 Required Treatment+Attenuation Stage= 41.55 ft

Provided Treatment+Attenuation Vol.= 4.13 ac-ft
 Provided Treatment+Attenuation Stage= 41.75 ft

Estimated Treat. Vol.+Storm Sewer Att.= 3.09 ac-ft
 Estimated Storm Sewer TW EL.= 41.32 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 4.18 ac

Complete Report (not including cost) Ver 4.3.5

Project: US 301 PD_E

Date: 4/10/2023 4:51:39 PM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	Basin 7
Rainfall Zone	Florida Zone 4
Annual Mean Rainfall	51.00
Pre-Condition Landuse Information	
Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	23.91
Rational Coefficient (0-1)	0.37
Non DCIA Curve Number	90.00
DCIA Percent (0-100)	17.71
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	37.108
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	69.547
Phosphorus Loading (kg/yr)	9.151
Post-Condition Landuse Information	
Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	23.91
Rational Coefficient (0-1)	0.58
Non DCIA Curve Number	89.00
DCIA Percent (0-100)	58.49
Wet Pond Area (ac)	1.20
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	56.438
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	105.774
Phosphorus Loading (kg/yr)	13.918

Catchment Number: 1 Name: Basin 7

Project: US 301 PD_E

Date: 4/10/2023

Multiple BMP in Series Design Parameters

BMP in Series Number: 1

BMP Type: Swale

Swale Top Width for Flood Conditions - W (ft)	28.000
Swale Bottom Width - B (ft)	5.000
Swale Length - L (ft)	4,950.000
Average Impervious Length (ft)	4,950.000
Average Impervious Width (ft)	112.000
Average Pervious Width (ft)	103.500
Swale Slope (foot drop/foot length) - S	0.001
Mannings N	0.060
Soil Infiltration Rate (in/hr)	4.000
Side Slope of Swale horizontal/vertical - Z	6.000
Average Height of Swale Block - H	0.500
Length of Berm Upstream of Crest - L_b	0.000
Runoff Area (acres)	24.489
Number of Swale Blocks	

BMP in Series Number: 2

BMP Type: Wet Detention

Permanent Pool Volume (ac-ft)	8.730
Permanent Pool Volume (ac-ft) for 31 days residence	4.793
Annual Residence Time (days)	56
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

BMP in Series Number: 3

BMP Type: None

BMP in Series Number: 4

BMP Type: None

Watershed Characteristics

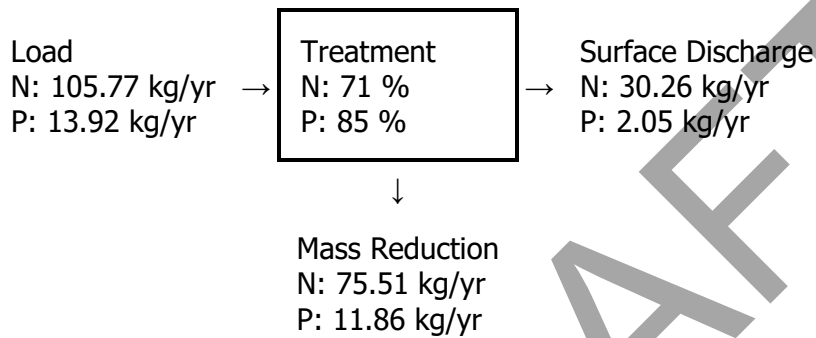
Catchment Area (acres)	23.91
Contributing Area (acres)	22.710
Non-DCIA Curve Number	89.00
DCIA Percent	58.49

Rainfall Zone	Florida Zone 4
Rainfall (in)	51.00

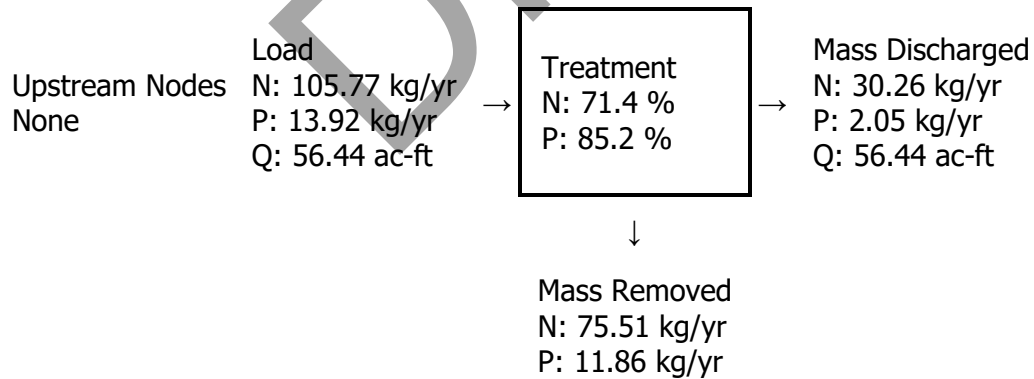
Surface Water Discharge

Required TN Treatment Efficiency (%) 34
 Provided TN Treatment Efficiency (%) 71
 Required TP Treatment Efficiency (%) 34
 Provided TP Treatment Efficiency (%) 85

Load for Multiple BMP in Series



Load Diagram for Multiple BMP (As Used In Routing)



Summary Treatment Report Version: 4.3.5

Project: US 301 PD_E

Analysis Type: Net Improvement

Date:4/10/2023

BMP Types:

Catchment 1 - (Basin 7) Multiple
BMP

Routing Summary

Catchment 1 Routed to Outlet

Based on % removal values to the
nearest percent

Total nitrogen target removal met? **Yes**

Total phosphorus target removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	69.55 kg/yr	
Total N post load	105.77 kg/yr	
Target N load reduction	34 %	
Target N discharge load	69.55 kg/yr	
Percent N load reduction	71 %	
Provided N discharge load	30.26 kg/yr	66.73 lb/yr
Provided N load removed	75.51 kg/yr	166.51 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	9.151 kg/yr	
Total P post load	13.918 kg/yr	
Target P load reduction	34 %	
Target P discharge load	9.151 kg/yr	
Percent P load reduction	85 %	
Provided P discharge load	2.055 kg/yr	4.53 lb/yr
Provided P load removed	11.863 kg/yr	26.157 lb/yr



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **8**
 POND NAME : **8A**

Station Limits: From: **1695+00** Roadway Length = 6500 ft
 To: **1760+00** R/W Width = 192 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 5.07 ac
 Pervious Roadway Area: 23.58 ac
 Total Roadway Area: 28.65 ac

Pond Area: Pervious Pond Area = 2.10 ac

Total Area: Impervious Area: 5.07 ac
 Pervious Area: 25.68 ac
 Total Area: 30.75 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	5.07 ac	497.2
Open Space (lawns, parks, golf courses, cemeteries,	D	89	17.05 ac	1517.7
Depressional areas & existing storage	D	90	6.52 ac	587.2
Depressional areas & existing storage	D	90	2.10 ac	189.4
Total:			30.75 ac	2791.4

CN = Total CN*Area / Total Area = **90.8**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **1.02 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Precipitation (P) = **8.19 in**

Runoff (Q) = **7.08 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
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			5.37 in
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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **8**
 POND NAME : **8A**

Station Limits: From: 1695+00 Roadway Length = 6500 ft
 To: 1760+00 R/W Width = 192 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	<u>12.0 ft</u>	<u>6</u>	72 ft
Paved Shoulder	<u>5.0 ft</u>	<u>2</u>	10 ft
Median Shoulder	<u>4.0 ft</u>	<u>2</u>	8 ft
Sidewalk or Trail	<u>6.0 ft</u>	<u>1</u>	6 ft
Curb&Gutter	<u>2.3 ft</u>	<u>2</u>	5 ft
Shared Use Path	<u>12.0 ft</u>	<u>1</u>	12 ft
Barrier Wall			0 ft
Total Impervious Width:			<u>113 ft</u>

Impervious Roadway Area: 16.79 ac
 Pervious Roadway Area: 11.86 ac
 Total Roadway Area: 28.65 ac

Pond Area: Pervious Pond Area : 0.80 ac
 Water Surface Area: 1.30 ac Wet Pond
 Total Pond Area: 2.10 ac

Total Area: Impervious Area: 16.79 ac
 Pervious Area: 12.66 ac
 Water Surface Area: 1.30 ac
 Total Area: 30.75 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	16.79 ac	1645.1
Open Space (lawns, parks, golf courses, cemeteries,	D	89	11.86 ac	1055.8
Open Space (lawns, parks, golf courses, cemeteries,	D	89	0.80 ac	71.3
Proposed Ponds (Water Surface)	D	100	1.30 ac	130.3
Total:			<u>30.75 ac</u>	<u>2902.5</u>

CN = Total CN*Area / Total Area = 94.4

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ 0.60 in

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Precipitation (P) = 8.19 in

Runoff (Q) = 7.52 in

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			<u>6.45 in</u>
--	--	--	----------------

			<u>5.79 in</u>
--	--	--	----------------



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **8**
 POND NAME : **8A**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	7.16 ac
Wet Detention	1.00 in

x DCIA (Net New) = 0.60 ac-ft

--	--

Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.60 ac-ft
OFW Requirement, provide 50% more TV = 0.90 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q _{pre} =	18.16 ac-ft		13.77 ac-ft
Q _{post} =	19.26 ac-ft		14.83 ac-ft
ΔQ =	1.11 ac-ft		1.06 ac-ft

Attenuation V_{req} = 1.11 ac-ft (use largest value)



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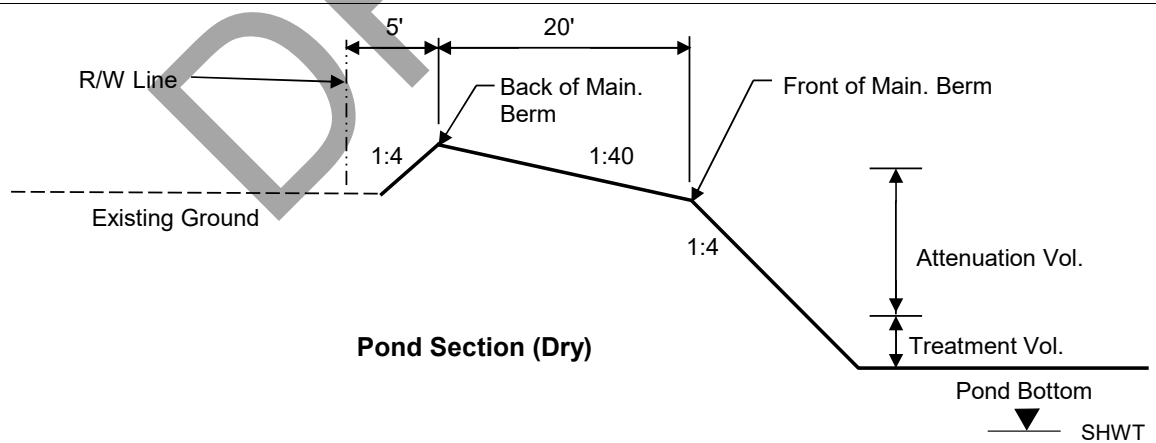
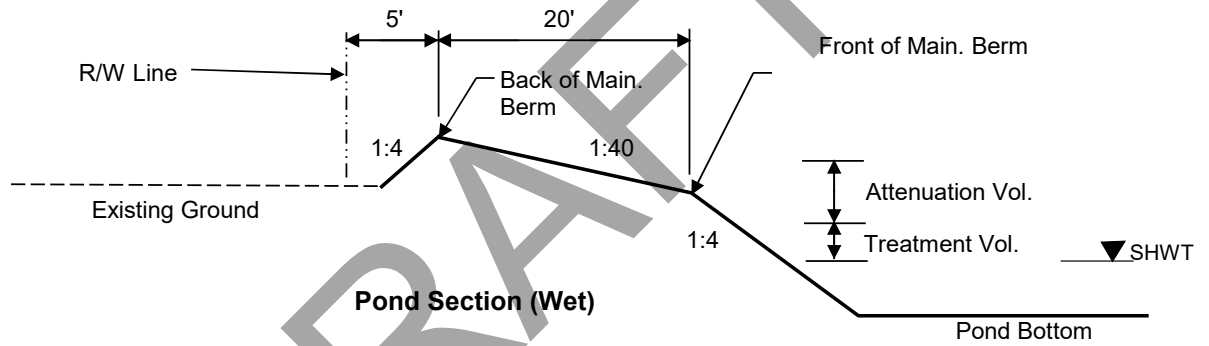
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **8**
 POND NAME : **8A**

Maintenance Area Width =	20.0 ft	@ 1:40	Existing Ground Elevation =	45.00
Pond Tie-In Width =	5.0 ft	@ 1:4	Normal Water Elevation =	43.00
Maximum Storage Depth (SD) =	2.25 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	46.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.050%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1000 ft	
Estimated Energy Losses =	0.5 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	44.5 ft	





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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **8**
 POND NAME : **8A**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
45.00	Pond R/W	2.25 ac	400.0 ft	245.0 ft	
46.25	Back of Main. Berm	2.10 ac	390.0 ft	235.0 ft	4.86 ac-ft
46.00		1.83 ac	370.0 ft	215.0 ft	4.36 ac-ft
45.75	Front of Main. Berm	1.57 ac	350.0 ft	195.0 ft	3.94 ac-ft
44.75	Provided Treat.Vol.+Att.Vol	1.47 ac	342.0 ft	187.0 ft	2.42 ac-ft
44.50	Req'd Treat.Vol+Att. Vol	1.44 ac	340.0 ft	185.0 ft	2.06 ac-ft
44.22	Estimated Storm Sewer TW	1.42 ac	337.8 ft	182.8 ft	1.66 ac-ft
43.70	Top of Treatment Vol.	1.37 ac	333.6 ft	178.6 ft	0.93 ac-ft
43.00	Normal Water Level	1.30 ac	328.0 ft	173.0 ft	0.00 ac-ft
41.00		1.12 ac	312.0 ft	157.0 ft	
37.00	Pond Bottom	0.87 ac	304.0 ft	125.0 ft	

Required Treatment+Attenuation Vol.= 2.00 ac-ft
 Required Treatment+Attenuation Stage= 44.50 ft

Provided Treatment+Attenuation Vol.= 2.42 ac-ft
 Provided Treatment+Attenuation Stage= 44.75 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.66 ac-ft
 Estimated Storm Sewer TW EL.= 44.22 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.70 ac



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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **8**
 POND NAME : **8B**

Station Limits: From: **1695+00** Roadway Length = 6500 ft
 To: **1760+00** R/W Width = 192 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 5.07 ac
 Pervious Roadway Area: 23.58 ac
 Total Roadway Area: 28.65 ac

Pond Area: Pervious Pond Area = 1.77 ac

Total Area: Impervious Area: 5.07 ac
 Pervious Area: 25.35 ac
 Total Area: 30.42 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	5.07 ac	497.2
Open Space (lawns, parks, golf courses, cemeteries,	D	89	17.05 ac	1517.7
Depressional areas & existing storage	D	90	6.52 ac	587.2
Depressional areas & existing storage	D	90	1.77 ac	159.6
Total:			30.42 ac	2761.7

CN = Total CN*Area / Total Area = **90.8**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **1.02 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Precipitation (P) = **8.19 in**

Runoff (Q) = **7.09 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	----------------

			5.37 in
--	--	--	----------------



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **8**
 POND NAME : **8B**

Station Limits: From: 1695+00 Roadway Length = 6500 ft
 To: 1760+00 R/W Width = 192 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	<u>12.0 ft</u>	<u>6</u>	72 ft
Paved Shoulder	<u>5.0 ft</u>	<u>2</u>	10 ft
Median Shoulder	<u>4.0 ft</u>	<u>2</u>	8 ft
Sidewalk or Trail	<u>6.0 ft</u>	<u>1</u>	6 ft
Curb&Gutter	<u>2.3 ft</u>	<u>2</u>	5 ft
Shared Use Path	<u>12.0 ft</u>	<u>1</u>	12 ft
Barrier Wall			0 ft
Total Impervious Width:			<u>113 ft</u>

Impervious Roadway Area: 16.79 ac
 Pervious Roadway Area: 11.86 ac
 Total Roadway Area: 28.65 ac

Pond Area: Pervious Pond Area : 0.74 ac
 Water Surface Area: 1.04 ac Wet Pond
 Total Pond Area: 1.77 ac

Total Area: Impervious Area: 16.79 ac
 Pervious Area: 12.60 ac
 Water Surface Area: 1.04 ac
 Total Area: 30.42 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	16.79 ac	1645.1
Open Space (lawns, parks, golf courses, cemeteries,	D	89	11.86 ac	1055.8
Open Space (lawns, parks, golf courses, cemeteries,	D	89	0.74 ac	65.5
Proposed Ponds (Water Surface)	D	100	1.04 ac	103.7
Total:			30.42 ac	2870.2

CN = Total CN*Area / Total Area = 94.3

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = 0.60 in

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Precipitation (P) = 8.19 in

Runoff (Q) = 7.51 in

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			<u>6.45 in</u>
--	--	--	----------------

			<u>5.78 in</u>
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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **8**
 POND NAME : **8B**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	7.16 ac
Wet Detention	1.00 in

x DCIA (Net New) = 0.60 ac-ft

Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.60 ac-ft
OFW Requirement, provide 50% more TV = 0.90 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q _{pre} =	17.96 ac-ft		13.62 ac-ft
Q _{post} =	19.04 ac-ft		14.66 ac-ft
ΔQ =	1.08 ac-ft		1.04 ac-ft

Attenuation V_{req} = 1.08 ac-ft (use largest value)



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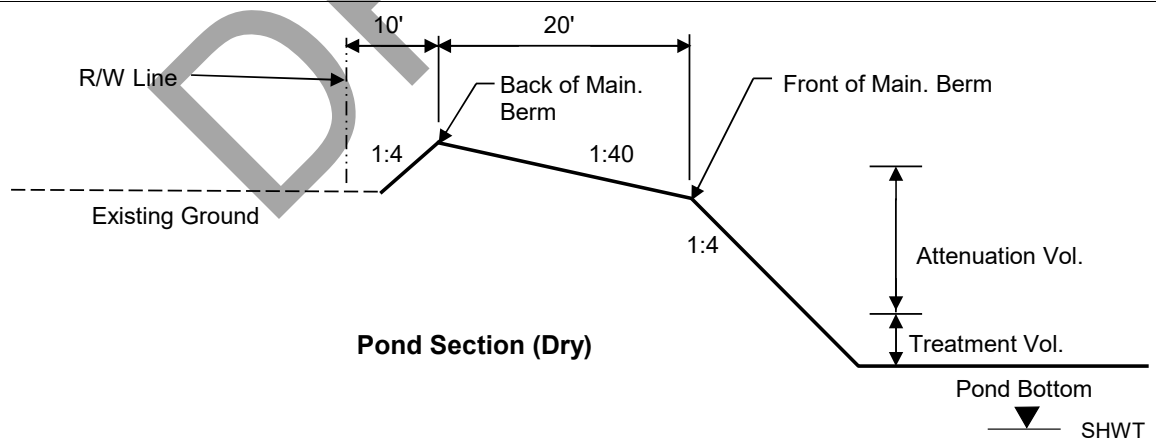
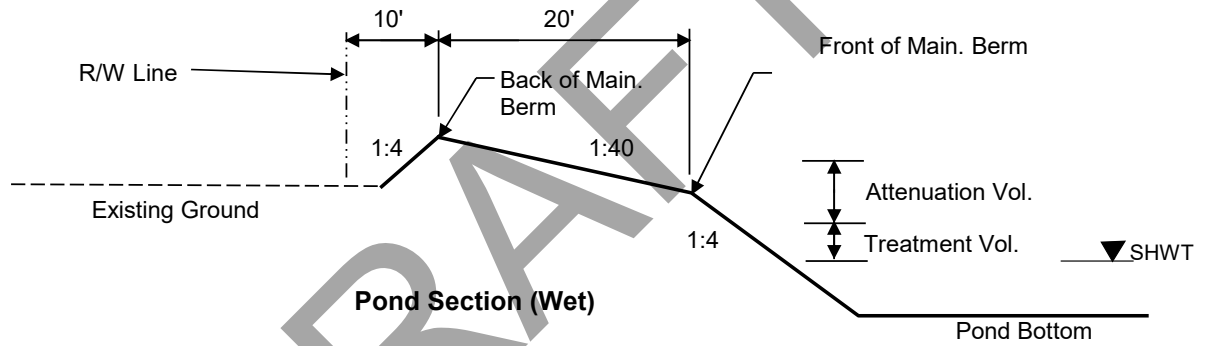
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **8**
 POND NAME : **8B**

Maintenance Area Width =	20.0 ft	@ 1:40	Existing Ground Elevation =	41.00
Pond Tie-In Width =	10.0 ft	@ 1:4	Normal Water Elevation =	40.00
Maximum Storage Depth (SD) =	2.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	46.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.050%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	750 ft	
Estimated Energy Losses =	0.4 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	44.6 ft	





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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **8**
 POND NAME : **8B**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
41.00	Pond R/W	2.04 ac	353.0 ft	252.0 ft	
43.50	Back of Main. Berm	1.77 ac	333.0 ft	232.0 ft	4.25 ac-ft
43.25		1.52 ac	313.0 ft	212.0 ft	3.84 ac-ft
43.00	Front of Main. Berm	1.29 ac	293.0 ft	192.0 ft	3.49 ac-ft
42.00	Provided Treat.Vol.+Att.Vol	1.20 ac	285.0 ft	184.0 ft	2.24 ac-ft
41.90	Req'd Treat.Vol+Att. Vol	1.20 ac	284.2 ft	183.2 ft	2.12 ac-ft
41.49	Estimated Storm Sewer TW	1.16 ac	280.9 ft	179.9 ft	1.64 ac-ft
41.00	Top of Treatment Vol.	1.12 ac	277.0 ft	176.0 ft	1.08 ac-ft
40.00	Normal Water Level	1.04 ac	269.0 ft	168.0 ft	0.00 ac-ft
38.00		0.88 ac	253.0 ft	152.0 ft	
34.00	Pond Bottom	0.67 ac	245.0 ft	120.0 ft	

Required Treatment+Attenuation Vol.= 1.98 ac-ft
 Required Treatment+Attenuation Stage= 41.90 ft

Provided Treatment+Attenuation Vol.= 2.24 ac-ft
 Provided Treatment+Attenuation Stage= 42.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.64 ac-ft
 Estimated Storm Sewer TW EL.= 41.49 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.45 ac



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **8**
 POND NAME : **8C**

Station Limits: From: **1695+00** Roadway Length = 6500 ft
 To: **1760+00** R/W Width = 192 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 5.07 ac
 Pervious Roadway Area: 23.58 ac
 Total Roadway Area: 28.65 ac

Pond Area: Pervious Pond Area = 2.00 ac

Total Area: Impervious Area: 5.07 ac
 Pervious Area: 25.57 ac
 Total Area: 30.65 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	5.07 ac	497.2
Open Space (lawns, parks, golf courses, cemeteries,	D	89	17.05 ac	1517.7
Depressional areas & existing storage	D	90	6.52 ac	587.2
Depressional areas & existing storage	D	90	2.00 ac	179.8
Pasture, grassland or range; Good condition (> 75%	D	80		0.0
Total:			30.65 ac	2781.8

CN = Total CN*Area / Total Area = **90.8**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **1.02 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **7.08 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	---------

			5.37 in
--	--	--	---------



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Made by: ZKE
 Checked by: REC

DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **8**
 POND NAME : **8C**

Station Limits: From: 1695+00 Roadway Length = 6500 ft
 To: 1760+00 R/W Width = 192 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	<u>12.0 ft</u>	<u>6</u>	72 ft
Paved Shoulder	<u>5.0 ft</u>	<u>2</u>	10 ft
Median Shoulder	<u>4.0 ft</u>	<u>2</u>	8 ft
Sidewalk or Trail	<u>6.0 ft</u>	<u>1</u>	6 ft
Curb&Gutter	<u>2.3 ft</u>	<u>2</u>	5 ft
Shared Use Path	<u>12.0 ft</u>	<u>1</u>	12 ft
Barrier Wall			0 ft
Total Impervious Width:			<u>113 ft</u>

Impervious Roadway Area: 16.79 ac
 Pervious Roadway Area: 11.86 ac
 Total Roadway Area: 28.65 ac

Pond Area: Pervious Pond Area : 0.75 ac
 Water Surface Area: 1.25 ac Wet Pond
 Total Pond Area: 2.00 ac

Total Area: Impervious Area: 16.79 ac
 Pervious Area: 12.61 ac
 Water Surface Area: 1.25 ac
 Total Area: 30.65 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	16.79 ac	1645.1
Open Space (lawns, parks, golf courses, cemeteries,	D	89	11.86 ac	1055.8
Open Space (lawns, parks, golf courses, cemeteries,	D	89	0.75 ac	66.9
Proposed Ponds (Water Surface)	D	100	1.25 ac	124.6
Total:			30.65 ac	2892.4

CN = Total CN*Area / Total Area = 94.4

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ 0.60 in

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Precipitation (P) = 8.19 in

Runoff (Q) = 7.52 in

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			<u>6.45 in</u>
--	--	--	----------------

			<u>5.79 in</u>
--	--	--	----------------



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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **8**
 POND NAME : **8C**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	7.16 ac
Wet Detention	1.00 in

x DCIA (Net New) = 0.60 ac-ft

--	--

Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.60 ac-ft
OFW Requirement, provide 50% more TV = 0.90 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q _{pre} =	18.09 ac-ft		13.72 ac-ft
Q _{post} =	19.20 ac-ft		14.78 ac-ft
ΔQ =	1.10 ac-ft		1.06 ac-ft

Attenuation V_{req} = 1.10 ac-ft (use largest value)



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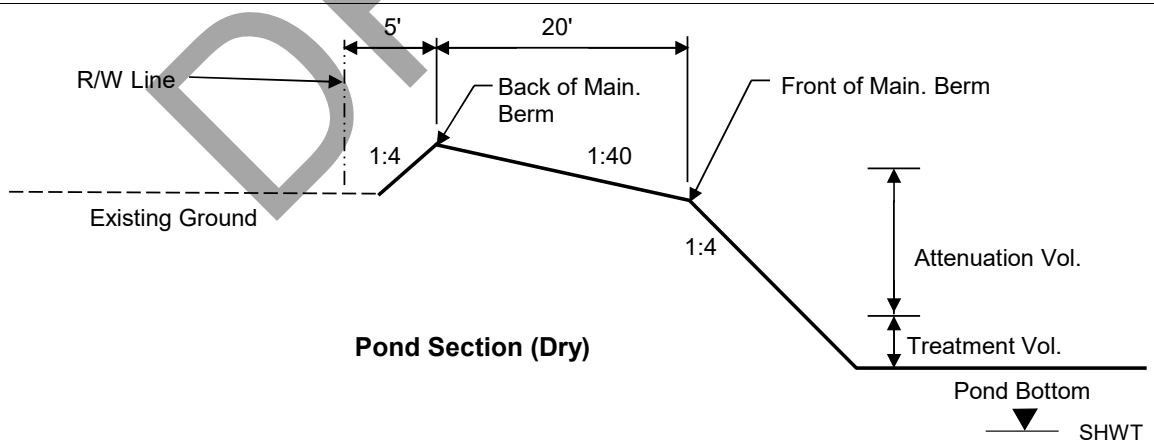
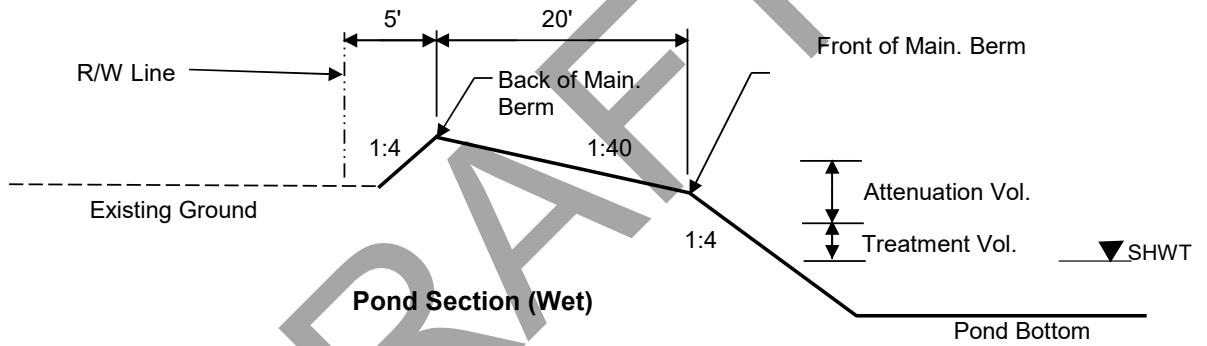
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **8**
 POND NAME : **8C**

Maintenance Area Width =	20.0 ft	@ 1:40	Existing Ground Elevation =	45.00
Pond Tie-In Width =	5.0 ft	@ 1:4	Normal Water Elevation =	43.00
Maximum Storage Depth (SD) =	2.25 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	46.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.050%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1500 ft	
Estimated Energy Losses =	0.8 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	44.3 ft	





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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **8**
 POND NAME : **8C**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
45.00	Pond R/W	2.13 ac	310.0 ft	300.0 ft	
46.25	Back of Main. Berm	2.00 ac	300.0 ft	290.0 ft	4.63 ac-ft
46.00		1.74 ac	280.0 ft	270.0 ft	4.16 ac-ft
45.75	Front of Main. Berm	1.49 ac	260.0 ft	250.0 ft	3.76 ac-ft
44.75	Provided Treat.Vol.+Att.Vol	1.40 ac	252.0 ft	242.0 ft	2.31 ac-ft
44.60	Req'd Treat.Vol+Att. Vol	1.39 ac	250.8 ft	240.8 ft	2.10 ac-ft
44.28	Estimated Storm Sewer TW	1.36 ac	248.2 ft	238.2 ft	1.66 ac-ft
43.80	Top of Treatment Vol.	1.32 ac	244.4 ft	234.4 ft	1.02 ac-ft
43.00	Normal Water Level	1.25 ac	238.0 ft	228.0 ft	0.00 ac-ft
41.00		1.08 ac	222.0 ft	212.0 ft	

Required Treatment+Attenuation Vol.= 2.00 ac-ft
 Required Treatment+Attenuation Stage= 44.60 ft

Provided Treatment+Attenuation Vol.= 2.31 ac-ft
 Provided Treatment+Attenuation Stage= 44.75 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.66 ac-ft
 Estimated Storm Sewer TW EL.= 44.28 ft Try again

PROPOSED POND R/W (Safety Factor of 20%) = 2.56 ac

Complete Report (not including cost) Ver 4.3.5

Project: US 301 PD_E

Date: 4/10/2023 4:53:06 PM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	Basin 8
Rainfall Zone	Florida Zone 4
Annual Mean Rainfall	51.00
Pre-Condition Landuse Information	
Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	30.75
Rational Coefficient (0-1)	0.34
Non DCIA Curve Number	89.00
DCIA Percent (0-100)	16.50
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	44.988
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	84.314
Phosphorus Loading (kg/yr)	11.094
Post-Condition Landuse Information	
Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	30.75
Rational Coefficient (0-1)	0.59
Non DCIA Curve Number	89.00
DCIA Percent (0-100)	58.82
Wet Pond Area (ac)	1.30
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	73.419
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	137.600
Phosphorus Loading (kg/yr)	18.105

Catchment Number: 1 Name: Basin 8

Project: US 301 PD_E

Date: 4/10/2023

Multiple BMP in Series Design Parameters

BMP in Series Number: 1

BMP Type: Swale

Swale Top Width for Flood Conditions - W (ft)	28.000
Swale Bottom Width - B (ft)	5.000
Swale Length - L (ft)	6,500.000
Average Impervious Length (ft)	6,500.000
Average Impervious Width (ft)	112.000
Average Pervious Width (ft)	103.500
Swale Slope (foot drop/foot length) - S	0.001
Mannings N	0.060
Soil Infiltration Rate (in/hr)	0.400
Side Slope of Swale horizontal/vertical - Z	6.000
Average Height of Swale Block - H	0.500
Length of Berm Upstream of Crest - L_b	0.000
Runoff Area (acres)	32.157
Number of Swale Blocks	

BMP in Series Number: 2

BMP Type: Wet Detention

Permanent Pool Volume (ac-ft)	6.420
Permanent Pool Volume (ac-ft) for 31 days residence	6.236
Annual Residence Time (days)	32
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

BMP in Series Number: 3

BMP Type: None

BMP in Series Number: 4

BMP Type: None

Watershed Characteristics

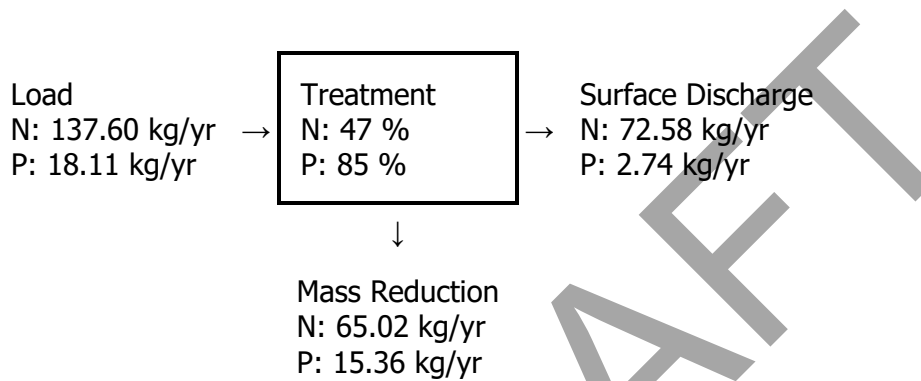
Catchment Area (acres)	30.75
Contributing Area (acres)	29.450
Non-DCIA Curve Number	89.00
DCIA Percent	58.82

Rainfall Zone	Florida Zone 4
Rainfall (in)	51.00

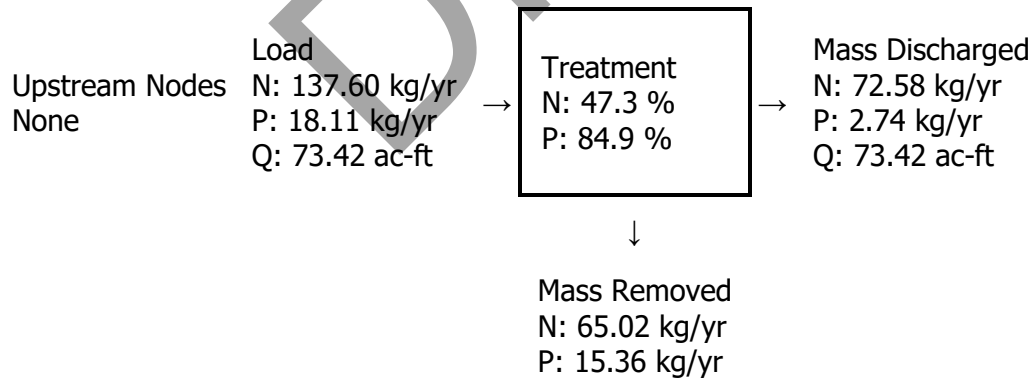
Surface Water Discharge

Required TN Treatment Efficiency (%) 39
 Provided TN Treatment Efficiency (%) 47
 Required TP Treatment Efficiency (%) 39
 Provided TP Treatment Efficiency (%) 85

Load for Multiple BMP in Series



Load Diagram for Multiple BMP (As Used In Routing)



Summary Treatment Report Version: 4.3.5

Project: US 301 PD_E

Analysis Type: Net Improvement

Date:4/10/2023

BMP Types:

Catchment 1 - (Basin 8) Multiple
BMP

Routing Summary

Catchment 1 Routed to Outlet

Based on % removal values to the
nearest percent

Total nitrogen target removal met? **Yes**

Total phosphorus target removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	84.31 kg/yr	
Total N post load	137.6 kg/yr	
Target N load reduction	39 %	
Target N discharge load	84.31 kg/yr	
Percent N load reduction	47 %	
Provided N discharge load	72.58 kg/yr	160.03 lb/yr
Provided N load removed	65.02 kg/yr	143.38 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	11.094 kg/yr	
Total P post load	18.105 kg/yr	
Target P load reduction	39 %	
Target P discharge load	11.094 kg/yr	
Percent P load reduction	85 %	
Provided P discharge load	2.741 kg/yr	6.04 lb/yr
Provided P load removed	15.365 kg/yr	33.879 lb/yr



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DATE: May 30, 2023
 Job Number: **AIM-010-01**

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **9**
 POND NAME : **9A**

Station Limits: From: **1760+00** Roadway Length = 2800 ft
 To: **1788+00** R/W Width = 192 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 2.19 ac
 Pervious Roadway Area: 10.16 ac
 Total Roadway Area: 12.34 ac

Pond Area: Pervious Pond Area = 1.52 ac

Total Area: Impervious Area: 2.19 ac
 Pervious Area: 11.68 ac
 Total Area: 13.86 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	0.00 ac	0.0
Impervious areas; Streets & roads	D	98	2.19 ac	214.2
Open Space (lawns, parks, golf courses, cemeteries,	A	68	0.00 ac	0.0
Open Space (lawns, parks, golf courses, cemeteries,	D	89	4.24 ac	377.6
Woods; Good condition (Woods are protected from	A	30	0.00 ac	0.0
Woods; Good condition (Woods are protected from	D	77	0.00 ac	0.0
Depressional areas & existing storage	D	90	5.91 ac	532.2
Depressional areas & existing storage	D	90	1.52 ac	136.7
Pasture, grassland or range; Good condition (> 75%	D	80		0.0
Total:			13.86 ac	1260.7

CN = Total CN*Area / Total Area = **91.0**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **0.99 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **7.11 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
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			5.39 in
--	--	--	---------



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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **9**
 POND NAME : **9A**

Station Limits: From: **1760+00** Roadway Length = 2800 ft
 To: **1788+00** R/W Width = 192 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	6	72 ft
Paved Shoulder	5.0 ft	2	10 ft
Median Shoulder	4.0 ft	2	8 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	2	5 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			113 ft

Impervious Roadway Area: 7.23 ac
 Pervious Roadway Area: 5.11 ac
 Total Roadway Area: 12.34 ac

Pond Area: Pervious Pond Area : 0.64 ac
 Water Surface Area: 0.88 ac **Wet Pond**
 Total Pond Area: 1.52 ac

Total Area: Impervious Area: 7.23 ac
 Pervious Area: 5.75 ac
 Water Surface Area: 0.88 ac
 Total Area: 13.86 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	0.00 ac	0.0
Impervious areas; Streets & roads	D	98	7.23 ac	708.7
Open Space (lawns, parks, golf courses, cemeteries,	A	68	0.00 ac	0.0
Open Space (lawns, parks, golf courses, cemeteries,	D	89	5.11 ac	454.8
Open Space (lawns, parks, golf courses, cemeteries,	D	89	0.64 ac	56.8
Proposed Ponds (Water Surface)	D	100	0.88 ac	88.2
Total:			13.86 ac	1308.4

CN = Total CN*Area / Total Area = **94.4**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **0.59 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **7.52 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	---------

			5.79 in
--	--	--	---------



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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **9**
 POND NAME : **9A**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	3.09 ac
Wet Detention	1.00 in

x DCIA (Net New) = 0.26 ac-ft

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Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.26 ac-ft
OFW Requirement, provide 50% more TV = 0.39 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q _{pre} =	8.21 ac-ft		6.23 ac-ft
Q _{post} =	8.68 ac-ft		6.69 ac-ft
ΔQ =	0.48 ac-ft		0.46 ac-ft

Attenuation V_{req} = 0.48 ac-ft (use largest value)



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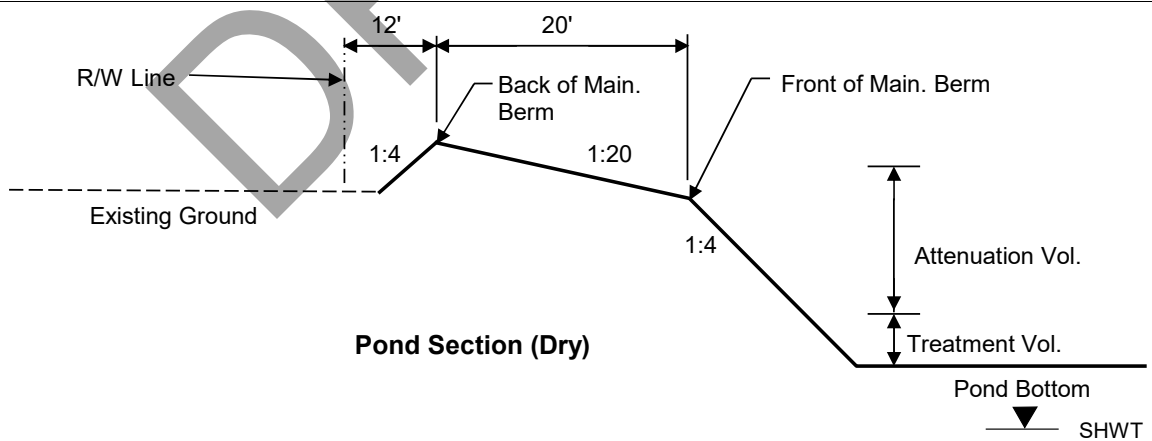
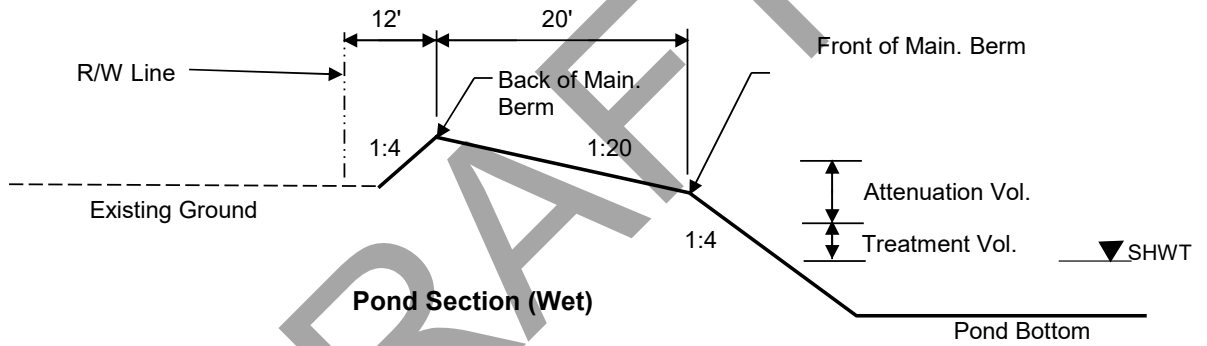
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **9**
 POND NAME : **9A**

Maintenance Area Width =	<u>20.0 ft</u>	@ 1:20	Existing Ground Elevation =	<u>42.00</u>
Pond Tie-In Width =	<u>12.0 ft</u>	@ 1:4	Normal Water Elevation =	<u>42.00</u>
Maximum Storage Depth (SD) =	<u>2.00 ft</u>	with 1.0 ft freeboard	Lowest EOP Elevation =	<u>47.00</u>

Hydraulic Grade Line (HGL) check

HGL Slope =	<u>0.100%</u>	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	<u>1500 ft</u>	
Estimated Energy Losses =	<u>1.5 ft</u>	
HGL Clearance =	<u>1.0 ft</u>	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	<u>44.5 ft</u>	





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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **9**
 POND NAME : **9A**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
42.00	Pond R/W	1.84 ac	400.0 ft	200.0 ft	
45.00	Back of Main. Berm	1.52 ac	376.0 ft	176.0 ft	3.21 ac-ft
44.50		1.27 ac	356.0 ft	156.0 ft	2.51 ac-ft
44.00	Front of Main. Berm	1.05 ac	336.0 ft	136.0 ft	1.93 ac-ft
43.00	Provided Treat.Vol.+Att.Vol	0.96 ac	328.0 ft	128.0 ft	0.92 ac-ft
42.95	Req'd Treat.Vol+Att. Vol	0.96 ac	327.6 ft	127.6 ft	0.87 ac-ft
42.78	Estimated Storm Sewer TW	0.95 ac	326.2 ft	126.2 ft	0.71 ac-ft
42.50	Top of Treatment Vol.	0.92 ac	324.0 ft	124.0 ft	0.45 ac-ft
42.00	Normal Water Level	0.88 ac	320.0 ft	120.0 ft	0.00 ac-ft
40.00		0.73 ac	304.0 ft	104.0 ft	
36.00	Pond Bottom	0.49 ac	296.0 ft	72.0 ft	

Required Treatment+Attenuation Vol.= 0.86 ac-ft
 Required Treatment+Attenuation Stage= 42.95 ft

Provided Treatment+Attenuation Vol.= 0.92 ac-ft
 Provided Treatment+Attenuation Stage= 43.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 0.71 ac-ft
 Estimated Storm Sewer TW EL.= 42.78 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.20 ac



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DATE: May 30, 2023
 Job Number: **AIM-010-01**

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **9**
 POND NAME : **9B**

Station Limits: From: **1760+00** Roadway Length = 2800 ft
 To: **1788+00** R/W Width = **192 ft**

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 2.19 ac
 Pervious Roadway Area: 10.16 ac
 Total Roadway Area: 12.34 ac

Pond Area: Pervious Pond Area = 1.40 ac

Total Area: Impervious Area: 2.19 ac
 Pervious Area: 11.56 ac
 Total Area: 13.74 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	2.19 ac	214.2
Open Space (lawns, parks, golf courses, cemeteries,	D	89	4.24 ac	377.6
Depressional areas & existing storage	D	90	5.91 ac	532.2
Residential Areas (2.0 acre, 12% Impervious)	D	82	1.40 ac	114.8
Pasture, grassland or range; Good condition (> 75%	D	80		0.0
Total:			13.74 ac	1238.8

CN = Total CN*Area / Total Area = **90.1**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **1.09 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Precipitation (P) = **8.19 in**

Runoff (Q) = **7.01 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	----------------

			5.30 in
--	--	--	----------------



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **9**
 POND NAME : **9B**

Station Limits: From: **1760+00** Roadway Length = 2800 ft
 To: **1788+00** R/W Width = 192 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	6	72 ft
Paved Shoulder	5.0 ft	2	10 ft
Median Shoulder	4.0 ft	2	8 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	2	5 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			113 ft

Impervious Roadway Area: 7.23 ac
 Pervious Roadway Area: 5.11 ac
 Total Roadway Area: 12.34 ac

Pond Area: Pervious Pond Area : 0.43 ac
 Water Surface Area: 0.97 ac Wet Pond
 Total Pond Area: 1.40 ac

Total Area: Impervious Area: 7.23 ac
 Pervious Area: 5.54 ac
 Water Surface Area: 0.97 ac
 Total Area: 13.74 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	7.23 ac	708.7
Open Space (lawns, parks, golf courses, cemeteries,	D	89	5.11 ac	454.8
Open Space (lawns, parks, golf courses, cemeteries,	D	89	0.43 ac	38.2
Proposed Ponds (Water Surface)	D	100	0.97 ac	97.1
Total:			13.74 ac	1298.8

CN = Total CN*Area / Total Area = **94.5**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **0.58 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Precipitation (P) = **8.19 in**

Runoff (Q) = **7.53 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	----------------

			5.80 in
--	--	--	----------------



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **9**
 POND NAME : **9B**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	3.09 ac
Wet Detention	1.00 in

x DCIA (Net New) = 0.26 ac-ft

--	--

Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.26 ac-ft
OFW Requirement, provide 50% more TV = 0.39 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q _{pre} =	8.03 ac-ft		6.07 ac-ft
Q _{post} =	8.63 ac-ft		6.64 ac-ft
ΔQ =	0.60 ac-ft		0.57 ac-ft

Attenuation V_{req} = 0.60 ac-ft (use largest value)



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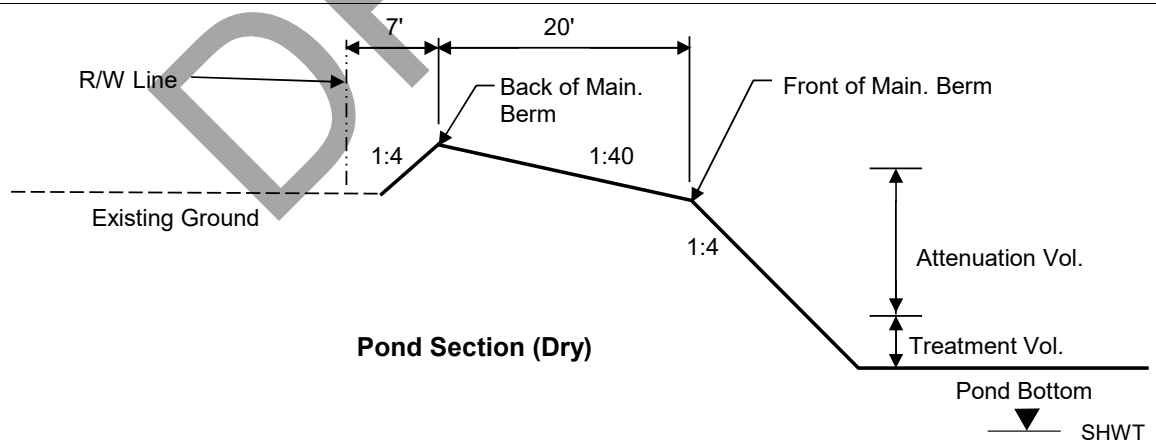
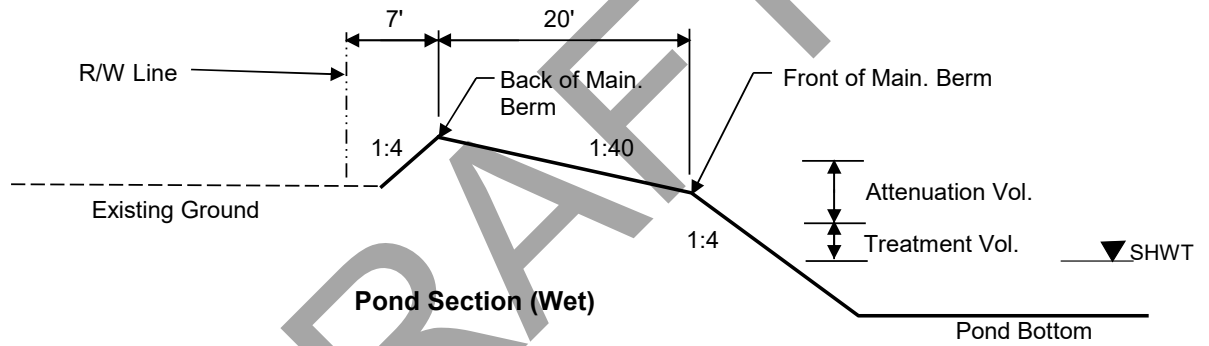
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **9**
 POND NAME : **9B**

Maintenance Area Width =	20.0 ft	@ 1:40	Existing Ground Elevation =	44.00
Pond Tie-In Width =	7.0 ft	@ 1:4	Normal Water Elevation =	43.00
Maximum Storage Depth (SD) =	1.75 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	48.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.050%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	500 ft	
Estimated Energy Losses =	0.3 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	46.8 ft	





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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **9**
 POND NAME : **9B**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
44.00	Pond R/W	1.52 ac	400.0 ft	330.0 ft	
45.75	Back of Main. Berm	1.40 ac	386.0 ft	316.0 ft	2.95 ac-ft
45.50		1.24 ac	366.0 ft	296.0 ft	2.62 ac-ft
45.25	Front of Main. Berm	1.10 ac	346.0 ft	276.0 ft	2.32 ac-ft
44.25	Provided Treat.Vol.+Att.Vol	1.04 ac	338.0 ft	268.0 ft	1.26 ac-ft
44.00	Req'd Treat.Vol+Att. Vol	1.03 ac	336.0 ft	266.0 ft	1.00 ac-ft
43.84	Estimated Storm Sewer TW	1.02 ac	334.7 ft	264.7 ft	0.83 ac-ft
43.40	Top of Treatment Vol.	0.99 ac	331.2 ft	261.2 ft	0.39 ac-ft
43.00	Normal Water Level	0.97 ac	328.0 ft	258.0 ft	0.00 ac-ft
41.00		0.87 ac	312.0 ft	242.0 ft	
37.00	Pond Bottom	0.73 ac	304.0 ft	210.0 ft	

Required Treatment+Attenuation Vol.= 0.98 ac-ft
 Required Treatment+Attenuation Stage= 44.00 ft

Provided Treatment+Attenuation Vol.= 1.26 ac-ft
 Provided Treatment+Attenuation Stage= 44.25 ft

Estimated Treat. Vol.+Storm Sewer Att.= 0.83 ac-ft
 Estimated Storm Sewer TW EL.= 43.84 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.82 ac



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **9**
 POND NAME : **9C**

Station Limits: From: **1760+00** Roadway Length = 2800 ft
 To: **1788+00** R/W Width = 192 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 2.19 ac
 Pervious Roadway Area: 10.16 ac
 Total Roadway Area: 12.34 ac

Pond Area: Pervious Pond Area = 1.29 ac

Total Area: Impervious Area: 2.19 ac
 Pervious Area: 11.45 ac
 Total Area: 13.64 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	2.19 ac	214.2
Open Space (lawns, parks, golf courses, cemeteries,	D	89	4.24 ac	377.6
Depressional areas & existing storage	D	90	5.91 ac	532.2
Woods; Good condition (Woods are protected from	D	77	1.29 ac	99.6
Pasture, grassland or range; Good condition (> 75%	D	80		0.0
Total:			13.64 ac	1223.6

CN = Total CN*Area / Total Area = **89.7**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **1.14 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **6.96 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	---------

			5.26 in
--	--	--	---------



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **9**
 POND NAME : **9C**

Station Limits: From: **1760+00** Roadway Length = 2800 ft
 To: **1788+00** R/W Width = 192 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	6	72 ft
Paved Shoulder	5.0 ft	2	10 ft
Median Shoulder	4.0 ft	2	8 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	2	5 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			113 ft

Impervious Roadway Area: 7.23 ac
 Pervious Roadway Area: 5.11 ac
 Total Roadway Area: 12.34 ac

Pond Area: Pervious Pond Area : 0.58 ac
 Water Surface Area: 0.71 ac **Wet Pond**
 Total Pond Area: 1.29 ac

Total Area: Impervious Area: 7.23 ac
 Pervious Area: 5.69 ac
 Water Surface Area: 0.71 ac
 Total Area: 13.64 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	7.23 ac	708.7
Open Space (lawns, parks, golf courses, cemeteries,	D	89	5.11 ac	454.8
Open Space (lawns, parks, golf courses, cemeteries,	D	89	0.58 ac	52.0
Proposed Ponds (Water Surface)	D	100	0.71 ac	71.0
Total:			13.64 ac	1286.4

CN = Total CN*Area / Total Area = **94.3**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **0.60 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Precipitation (P) = **8.19 in**

Runoff (Q) = **7.51 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	----------------

			5.78 in
--	--	--	----------------



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **9**
 POND NAME : **9C**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	3.09 ac
Wet Detention	1.00 in

$3.09 \text{ ac} \times 1.00 \text{ in} \times \text{DCIA (Net New)} = 0.26 \text{ ac-ft}$

--	--

Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.26 ac-ft
OFW Requirement, provide 50% more TV = 0.39 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
$Q_{pre} =$	7.91 ac-ft		5.97 ac-ft
$Q_{post} =$	8.54 ac-ft		6.57 ac-ft
$\Delta Q =$	0.63 ac-ft		0.60 ac-ft

Attenuation $V_{req} = 0.63 \text{ ac-ft}$ (use largest value)



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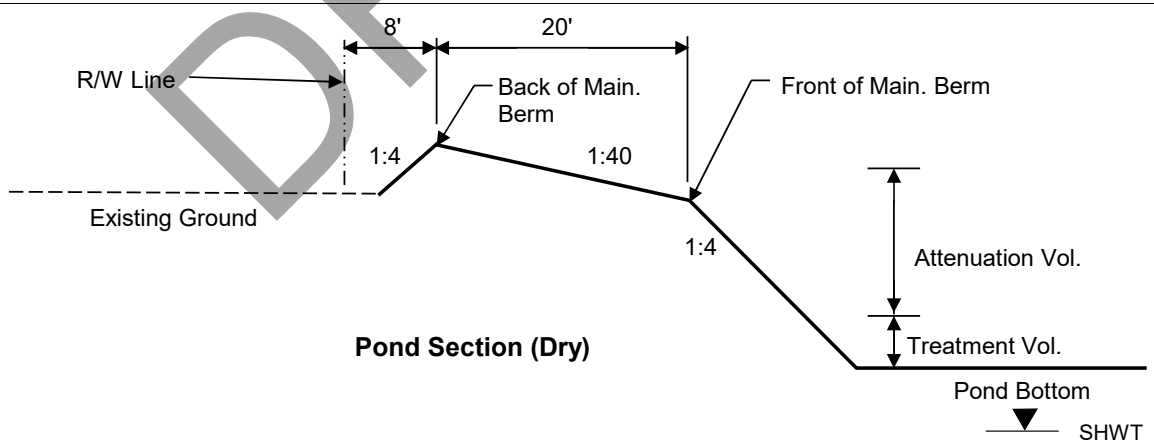
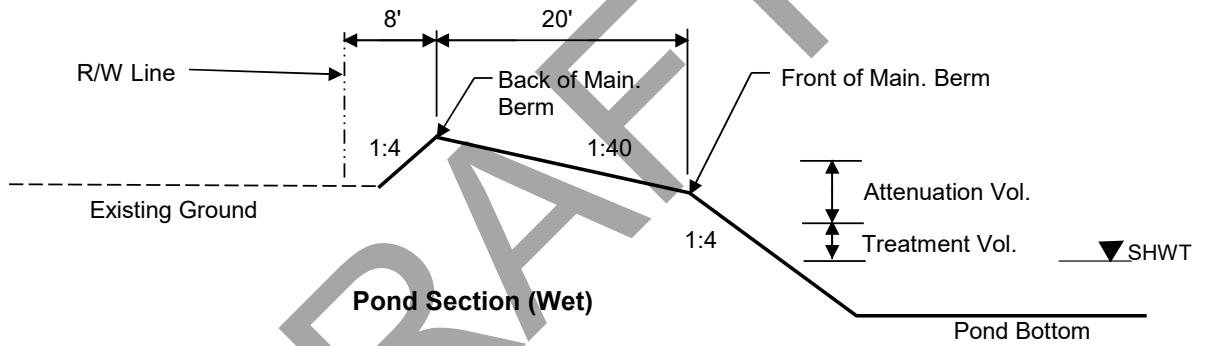
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **9**
 POND NAME : **9C**

Maintenance Area Width =	<u>20.0 ft</u>	@ 1:40	Existing Ground Elevation =	<u>44.00</u>
Pond Tie-In Width =	<u>8.0 ft</u>	@ 1:4	Normal Water Elevation =	<u>43.00</u>
Maximum Storage Depth (SD) =	<u>2.00 ft</u>	with 1.0 ft freeboard	Lowest EOP Elevation =	<u>48.00</u>

Hydraulic Grade Line (HGL) check

HGL Slope =	<u>0.050%</u>	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	<u>750 ft</u>	
Estimated Energy Losses =	<u>0.4 ft</u>	
HGL Clearance =	<u>1.0 ft</u>	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	<u>46.6 ft</u>	





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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **9**
 POND NAME : **9C**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
44.00	Pond R/W	1.48 ac	305.0 ft	211.0 ft	
46.00	Back of Main. Berm	1.29 ac	289.0 ft	195.0 ft	2.53 ac-ft
45.75		1.08 ac	269.0 ft	175.0 ft	2.24 ac-ft
45.50	Front of Main. Berm	0.89 ac	249.0 ft	155.0 ft	1.99 ac-ft
44.50	Provided Treat.Vol.+Att.Vol	0.81 ac	241.0 ft	147.0 ft	1.14 ac-ft
44.40	Req'd Treat.Vol+Att. Vol	0.81 ac	240.2 ft	146.2 ft	1.06 ac-ft
44.15	Estimated Storm Sewer TW	0.79 ac	238.2 ft	144.2 ft	0.86 ac-ft
43.60	Top of Treatment Vol.	0.75 ac	233.8 ft	139.8 ft	0.44 ac-ft
43.00	Normal Water Level	0.71 ac	229.0 ft	135.0 ft	0.00 ac-ft
41.00		0.58 ac	213.0 ft	119.0 ft	
37.00	Pond Bottom	0.41 ac	205.0 ft	87.0 ft	

Required Treatment+Attenuation Vol.= 1.01 ac-ft
 Required Treatment+Attenuation Stage= 44.40 ft

Provided Treatment+Attenuation Vol.= 1.14 ac-ft
 Provided Treatment+Attenuation Stage= 44.50 ft

Estimated Treat. Vol.+Storm Sewer Att.= 0.86 ac-ft
 Estimated Storm Sewer TW EL.= 44.15 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 1.77 ac

Complete Report (not including cost) Ver 4.3.5

Project: US 301 PD_E

Date: 4/10/2023 4:54:28 PM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	Basin 9
Rainfall Zone	Florida Zone 4
Annual Mean Rainfall	51.00
Pre-Condition Landuse Information	
Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	13.61
Rational Coefficient (0-1)	0.36
Non DCIA Curve Number	90.00
DCIA Percent (0-100)	16.06
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	20.588
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	38.586
Phosphorus Loading (kg/yr)	5.077
Post-Condition Landuse Information	
Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	13.61
Rational Coefficient (0-1)	0.58
Non DCIA Curve Number	89.00
DCIA Percent (0-100)	58.21
Wet Pond Area (ac)	0.69
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	32.022
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	60.015
Phosphorus Loading (kg/yr)	7.897

Catchment Number: 1 Name: Basin 9

Project: US 301 PD_E

Date: 4/10/2023

Multiple BMP in Series Design Parameters

BMP in Series Number: 1

BMP Type: Swale

Swale Top Width for Flood Conditions - W (ft)	28.000
Swale Bottom Width - B (ft)	5.000
Swale Length - L (ft)	2,800.000
Average Impervious Length (ft)	2,800.000
Average Impervious Width (ft)	112.000
Average Pervious Width (ft)	103.500
Swale Slope (foot drop/foot length) - S	0.001
Mannings N	0.060
Soil Infiltration Rate (in/hr)	0.400
Side Slope of Swale horizontal/vertical - Z	6.000
Average Height of Swale Block - H	0.500
Length of Berm Upstream of Crest - L_b	0.000
Runoff Area (acres)	13.852
Number of Swale Blocks	

BMP in Series Number: 2

BMP Type: Wet Detention

Permanent Pool Volume (ac-ft)	3.170
Permanent Pool Volume (ac-ft) for 31 days residence	2.720
Annual Residence Time (days)	36
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

BMP in Series Number: 3

BMP Type: None

BMP in Series Number: 4

BMP Type: None

Watershed Characteristics

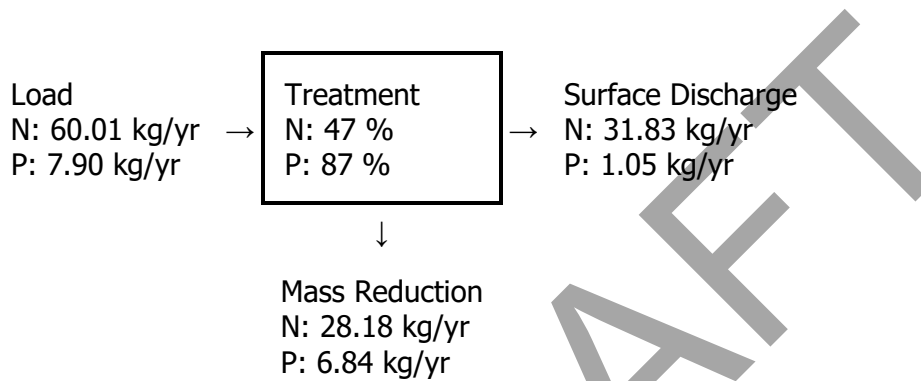
Catchment Area (acres)	13.61
Contributing Area (acres)	12.920
Non-DCIA Curve Number	89.00
DCIA Percent	58.21

Rainfall Zone	Florida Zone 4
Rainfall (in)	51.00

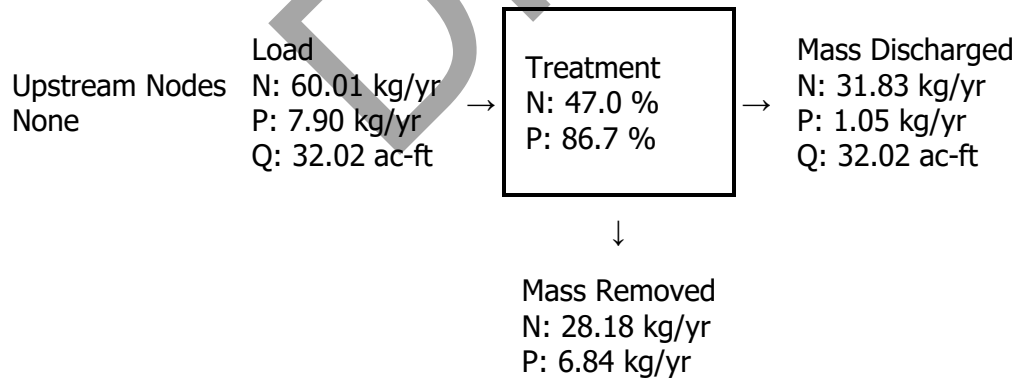
Surface Water Discharge

Required TN Treatment Efficiency (%) 36
 Provided TN Treatment Efficiency (%) 47
 Required TP Treatment Efficiency (%) 36
 Provided TP Treatment Efficiency (%) 87

Load for Multiple BMP in Series



Load Diagram for Multiple BMP (As Used In Routing)



Summary Treatment Report Version: 4.3.5

Project: US 301 PD_E

Analysis Type: Net Improvement

Date:4/10/2023

BMP Types:

Catchment 1 - (Basin 9) Multiple
BMP

Routing Summary

Catchment 1 Routed to Outlet

Based on % removal values to the
nearest percent

Total nitrogen target removal met? **Yes**

Total phosphorus target removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	38.59 kg/yr	
Total N post load	60.01 kg/yr	
Target N load reduction	36 %	
Target N discharge load	38.59 kg/yr	
Percent N load reduction	47 %	
Provided N discharge load	31.83 kg/yr	70.19 lb/yr
Provided N load removed	28.18 kg/yr	62.14 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	5.077 kg/yr	
Total P post load	7.897 kg/yr	
Target P load reduction	36 %	
Target P discharge load	5.077 kg/yr	
Percent P load reduction	87 %	
Provided P discharge load	1.053 kg/yr	2.32 lb/yr
Provided P load removed	6.843 kg/yr	15.09 lb/yr



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **10**
 POND NAME : **10A**

Station Limits: From: **1788+00** Roadway Length = 5500 ft
 To: **1843+00** R/W Width = 192 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 4.29 ac
 Pervious Roadway Area: 19.95 ac
 Total Roadway Area: 24.24 ac

Pond Area: Pervious Pond Area = 2.09 ac

Total Area: Impervious Area: 4.29 ac
 Pervious Area: 22.04 ac
 Total Area: 26.33 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	4.29 ac	420.7
Open Space (lawns, parks, golf courses, cemeteries,	D	89	8.33 ac	741.7
Depressional areas & existing storage	D	90	11.62 ac	1045.5
Residential Areas (2.0 acre, 12% Impervious)	D	82	2.09 ac	171.1
Pasture, grassland or range; Good condition (> 75%	D	80		0.0
Total:			26.33 ac	2378.9

CN = Total CN*Area / Total Area = **90.4**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **1.07 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **7.03 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	---------

			5.32 in
--	--	--	---------



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **10**
 POND NAME : **10A**

Station Limits: From: **1788+00** Roadway Length = 5500 ft
 To: **1843+00** R/W Width = 192 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	6	72 ft
Paved Shoulder	5.0 ft	2	10 ft
Median Shoulder	4.0 ft	2	8 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	2	5 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			113 ft

Impervious Roadway Area: 14.20 ac
 Pervious Roadway Area: 10.04 ac
 Total Roadway Area: 24.24 ac

Pond Area: Pervious Pond Area : 0.86 ac
 Water Surface Area: 1.23 ac Wet Pond
 Total Pond Area: 2.09 ac

Total Area: Impervious Area: 14.20 ac
 Pervious Area: 10.90 ac
 Water Surface Area: 1.23 ac
 Total Area: 26.33 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	14.20 ac	1392.0
Open Space (lawns, parks, golf courses, cemeteries,	D	89	10.04 ac	893.4
Open Space (lawns, parks, golf courses, cemeteries,	D	89	0.86 ac	76.6
Proposed Ponds (Water Surface)	D	100	1.23 ac	122.6
Total:			26.33 ac	2484.6

CN = Total CN*Area / Total Area = **94.4**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **0.60 in**

Precipitation (P) = **8.19 in** **6.45 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **7.51 in** **5.79 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **10**
 POND NAME : **10A**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	6.06 ac
Wet Detention	1.00 in

x DCIA (Net New) = 0.51 ac-ft

--	--

Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.51 ac-ft
OFW Requirement, provide 50% more TV = 0.76 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q _{pre} =	15.44 ac-ft		11.68 ac-ft
Q _{post} =	16.49 ac-ft		12.69 ac-ft
ΔQ =	1.05 ac-ft		1.01 ac-ft

Attenuation V_{req} = 1.05 ac-ft (use largest value)



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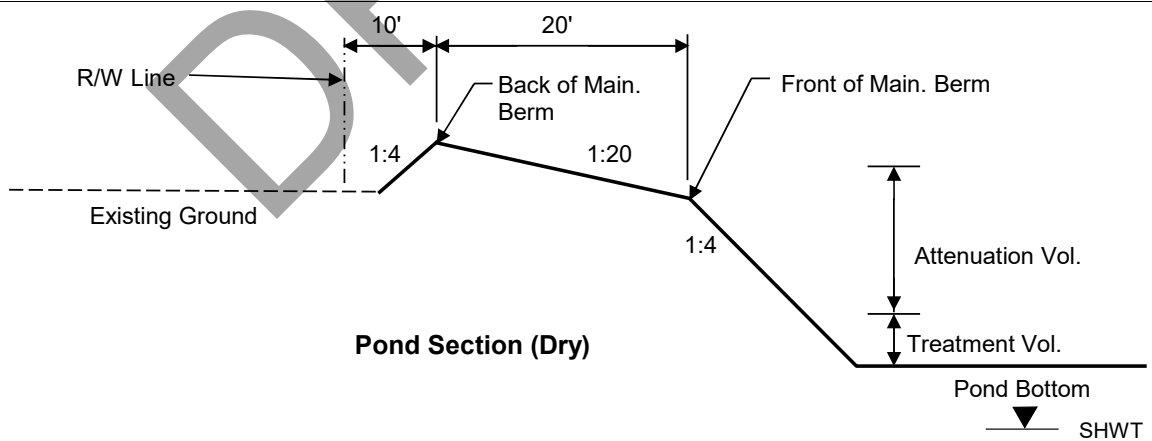
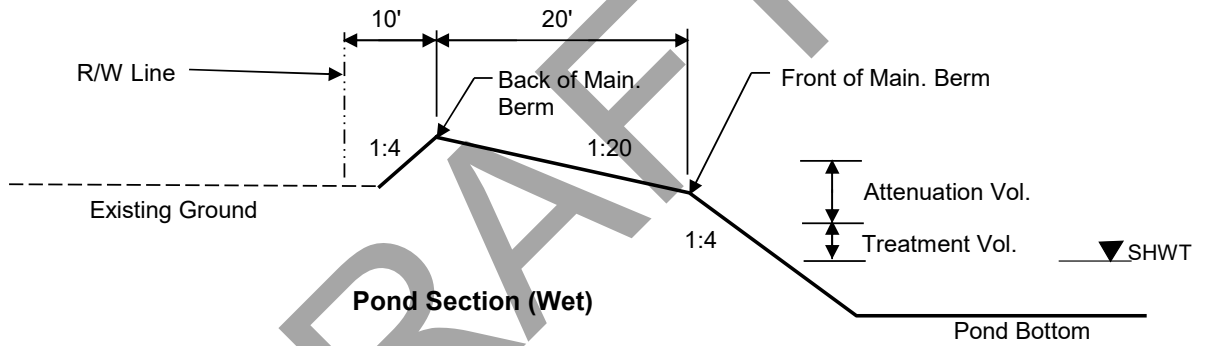
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **10**
 POND NAME : **10A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	45.00
Pond Tie-In Width =	10.0 ft	@ 1:4	Normal Water Elevation =	44.00
Maximum Storage Depth (SD) =	2.50 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	48.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.050%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	500 ft	
Estimated Energy Losses =	0.3 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	46.8 ft	





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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **10**
 POND NAME : **10A**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
45.00	Pond R/W	2.41 ac	525.0 ft	200.0 ft	
47.50	Back of Main. Berm	2.09 ac	505.0 ft	180.0 ft	5.18 ac-ft
47.00		1.78 ac	485.0 ft	160.0 ft	4.22 ac-ft
46.50	Front of Main. Berm	1.49 ac	465.0 ft	140.0 ft	3.40 ac-ft
45.50	Provided Treat.Vol.+Att.Vol	1.38 ac	457.0 ft	132.0 ft	1.96 ac-ft
45.40	Req'd Treat.Vol+Att. Vol	1.37 ac	456.2 ft	131.2 ft	1.82 ac-ft
45.17	Estimated Storm Sewer TW	1.35 ac	454.4 ft	129.4 ft	1.51 ac-ft
44.65	Top of Treatment Vol.	1.29 ac	450.2 ft	125.2 ft	0.82 ac-ft
44.00	Normal Water Level	1.23 ac	445.0 ft	120.0 ft	0.00 ac-ft
42.00		1.02 ac	429.0 ft	104.0 ft	
38.00	Pond Bottom	0.70 ac	421.0 ft	72.0 ft	

Required Treatment+Attenuation Vol.= 1.81 ac-ft
 Required Treatment+Attenuation Stage= 45.40 ft

Provided Treatment+Attenuation Vol.= 1.96 ac-ft
 Provided Treatment+Attenuation Stage= 45.50 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.51 ac-ft
 Estimated Storm Sewer TW EL.= 45.17 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 2.89 ac



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **10**
 POND NAME : **10B**

Station Limits: From: **1788+00** Roadway Length = 5500 ft
 To: **1843+00** R/W Width = 192 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Median Shoulder			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shared Use Path			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 4.29 ac
 Pervious Roadway Area: 19.95 ac
 Total Roadway Area: 24.24 ac

Pond Area: Pervious Pond Area = 3.68 ac

Total Area: Impervious Area: 4.29 ac
 Pervious Area: 23.63 ac
 Total Area: 27.93 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	4.29 ac	420.7
Open Space (lawns, parks, golf courses, cemeteries,	D	89	8.33 ac	741.7
Depressional areas & existing storage	D	90	11.62 ac	1045.5
Pasture, grassland or range; Good condition (> 75%	D	80	3.68 ac	294.6
Pasture, grassland or range; Good condition (> 75%	D	80		0.0
Total:			27.93 ac	2502.5

CN = Total CN*Area / Total Area = **89.6**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **1.16 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Precipitation (P) = **8.19 in**

Runoff (Q) = **6.95 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	---------

			5.24 in
--	--	--	---------



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **10**
 POND NAME : **10B**

Station Limits: From: **1788+00** Roadway Length = 5500 ft
 To: **1843+00** R/W Width = 192 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	6	72 ft
Paved Shoulder	5.0 ft	2	10 ft
Median Shoulder	4.0 ft	2	8 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	2	5 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			113 ft

Impervious Roadway Area: 14.20 ac
 Pervious Roadway Area: 10.04 ac
 Total Roadway Area: 24.24 ac

Pond Area: Pervious Pond Area : 0.97 ac
 Water Surface Area: 2.71 ac Wet Pond
 Total Pond Area: 3.68 ac

Total Area: Impervious Area: 14.20 ac
 Pervious Area: 11.01 ac
 Water Surface Area: 2.71 ac
 Total Area: 27.93 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	14.20 ac	1392.0
Open Space (lawns, parks, golf courses, cemeteries,	D	89	10.04 ac	893.4
Open Space (lawns, parks, golf courses, cemeteries,	D	89	0.97 ac	86.3
Proposed Ponds (Water Surface)	D	100	2.71 ac	271.4
Total:			27.93 ac	2643.0

CN = Total CN*Area / Total Area = **94.6**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **0.57 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **7.55 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	---------

			5.82 in
--	--	--	---------



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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **10**
 POND NAME : **10B**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	6.06 ac
Wet Detention	1.00 in

x DCIA (Net New) = 0.51 ac-ft

Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.51 ac-ft
OFW Requirement, provide 50% more TV = 0.76 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q _{pre} =	16.16 ac-ft		12.20 ac-ft
Q _{post} =	17.57 ac-ft		13.54 ac-ft
ΔQ =	1.40 ac-ft		1.34 ac-ft

Attenuation V_{req} = 1.40 ac-ft (use largest value)



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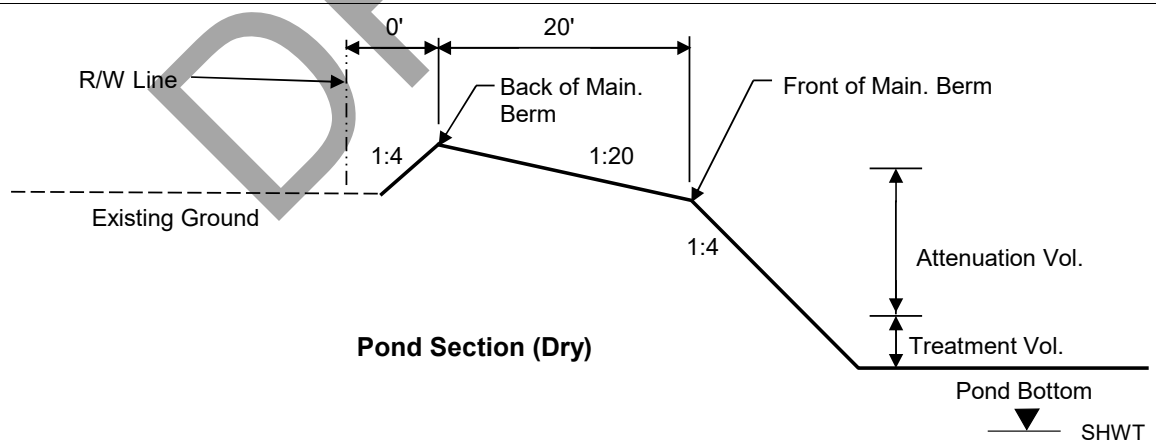
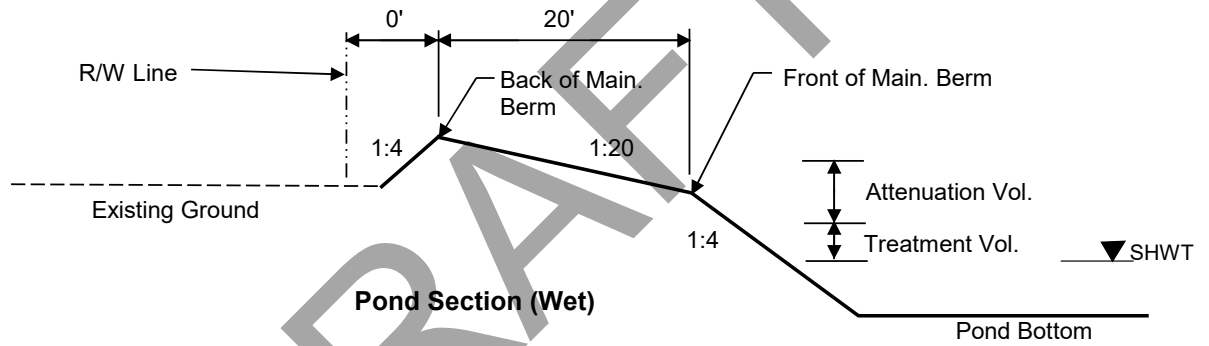
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **10**
 POND NAME : **10B**

Maintenance Area Width =	<u>20.0 ft</u>	@ 1:20	Existing Ground Elevation =	<u>51.00</u>
Pond Tie-In Width =	<u>0.0 ft</u>	@ 1:4	Normal Water Elevation =	<u>48.00</u>
Maximum Storage Depth (SD) =	<u>2.00 ft</u>	with 1.0 ft freeboard	Lowest EOP Elevation =	<u>50.00</u>

Hydraulic Grade Line (HGL) check

HGL Slope =	<u>0.050%</u>	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	<u>600 ft</u>	
Estimated Energy Losses =	<u>0.3 ft</u>	
HGL Clearance =	<u>1.0 ft</u>	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	<u>48.7 ft</u>	





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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **10**
 POND NAME : **10B**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
51.00	Pond R/W	3.68 ac	465.0 ft	345.0 ft	
51.00	Back of Main. Berm	3.68 ac	465.0 ft	345.0 ft	9.01 ac-ft
50.50		3.32 ac	445.0 ft	325.0 ft	7.26 ac-ft
50.00	Front of Main. Berm	2.98 ac	425.0 ft	305.0 ft	5.69 ac-ft
49.00	Provided Treat.Vol.+Att.Vol	2.84 ac	417.0 ft	297.0 ft	2.78 ac-ft
48.80	Req'd Treat.Vol+Att. Vol	2.82 ac	415.4 ft	295.4 ft	2.21 ac-ft
48.67	Estimated Storm Sewer TW	2.80 ac	414.4 ft	294.4 ft	1.85 ac-ft
48.30	Top of Treatment Vol.	2.75 ac	411.4 ft	291.4 ft	0.82 ac-ft
48.00	Normal Water Level	2.71 ac	409.0 ft	289.0 ft	0.00 ac-ft
46.00		2.46 ac	393.0 ft	273.0 ft	
42.00	Pond Bottom	2.13 ac	385.0 ft	241.0 ft	

Required Treatment+Attenuation Vol.= 2.16 ac-ft
 Required Treatment+Attenuation Stage= 48.80 ft

Provided Treatment+Attenuation Vol.= 2.78 ac-ft
 Provided Treatment+Attenuation Stage= 49.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 1.85 ac-ft
 Estimated Storm Sewer TW EL.= 48.67 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 4.42 ac

Complete Report (not including cost) Ver 4.3.5

Project: US 301 PD_E

Date: 4/10/2023 4:56:01 PM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	Basin 10
Rainfall Zone	Florida Zone 4
Annual Mean Rainfall	51.00
Pre-Condition Landuse Information	
Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	27.83
Rational Coefficient (0-1)	0.34
Non DCIA Curve Number	89.00
DCIA Percent (0-100)	15.42
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	39.980
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	74.929
Phosphorus Loading (kg/yr)	9.859
Post-Condition Landuse Information	
Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	27.83
Rational Coefficient (0-1)	0.60
Non DCIA Curve Number	89.00
DCIA Percent (0-100)	60.50
Wet Pond Area (ac)	2.63
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	63.842
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	119.651
Phosphorus Loading (kg/yr)	15.744

Catchment Number: 1 Name: Basin 10

Project: US 301 PD_E

Date: 4/10/2023

Multiple BMP in Series Design Parameters

BMP in Series Number: 1

BMP Type: Swale

Swale Top Width for Flood Conditions - W (ft)	28.000
Swale Bottom Width - B (ft)	5.000
Swale Length - L (ft)	5,500.000
Average Impervious Length (ft)	5,500.000
Average Impervious Width (ft)	112.000
Average Pervious Width (ft)	103.500
Swale Slope (foot drop/foot length) - S	0.001
Mannings N	0.060
Soil Infiltration Rate (in/hr)	0.400
Side Slope of Swale horizontal/vertical - Z	6.000
Average Height of Swale Block - H	0.500
Length of Berm Upstream of Crest - L_b	0.000
Runoff Area (acres)	27.210
Number of Swale Blocks	

BMP in Series Number: 2

BMP Type: Wet Detention

Permanent Pool Volume (ac-ft)	13.910
Permanent Pool Volume (ac-ft) for 31 days residence	5.422
Annual Residence Time (days)	80
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

BMP in Series Number: 3

BMP Type: None

BMP in Series Number: 4

BMP Type: None

Watershed Characteristics

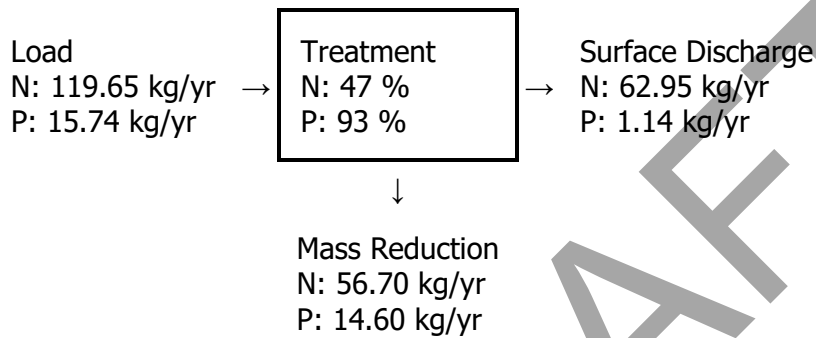
Catchment Area (acres)	27.83
Contributing Area (acres)	25.200
Non-DCIA Curve Number	89.00
DCIA Percent	60.50

Rainfall Zone Florida Zone 4
Rainfall (in) 51.00

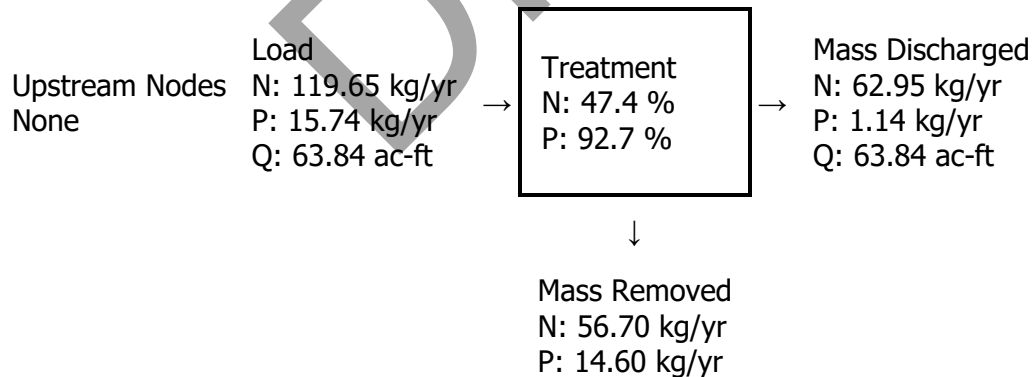
Surface Water Discharge

Required TN Treatment Efficiency (%) 37
Provided TN Treatment Efficiency (%) 47
Required TP Treatment Efficiency (%) 37
Provided TP Treatment Efficiency (%) 93

Load for Multiple BMP in Series



Load Diagram for Multiple BMP (As Used In Routing)



Summary Treatment Report Version: 4.3.5

Project: US 301 PD_E

Analysis Type: Net Improvement

Date:4/10/2023

BMP Types:

Catchment 1 - (Basin 10) Multiple **Routing Summary**
BMP Catchment 1 Routed to Outlet

Based on % removal values to the nearest percent

Total nitrogen target removal met? **Yes**

Total phosphorus target removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	74.93 kg/yr	
Total N post load	119.65 kg/yr	
Target N load reduction	37 %	
Target N discharge load	74.93 kg/yr	
Percent N load reduction	47 %	
Provided N discharge load	62.95 kg/yr	138.81 lb/yr
Provided N load removed	56.7 kg/yr	125.02 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	9.859 kg/yr	
Total P post load	15.744 kg/yr	
Target P load reduction	37 %	
Target P discharge load	9.859 kg/yr	
Percent P load reduction	93 %	
Provided P discharge load	1.142 kg/yr	2.52 lb/yr
Provided P load removed	14.601 kg/yr	32.195 lb/yr



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **12**
 POND NAME : **12A**

Station Limits: From: **1843+00** Roadway Length = 9300 ft
 To: **1936+00** R/W Width = 235 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 7.26 ac
 Pervious Roadway Area: 42.91 ac
 Total Roadway Area: 50.17 ac

Pond Area: Pervious Pond Area = 2.74 ac

Total Area: Impervious Area: 7.26 ac
 Pervious Area: 45.66 ac
 Total Area: 52.91 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	7.26 ac	711.4
Open Space (lawns, parks, golf courses, cemeteries,	D	89	14.09 ac	1254.1
Woods; Good condition (Woods are protected from	D	77	21.38 ac	1646.6
Woods & Wetlands Combination	D	97	7.44 ac	721.5
Pasture, grassland or range; Good condition (> 75%	D	80	2.74 ac	219.4
Pasture, grassland or range; Good condition (> 75%	D	80		0.0
Total:			52.91 ac	4552.9

CN = Total CN*Area / Total Area = **86.0**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **1.62 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **6.52 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	---------

			4.84 in
--	--	--	---------



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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **12**
 POND NAME : **12A**

Station Limits: From: **1843+00** Roadway Length = 9300 ft
 To: **1936+00** R/W Width = 235 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	6	72 ft
Paved Shoulder	5.0 ft	2	10 ft
Median Shoulder	4.0 ft	2	8 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	2	5 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			113 ft

Impervious Roadway Area: 24.02 ac
 Pervious Roadway Area: 26.15 ac
 Total Roadway Area: 50.17 ac

Pond Area: Pervious Pond Area : 1.09 ac
 Water Surface Area: 1.66 ac Wet Pond
 Total Pond Area: 2.74 ac

Total Area: Impervious Area: 24.02 ac
 Pervious Area: 27.24 ac
 Water Surface Area: 1.66 ac
 Total Area: 52.91 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	24.02 ac	2353.8
Open Space (lawns, parks, golf courses, cemeteries,	D	89	26.15 ac	2327.7
Open Space (lawns, parks, golf courses, cemeteries,	D	89	1.09 ac	96.6
Proposed Ponds (Water Surface)	D	100	1.66 ac	165.6
Total:			52.91 ac	4943.7

CN = Total CN*Area / Total Area = **93.4**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **0.70 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Precipitation (P) = **8.19 in**

Runoff (Q) = **7.40 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	---------

			5.68 in
--	--	--	---------



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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **12**
 POND NAME : **12A**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	10.25 ac
Wet Detention	1.00 in

x DCIA (Net New) = 0.85 ac-ft

--	--

Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.85 ac-ft
OFW Requirement, provide 50% more TV = 1.28 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q _{pre} =	28.75 ac-ft		21.36 ac-ft
Q _{post} =	32.64 ac-ft		25.03 ac-ft
ΔQ =	3.89 ac-ft		3.68 ac-ft

Attenuation V_{req} = 3.89 ac-ft (use largest value)



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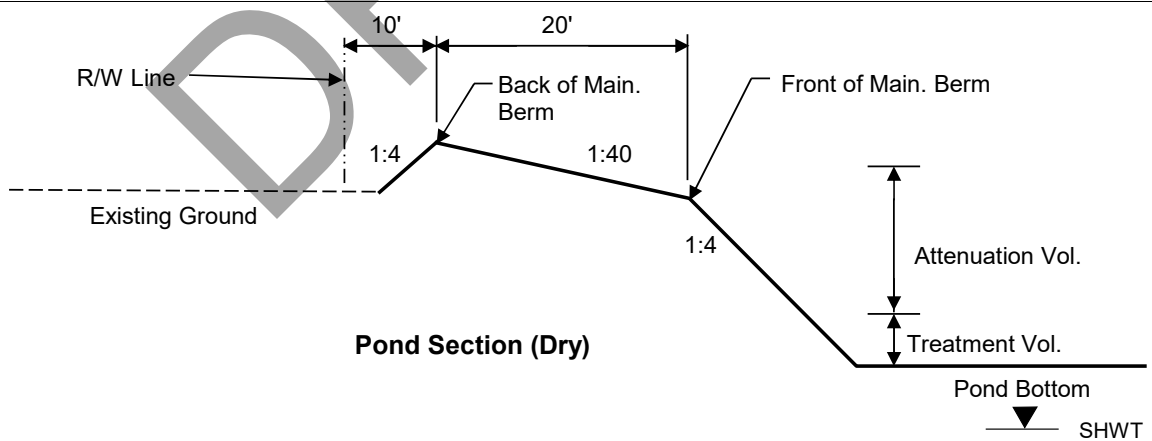
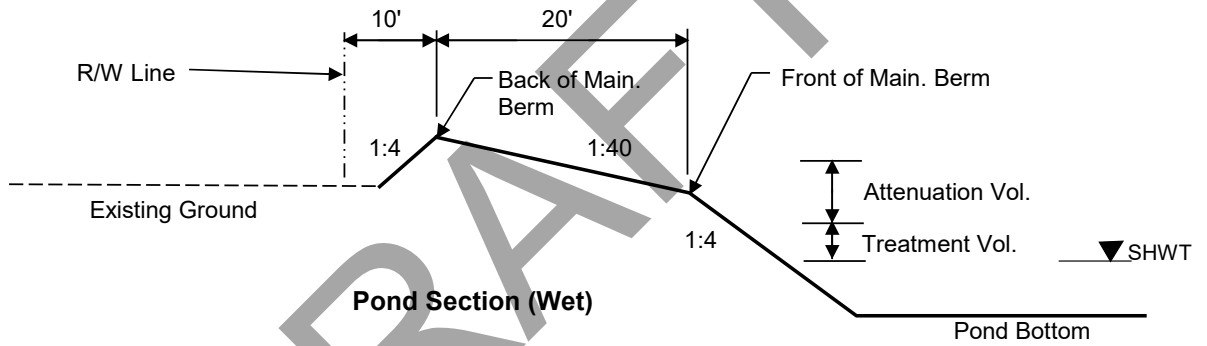
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **12**
 POND NAME : **12A**

Maintenance Area Width =	20.0 ft	@ 1:40	Existing Ground Elevation =	51.00
Pond Tie-In Width =	10.4 ft	@ 1:4	Normal Water Elevation =	49.00
Maximum Storage Depth (SD) =	3.60 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	54.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.050%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1500 ft	
Estimated Energy Losses =	0.8 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	52.3 ft	





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Made by: ZKE
 Checked by: REC

DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **12**
 POND NAME : **12A**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
51.00	Pond R/W	3.10 ac	487.0 ft	277.0 ft	
53.60	Back of Main. Berm	2.74 ac	466.2 ft	256.2 ft	8.93 ac-ft
53.35		2.42 ac	446.2 ft	236.2 ft	8.28 ac-ft
53.10	Front of Main. Berm	2.12 ac	426.2 ft	216.2 ft	7.72 ac-ft
52.10	Provided Treat.Vol.+Att.Vol	2.00 ac	418.2 ft	208.2 ft	5.66 ac-ft
51.90	Req'd Treat.Vol+Att. Vol	1.98 ac	416.6 ft	206.6 ft	5.26 ac-ft
51.53	Estimated Storm Sewer TW	1.93 ac	413.6 ft	203.6 ft	4.53 ac-ft
49.80	Top of Treatment Vol.	1.74 ac	399.8 ft	189.8 ft	1.36 ac-ft
49.00	Normal Water Level	1.66 ac	393.4 ft	183.4 ft	0.00 ac-ft
47.00		1.45 ac	377.4 ft	167.4 ft	
43.00	Pond Bottom	1.15 ac	369.4 ft	135.4 ft	

Required Treatment+Attenuation Vol.= 5.17 ac-ft
 Required Treatment+Attenuation Stage= 51.90 ft

Provided Treatment+Attenuation Vol.= 5.66 ac-ft
 Provided Treatment+Attenuation Stage= 52.10 ft

Estimated Treat. Vol.+Storm Sewer Att.= 4.53 ac-ft
 Estimated Storm Sewer TW EL.= 51.53 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 3.72 ac



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **12**
 POND NAME : **12B**

Station Limits: From: **1843+00** Roadway Length = 9300 ft
 To: **1936+00** R/W Width = 235 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 7.26 ac
 Pervious Roadway Area: 42.91 ac
 Total Roadway Area: 50.17 ac

Pond Area: Pervious Pond Area = 2.62 ac

Total Area: Impervious Area: 7.26 ac
 Pervious Area: 45.53 ac
 Total Area: 52.79 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	7.26 ac	711.4
Open Space (lawns, parks, golf courses, cemeteries,	D	89	14.09 ac	1254.1
Woods; Good condition (Woods are protected from	D	77	21.38 ac	1646.6
Woods & Wetlands Combination	D	97	7.44 ac	721.5
Pasture, grassland or range; Good condition (> 75%	D	80	2.62 ac	209.7
Pasture, grassland or range; Good condition (> 75%	D	80		0.0
Total:			52.79 ac	4543.3

CN = Total CN*Area / Total Area = **86.1**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **1.62 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **6.52 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	---------

			4.84 in
--	--	--	---------



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **12**
 POND NAME : **12B**

Station Limits: From: **1843+00** Roadway Length = 9300 ft
 To: **1936+00** R/W Width = 235 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	6	72 ft
Paved Shoulder	5.0 ft	2	10 ft
Median Shoulder	4.0 ft	2	8 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	2	5 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			113 ft

Impervious Roadway Area: 24.02 ac
 Pervious Roadway Area: 26.15 ac
 Total Roadway Area: 50.17 ac

Pond Area: Pervious Pond Area : 1.05 ac
 Water Surface Area: 1.57 ac **Wet Pond**
 Total Pond Area: 2.62 ac

Total Area: Impervious Area: 24.02 ac
 Pervious Area: 27.21 ac
 Water Surface Area: 1.57 ac
 Total Area: 52.79 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	24.02 ac	2353.8
Open Space (lawns, parks, golf courses, cemeteries,	D	89	26.15 ac	2327.7
Open Space (lawns, parks, golf courses, cemeteries,	D	89	1.05 ac	93.8
Proposed Ponds (Water Surface)	D	100	1.57 ac	156.7
Total:			52.79 ac	4932.0

CN = Total CN*Area / Total Area = **93.4**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **0.70 in**

Precipitation (P) = **8.19 in** **6.45 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **7.40 in** **5.68 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------



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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **12**
 POND NAME : **12B**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	10.25 ac
Wet Detention	1.00 in

x DCIA (Net New) = 0.85 ac-ft	

Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.85 ac-ft
OFW Requirement, provide 50% more TV = 1.28 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q _{pre} =	28.70 ac-ft		21.31 ac-ft
Q _{post} =	32.56 ac-ft		24.97 ac-ft
ΔQ =	3.87 ac-ft		3.66 ac-ft

Attenuation V_{req} = 3.87 ac-ft (use largest value)



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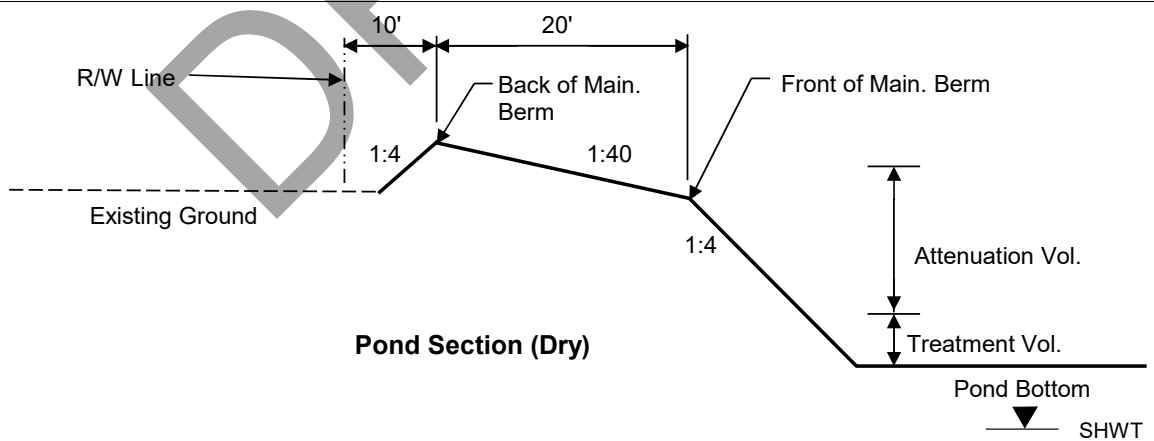
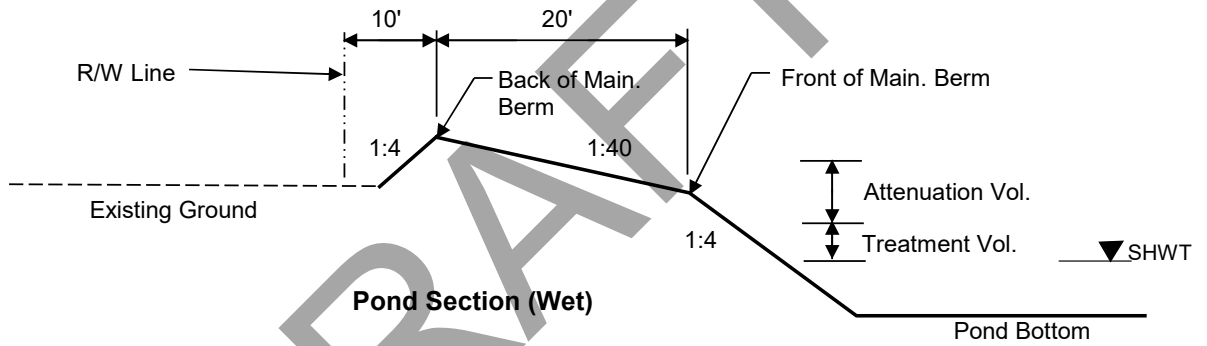
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **12**
 POND NAME : **12B**

Maintenance Area Width =	20.0 ft	@ 1:40	Existing Ground Elevation =	51.00
Pond Tie-In Width =	10.4 ft	@ 1:4	Normal Water Elevation =	49.00
Maximum Storage Depth (SD) =	3.60 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	54.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.050%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	1500 ft	
Estimated Energy Losses =	0.8 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	52.3 ft	





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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **12**
 POND NAME : **12B**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
51.00	Pond R/W	2.97 ac	470.0 ft	275.0 ft	
53.60	Back of Main. Berm	2.62 ac	449.2 ft	254.2 ft	8.48 ac-ft
53.35		2.31 ac	429.2 ft	234.2 ft	7.86 ac-ft
53.10	Front of Main. Berm	2.01 ac	409.2 ft	214.2 ft	7.32 ac-ft
52.10	Provided Treat.Vol.+Att.Vol	1.90 ac	401.2 ft	206.2 ft	5.37 ac-ft
52.00	Req'd Treat.Vol+Att. Vol	1.89 ac	400.4 ft	205.4 ft	5.18 ac-ft
51.65	Estimated Storm Sewer TW	1.85 ac	397.6 ft	202.6 ft	4.51 ac-ft
49.82	Top of Treatment Vol.	1.65 ac	383.0 ft	188.0 ft	1.32 ac-ft
49.00	Normal Water Level	1.57 ac	376.4 ft	181.4 ft	0.00 ac-ft
47.00		1.37 ac	360.4 ft	165.4 ft	
43.00	Pond Bottom	1.08 ac	352.4 ft	133.4 ft	

Required Treatment+Attenuation Vol.= 5.15 ac-ft
 Required Treatment+Attenuation Stage= 52.00 ft

Provided Treatment+Attenuation Vol.= 5.37 ac-ft
 Provided Treatment+Attenuation Stage= 52.10 ft

Estimated Treat. Vol.+Storm Sewer Att.= 4.51 ac-ft
 Estimated Storm Sewer TW EL.= 51.65 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 3.56 ac



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **12**
 POND NAME : **12C**

Station Limits: From: **1843+00** Roadway Length = 9300 ft
 To: **1936+00** R/W Width = 235 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 7.26 ac
 Pervious Roadway Area: 42.91 ac
 Total Roadway Area: 50.17 ac

Pond Area: Pervious Pond Area = 6.10 ac

Total Area: Impervious Area: 7.26 ac
 Pervious Area: 49.02 ac
 Total Area: 56.28 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	7.26 ac	711.4
Open Space (lawns, parks, golf courses, cemeteries,	D	89	14.09 ac	1254.1
Woods; Good condition (Woods are protected from	D	77	21.38 ac	1646.6
Woods & Wetlands Combination	D	97	7.44 ac	721.5
Pasture, grassland or range; Good condition (> 75%	D	80	6.10 ac	488.3
Pasture, grassland or range; Good condition (> 75%	D	80		0.0
Total:			56.28 ac	4821.8

CN = Total CN*Area / Total Area = **85.7**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **1.67 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **6.48 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	---------

			4.80 in
--	--	--	---------



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **12**
 POND NAME : **12C**

Station Limits: From: **1843+00** Roadway Length = 9300 ft
 To: **1936+00** R/W Width = 235 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	6	72 ft
Paved Shoulder	5.0 ft	2	10 ft
Median Shoulder	4.0 ft	2	8 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	2	5 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			113 ft

Impervious Roadway Area: 24.02 ac
 Pervious Roadway Area: 26.15 ac
 Total Roadway Area: 50.17 ac

Pond Area: Pervious Pond Area : 1.34 ac
 Water Surface Area: 4.76 ac **Wet Pond**
 Total Pond Area: 6.10 ac

Total Area: Impervious Area: 24.02 ac
 Pervious Area: 27.49 ac
 Water Surface Area: 4.76 ac
 Total Area: 56.28 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	D	98	24.02 ac	2353.8
Open Space (lawns, parks, golf courses, cemeteries,	D	89	26.15 ac	2327.7
Open Space (lawns, parks, golf courses, cemeteries,	D	89	1.34 ac	119.2
Proposed Ponds (Water Surface)	D	100	4.76 ac	476.4
Total:			56.28 ac	5277.1

CN = Total CN*Area / Total Area = **93.8**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **0.66 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **7.44 in**

Permitting Agency Event			Storm Sewer Design
-------------------------	--	--	--------------------

			6.45 in
--	--	--	---------

			5.72 in
--	--	--	---------



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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **12**
 POND NAME : **12C**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Net New Contr DCIA	10.25 ac
Wet Detention	1.00 in

x DCIA (Net New) = 0.85 ac-ft

--	--

Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.85 ac-ft
OFW Requirement, provide 50% more TV = 1.28 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q _{pre} =	30.38 ac-ft		22.53 ac-ft
Q _{post} =	34.91 ac-ft		26.81 ac-ft
ΔQ =	4.53 ac-ft		4.28 ac-ft

Attenuation V_{req} = 4.53 ac-ft (use largest value)



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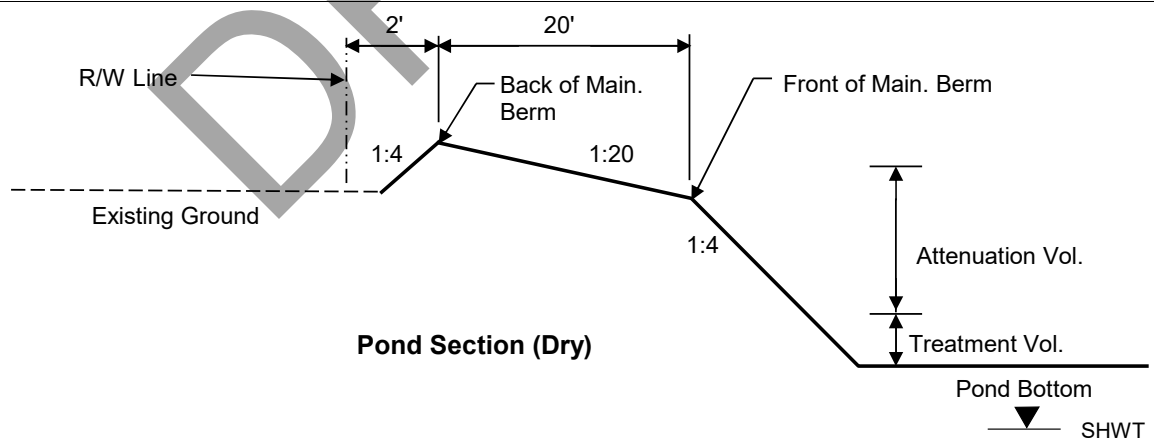
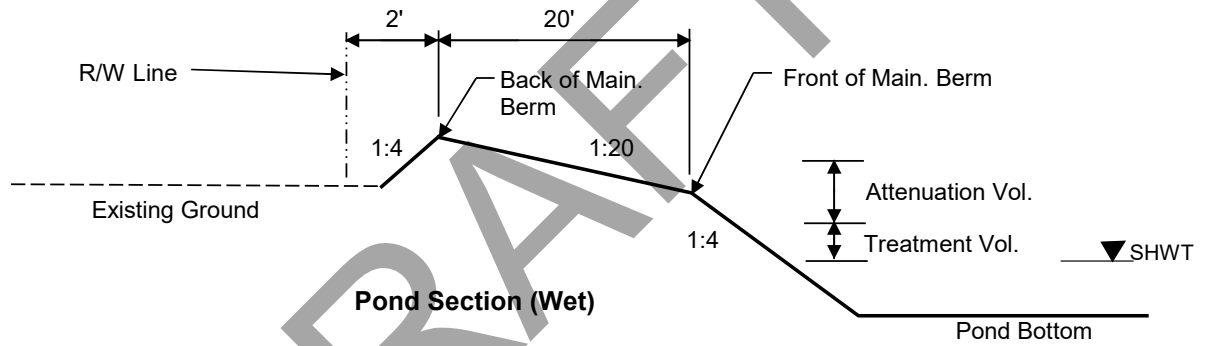
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **12**
 POND NAME : **12C**

Maintenance Area Width =	<u>20.0 ft</u>	@ 1:20	Existing Ground Elevation =	<u>55.00</u>
Pond Tie-In Width =	<u>2.0 ft</u>	@ 1:4	Normal Water Elevation =	<u>52.00</u>
Maximum Storage Depth (SD) =	<u>2.50 ft</u>	with 1.0 ft freeboard	Lowest EOP Elevation =	<u>54.25</u>

Hydraulic Grade Line (HGL) check

HGL Slope =	<u>0.050%</u>	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	<u>250 ft</u>	
Estimated Energy Losses =	<u>0.1 ft</u>	
HGL Clearance =	<u>1.0 ft</u>	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	<u>53.1 ft</u>	





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PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **12**
 POND NAME : **12C**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
55.00	Pond R/W	6.20 ac	540.0 ft	500.0 ft	
55.50	Back of Main. Berm	6.10 ac	536.0 ft	496.0 ft	18.09 ac-ft
55.00		5.64 ac	516.0 ft	476.0 ft	15.15 ac-ft
54.50	Front of Main. Berm	5.19 ac	496.0 ft	456.0 ft	12.44 ac-ft
53.50	Provided Treat.Vol.+Att.Vol	5.02 ac	488.0 ft	448.0 ft	7.34 ac-ft
53.20	Req'd Treat.Vol+Att. Vol	4.97 ac	485.6 ft	445.6 ft	5.84 ac-ft
53.07	Estimated Storm Sewer TW	4.95 ac	484.6 ft	444.6 ft	5.19 ac-ft
52.27	Top of Treatment Vol.	4.81 ac	478.2 ft	438.2 ft	1.29 ac-ft
52.00	Normal Water Level	4.76 ac	476.0 ft	436.0 ft	0.00 ac-ft
50.00		4.44 ac	460.0 ft	420.0 ft	
46.00	Pond Bottom	4.03 ac	452.0 ft	388.0 ft	

Required Treatment+Attenuation Vol.= 5.81 ac-ft
 Required Treatment+Attenuation Stage= 53.20 ft

Provided Treatment+Attenuation Vol.= 7.34 ac-ft
 Provided Treatment+Attenuation Stage= 53.50 ft

Estimated Treat. Vol.+Storm Sewer Att.= 5.14 ac-ft
 Estimated Storm Sewer TW EL.= 53.07 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 7.44 ac

Complete Report (not including cost) Ver 4.3.5

Project: US 301 PD_E

Date: 4/10/2023 4:55:57 PM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	Basin 12
Rainfall Zone	Florida Zone 4
Annual Mean Rainfall	51.00
Pre-Condition Landuse Information	
Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	52.88
Rational Coefficient (0-1)	0.21
Non DCIA Curve Number	77.00
DCIA Percent (0-100)	13.73
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	46.612
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	87.359
Phosphorus Loading (kg/yr)	11.495
Post-Condition Landuse Information	
Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	52.88
Rational Coefficient (0-1)	0.51
Non DCIA Curve Number	89.00
DCIA Percent (0-100)	45.42
Wet Pond Area (ac)	1.63
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	111.089
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	208.198
Phosphorus Loading (kg/yr)	27.394

Catchment Number: 1 Name: Basin 12

Project: US 301 PD_E

Date: 4/10/2023

Multiple BMP in Series Design Parameters

BMP in Series Number: 1

BMP Type: Swale

Swale Top Width for Flood Conditions - W (ft)	23.000
Swale Bottom Width - B (ft)	5.000
Swale Length - L (ft)	9,300.000
Average Impervious Length (ft)	9,300.000
Average Impervious Width (ft)	112.000
Average Pervious Width (ft)	103.500
Swale Slope (foot drop/foot length) - S	0.001
Mannings N	0.060
Soil Infiltration Rate (in/hr)	0.400
Side Slope of Swale horizontal/vertical - Z	6.000
Average Height of Swale Block - H	0.500
Length of Berm Upstream of Crest - L_b	0.000
Runoff Area (acres)	46.009
Number of Swale Blocks	

BMP in Series Number: 2

BMP Type: Wet Detention

Permanent Pool Volume (ac-ft)	8.160
Permanent Pool Volume (ac-ft) for 31 days residence	9.435
Annual Residence Time (days)	27
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

BMP in Series Number: 3

BMP Type: None

BMP in Series Number: 4

BMP Type: None

Watershed Characteristics

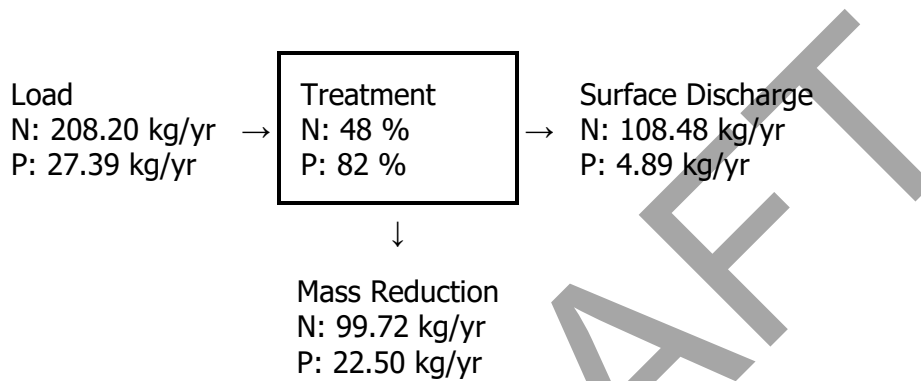
Catchment Area (acres)	52.88
Contributing Area (acres)	51.250
Non-DCIA Curve Number	89.00
DCIA Percent	45.42

Rainfall Zone Florida Zone 4
 Rainfall (in) 51.00

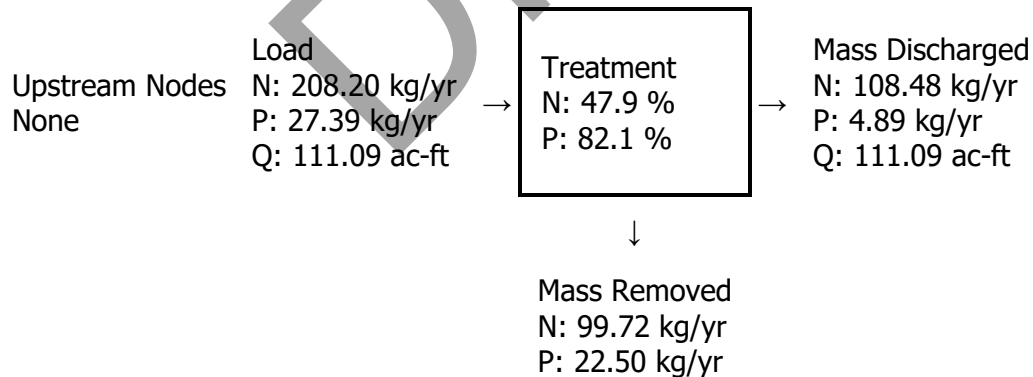
Surface Water Discharge

Required TN Treatment Efficiency (%) 58
 Provided TN Treatment Efficiency (%) 48
 Required TP Treatment Efficiency (%) 58
 Provided TP Treatment Efficiency (%) 82

Load for Multiple BMP in Series



Load Diagram for Multiple BMP (As Used In Routing)



Summary Treatment Report Version: 4.3.5

Analysis Type: Net Improvement

Routing Summary

BMP Types:

Catchment 1 Routed to Outlet

Catchment 1 - (Basin 12) Multiple

BMP

Based on % removal values to the nearest percent

Total nitrogen target removal met? **No**

Total phosphorus target removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	87.36 kg/yr	
Total N post load	208.2 kg/yr	
Target N load reduction	58 %	
Target N discharge load	87.36 kg/yr	
Percent N load reduction	48 %	
Provided N discharge load	108.48 kg/yr	239.19 lb/yr
Provided N load removed	99.72 kg/yr	219.88 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	11.495 kg/yr	
Total P post load	27.394 kg/yr	
Target P load reduction	58 %	
Target P discharge load	11.495 kg/yr	
Percent P load reduction	82 %	
Provided P discharge load	4.892 kg/yr	10.79 lb/yr
Provided P load removed	22.502 kg/yr	49.617 lb/yr



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 (407) 971-8955 (fax)

Made by: ZKE
 Checked by: REC

DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **13**
 POND NAME : **13A**

Station Limits: From: **1936+00** Roadway Length = 7400 ft
 To: **2010+00** R/W Width = 200 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 5.78 ac
 Pervious Roadway Area: 28.20 ac
 Total Roadway Area: 33.98 ac

Pond Area: Pervious Pond Area = 3.97 ac

Total Area: Impervious Area: 5.78 ac
 Pervious Area: 32.17 ac
 Total Area: 37.95 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.73 ac	267.7
Impervious areas; Streets & roads	D	98	3.04 ac	298.3
Open Space (lawns, parks, golf courses, cemeteries,	A	68	5.30 ac	360.6
Open Space (lawns, parks, golf courses, cemeteries,	D	89	11.21 ac	997.9
Woods; Good condition (Woods are protected from	A	30	8.03 ac	241.0
Woods; Good condition (Woods are protected from	D	77	3.65 ac	281.1
Pasture, grassland or range; Good condition (> 75%	D	80	3.97 ac	317.8
Total:			37.95 ac	2764.5

CN = Total CN*Area / Total Area = **72.8**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **3.73 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **4.96 in**

Permitting Agency Event			Storm Sewer Design
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			6.45 in
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			3.45 in
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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **13**
 POND NAME : **13A**

Station Limits: From: **1936+00** Roadway Length = 7400 ft
 To: **2010+00** R/W Width = 200 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	6	72 ft
Paved Shoulder	5.0 ft	2	10 ft
Median Shoulder	4.0 ft	2	8 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	2	5 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			113 ft

Impervious Roadway Area: 19.11 ac
 Pervious Roadway Area: 14.86 ac
 Total Roadway Area: 33.98 ac

Pond Area: Pervious Pond Area : 1.51 ac
 Water Surface Area: 2.46 ac **Wet Pond**
 Total Pond Area: 3.97 ac

Total Area: Impervious Area: 19.11 ac
 Pervious Area: 16.38 ac
 Water Surface Area: 2.46 ac
 Total Area: 37.95 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	9.04 ac	885.8
Impervious areas; Streets & roads	D	98	10.07 ac	987.1
Open Space (lawns, parks, golf courses, cemeteries,	A	68	7.03 ac	478.1
Open Space (lawns, parks, golf courses, cemeteries,	D	89	7.83 ac	697.2
Open Space (lawns, parks, golf courses, cemeteries,	D	89	1.51 ac	134.6
Proposed Ponds (Water Surface)	D	100	2.46 ac	246.0
Total:			37.95 ac	3428.9

CN = Total CN*Area / Total Area = **90.4**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **1.07 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Precipitation (P) = **8.19 in 0.00 in 0.00 in 6.45 in**

Runoff (Q) = **7.04 in 0.05 in 0.05 in 5.33 in**

Permitting Agency Event			Storm Sewer Design
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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **13**
 POND NAME : **13A**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Note: Proposed pond alternative accounts for impacted 0.28 ac swale per Permit No. 27103

Net New Contr DCIA	8.15 ac
Wet Detention	1.00 in

x DCIA (Net New) = 0.68 ac-ft

Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.68 ac-ft
OFW Requirement, provide 50% more TV = 1.02 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q _{pre} =	15.69 ac-ft		10.91 ac-ft
Q _{post} =	22.25 ac-ft		16.84 ac-ft
ΔQ =	6.56 ac-ft		5.93 ac-ft

Attenuation V_{req} = 6.56 ac-ft (use largest value)



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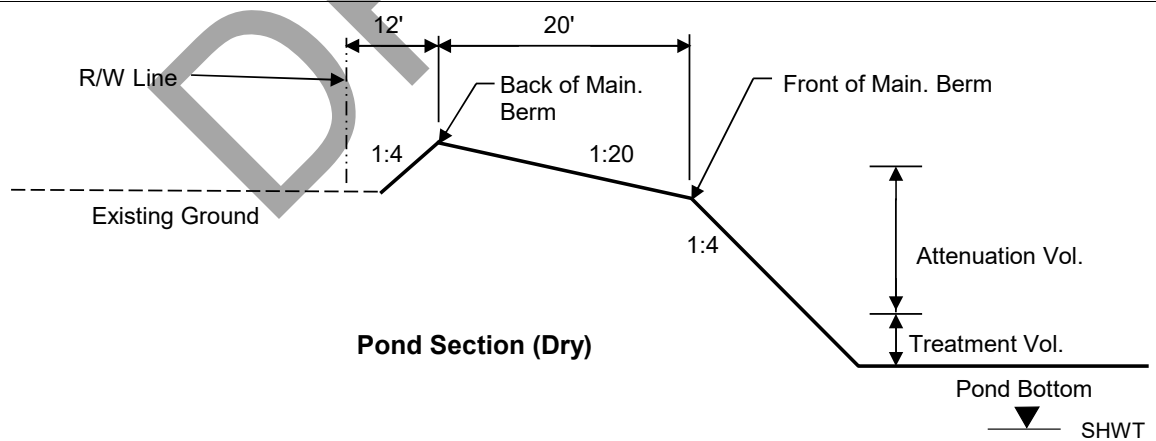
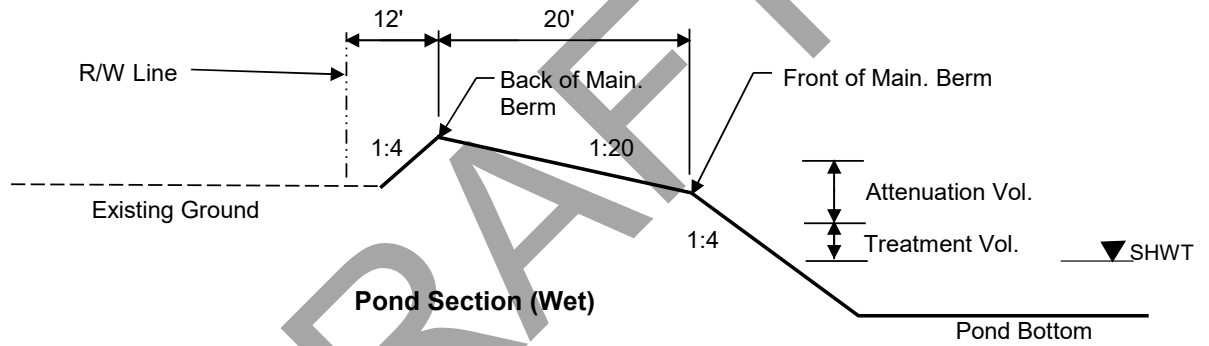
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **13**
 POND NAME : **13A**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	57.00
Pond Tie-In Width =	12.0 ft	@ 1:4	Normal Water Elevation =	55.00
Maximum Storage Depth (SD) =	4.00 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	59.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	250 ft	
Estimated Energy Losses =	0.3 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	57.8 ft	





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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **13**
 POND NAME : **13A**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
57.00	Pond R/W	4.53 ac	783.0 ft	252.0 ft	
60.00	Back of Main. Berm	3.97 ac	759.0 ft	228.0 ft	14.65 ac-ft
59.50		3.53 ac	739.0 ft	208.0 ft	12.77 ac-ft
59.00	Front of Main. Berm	3.10 ac	719.0 ft	188.0 ft	11.11 ac-ft
58.00	Provided Treat.Vol.+Att.Vol	2.94 ac	711.0 ft	180.0 ft	8.09 ac-ft
57.85	Req'd Treat.Vol+Att. Vol	2.91 ac	709.8 ft	178.8 ft	7.65 ac-ft
57.49	Estimated Storm Sewer TW	2.85 ac	706.9 ft	175.9 ft	6.61 ac-ft
55.45	Top of Treatment Vol.	2.53 ac	690.6 ft	159.6 ft	1.12 ac-ft
55.00	Normal Water Level	2.46 ac	687.0 ft	156.0 ft	0.00 ac-ft
53.00		2.16 ac	671.0 ft	140.0 ft	
49.00	Pond Bottom	1.64 ac	663.0 ft	108.0 ft	

Required Treatment+Attenuation Vol.= 7.58 ac-ft
 Required Treatment+Attenuation Stage= 57.85 ft

Provided Treatment+Attenuation Vol.= 8.09 ac-ft
 Provided Treatment+Attenuation Stage= 58.00 ft

Estimated Treat. Vol.+Storm Sewer Att.= 6.61 ac-ft
 Estimated Storm Sewer TW EL.= 57.49 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 5.44 ac



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **13**
 POND NAME : **13B**

Station Limits: From: **1936+00** Roadway Length = 7400 ft
 To: **2010+00** R/W Width = 200 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 5.78 ac
 Pervious Roadway Area: 28.20 ac
 Total Roadway Area: 33.98 ac

Pond Area: Pervious Pond Area = 4.18 ac

Total Area: Impervious Area: 5.78 ac
 Pervious Area: 32.38 ac
 Total Area: 38.15 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.73 ac	267.7
Impervious areas; Streets & roads	D	98	3.04 ac	298.3
Open Space (lawns, parks, golf courses, cemeteries,	A	68	5.30 ac	360.6
Open Space (lawns, parks, golf courses, cemeteries,	D	89	11.21 ac	997.9
Woods; Good condition (Woods are protected from	A	30	8.03 ac	241.0
Woods; Good condition (Woods are protected from	D	77	3.65 ac	281.1
Pasture, grassland or range; Good condition (> 75%	D	80	4.18 ac	334.2
Pasture, grassland or range; Good condition (> 75%	D	80		0.0
Total:			38.15 ac	2780.9

CN = Total CN*Area / Total Area = **72.9**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **3.72 in**

Precipitation (P) = **8.19 in** **6.45 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **4.97 in** **3.45 in**

Permitting Agency Event			Storm Sewer Design
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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **13**
 POND NAME : **13B**

Station Limits: From: **1936+00** Roadway Length = 7400 ft
 To: **2010+00** R/W Width = 200 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	6	72 ft
Paved Shoulder	5.0 ft	2	10 ft
Median Shoulder	4.0 ft	2	8 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	2	5 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			113 ft

Impervious Roadway Area: 19.11 ac
 Pervious Roadway Area: 14.86 ac
 Total Roadway Area: 33.98 ac

Pond Area: Pervious Pond Area : 1.26 ac
 Water Surface Area: 2.92 ac Wet Pond
 Total Pond Area: 4.18 ac

Total Area: Impervious Area: 19.11 ac
 Pervious Area: 16.12 ac
 Water Surface Area: 2.92 ac
 Total Area: 38.15 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	9.04 ac	885.8
Impervious areas; Streets & roads	D	98	10.07 ac	987.1
Open Space (lawns, parks, golf courses, cemeteries,	A	68	7.03 ac	478.1
Open Space (lawns, parks, golf courses, cemeteries,	D	89	7.83 ac	697.2
Open Space (lawns, parks, golf courses, cemeteries,	D	89	1.26 ac	111.7
Proposed Ponds (Water Surface)	D	100	2.92 ac	292.3
Total:			38.15 ac	3452.2

CN = Total CN*Area / Total Area = **90.5**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **1.05 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **7.05 in**

Permitting Agency Event			Storm Sewer Design
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			6.45 in
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			5.34 in
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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **13**
 POND NAME : **13B**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Note: Proposed pond alternative accounts for impacted 0.28 ac swale per Permit No. 27103

Net New Contr DCIA	8.15 ac
Wet Detention	1.00 in

x DCIA (Net New) = 0.68 ac-ft

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Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.68 ac-ft
OFW Requirement, provide 50% more TV = 1.02 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q _{pre} =	15.79 ac-ft		10.98 ac-ft
Q _{post} =	22.42 ac-ft		16.98 ac-ft
ΔQ =	6.63 ac-ft		5.99 ac-ft

Attenuation V_{req} = 6.63 ac-ft (use largest value)



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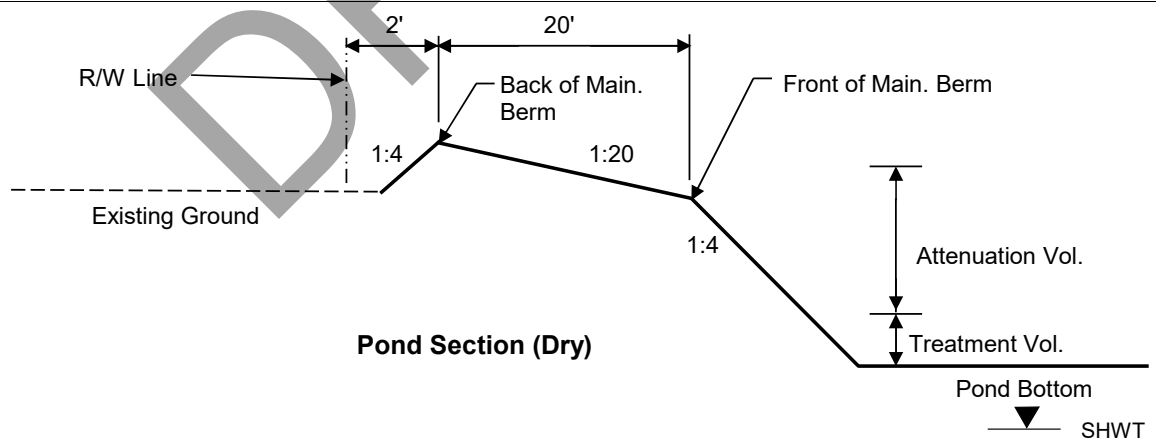
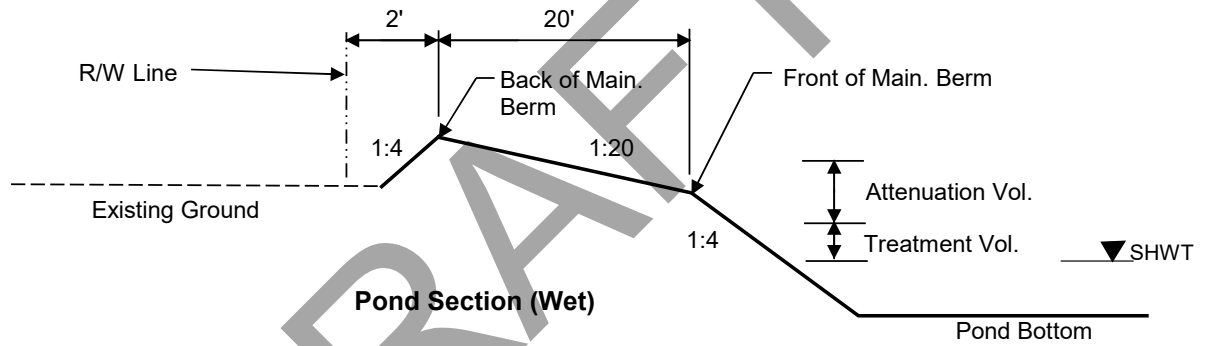
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **13**
 POND NAME : **13B**

Maintenance Area Width =	<u>20.0 ft</u>	@ 1:20	Existing Ground Elevation =	<u>59.00</u>
Pond Tie-In Width =	<u>2.0 ft</u>	@ 1:4	Normal Water Elevation =	<u>55.00</u>
Maximum Storage Depth (SD) =	<u>3.50 ft</u>	with 1.0 ft freeboard	Lowest EOP Elevation =	<u>59.00</u>

Hydraulic Grade Line (HGL) check

HGL Slope =	<u>0.100%</u>	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	<u>250 ft</u>	
Estimated Energy Losses =	<u>0.3 ft</u>	
HGL Clearance =	<u>1.0 ft</u>	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	<u>57.8 ft</u>	





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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **13**
 POND NAME : **13B**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
59.00	Pond R/W	4.26 ac	530.0 ft	350.0 ft	
59.50	Back of Main. Berm	4.18 ac	526.0 ft	346.0 ft	14.87 ac-ft
59.00		3.79 ac	506.0 ft	326.0 ft	12.88 ac-ft
58.50	Front of Main. Berm	3.41 ac	486.0 ft	306.0 ft	11.08 ac-ft
57.50	Provided Treat.Vol.+Att.Vol	3.27 ac	478.0 ft	298.0 ft	7.74 ac-ft
57.40	Req'd Treat.Vol+Att. Vol	3.26 ac	477.2 ft	297.2 ft	7.41 ac-ft
57.17	Estimated Storm Sewer TW	3.22 ac	475.4 ft	295.4 ft	6.67 ac-ft
55.25	Top of Treatment Vol.	2.96 ac	460.0 ft	280.0 ft	0.73 ac-ft
55.00	Normal Water Level	2.92 ac	458.0 ft	278.0 ft	0.00 ac-ft
53.00		2.66 ac	442.0 ft	262.0 ft	
49.00	Pond Bottom	2.29 ac	434.0 ft	230.0 ft	

Required Treatment+Attenuation Vol.= 7.31 ac-ft
 Required Treatment+Attenuation Stage= 57.40 ft

Provided Treatment+Attenuation Vol.= 7.74 ac-ft
 Provided Treatment+Attenuation Stage= 57.50 ft

Estimated Treat. Vol.+Storm Sewer Att.= 6.67 ac-ft
 Estimated Storm Sewer TW EL.= 57.17 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 5.11 ac



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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **13**
 POND NAME : **13C**

Station Limits: From: **1936+00** Roadway Length = 7400 ft
 To: **2010+00** R/W Width = 200 ft

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	2	24 ft
Paved Shoulder	5.0 ft	2	10 ft
Imperv. Median			0 ft
Sidewalk or Trail			0 ft
Curb&Gutter			0 ft
Shldr Gutter			0 ft
Barrier Wall			0 ft
Total Impervious Width:			34 ft

Impervious Roadway Area: 5.78 ac
 Pervious Roadway Area: 28.20 ac
 Total Roadway Area: 33.98 ac

Pond Area: Pervious Pond Area = 5.16 ac

Total Area: Impervious Area: 5.78 ac
 Pervious Area: 33.36 ac
 Total Area: 39.13 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	2.73 ac	267.7
Impervious areas; Streets & roads	D	98	3.04 ac	298.3
Open Space (lawns, parks, golf courses, cemeteries,	A	68	5.30 ac	360.6
Open Space (lawns, parks, golf courses, cemeteries,	D	89	11.21 ac	997.9
Woods; Good condition (Woods are protected from	A	30	8.03 ac	241.0
Woods; Good condition (Woods are protected from	D	77	3.65 ac	281.1
Pasture, grassland or range; Good condition (> 75%	D	80	5.16 ac	412.6
Pasture, grassland or range; Good condition (> 75%	D	80		0.0
Total:			39.13 ac	2859.2

CN = Total CN*Area / Total Area = **73.1**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ **3.69 in**

Precipitation (P) = **8.19 in** **6.45 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **4.99 in** **3.47 in**

Permitting Agency Event			Storm Sewer Design
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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **13**
 POND NAME : **13C**

Station Limits: From: **1936+00** Roadway Length = 7400 ft
 To: **2010+00** R/W Width = 200 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12.0 ft	6	72 ft
Paved Shoulder	5.0 ft	2	10 ft
Median Shoulder	4.0 ft	2	8 ft
Sidewalk or Trail	6.0 ft	1	6 ft
Curb&Gutter	2.3 ft	2	5 ft
Shared Use Path	12.0 ft	1	12 ft
Barrier Wall			0 ft
Total Impervious Width:			113 ft

Impervious Roadway Area: 19.11 ac
 Pervious Roadway Area: 14.86 ac
 Total Roadway Area: 33.98 ac

Pond Area: Pervious Pond Area : 1.44 ac
 Water Surface Area: 3.72 ac **Wet Pond**
 Total Pond Area: 5.16 ac

Total Area: Impervious Area: 19.11 ac
 Pervious Area: 16.30 ac
 Water Surface Area: 3.72 ac
 Total Area: 39.13 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious areas; Streets & roads	A	98	9.04 ac	885.8
Impervious areas; Streets & roads	D	98	10.07 ac	987.1
Open Space (lawns, parks, golf courses, cemeteries,	A	68	7.03 ac	478.1
Open Space (lawns, parks, golf courses, cemeteries,	D	89	7.83 ac	697.2
Open Space (lawns, parks, golf courses, cemeteries,	D	89	1.44 ac	127.8
Proposed Ponds (Water Surface)	D	100	3.72 ac	372.1
Total:			39.13 ac	3548.2

CN = Total CN*Area / Total Area = **90.7**

Runoff:

Soil Capacity (S) = $\frac{1000 - 10}{CN}$ = **1.03 in**

Precipitation (P) = **8.19 in**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$

Runoff (Q) = **7.07 in**

Permitting Agency Event			Storm Sewer Design
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			6.45 in
--	--	--	---------

			5.36 in
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DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **13**
 POND NAME : **13C**

POND SIZING

Required Treatment Volume (TV)

Selection criteria

Permitting Agency	SWFWMD
StormW.Mgmt.	Wet Detention
Online/Offline	Online
Impaired/OFW	Yes/Yes
Open/Closed Basin	Open

Note: Proposed pond alternative accounts for impacted 0.28 ac swale per Permit No. 27103

Net New Contr DCIA	8.15 ac
Wet Detention	1.00 in

x DCIA (Net New) = 0.68 ac-ft

Note:DCIA accounts for impervious area which contribute pollutants

Treatment V_{req} = Largest of Trt. Vol. = 0.68 ac-ft
OFW Requirement, provide 50% more TV = 1.02 ac-ft

Required Attenuation Volume:

Total Runoff (ac-ft)

	SWFWMD		Storm Sewer Design
Q _{pre} =	16.26 ac-ft		11.32 ac-ft
Q _{post} =	23.06 ac-ft		17.48 ac-ft
ΔQ =	6.80 ac-ft		6.16 ac-ft

Attenuation V_{req} = 6.80 ac-ft (use largest value)



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Made by: ZKE
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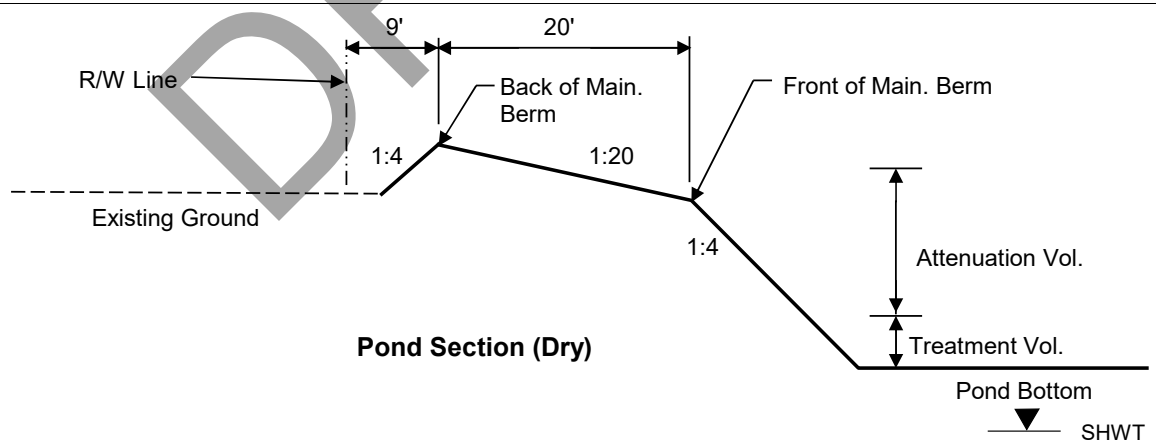
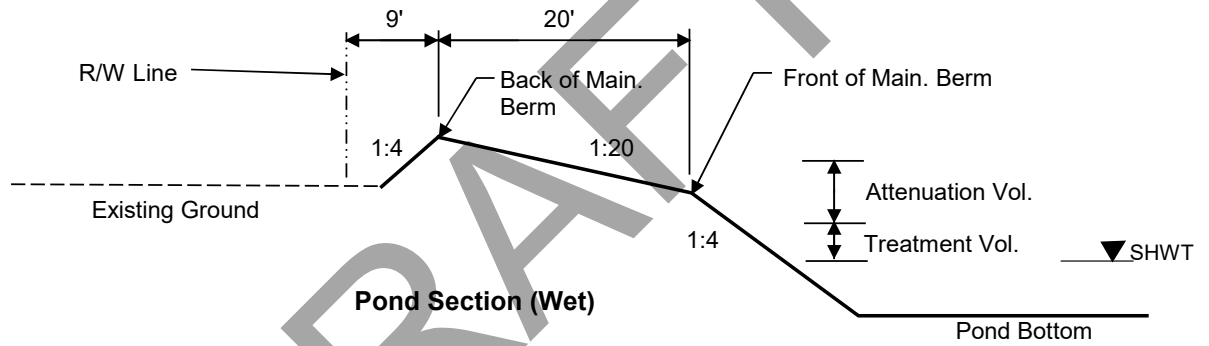
DATE: May 30, 2023
 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **13**
 POND NAME : **13C**

Maintenance Area Width =	20.0 ft	@ 1:20	Existing Ground Elevation =	57.00
Pond Tie-In Width =	9.0 ft	@ 1:4	Normal Water Elevation =	55.00
Maximum Storage Depth (SD) =	3.25 ft	with 1.0 ft freeboard	Lowest EOP Elevation =	59.00

Hydraulic Grade Line (HGL) check

HGL Slope =	0.100%	Use 0.05% for very flat terrain to 0.1% for flat terrain
Distance from Pond to Lowest EOP =	800 ft	
Estimated Energy Losses =	0.8 ft	
HGL Clearance =	1.0 ft	Use 1.0 foot as a standard HGL clearance (no junction losses)
Estimated Storm Sewer Tailwater EL =	57.2 ft	





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 Job Number: AIM-010-01

PROJECT : **US 301 PD&E Study From Fowler Avenue to Proposed SR 56**
 BASIN NAME : **13**
 POND NAME : **13C**

Pond Stage / Storage Calculations

ELEVATION	DESCRIPTION	AREA	DIMENSIONS		STORAGE
			LENGTH	WIDTH	
57.00	Pond R/W	5.58 ac	705.0 ft	345.0 ft	
59.25	Back of Main. Berm	5.16 ac	687.0 ft	327.0 ft	17.67 ac-ft
58.75		4.70 ac	667.0 ft	307.0 ft	15.21 ac-ft
58.25	Front of Main. Berm	4.26 ac	647.0 ft	287.0 ft	12.97 ac-ft
57.25	Provided Treat.Vol.+Att.Vol	4.09 ac	639.0 ft	279.0 ft	8.79 ac-ft
57.05	Req'd Treat.Vol+Att. Vol	4.06 ac	637.4 ft	277.4 ft	7.97 ac-ft
56.77	Estimated Storm Sewer TW	4.01 ac	635.2 ft	275.2 ft	6.84 ac-ft
55.30	Top of Treatment Vol.	3.77 ac	623.4 ft	263.4 ft	1.12 ac-ft
55.00	Normal Water Level	3.72 ac	621.0 ft	261.0 ft	0.00 ac-ft
53.00		3.40 ac	605.0 ft	245.0 ft	
49.00	Pond Bottom	2.92 ac	597.0 ft	213.0 ft	

Required Treatment+Attenuation Vol.= 7.48 ac-ft
 Required Treatment+Attenuation Stage= 57.05 ft

Provided Treatment+Attenuation Vol.= 8.79 ac-ft
 Provided Treatment+Attenuation Stage= 57.25 ft

Estimated Treat. Vol.+Storm Sewer Att.= 6.84 ac-ft
 Estimated Storm Sewer TW EL.= 56.77 ft HGL requirements met

PROPOSED POND R/W (Safety Factor of 20%) = 6.70 ac

Complete Report (not including cost) Ver 4.3.5

Project: US 301 PD_E

Date: 4/10/2023 4:47:32 PM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	Basin 13
Rainfall Zone	Florida Zone 4
Annual Mean Rainfall	51.00
Pre-Condition Landuse Information	
Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	37.90
Rational Coefficient (0-1)	0.33
Non DCIA Curve Number	89.00
DCIA Percent (0-100)	14.77
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	53.843
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	100.911
Phosphorus Loading (kg/yr)	13.278
Post-Condition Landuse Information	
Landuse	Highway: TN=1.520 TP=0.200
Area (acres)	37.90
Rational Coefficient (0-1)	0.58
Non DCIA Curve Number	89.00
DCIA Percent (0-100)	56.81
Wet Pond Area (ac)	2.42
Nitrogen EMC (mg/l)	1.520
Phosphorus EMC (mg/l)	0.200
Runoff Volume (ac-ft/yr)	86.755
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	162.593
Phosphorus Loading (kg/yr)	21.394

Catchment Number: 1 Name: Basin 13

Project: US 301 PD_E

Date: 4/10/2023

Multiple BMP in Series Design Parameters

BMP in Series Number: 1

BMP Type: Swale

Swale Top Width for Flood Conditions - W (ft)	28.000
Swale Bottom Width - B (ft)	5.000
Swale Length - L (ft)	7,400.000
Average Impervious Length (ft)	7,400.000
Average Impervious Width (ft)	112.000
Average Pervious Width (ft)	103.500
Swale Slope (foot drop/foot length) - S	0.001
Mannings N	0.060
Soil Infiltration Rate (in/hr)	0.400
Side Slope of Swale horizontal/vertical - Z	6.000
Average Height of Swale Block - H	0.500
Length of Berm Upstream of Crest - L_b	0.000
Runoff Area (acres)	36.609
Number of Swale Blocks	

BMP in Series Number: 2

BMP Type: Wet Detention

Permanent Pool Volume (ac-ft)	11.980
Permanent Pool Volume (ac-ft) for 31 days residence	7.368
Annual Residence Time (days)	50
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

BMP in Series Number: 3

BMP Type: None

BMP in Series Number: 4

BMP Type: None

Watershed Characteristics

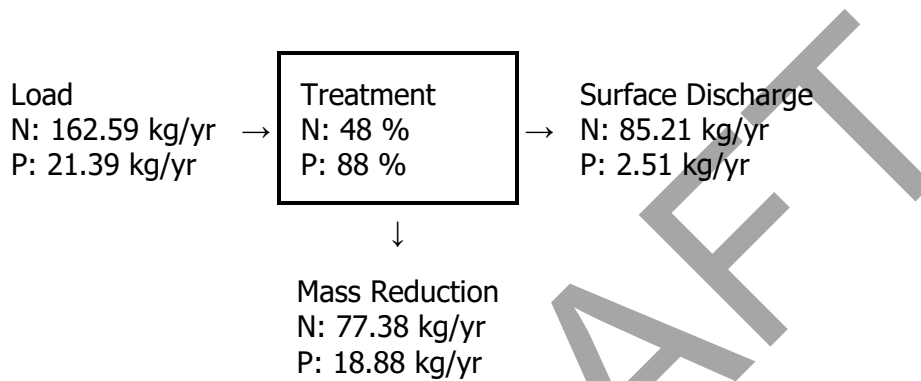
Catchment Area (acres)	37.90
Contributing Area (acres)	35.480
Non-DCIA Curve Number	89.00
DCIA Percent	56.81

Rainfall Zone Florida Zone 4
 Rainfall (in) 51.00

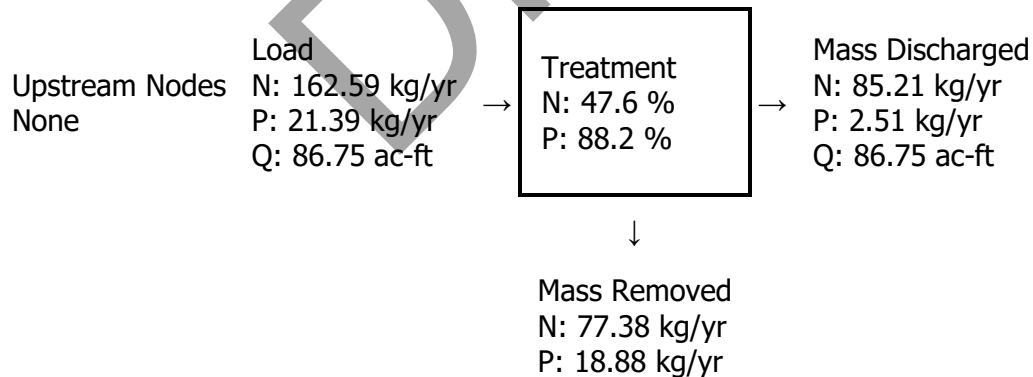
Surface Water Discharge

Required TN Treatment Efficiency (%) 38
 Provided TN Treatment Efficiency (%) 48
 Required TP Treatment Efficiency (%) 38
 Provided TP Treatment Efficiency (%) 88

Load for Multiple BMP in Series



Load Diagram for Multiple BMP (As Used In Routing)



Summary Treatment Report Version: 4.3.5

Analysis Type: Net Improvement

Routing Summary

BMP Types:

Catchment 1 Routed to Outlet

Catchment 1 - (Basin 13) Multiple

BMP

Based on % removal values to the nearest percent

Total nitrogen target removal met? **Yes**

Total phosphorus target removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	100.91 kg/yr	
Total N post load	162.59 kg/yr	
Target N load reduction	38 %	
Target N discharge load	100.91 kg/yr	
Percent N load reduction	48 %	
Provided N discharge load	85.21 kg/yr	187.89 lb/yr
Provided N load removed	77.38 kg/yr	170.63 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	13.278 kg/yr	
Total P post load	21.394 kg/yr	
Target P load reduction	38 %	
Target P discharge load	13.278 kg/yr	
Percent P load reduction	88 %	
Provided P discharge load	2.514 kg/yr	5.54 lb/yr
Provided P load removed	18.88 kg/yr	41.63 lb/yr

APPENDIX D

Floodplain Compensation Design Calculations

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US 301 PD&E Study - From Fowler Avenue to Proposed SR 56

Summary Floodplain Impact Areas						
FIA	Station	-	Station	Total Length of Impact (ft)	(Avg.) 100-yr Flood Elevation (ft)	Impact Volume (Ac-Ft)
FIA - 1A	1397+00.00	-	1402+55.12	555	37.54	0.35
FIA - 1B	1398+13.90	-	1438+46.57	4,033	36.96	5.48
FIA - 1C	1425+83.65	-	1453+00.00	2,716	36.70	0.73
FIA - 2A	1507+68.32	-	1634+89.25	12,721	36.48	24.51
FIA - 2B	1644+24.97	-	1649+43.95	519	40.28	0.87
FIA - 2C	1655+00.00	-	1679+44.79	2,445	39.33	1.91
FIA - 3A	1714+59.82	-	1795+00.00	8,040	45.00	35.65
FIA - 3B	1797+42.66	-	1842+61.25	4,519	50.00	23.38
FIA - 3C	1843+58.09	-	1892+00.00	4,842	49.50	12.87
FIA - 4	1892+00.00	-	1913+00.00	2,100	52.28	1.39
FIA - 5	1921+54.72	-	1948+82.00	2,727	56.15	3.94
FIA - 6A	1949+31.85	-	1972+00.00	2,268	62.22	9.13
FIA - 6B	1973+20.00	-	1990+12.90	1,693	63.34	0.40
FIA - 6C	1993+86.00	-	2004+00.00	1,014	66.70	2.71
TOTAL						123.32

Summary Floodplain Compensation Areas					
FPC	SHWT Elevation (ft)	Pond Bottom Elevation (ft)	100-yr Flood Elevation (ft)	Required Compensation Volume (ac-ft)	Compensation Volume Provided (ac-ft)
FPC 1	34.00	34.00	36.07	6.56	7.83
FPC 2	33.00	33.00	41.84	27.29	27.56
FPC 3	36.50	36.50	37.72		2.19
FPC 5	39.00	39.00	45.00	71.90	72.69
FPC 6	51.00	51.00	52.00	1.39	1.76
FPC 7	55.00	55.00	56.80	3.94	4.47
FPC 8	59.25	59.25	61.10	12.24	13.61
TOTAL				123.32	130.11

US 301 PD&E Study - From Fowler Avenue to Proposed SR 56

Floodplain Compensation Calculations - (FIA 1A)									
Floodplain Elevation based upon the Hillsborough River and Tampa Bypass Canal Stormwater Management Plan Update No. 1 (August 2011). This floodplain is located on the east side of US 301 between station 397+33.60 and station 402+55.12								100 yr. Floodplain Elev. - 37.54 ft	
Station	Length (ft)	MS Area Filled (ft ²)	Area Filled (ft ²)	Avg. Area Filled (ft ²)	MS Area Excavated (ft ²)	Area Excavated (ft ²)	Avg. Area Excavated (ft ²)	Impact Volume (ft ³)	Compensated Volume (ft ³)
1397+00.00		0.00000	0.00000		0.00000	0.00000			
	40.86			0.00000			0.00000	0.00	0.000
1397+40.86		0.00000	0.00000		0.00000	0.00000			
	55.49			0.00000			0.00000	0.00	0.000
1397+96.35		0.00000	0.00000		0.00000	0.00000			
	17.55			11.16495			0.00000	195.94	0.000
1398+13.90		44.65980	22.32990		0.00000	0.00000			
	96.34			28.46483			0.00000	2742.30	0.000
1399+10.24		69.19950	34.59975		0.00000	0.00000			
	16.17			34.22605			0.00000	553.44	0.000
1399+26.41		67.70470	33.85235		0.00000	0.00000			
	29.76			42.80328			0.00000	1273.83	0.000
1399+56.17		103.50840	51.75420		0.00000	0.00000			
	18.29			49.39950			0.00000	903.52	0.000
1399+74.46		94.08960	47.04480		0.00000	0.00000			
	16.67			40.99688			0.00000	683.42	0.000
1399+91.13		69.89790	34.94895		0.00000	0.00000			
	108.87			34.05670			0.00000	3707.75	0.000
1401+00.00		66.32890	33.16445		0.00000	0.00000			
	37.22			27.76720			0.00000	1033.50	0.000
1401+37.22		44.73990	22.36995		0.00000	0.00000			
	80.66			21.69470			0.00000	1749.89	0.000
1402+17.88		42.03890	21.01945		0.00000	0.00000			
	37.24			10.50973			0.00000	391.38	0.000
1402+55.12		0.00000	0.00000		0.00000	0.00000			
TOTAL (ft³)								15088.97	0.000
TOTAL (ac-ft)								0.35	0.00

US 301 PD&E Study - From Fowler Avenue to Proposed SR 56

Floodplain Compensation Calculations - (FIA 1B)									
Floodplain Elevation based upon the Hillsborough River and Tampa Bypass Canal Stormwater Management Plan Update No. 1 (August 2011). This floodplain is located on the west side of US 301 between station 398+13.90 and station 403+70.99 and continues again between station 409+48.61 and station 438+46.57.								100 yr. Floodplain Elev. - 36.96 ft	
Station	Length (ft)	MS Area Filled (ft ²)	Area Filled (ft ²)	Avg. Area Filled (ft ²)	MS Area Excavated (ft ²)	Area Excavated (ft ²)	Avg. Area Excavated (ft ²)	Impact Volume (ft ³)	Compensated Volume (ft ³)
1398+13.90		0.00000	0.00000		0.00000	0.00000			
	96.34			8.43980			0.00000	813.09	0.000
1399+10.24		33.75920	16.87960		0.00000	0.00000			
	16.17			26.60678			0.00000	430.23	0.000
1399+26.41		72.66790	36.33395		0.00000	0.00000			
	29.76			48.14160			0.00000	1432.69	0.000
1399+56.17		119.89850	59.94925		0.00000	0.00000			
	18.29			58.45780			0.00000	1069.19	0.000
1399+74.46		113.93270	56.96635		0.00000	0.00000			
	16.67			53.32213			0.00000	888.88	0.000
1399+91.13		99.35580	49.67790		0.00000	0.00000			
	108.87			48.89580			0.00000	5323.29	0.000
1401+00.00		96.22740	48.11370		0.00000	0.00000			
	37.22			40.62498			0.00000	1512.06	0.000
1401+37.22		66.27250	33.13625		0.00000	0.00000			
	80.66			34.45863			0.00000	2779.43	0.000
1402+17.88		71.56200	35.78100		0.00000	0.00000			
	84.82			39.11480			0.00000	3317.72	0.000
1403+02.70		84.89720	42.44860		0.00000	0.00000			
	34.39			39.31173			0.00000	1351.93	0.000
1403+37.09		72.34970	36.17485		0.00000	0.00000			
	33.90			18.08743			0.00000	613.16	0.000
1403+70.99		0.00000	0.00000		0.00000	0.00000			
	577.62			0.00000			0.00000	0.00	0.000
1409+48.61		0.00000	0.00000		0.00000	0.00000			
	51.39			71.00423			0.00000	3648.91	0.000
1410+00.00		284.01690	142.00845		0.00000	0.00000			
	100.00			147.63378			0.00000	14763.38	0.000
1411+00.00		306.51820	153.25910		0.00000	0.00000			
	42.36			98.76608			0.00000	4183.73	0.000
1411+42.36		88.54610	44.27305		0.00000	0.00000			
	17.50			32.38105			0.00000	566.67	0.000
1411+59.86		40.97810	20.48905		0.00000	0.00000			
	12.38			18.04488			0.00000	223.40	0.000
1411+72.24		31.20140	15.60070		0.00000	0.00000			
	327.76			13.31248			0.00000	4363.30	0.000
1415+00.00		22.04850	11.02425		0.00000	0.00000			
	400.00			12.64228			0.00000	5056.91	0.000
1419+00.00		28.52060	14.26030		0.00000	0.00000			
	75.97			7.13015			0.00000	541.68	0.000
1419+75.97		0.00000	0.00000		0.00000	0.00000			
	87.33			0.00000			0.00000	0.00	0.000
1420+63.30		0.00000	0.00000		0.00000	0.00000			
	36.70			7.04218			0.00000	258.45	0.000
1421+00.00		28.16870	14.08435		0.00000	0.00000			
	100.00			13.76448			0.00000	1376.45	0.000
1422+00.00		26.88920	13.44460		0.00000	0.00000			
	25.50			6.72230			0.00000	171.42	0.000
1422+25.50		0.00000	0.00000		0.00000	0.00000			
	43.70			0.00000			0.00000	0.00	0.000
1422+69.20		0.00000	0.00000		0.00000	0.00000			
	30.80			7.59635			0.00000	233.97	0.000
1423+00.00		30.38540	15.19270		0.00000	0.00000			
	100.00			16.13558			0.00000	1613.56	0.000
1424+00.00		34.15690	17.07845		0.00000	0.00000			
	70.81			8.53923			0.00000	604.66	0.000
1424+70.81		0.00000	0.00000		0.00000	0.00000			
	49.36			0.00000			0.00000	0.00	0.000
1425+20.17		0.00000	0.00000		0.00000	0.00000			

Inwood Consulting Engineers, Inc.
 3000 Dovera Drive
 Oviedo, FL 32765

Made by: TDO
 Ck. by: REC

Date: 4/10/2023
 FPID #: 255796-1
 Project Number: AIM-010-01

US 301 PD&E Study - From Fowler Avenue to Proposed SR 56

	63.48			25.61623			0.00000	1626.12	0.000
1425+83.65		102.46490	51.23245		0.00000	0.00000			
	116.35			53.07088			0.00000	6174.80	0.000
1427+00.00		109.81860	54.90930		0.00000	0.00000			
	100.00			53.13438			0.00000	5313.44	0.000
1428+00.00		102.71890	51.35945		0.00000	0.00000			
	200.00			97.97223			0.00000	19594.45	0.000
1430+00.00		289.17000	144.58500		0.00000	0.00000			
	500.00			214.81000			0.00000	107405.00	0.000
1435+00.00		570.07000	285.03500		0.00000	0.00000			
	281.65			147.16750			0.00000	41449.73	0.000
1437+81.65		18.60000	9.30000		0.00000	0.00000			
	46.08			4.65000			0.00000	214.27	0.000
1438+27.73		0.00000	0.00000		0.00000	0.00000			
	18.84			0.00000			0.00000	0.00	0.000
1438+46.57		0.00000	0.00000		0.00000	0.00000			
TOTAL (ft³)								238915.94	0.000
TOTAL (ac-ft)								5.48	0.00

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US 301 PD&E Study - From Fowler Avenue to Proposed SR 56

Floodplain Compensation Calculations - (FIA 1C)									
Floodplain Elevation based upon the Hillsborough River and Tampa Bypass Canal Stormwater Management Plan Update No. 1 (August 2011). This floodplain is located on the east side of US 301 between station 425+83.65 and station 440+31.12.								100 yr. Floodplain Elev. - 36.7 ft	
Station	Length (ft)	MS Area Filled (ft ²)	Area Filled (ft ²)	Avg. Area Filled (ft ²)	MS Area Excavated (ft ²)	Area Excavated (ft ²)	Avg. Area Excavated (ft ²)	Impact Volume (ft ³)	Compensated Volume (ft ³)
1425+83.65		0.00000	0.00000		0.00000	0.00000			
	116.35			6.96163			0.00000	809.99	0.000
1427+00.00		27.84650	13.92325		0.00000	0.00000			
	100.00			14.58738			0.00000	1458.74	0.000
1428+00.00		30.50300	15.25150		0.00000	0.00000			
	200.00			17.42855			0.00000	3485.71	0.000
1430+00.00		39.21120	19.60560		0.00000	0.00000			
	500.00			22.77730			0.00000	11388.65	0.000
1435+00.00		51.89800	25.94900		0.00000	0.00000			
	281.65			19.06320			0.00000	5369.15	0.000
1437+81.65		24.35480	12.17740		0.00000	0.00000			
	46.08			10.84450			0.00000	499.71	0.000
1438+27.73		19.02320	9.51160		0.00000	0.00000			
	18.84			9.50658			0.00000	179.10	0.000
1438+46.57		19.00310	9.50155		0.00000	0.00000			
	153.43			6.80090			0.00000	1043.46	0.000
1440+00.00		8.20050	4.10025		0.00000	0.00000			
	31.12			2.05013			0.00000	63.80	0.000
1440+31.12		0.00000	0.00000		0.00000	0.00000			
	403.68			0.00000			0.00000	0.00	0.000
1444+34.80		0.00000	0.00000		0.00000	0.00000			
	634.03			0.00000			0.00000	0.00	0.000
1450+68.83		0.00000	0.00000		0.00000	0.00000			
	209.53			0.00000			0.00000	0.00	0.000
1452+78.36		0.00000	0.00000		0.00000	0.00000			
	21.64			0.00000			0.00000	0.00	0.000
1453+00.00		0.00000	0.00000		0.00000	0.00000			
TOTAL (ft³)								31762.31	0.000
TOTAL (ac-ft)								0.73	0.00

US 301 PD&E Study - From Fowler Avenue to Proposed SR 56

Floodplain Compensation Calculations - (FIA 2A)									
Floodplain Elevation based upon the Hillsborough River and Tampa Bypass Canal Stormwater Management Plan Update No. 1 (August 2011). This floodplain is located on the east and west sides of US 301 between station 507+68.32 and station 634+89.25								100 yr. Floodplain Elev. - 36.48 ft	
Station	Length (ft)	MS Area Filled (ft ²)	Area Filled (ft ²)	Avg. Area Filled (ft ²)	MS Area Excavated (ft ²)	Area Excavated (ft ²)	Avg. Area Excavated (ft ²)	Impact Volume (ft ³)	Compensated Volume (ft ³)
1507+68.32		0.00000	0.00000		0.00000	0.00000			
	6.37			0.00000			0.00000	0.00	0.000
1507+74.69		0.00000	0.00000		0.00000	0.00000			
	14.04			3.01878			0.00000	42.38	0.000
1507+88.73		12.07510	6.03755		0.00000	0.00000			
	211.27			215.75378			0.00000	45582.30	0.000
1510+00.00		850.94000	425.47000		0.00000	0.00000			
	200.00			247.16400			0.00000	49432.80	0.000
1512+00.00		137.71600	68.85800		0.00000	0.00000			
	35.26			34.90025			0.00000	1230.58	0.000
1512+35.26		1.88500	0.94250		0.00000	0.00000			
	20.64			0.47125			0.00000	9.73	0.000
1512+55.90		0.00000	0.00000		0.00000	0.00000			
	2.29			0.00000			0.00000	0.00	0.000
1512+58.19		0.00000	0.00000		0.00000	0.00000			
	315.14			0.00000			0.00000	0.00	0.000
1515+73.33		0.00000	0.00000		0.00000	0.00000			
	156.48			2.69690			0.00000	422.01	0.000
1517+29.81		10.78760	5.39380		0.00000	0.00000			
	159.49			2.69690			0.00000	430.13	0.000
1518+89.30		0.00000	0.00000		0.00000	0.00000			
	110.70			0.00000			0.00000	0.00	0.000
1520+00.00		0.00000	0.00000		0.00000	0.00000			
	100.00			0.00000			0.00000	0.00	0.000
1521+00.00		0.00000	0.00000		0.00000	0.00000			
	114.05			0.00000			0.00000	0.00	0.000
1522+14.05		0.00000	0.00000		0.00000	0.00000			
	78.50			0.00000			0.00000	0.00	0.000
1522+92.55		0.00000	0.00000		0.00000	0.00000			
	107.45			0.00000			0.00000	0.00	0.000
1524+00.00		0.00000	0.00000		0.00000	0.00000			
	64.29			0.00000			0.00000	0.00	0.000
1524+64.29		0.00000	0.00000		0.00000	0.00000			
	233.34			0.00000			0.00000	0.00	0.000
1526+97.63		0.00000	0.00000		0.00000	0.00000			
	302.37			0.00000			0.00000	0.00	0.000
1530+00.00		0.00000	0.00000		0.00000	0.00000			
	328.30			0.00000			0.00000	0.00	0.000
1533+28.30		0.00000	0.00000		0.00000	0.00000			
	171.70			60.24615			0.00000	10344.26	0.000
1535+00.00		240.98460	120.49230		0.00000	0.00000			
	500.00			137.61475			0.00000	68807.38	0.000
1540+00.00		309.47440	154.73720		0.00000	0.00000			
	500.00			175.17273			0.00000	87586.36	0.000
1545+00.00		391.21650	195.60825		0.00000	0.00000			
	500.00			270.75318			0.00000	135376.59	0.000
1550+00.00		691.79620	345.89810		0.00000	0.00000			
	500.00			221.03215			0.00000	110516.08	0.000
1555+00.00		192.33240	96.16620		0.00000	0.00000			
	500.00			97.56250			0.00000	48781.25	0.000
1560+00.00		197.91760	98.95880		0.00000	0.00000			
	253.75			83.16758			0.00000	21103.77	0.000
1562+53.75		134.75270	67.37635		0.00000	0.00000			
	246.25			81.81193			0.00000	20146.19	0.000
1565+00.00		192.49500	96.24750		0.00000	0.00000			
	500.00			74.71865			0.00000	37359.33	0.000
1570+00.00		106.37960	53.18980		0.00000	0.00000			
	500.00			72.04243			0.00000	36021.21	0.000
1575+00.00		181.79010	90.89505		0.00000	0.00000			
	483.32			45.44753			0.00000	21965.70	0.000

US 301 PD&E Study - From Fowler Avenue to Proposed SR 56

1579+83.32		0.00000	0.00000		0.00000	0.00000			
	62.26			0.00000			0.00000	0.00	0.000
1580+45.58		0.00000	0.00000		0.00000	0.00000			
	454.42			62.54383			0.00000	28421.16	0.000
1585+00.00		250.17530	125.08765		0.00000	0.00000			
	500.00			109.04708			0.00000	54523.54	0.000
1590+00.00		186.01300	93.00650		0.00000	0.00000			
	500.00			87.43930			0.00000	43719.65	0.000
1595+00.00		163.74420	81.87210		0.00000	0.00000			
	500.00			98.39320			0.00000	49196.60	0.000
1600+00.00		229.82860	114.91430		0.00000	0.00000			
	500.00			95.16930			0.00000	47584.65	0.000
1605+00.00		150.84860	75.42430		0.00000	0.00000			
	484.39			37.71215			0.00000	18267.39	0.000
1609+84.39		0.00000	0.00000		0.00000	0.00000			
	11.79			0.00000			0.00000	0.00	0.000
1609+96.18		0.00000	0.00000		0.00000	0.00000			
	503.82			30.17960			0.00000	15205.09	0.000
1615+00.00		120.71840	60.35920		0.00000	0.00000			
	500.00			30.17960			0.00000	15089.80	0.000
1620+00.00		0.00000	0.00000		0.00000	0.00000			
	500.00			0.00000			0.00000	0.00	0.000
1625+00.00		0.00000	0.00000		0.00000	0.00000			
	299.16			0.00000			0.00000	0.00	0.000
1627+99.16		0.00000	0.00000		0.00000	0.00000			
	173.58			0.00000			0.00000	0.00	0.000
1629+72.74		0.00000	0.00000		0.00000	0.00000			
	325.40			0.00000			0.00000	0.00	0.000
1632+98.14		0.00000	0.00000		0.00000	0.00000			
	101.86			0.00000			0.00000	0.00	0.000
1634+00.00		0.00000	0.00000		0.00000	0.00000			
	89.25			0.00000			0.00000	0.00	0.000
1634+89.25		0.00000	0.00000		0.00000	0.00000			
							TOTAL (ft ³)	1067689.92	0.000
							TOTAL (ac-ft)	24.51	0.00

US 301 PD&E Study - From Fowler Avenue to Proposed SR 56

Floodplain Compensation Calculations - (FIA 2B)									
Floodplain Elevation based upon the Hillsborough River and Tampa Bypass Canal Stormwater Management Plan Update No. 1 (August 2011). This floodplain is located on the east and west sides of US 301 between station 644+24.97 and station 649+43.95. This floodplain is associated with Flint Creek. A flood elevation of 41.00 feet was used to be conservative.								100 yr. Floodplain Elev. - 39.56 ft @ downstream face of bridge.	
								100 yr. Floodplain Elev. - 41.00 ft @ upstream face of bridge.	
Station	Length (ft)	MS Area Filled (ft ²)	Area Filled (ft ²)	Avg. Area Filled (ft ²)	MS Area Excavated (ft ²)	Area Excavated (ft ²)	Avg. Area Excavated (ft ²)	Impact Volume (ft ³)	Compensated Volume (ft ³)
1644+24.97		0.00000	0.00000		0.00000	0.00000			
	32.35			1.75115			0.00000	56.65	0.000
1644+57.32		7.00460	3.50230		0.00000	0.00000			
	42.68			52.06315			0.00000	2222.06	0.000
1645+00.00		201.24800	100.62400		0.00000	0.00000			
	61.56			50.31200			0.00000	3097.21	0.000
1645+61.56		0.00000	0.00000		0.00000	0.00000			
	47.72			0.00000			0.00000	0.00	0.000
1646+09.28		0.00000	0.00000		0.00000	0.00000			
	190.72			94.05505			0.00000	17938.18	0.000
1648+00.00		376.22020	188.11010		0.00000	0.00000			
	82.49			112.69465			0.00000	9296.18	0.000
1648+82.49		74.55840	37.27920		0.00000	0.00000			
	61.46			18.63960			0.00000	1145.59	0.000
1649+43.95		0.00000	0.00000		0.00000	0.00000			
TOTAL (ft³)								37907.86	0.000
TOTAL (ac-ft)								0.87	0.00

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US 301 PD&E Study - From Fowler Avenue to Proposed SR 56

Floodplain Compensation Calculations - (FIA 2C)									
Floodplain Elevation based upon the Hillsborough River and Tampa Bypass Canal Stormwater Management Plan Update No. 1 (August 2011). This floodplain is located on the east side of US 301 between station 662+85.33 and station 679+44.79								100 yr. Floodplain Elev. - 39.33 ft	
Station	Length (ft)	MS Area Filled (ft ²)	Area Filled (ft ²)	Avg. Area Filled (ft ²)	MS Area Excavated (ft ²)	Area Excavated (ft ²)	Avg. Area Excavated (ft ²)	Impact Volume (ft ³)	Compensated Volume (ft ³)
1655+00.00		0.00000	0.00000		0.00000	0.00000			
	338.59			0.00000			0.00000	0.00	0.000
1658+38.59		0.00000	0.00000		0.00000	0.00000			
	446.74			0.00000			0.00000	0.00	0.000
1662+85.33		0.00000	0.00000		0.00000	0.00000			
	94.83			13.00743			0.00000	1233.49	0.000
1663+80.16		52.02970	26.01485		0.00000	0.00000			
	116.16			13.69633			0.00000	1590.97	0.000
1664+11.70		49.41730	24.70865		0.00000	0.00000			
	31.54			14.30563			0.00000	451.20	0.000
1664+96.32		2.75560	1.37780		0.00000	0.00000			
	22.36			2.64020			0.00000	59.03	0.000
1665+18.68		7.80520	3.90260		0.00000	0.00000			
	481.32			46.83880			0.00000	22544.45	0.000
1670+00.00		179.55000	89.77500		0.00000	0.00000			
	500.00			86.55000			0.00000	43275.00	0.000
1675+00.00		166.65000	83.32500		0.00000	0.00000			
	188.66			42.37900			0.00000	7995.22	0.000
1676+88.66		2.86600	1.43300		0.00000	0.00000			
	39.81			2.16313			0.00000	86.11	0.000
1677+28.47		5.78650	2.89325		0.00000	0.00000			
	21.41			46.43858			0.00000	994.25	0.000
1677+49.88		179.96780	89.98390		0.00000	0.00000			
	17.92			72.07088			0.00000	1291.51	0.000
1677+67.80		108.31570	54.15785		0.00000	0.00000			
	77.37			29.15068			0.00000	2255.39	0.000
1678+45.17		8.28700	4.14350		0.00000	0.00000			
	54.83			15.44798			0.00000	847.01	0.000
1679+00.00		53.50490	26.75245		0.00000	0.00000			
	44.79			13.37623			0.00000	599.12	0.000
1679+44.79		0.00000	0.00000		0.00000	0.00000			
TOTAL (ft³)								83222.76	0.000
TOTAL (ac-ft)								1.91	0.00

US 301 PD&E Study - From Fowler Avenue to Proposed SR 56

Floodplain Compensation Calculations - (FIA 3A)									
Floodplain Elevation based upon the Hillsborough River and Tampa Bypass Canal Stormwater Management Plan Update No. 1 (August 2011). This floodplain is located on the east side of US 301 between station 714+59.82 and station 794+27.99								100 yr. Floodplain Elev. ranges between elev. 44.51 ft and 45.31 ft Used elev. 45.00 ft as average.	
Station	Length (ft)	MS Area Filled (ft ²)	Area Filled (ft ²)	Avg. Area Filled (ft ²)	MS Area Excavated (ft ²)	Area Excavated (ft ²)	Avg. Area Excavated (ft ²)	Impact Volume (ft ³)	Compensated Volume (ft ³)
1714+59.82		0.00000	0.00000		0.00000	0.00000			
	31.89			4.57785			0.00000	145.99	0.000
1714+91.71		18.31140	9.15570		0.00000	0.00000			
	508.29			59.99750			0.00000	30496.13	0.000
1720+00.00		221.67860	110.83930		0.00000	0.00000			
	319.68			384.96290			0.00000	123064.94	0.000
1723+19.68		1318.17300	659.08650		0.00000	0.00000			
	180.32			483.74038			0.00000	87228.06	0.000
1725+00.00		616.78850	308.39425		0.00000	0.00000			
	500.00			453.15838			0.00000	226579.19	0.000
1730+00.00		1195.84500	597.92250		0.00000	0.00000			
	500.00			450.39590			0.00000	225197.95	0.000
1735+00.00		605.73860	302.86930		0.00000	0.00000			
	500.00			222.86190			0.00000	111430.95	0.000
1740+00.00		285.70900	142.85450		0.00000	0.00000			
	500.00			199.60923			0.00000	99804.61	0.000
1745+00.00		512.72790	256.36395		0.00000	0.00000			
	500.00			163.44118			0.00000	81720.59	0.000
1750+00.00		141.03680	70.51840		0.00000	0.00000			
	500.00			135.53965			0.00000	67769.83	0.000
1755+00.00		401.12180	200.56090		0.00000	0.00000			
	500.00			294.43955			0.00000	147219.78	0.000
1760+00.00		776.63640	388.31820		0.00000	0.00000			
	500.00			299.29413			0.00000	149647.06	0.000
1765+00.00		420.54010	210.27005		0.00000	0.00000			
	500.00			111.41358			0.00000	55706.79	0.000
1770+00.00		25.11420	12.55710		0.00000	0.00000			
	500.00			12.11930			0.00000	6059.65	0.000
1775+00.00		23.36300	11.68150		0.00000	0.00000			
	500.00			87.90253			0.00000	43951.26	0.000
1780+00.00		328.24710	164.12355		0.00000	0.00000			
	500.00			93.67065			0.00000	46835.33	0.000
1785+00.00		46.43550	23.21775		0.00000	0.00000			
	500.00			59.33273			0.00000	29666.36	0.000
1790+00.00		190.89540	95.44770		0.00000	0.00000			
	427.99			47.72385			0.00000	20425.33	0.000
1794+27.99		0.00000	0.00000		0.00000	0.00000			
	72.01						0.00000	0.00	0.000
1795+00.00		0.00000	0.00000		0.00000	0.00000			
TOTAL (ft³)								1552949.79	0.000
TOTAL (ac-ft)								35.65	0.00

US 301 PD&E Study - From Fowler Avenue to Proposed SR 56

Floodplain Compensation Calculations - (FIA 3B)									
Floodplain Elevation based upon the Hillsborough River and Tampa Bypass Canal Stormwater Management Plan Update No. 1 (August 2011). This floodplain is located on the east and west sides of US 301 between station 797+42.66 and station 842+61.25. The flood elevation is shown as overtopping the roadway between stations 797+42.66 and station 805+00.00								100 yr. Floodplain Elev. ranges between elev. 49.69 ft and 50.46 ft Used elev. 50.00 ft as average.	
Station	Length (ft)	MS Area Filled (ft ²)	Area Filled (ft ²)	Avg. Area Filled (ft ²)	MS Area Excavated (ft ²)	Area Excavated (ft ²)	Avg. Area Excavated (ft ²)	Impact Volume (ft ³)	Compensated Volume (ft ³)
1797+42.66		0.00000	0.00000		0.00000	0.00000			
	257.34			282.18425			0.00000	72617.29	0.000
1800+00.00		1128.73700	564.36850		0.00000	0.00000			
	500.00			524.34425			0.00000	262172.13	0.000
1805+00.00		968.64000	484.32000		0.00000	0.00000			
	500.00			321.60250			0.00000	160801.25	0.000
1810+00.00		317.77000	158.88500		0.00000	0.00000			
	500.00			263.41538			0.00000	131707.69	0.000
1815+00.00		735.89150	367.94575		0.00000	0.00000			
	500.00			249.66233			0.00000	124831.16	0.000
1820+00.00		262.75780	131.37890		0.00000	0.00000			
	500.00			99.05145			0.00000	49525.73	0.000
1825+00.00		133.44800	66.72400		0.00000	0.00000			
	500.00			147.09775			0.00000	73548.88	0.000
1830+00.00		454.94300	227.47150		0.00000	0.00000			
	500.00			153.88013			0.00000	76940.06	0.000
1835+00.00		160.57750	80.28875		0.00000	0.00000			
	500.00			85.99938			0.00000	42999.69	0.000
1840+00.00		183.42000	91.71000		0.00000	0.00000			
	261.25	1.00000		45.85500			0.00000	11979.62	0.000
1842+61.25		0.00000	0.00000		0.00000	0.00000			
TOTAL (ft³)								1018343.49	0.000
TOTAL (ac-ft)								23.38	0.00

US 301 PD&E Study - From Fowler Avenue to Proposed SR 56

Floodplain Compensation Calculations - (FIA 3C)									
Floodplain Elevation based upon the Hillsborough River and Tampa Bypass Canal Stormwater Management Plan Update No. 1 (August 2011). This floodplain is located on the east and west side of US 301 between station 843+58.09 and station 890+67.90. This floodplain area is associated with the Hillborough River.							100 yr. Floodplain Elev. ranges between elev. 49.76 ft and 49.39 ft Used elev. 49.50 ft as average.		
Station	Length (ft)	MS Area Filled (ft ²)	Area Filled (ft ²)	Avg. Area Filled (ft ²)	MS Area Excavated (ft ²)	Area Excavated (ft ²)	Avg. Area Excavated (ft ²)	Impact Volume (ft ³)	Compensated Volume (ft ³)
1843+58.09		0.00000	0.00000		0.00000	0.00000			
	141.91			8.87290			0.00000	1259.15	0.000
1845+00.00		35.49160	17.74580		0.00000	0.00000			
	500.00			47.10790			0.00000	23553.95	0.000
1850+00.00		152.94000	76.47000		0.00000	0.00000			
	500.00			60.10000			0.00000	30050.00	0.000
1855+00.00		87.46000	43.73000		0.00000	0.00000			
	500.00			65.56000			0.00000	32780.00	0.000
1860+00.00		174.78000	87.39000		0.00000	0.00000			
	380.29			60.02263			0.00000	22826.00	0.000
1863+80.29		65.31050	32.65525		0.00000	0.00000			
	406.75			199.32243			0.00000	81074.40	0.000
1867+87.04		731.97920	365.98960		0.00000	0.00000			
	212.96			310.78178			0.00000	66184.09	0.000
1870+00.00		511.14790	255.57395		0.00000	0.00000			
	500.00			223.66605			0.00000	111833.03	0.000
1875+00.00		383.51630	191.75815		0.00000	0.00000			
	500.00			176.55510			0.00000	88277.55	0.000
1880+00.00		322.70410	161.35205		0.00000	0.00000			
	500.00			125.61823			0.00000	62809.11	0.000
1885+00.00		179.76880	89.88440		0.00000	0.00000			
	491.21			50.31973			0.00000	24717.55	0.000
1889+91.21		21.51010	10.75505		0.00000	0.00000			
	8.79			10.54593			0.00000	92.70	0.000
1890+00.00		20.67360	10.33680		0.00000	0.00000			
	35.11			8.41530			0.00000	295.46	0.000
1890+35.11		12.98760	6.49380		0.00000	0.00000			
	32.79			3.24690			0.00000	106.47	0.000
1890+67.90		0.00000	0.00000		0.00000	0.00000			
	101.28			0.00000			0.00000	0.00	0.000
1891+69.18		0.00000	0.00000		0.00000	0.00000			
	30.82			0.00000			0.00000	0.00	0.000
1892+00.00		0.00000	0.00000		0.00000	0.00000			
TOTAL (ft³)								560595.46	0.000
TOTAL (ac-ft)								12.87	0.00

US 301 PD&E Study - From Fowler Avenue to Proposed SR 56

Floodplain Compensation Calculations - (FIA 4)									
Floodplain Elevation based upon the Hillsborough River and Tampa Bypass Canal Stormwater Management Plan Update No. 1 (August 2011). This floodplain is located on the west side of US 301 between station 897+49.85 and station 907+02.82								100 yr. Floodplain Elev. = 52.28 ft	
Station	Length (ft)	MS Area Filled (ft ²)	Area Filled (ft ²)	Avg. Area Filled (ft ²)	MS Area Excavated (ft ²)	Area Excavated (ft ²)	Avg. Area Excavated (ft ²)	Impact Volume (ft ³)	Compensated Volume (ft ³)
1892+00.00		0.00000	0.00000		0.00000	0.00000			
	300.00			0.00000			0.00000	0.00	0.000
1895+00.00		0.00000	0.00000		0.00000	0.00000			
	249.85			17.88790			0.00000	4469.29	0.000
1897+49.85		71.55160	35.77580		0.00000	0.00000			
	50.22			36.91770			0.00000	1854.01	0.000
1898+00.07		76.11920	38.05960		0.00000	0.00000			
	72.51			47.99875			0.00000	3480.39	0.000
1898+72.58		115.87580	57.93790		0.00000	0.00000			
	93.00			84.70143			0.00000	7877.23	0.000
1899+65.58		222.92990	111.46495		0.00000	0.00000			
	119.60			95.83223			0.00000	11461.53	0.000
1900+85.18		160.39900	80.19950		0.00000	0.00000			
	214.82			54.20305			0.00000	11643.90	0.000
1903+00.00		56.41320	28.20660		0.00000	0.00000			
	200.00			45.84945			0.00000	9169.89	0.000
1905+00.00		126.98460	63.49230		0.00000	0.00000			
	103.59			43.36638			0.00000	4492.32	0.000
1906+03.59		46.48090	23.24045		0.00000	0.00000			
	99.23			11.62023			0.00000	1153.07	0.000
1907+02.82		0.00000	0.00000		0.00000	0.00000			
	524.53			0.00000			0.00000	0.00	0.000
1912+27.35		0.00000	0.00000		0.00000	0.00000			
	72.65						0.00000	0.00	0.000
1913+00.00		0.00000	0.00000		0.00000	0.00000			
TOTAL (ft³)								60564.35	0.000
TOTAL (ac-ft)								1.39	0.00

US 301 PD&E Study - From Fowler Avenue to Proposed SR 56

Floodplain Compensation Calculations - (FIA 5)									
Floodplain Elevation based upon the Hillsborough River and Tampa Bypass Canal Stormwater Management Plan Update No. 1 (August 2011). This floodplain is located on the east side of US 301 between station 921+54.72 and station 948+82.00.								100 yr. Floodplain Elev. = 56.15 ft	
Station	Length (ft)	MS Area Filled (ft ²)	Area Filled (ft ²)	Avg. Area Filled (ft ²)	MS Area Excavated (ft ²)	Area Excavated (ft ²)	Avg. Area Excavated (ft ²)	Impact Volume (ft ³)	Compensated Volume (ft ³)
1921+54.72		0.00000	0.00000		0.00000	0.00000			
	345.28			64.21820			0.00000	22173.26	0.000
1925+00.00		256.87280	128.43640		0.00000	0.00000			
	500.00			117.98563			0.00000	58992.81	0.000
1930+00.00		215.06970	107.53485		0.00000	0.00000			
	500.00			87.43728			0.00000	43718.64	0.000
1935+00.00		134.67940	67.33970		0.00000	0.00000			
	500.00			57.67733			0.00000	28838.66	0.000
1940+00.00		96.02990	48.01495		0.00000	0.00000			
	500.00			30.81718			0.00000	15408.59	0.000
1945+00.00		27.23880	13.61940		0.00000	0.00000			
	382.00			6.80970			0.00000	2601.31	0.000
1948+82.00		0.00000	0.00000		0.00000	0.00000			
TOTAL (ft³)								171733.27	0.000
TOTAL (ac-ft)								3.94	0.00

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US 301 PD&E Study - From Fowler Avenue to Proposed SR 56

Floodplain Compensation Calculations - (FIA 6C)									
Floodplain Elevation based upon the New River/Upper Hillsborough River Watershed Model (2014). This floodplain is located on the east and west sides of US 301 between station 1993+86.00 and station 2027+45.00								100 yr. Floodplain Elev. - From 65.83 ft to 67.57 ft	
Station	Length (ft)	MS Area Filled (ft ²)	Area Filled (ft ²)	Avg. Area Filled (ft ²)	MS Area Excavated (ft ²)	Area Excavated (ft ²)	Avg. Area Excavated (ft ²)	Impact Volume (ft ³)	Compensated Volume (ft ³)
1993+86.00		0.00000	0.00000		0.00000	0.00000			
	124.00			53.98933			0.00000	6694.68	0.000
1995+10.00		215.95730	107.97865		0.00000	0.00000			
	40.00			113.14250			0.00000	4525.70	0.000
1995+50.00		236.61270	118.30635		0.00000	0.00000			
	80.00			169.07285			0.00000	13525.83	0.000
1996+30.00		439.67870	219.83935		0.00000	0.00000			
	20.00			217.40715			0.00000	4348.14	0.000
1996+50.00		429.94990	214.97495		0.00000	0.00000			
	150.00			193.71233			0.00000	29056.85	0.000
1998+00.00		344.89940	172.44970		0.00000	0.00000			
	200.00			157.42820			0.00000	31485.64	0.000
2000+00.00		284.81340	142.40670		0.00000	0.00000			
	200.00			95.85068			0.00000	19170.14	0.000
2002+00.00		98.58930	49.29465		0.00000	0.00000			
	200.00			24.64733			0.00000	4929.47	0.000
2004+00.00		0.00000	0.00000		0.00000	0.00000			
TOTAL (ft³)								118116.44	0.000
TOTAL (ac-ft)								2.71	0.00

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US 301 PD&E Study - From Fowler Avenue to Proposed SR 56

Floodplain Compensation Area Calculations - Cut Below 100-yr Elevation (FPC1)					
ELEV. (ft)	AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
44.00 Pond R/W	5.45				
36.07 100-yr (FPIA-1)	3.90				7.83
		3.79	2.07	7.83	
34.00 SHWT	3.67				0.00

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US 301 PD&E Study - From Fowler Avenue to Proposed SR 56

Floodplain Compensation Area Calculations - Cut Below 100-yr Elevation (FPC3)						
ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
44.00	Pond R/W	3.49				
37.72	100-yr (FPIA-1)	1.87				2.19
			1.80	1.22	2.19	
36.50	SHWT	1.72				0.00

Floodplain Compensation Area Calculations - Cut Below 100-yr Elevation (FPC2)						
ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
Elev. Varies	Pond R/W	7.45				
41.84	100-yr (FPIA-1)	6.21				27.56
			5.70	4.84	27.56	
37.00	SHWT	5.18				0.00

* Existing ground gradient from El. 50.00 to 36.00 across proposed FPC site.

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US 301 PD&E Study - From Fowler Avenue to Proposed SR 56

Floodplain Compensation Area Calculations - Cut Below 100-yr Elevation (FPC5)					
ELEV. (ft)	AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
45.00 Avg. Pond R/W	25.47				
45.00 100-yr (FPIA-1)	25.47				72.69*
		24.23	6.00	145.38	
39.00 SHWT	22.99				0

* Existing ground gradient from El. 45.00 to 39.00 across proposed FPC site. Volume divided by 2 .

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US 301 PD&E Study - From Fowler Avenue to Proposed SR 56

Floodplain Compensation Area Calculations - Cut Below 100-yr Elevation (FPC6)					
ELEV. (ft)	AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
52.28 100-yr (FPIA-4)	2.15				
52.00 Pond R/W	1.83				1.76
		1.76	1.00	1.76	
51.00 SHWT	1.68				0.00

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US 301 PD&E Study - From Fowler Avenue to Proposed SR 56

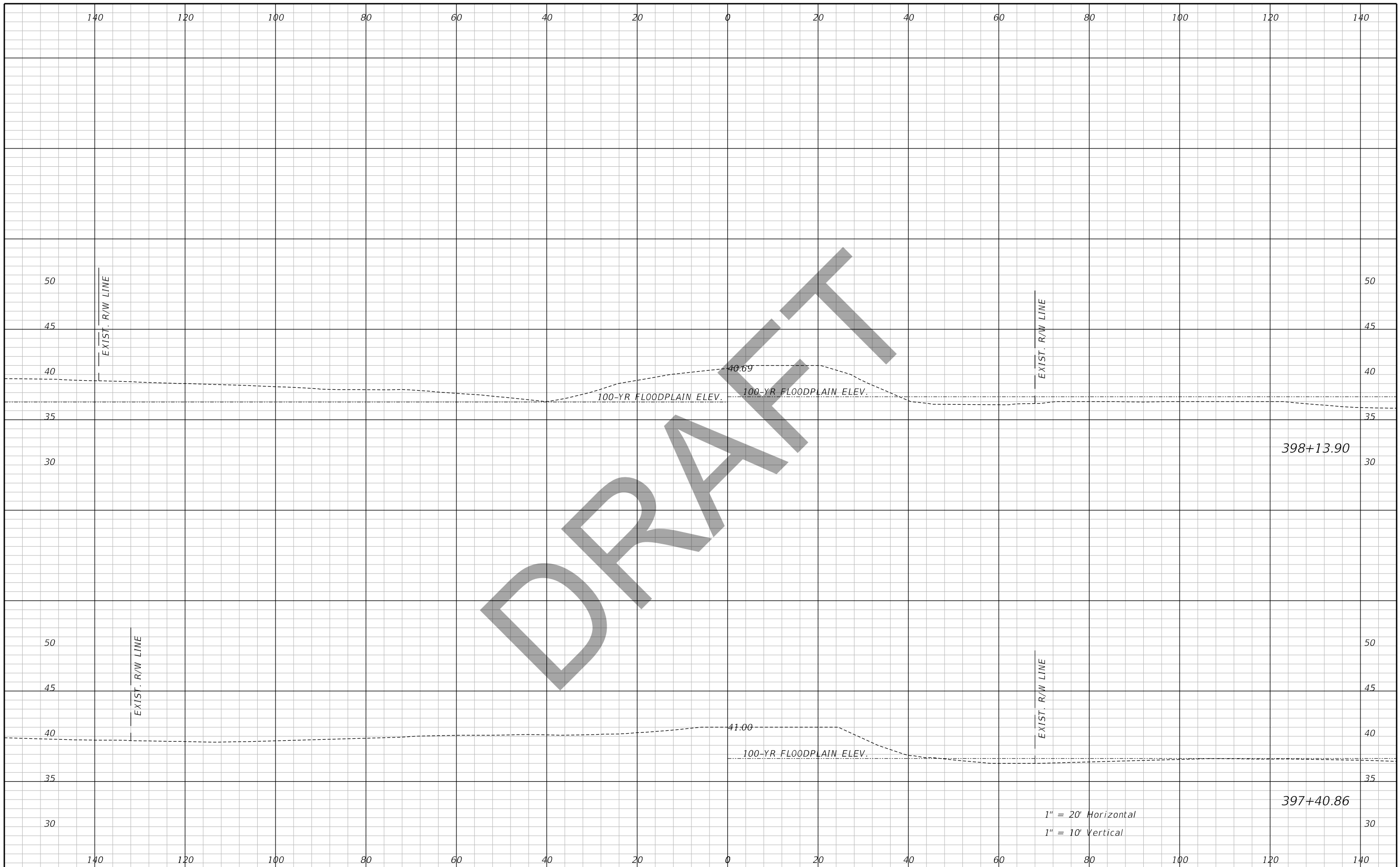
Floodplain Compensation Area Calculations - Cut Below 100-yr Elevation (FPC7)					
ELEV. (ft)	AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
58.00	Pond R/W	5.66			
56.80	100-yr	5.08			4.47
		4.97	1.80	8.95	
55.00	SHWT	4.86			0.00

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US 301 PD&E Study - From Fowler Avenue to Proposed SR 56

Floodplain Compensation Area Calculations - Cut Below 100-yr Elevation (FPC8)					
ELEV. (ft)	AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
62.00 Pond R/W	8.47				
61.10 100-yr (FPIA-1)	7.61				13.61
		7.36	1.85	13.61	
59.25 SHWT	7.10				0.00

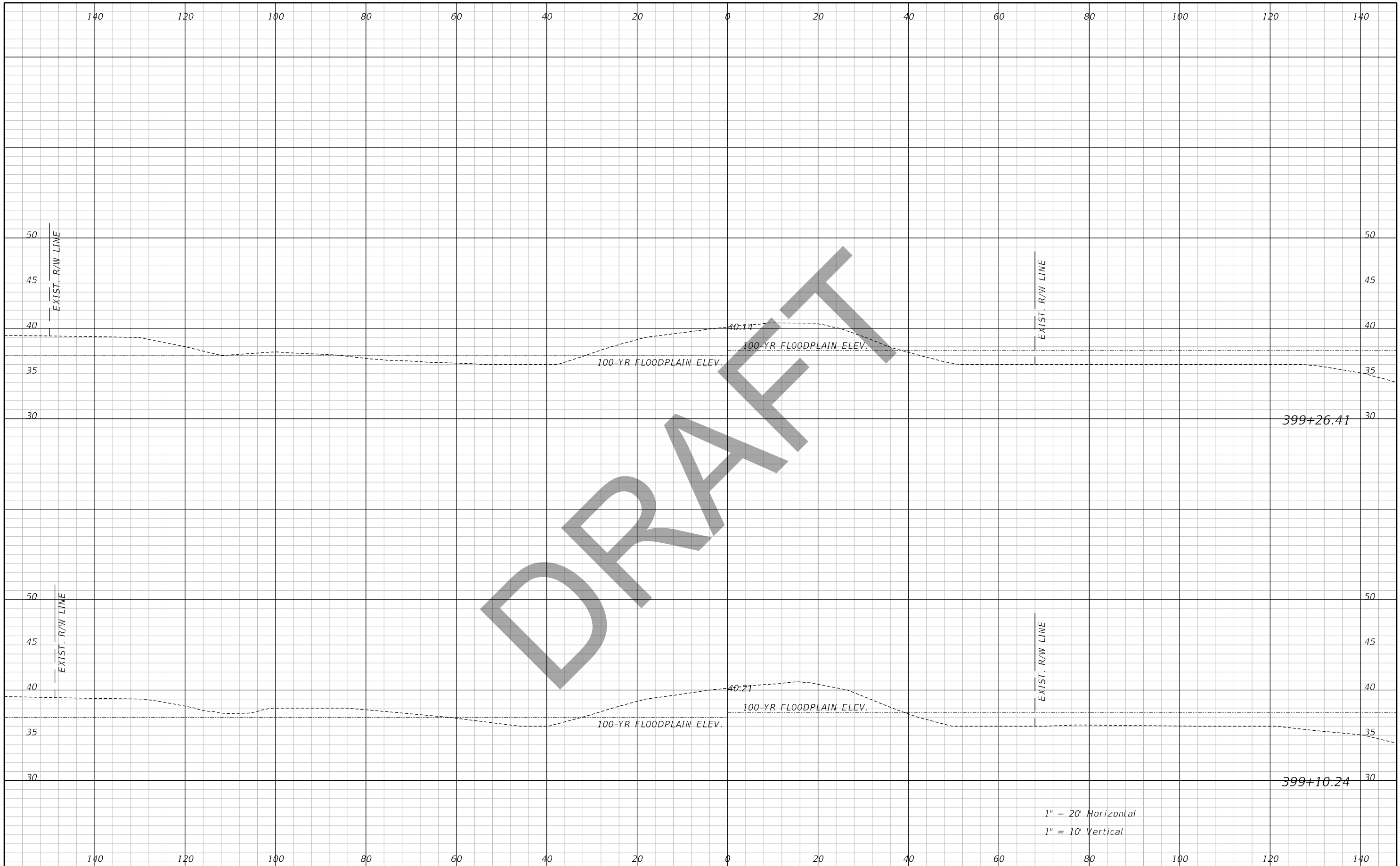
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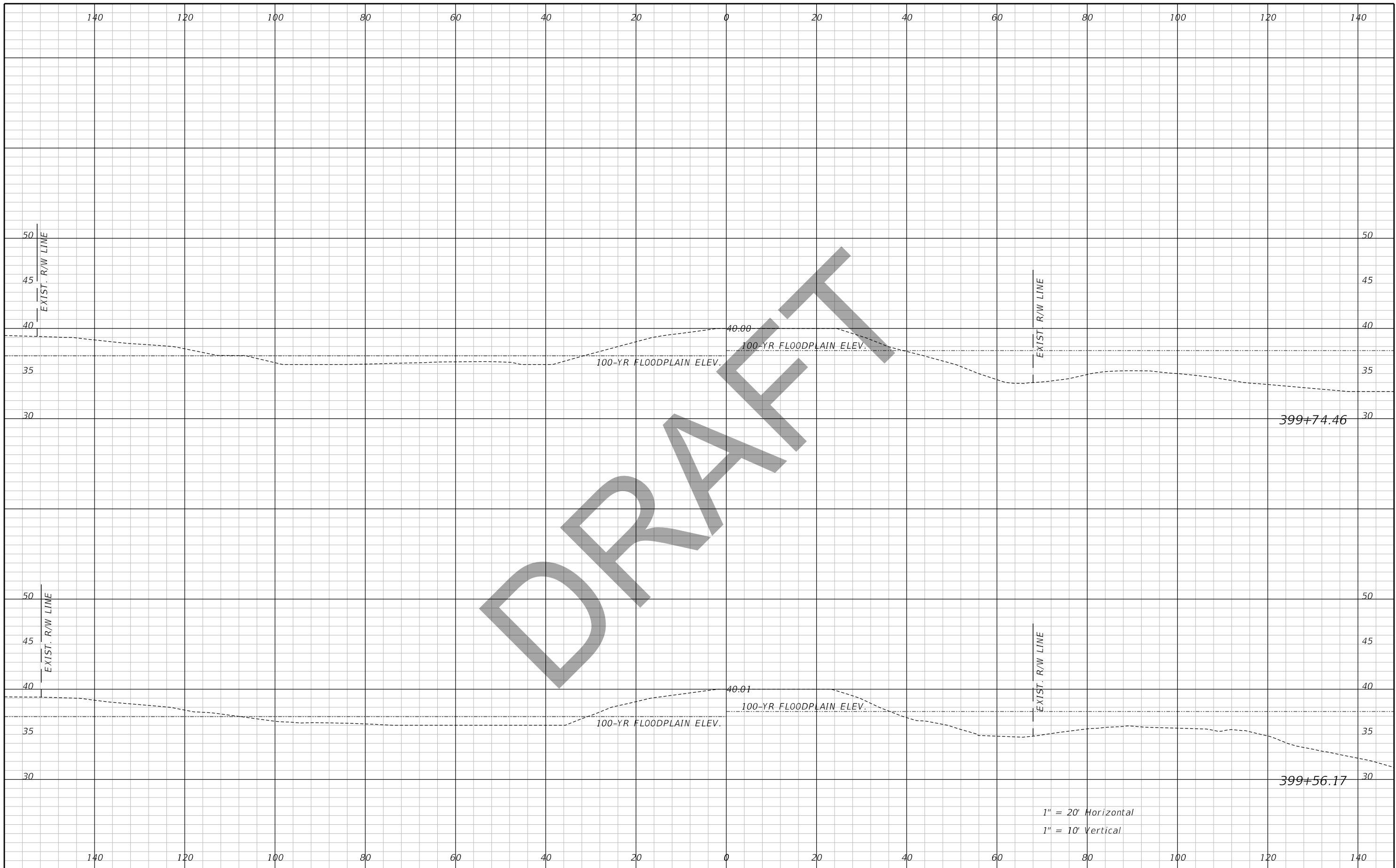
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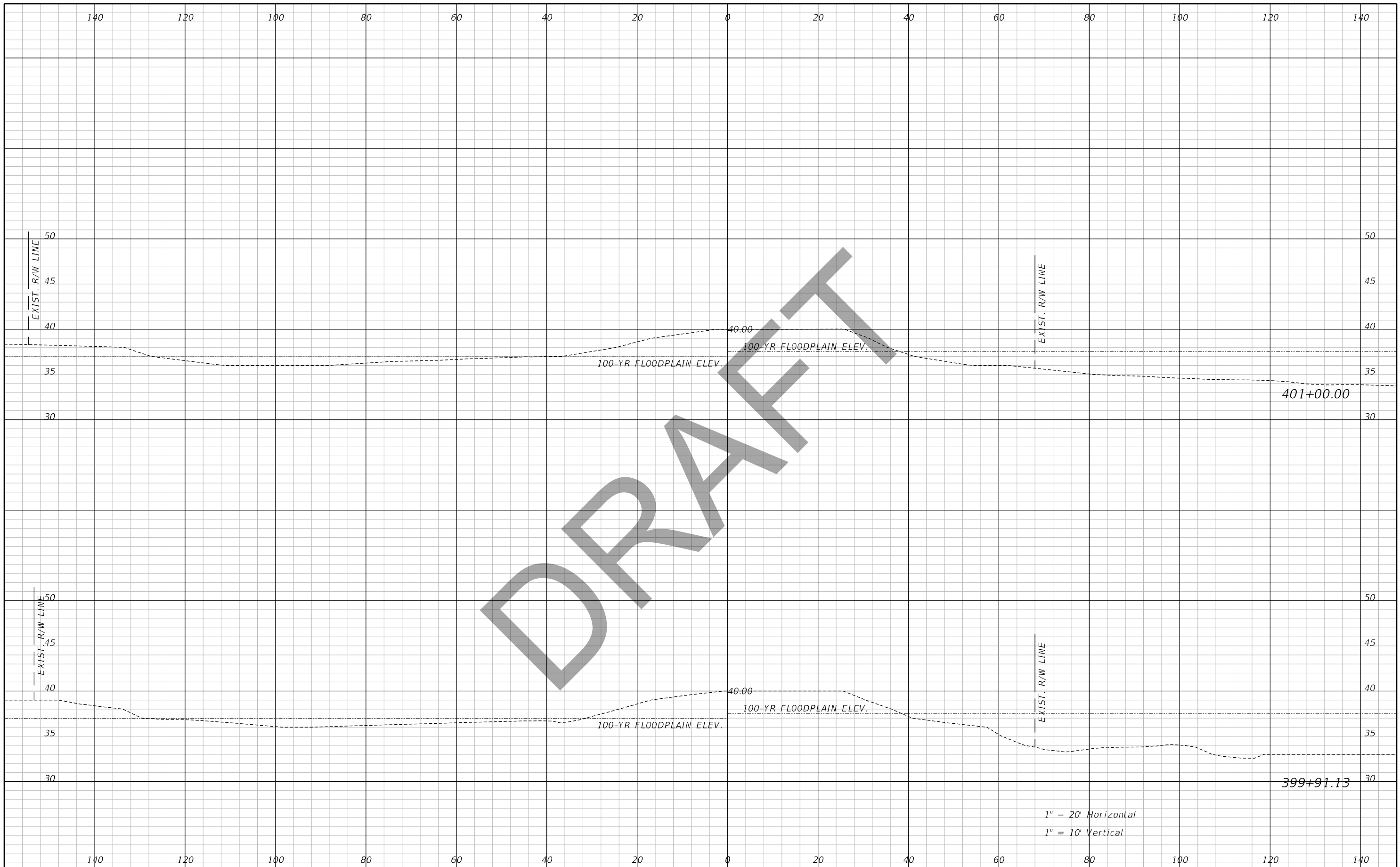
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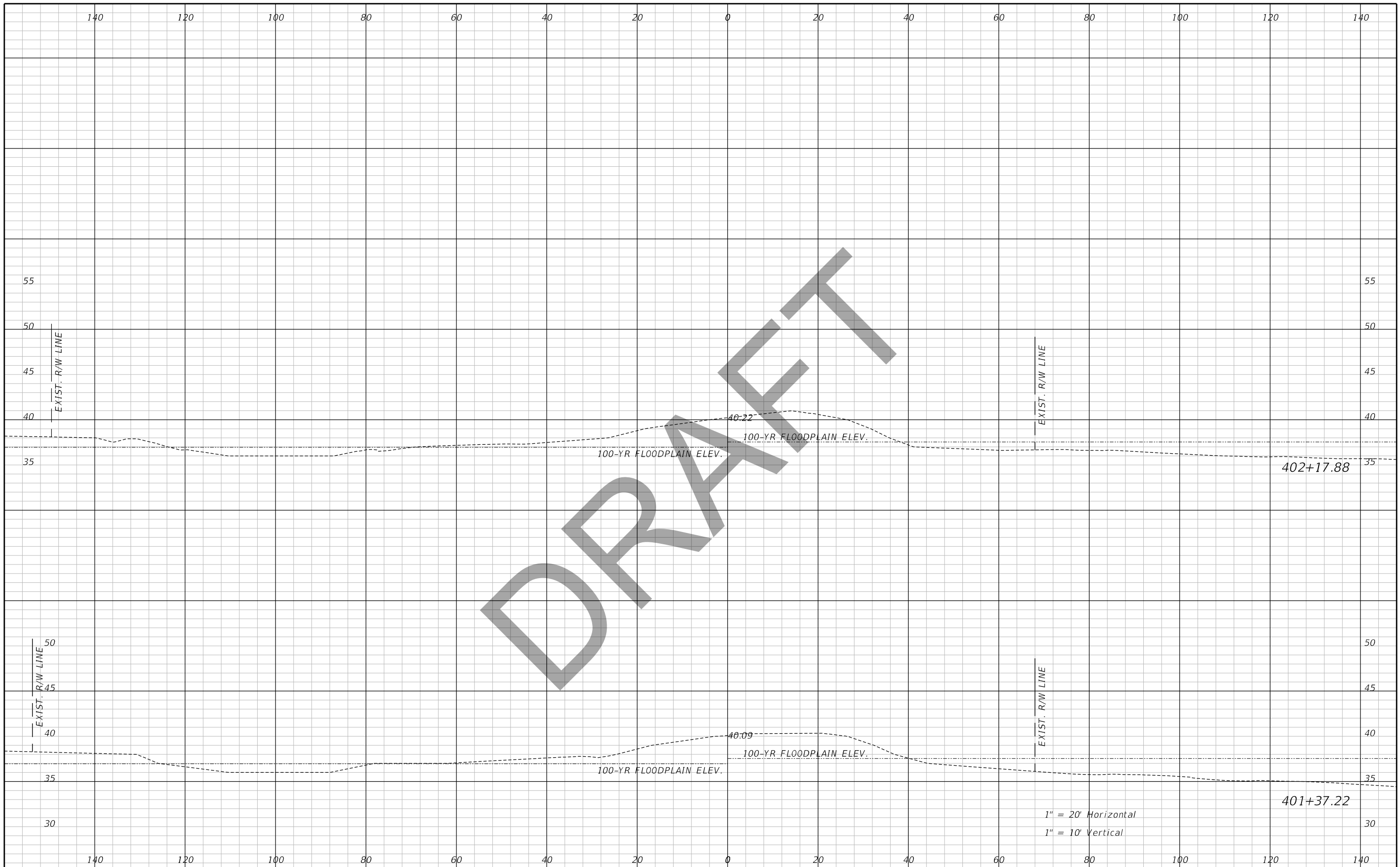
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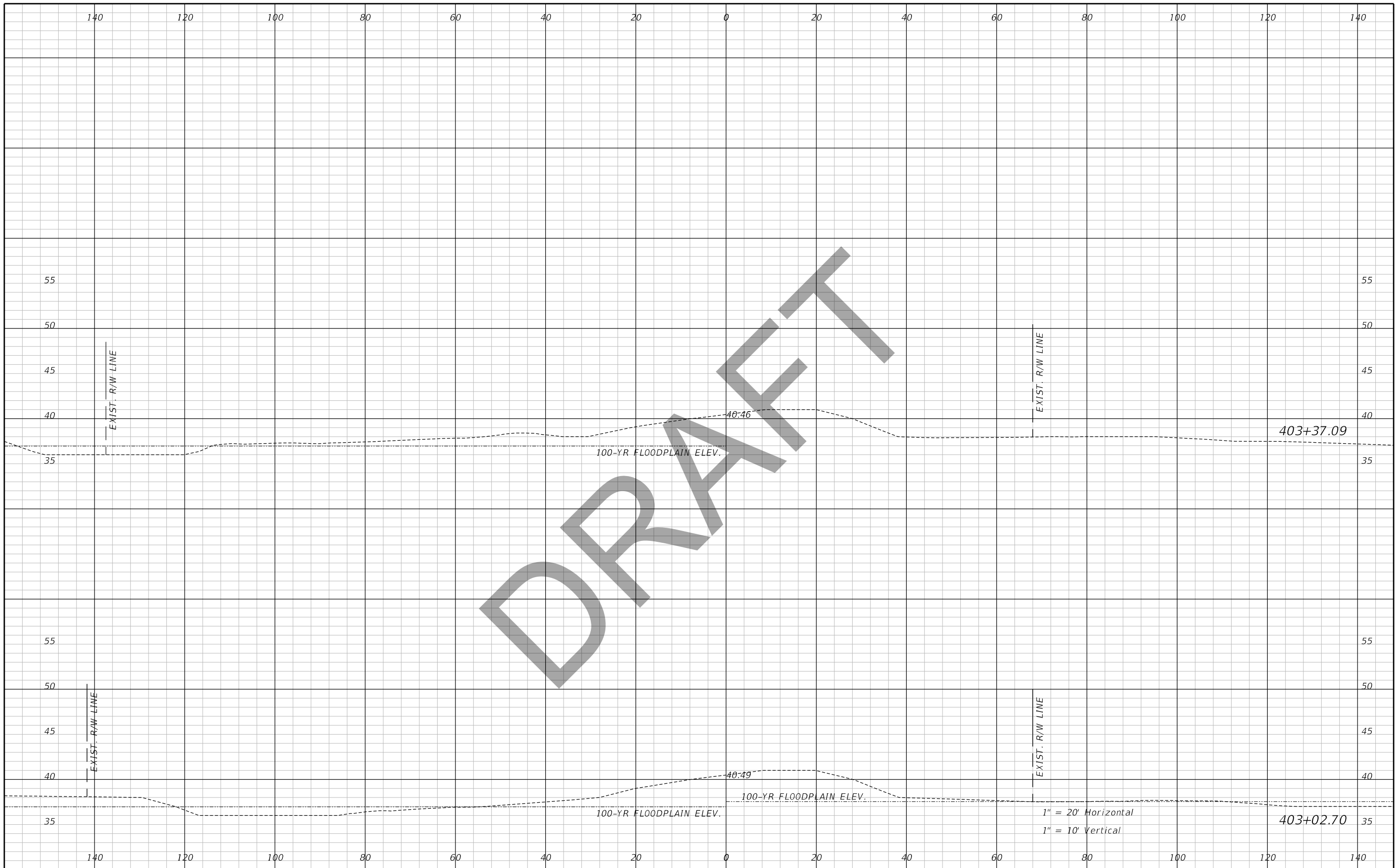
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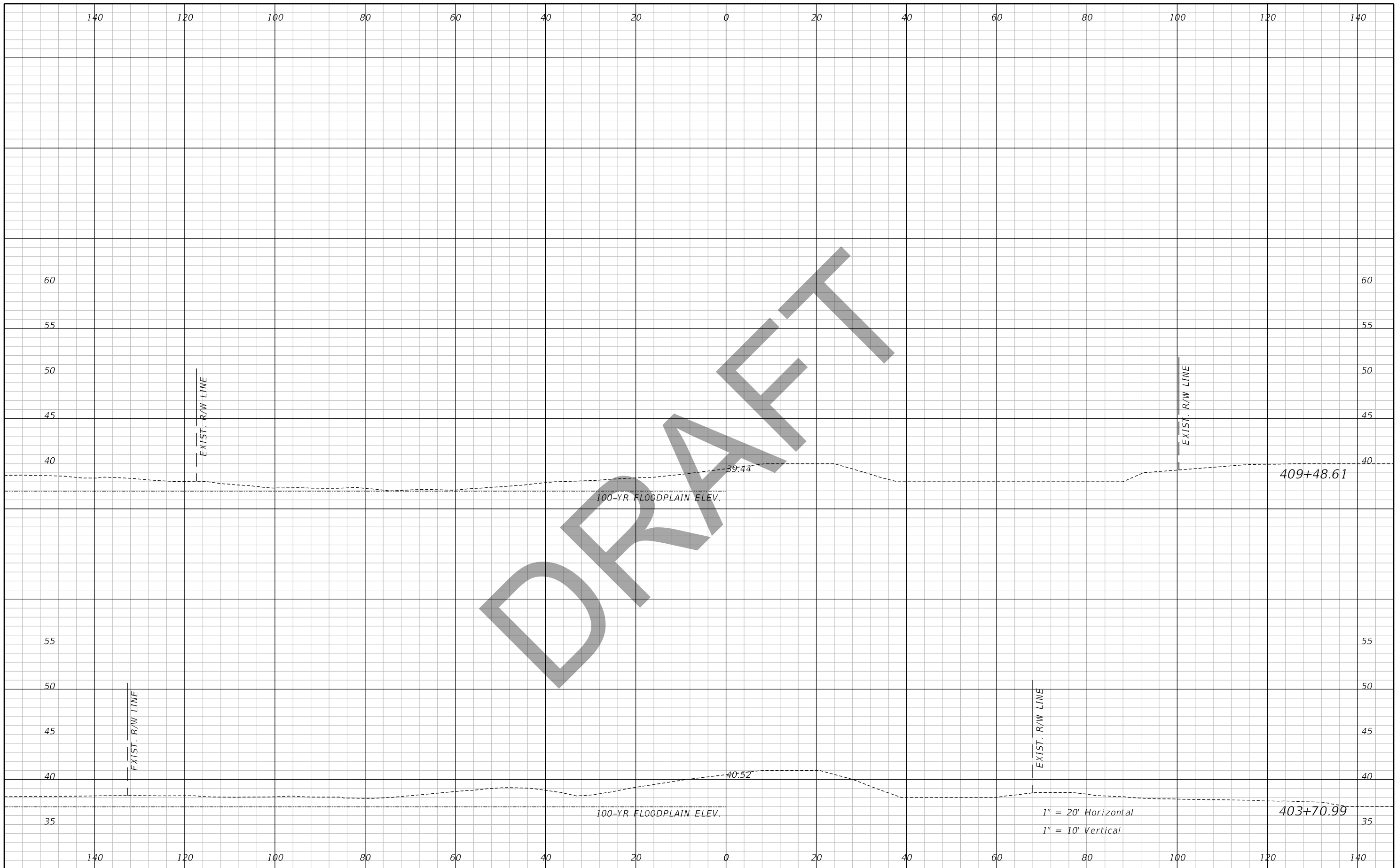
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FLOODPLAIN IMPACT & COMPENSATION

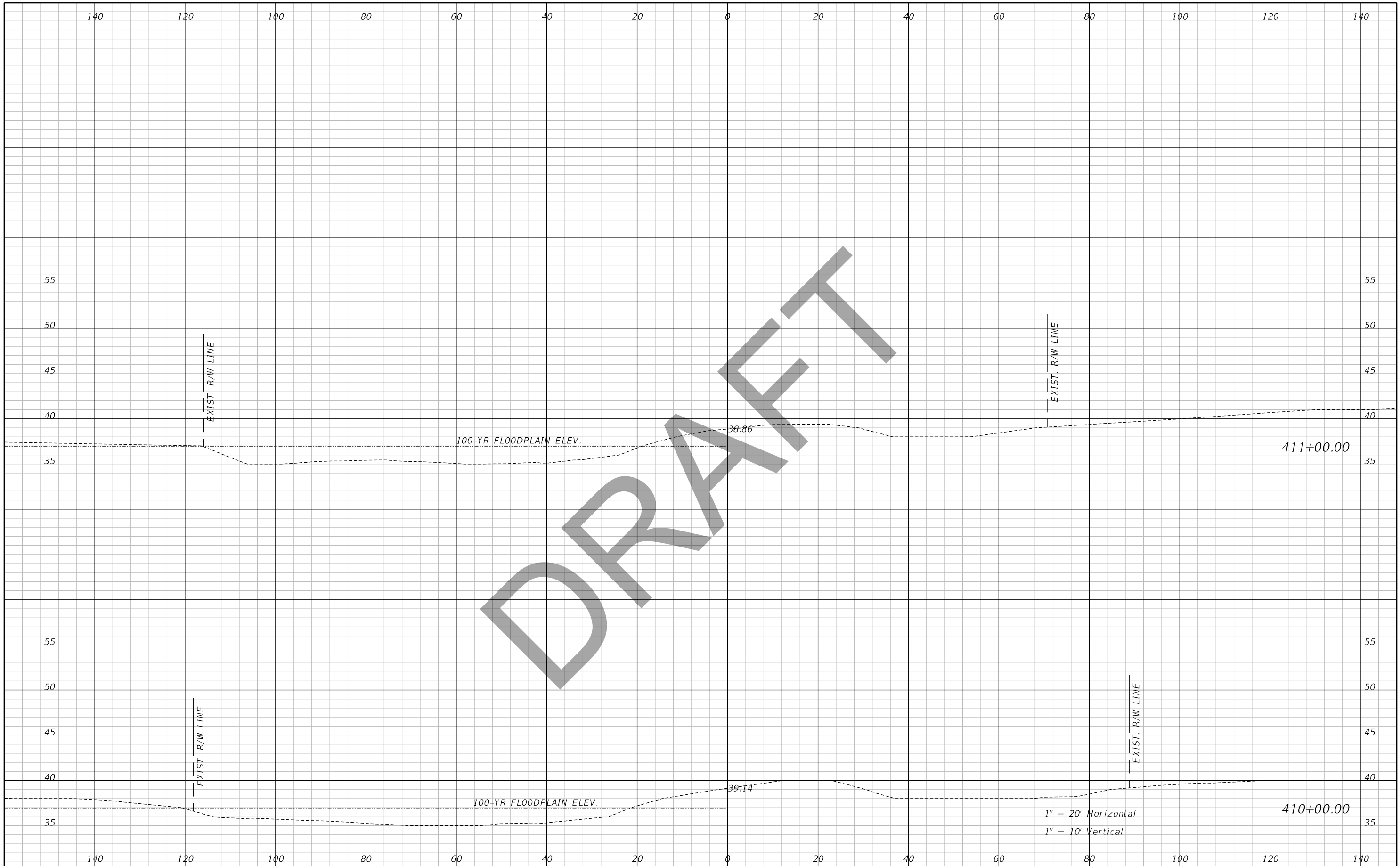
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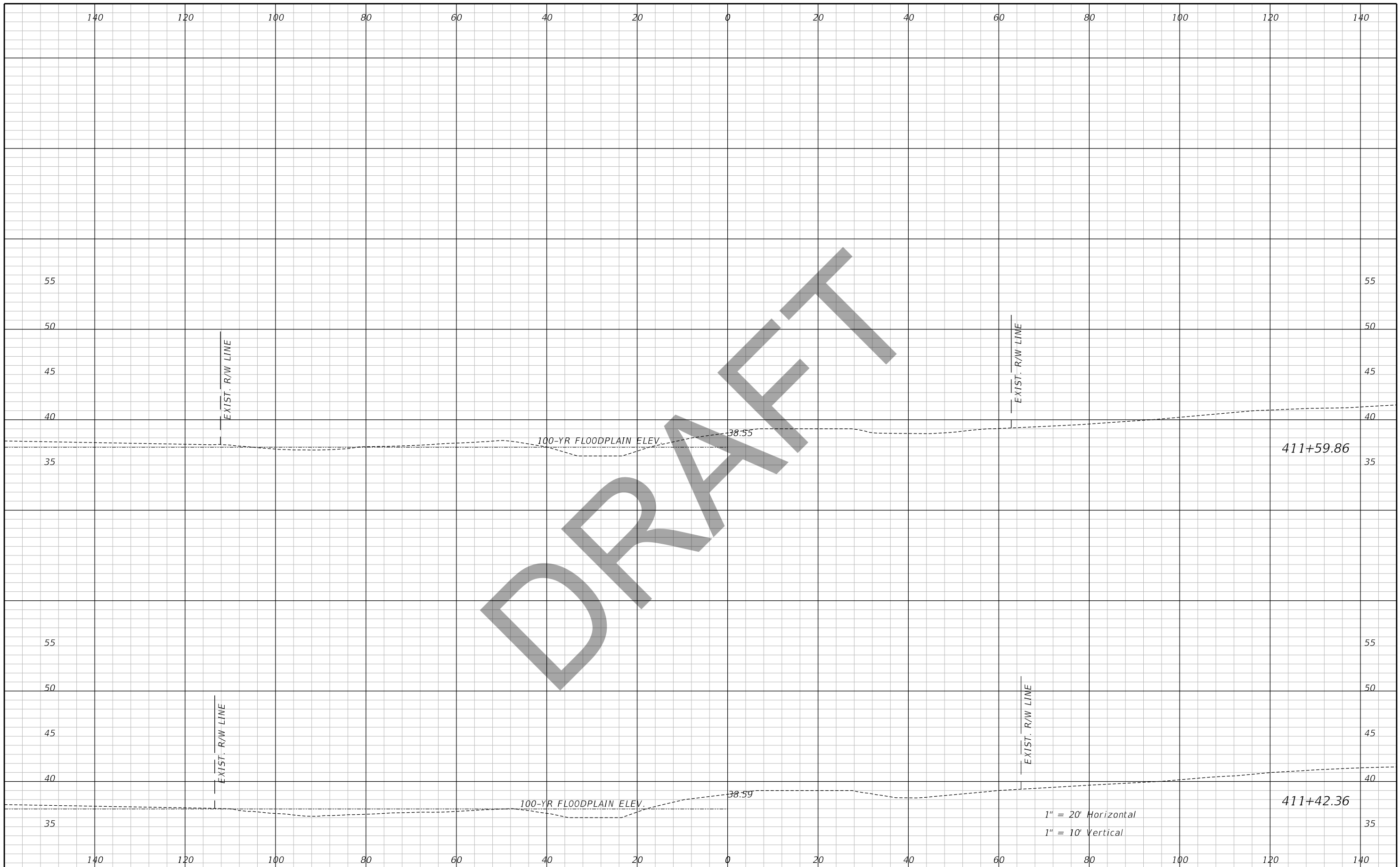
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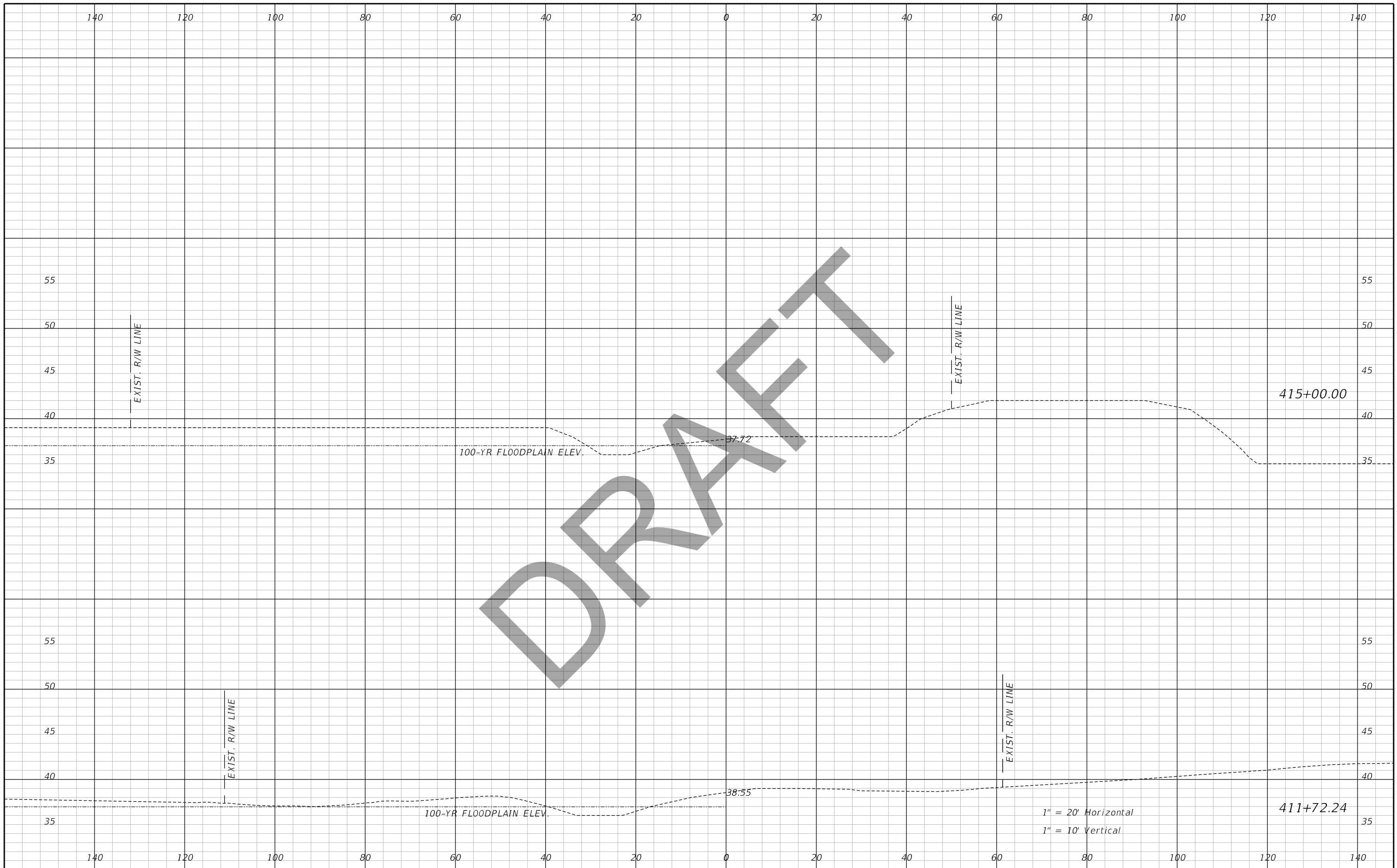
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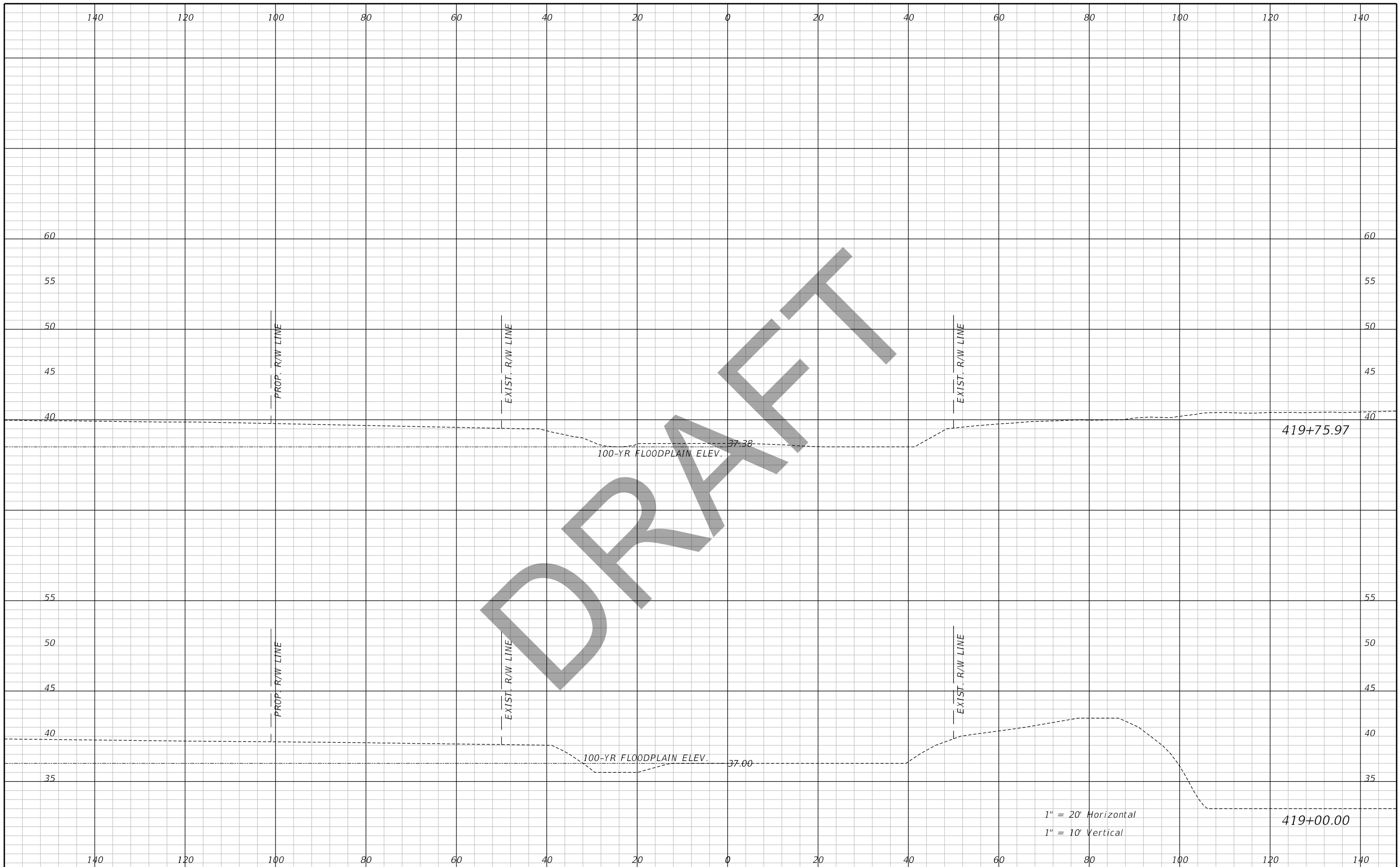
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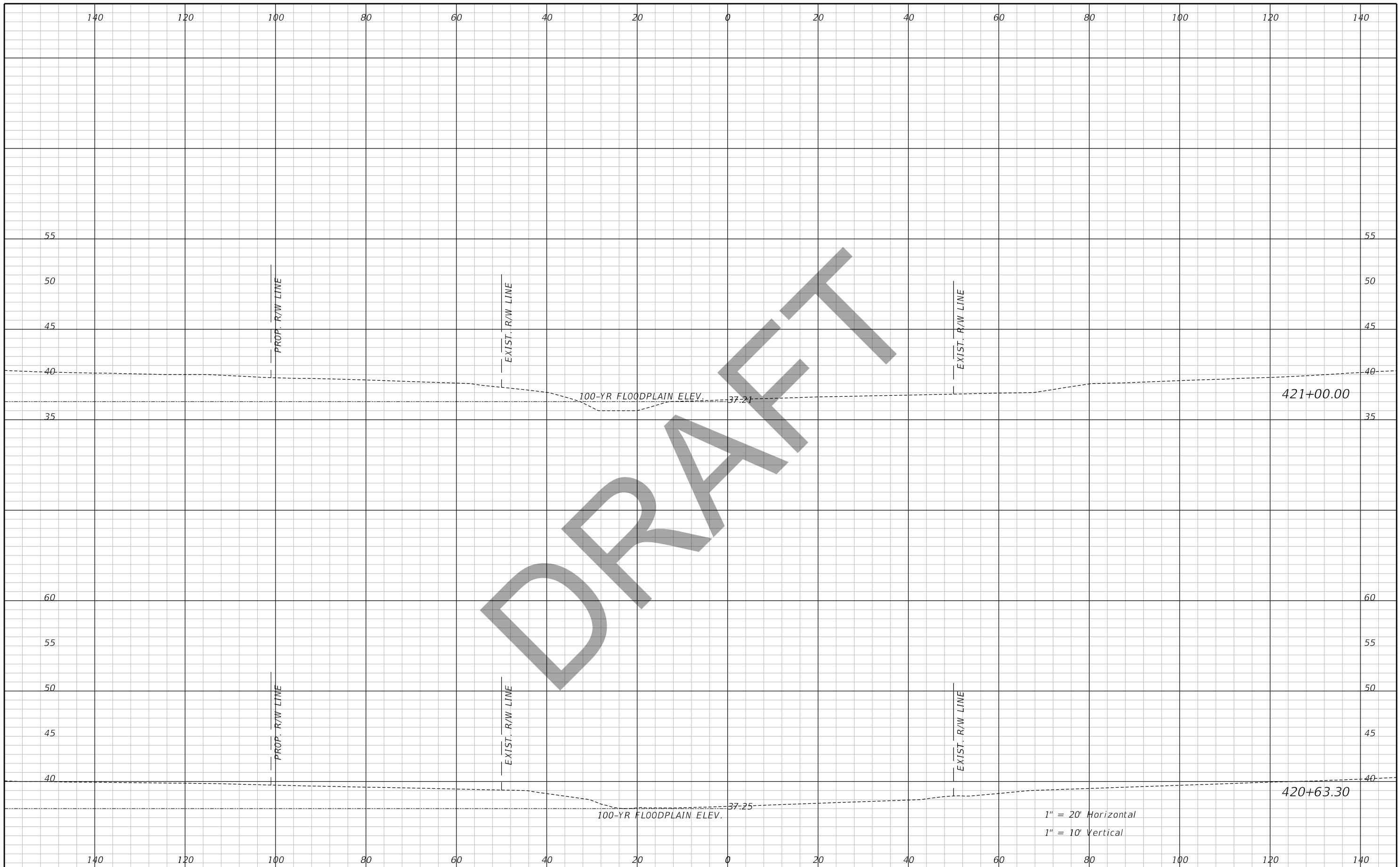
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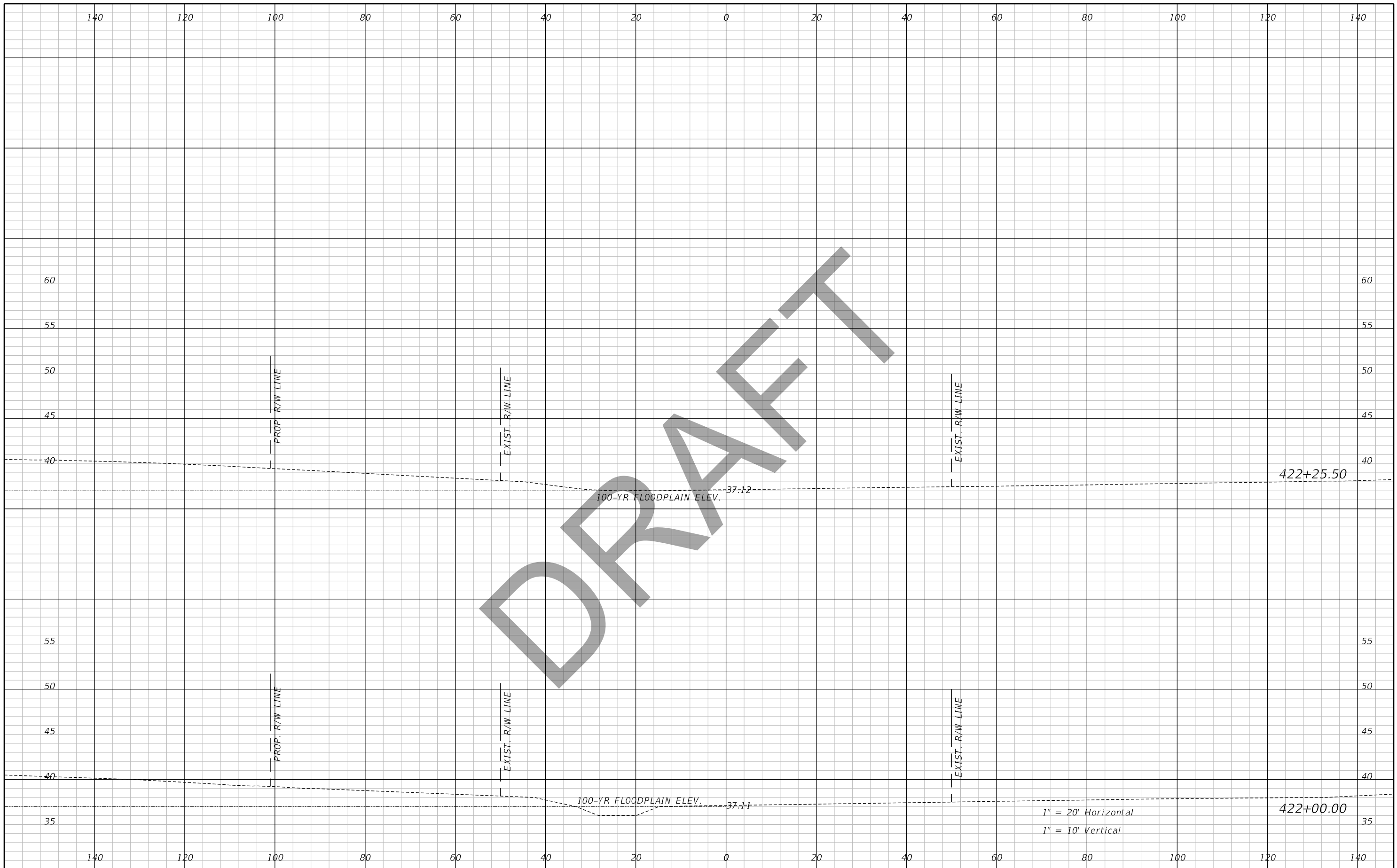
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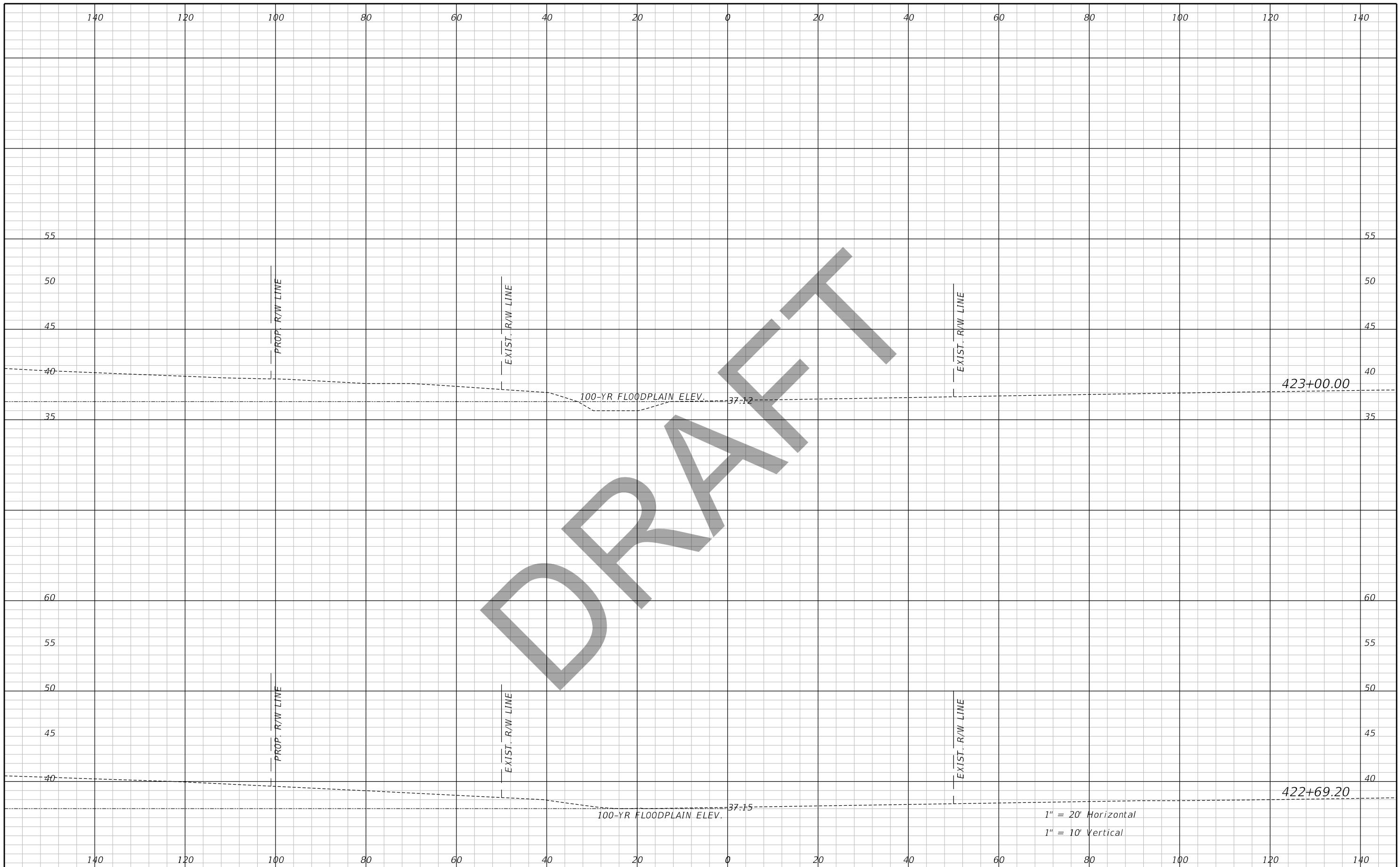
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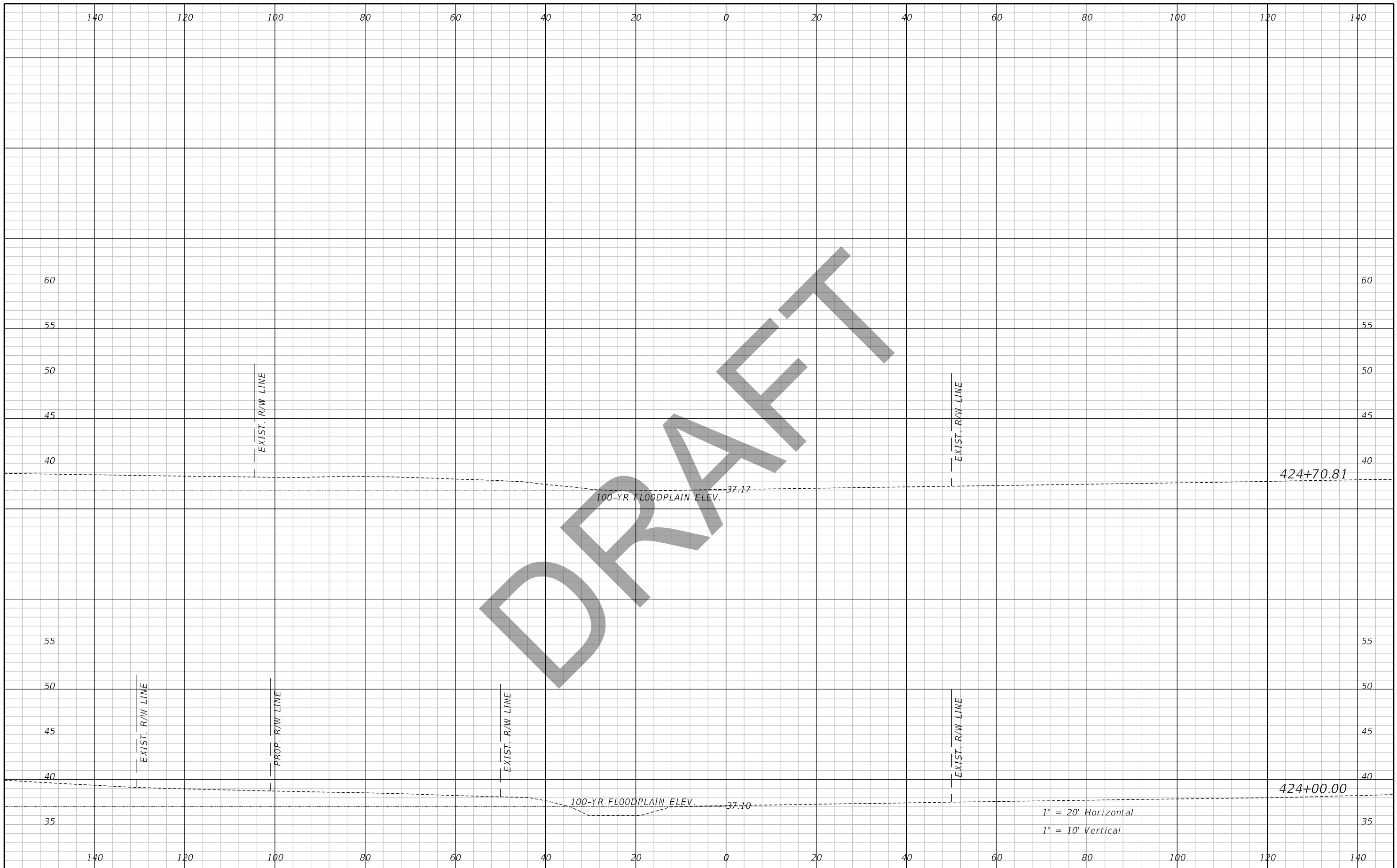
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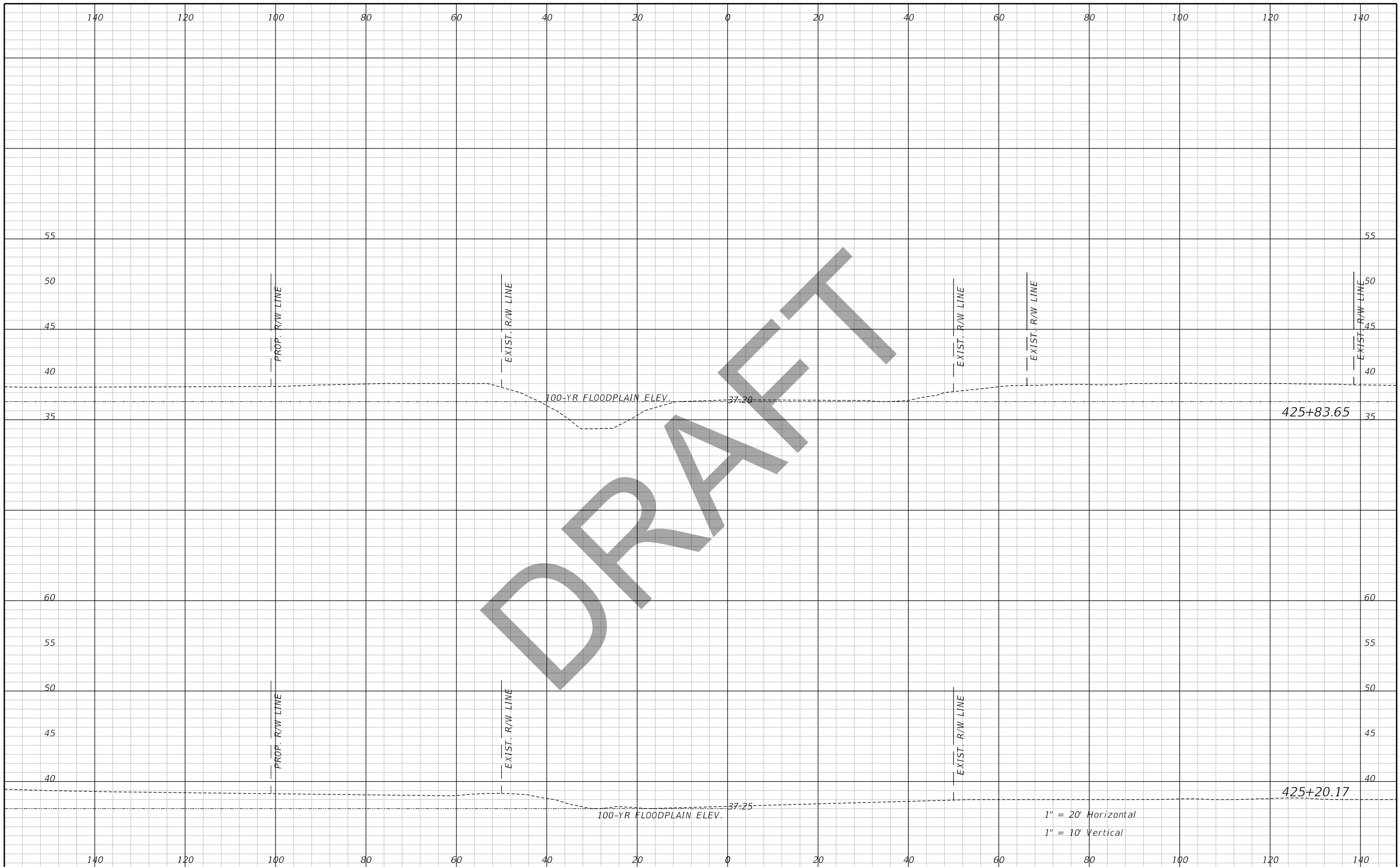
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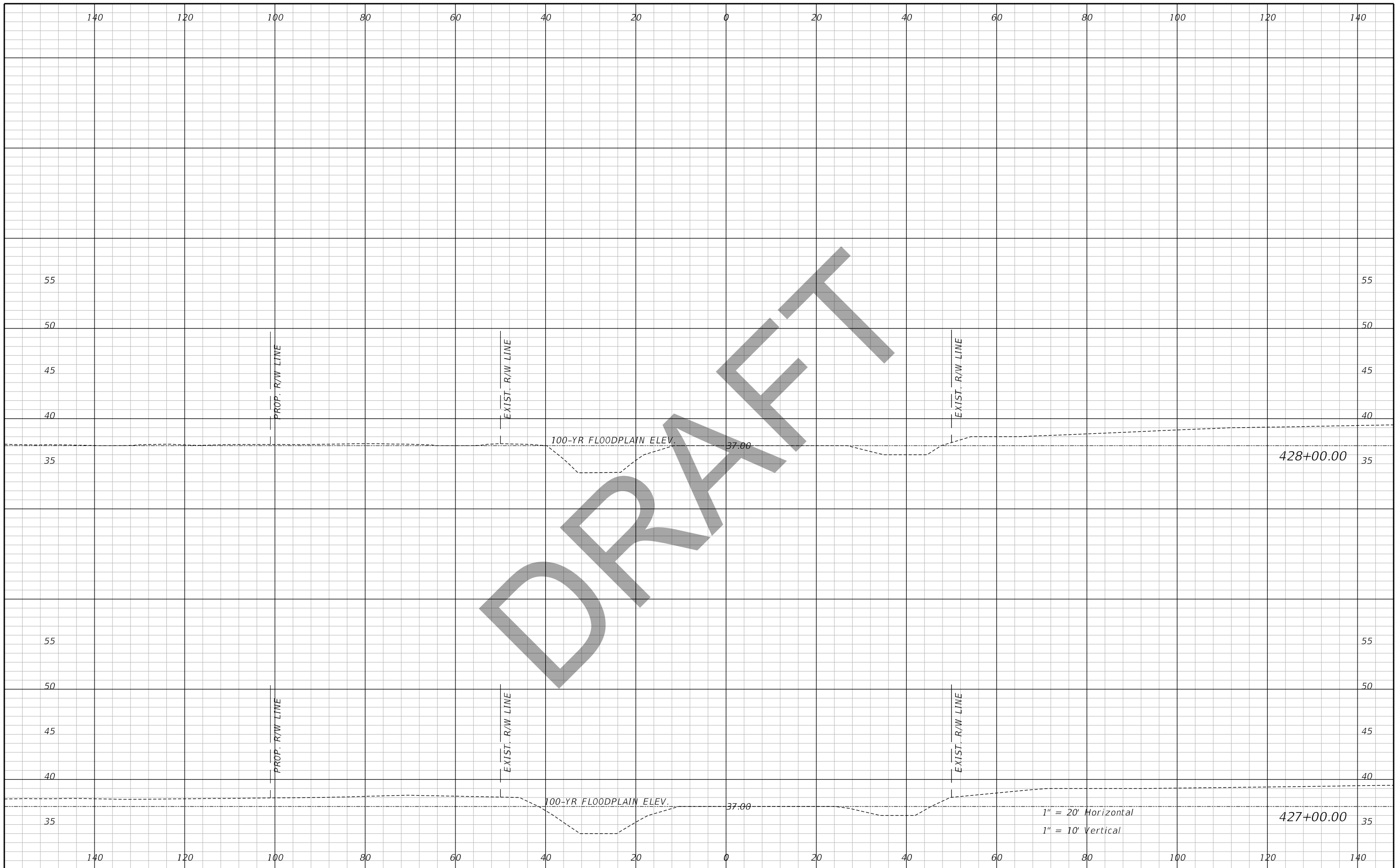
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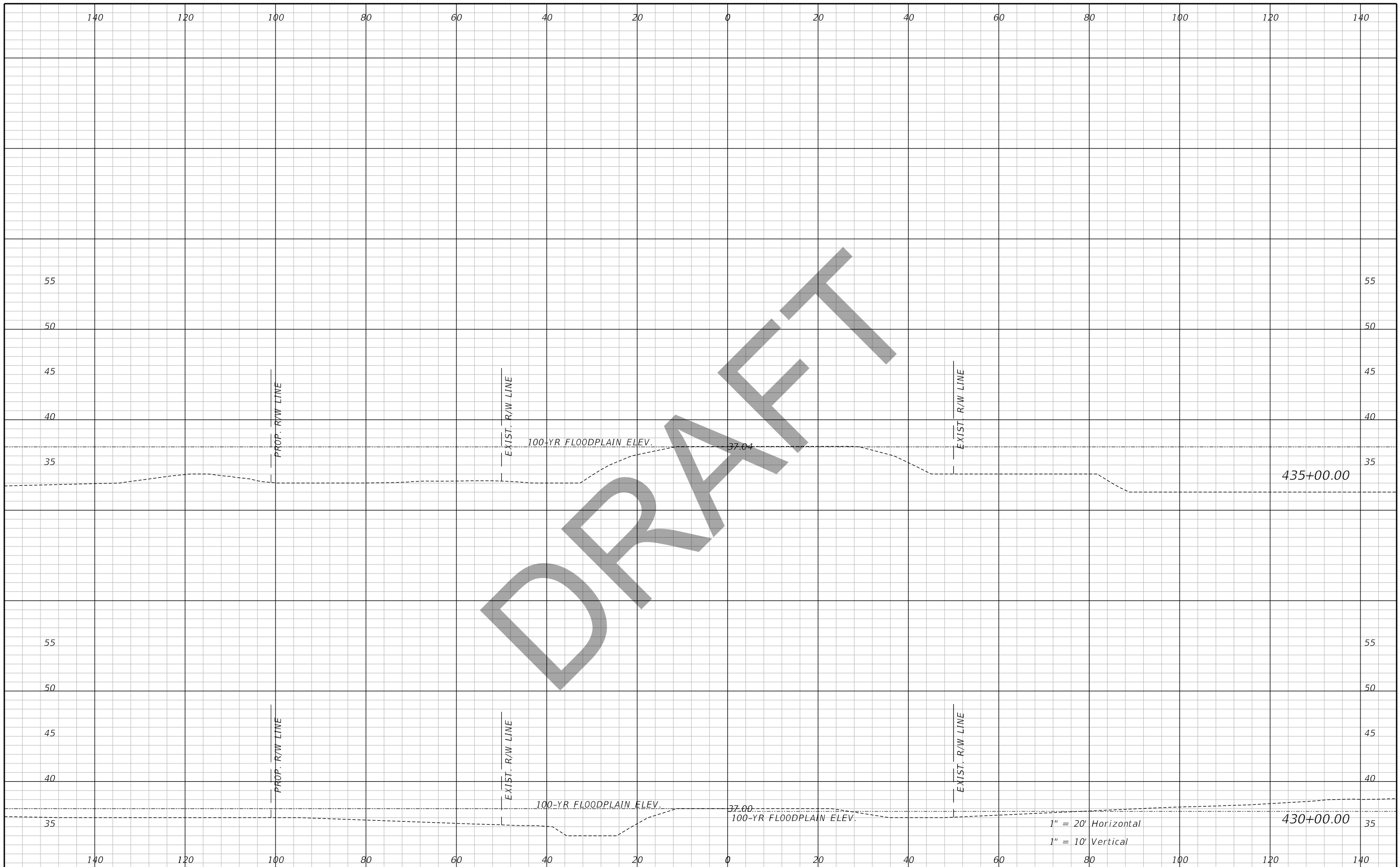
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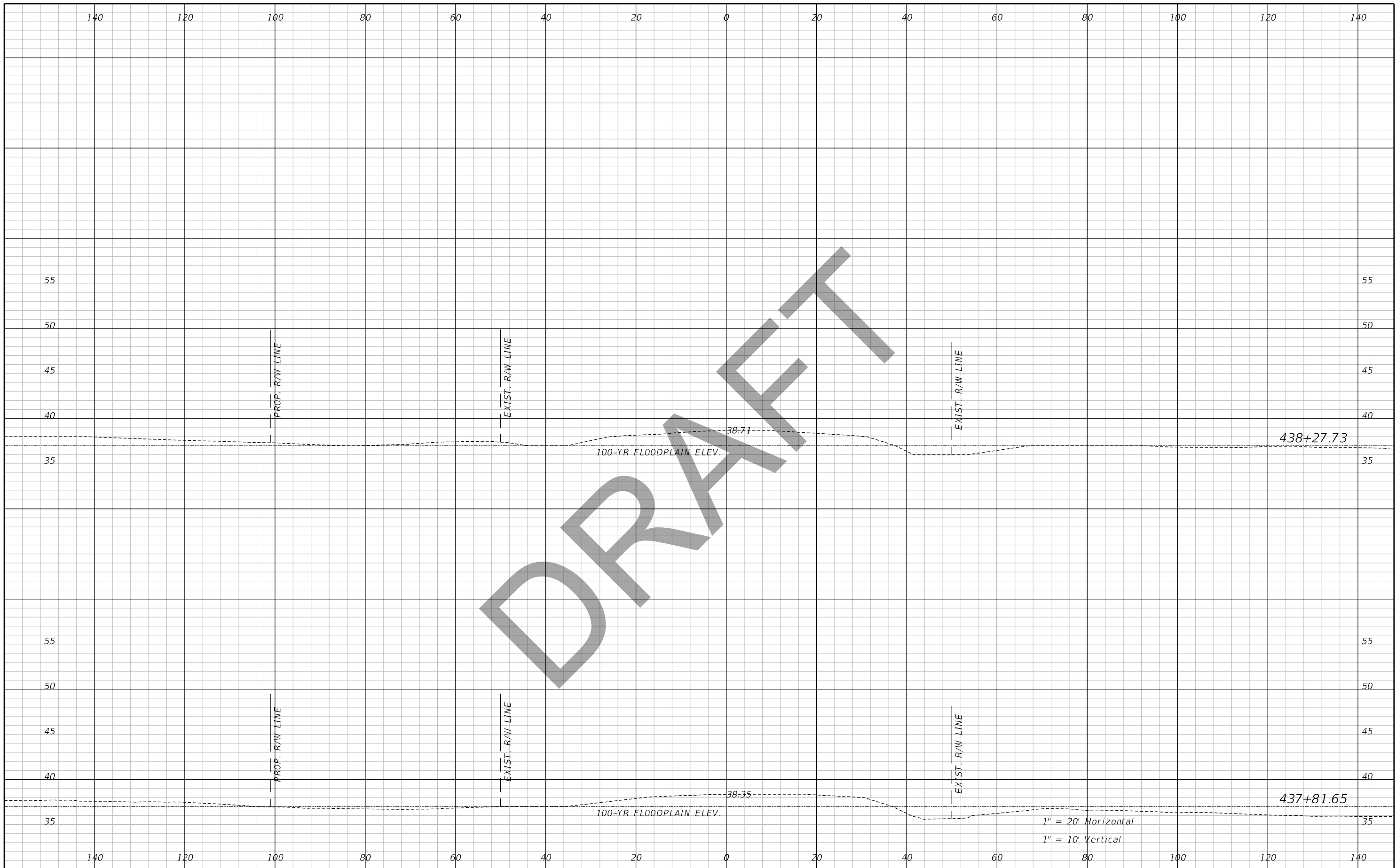
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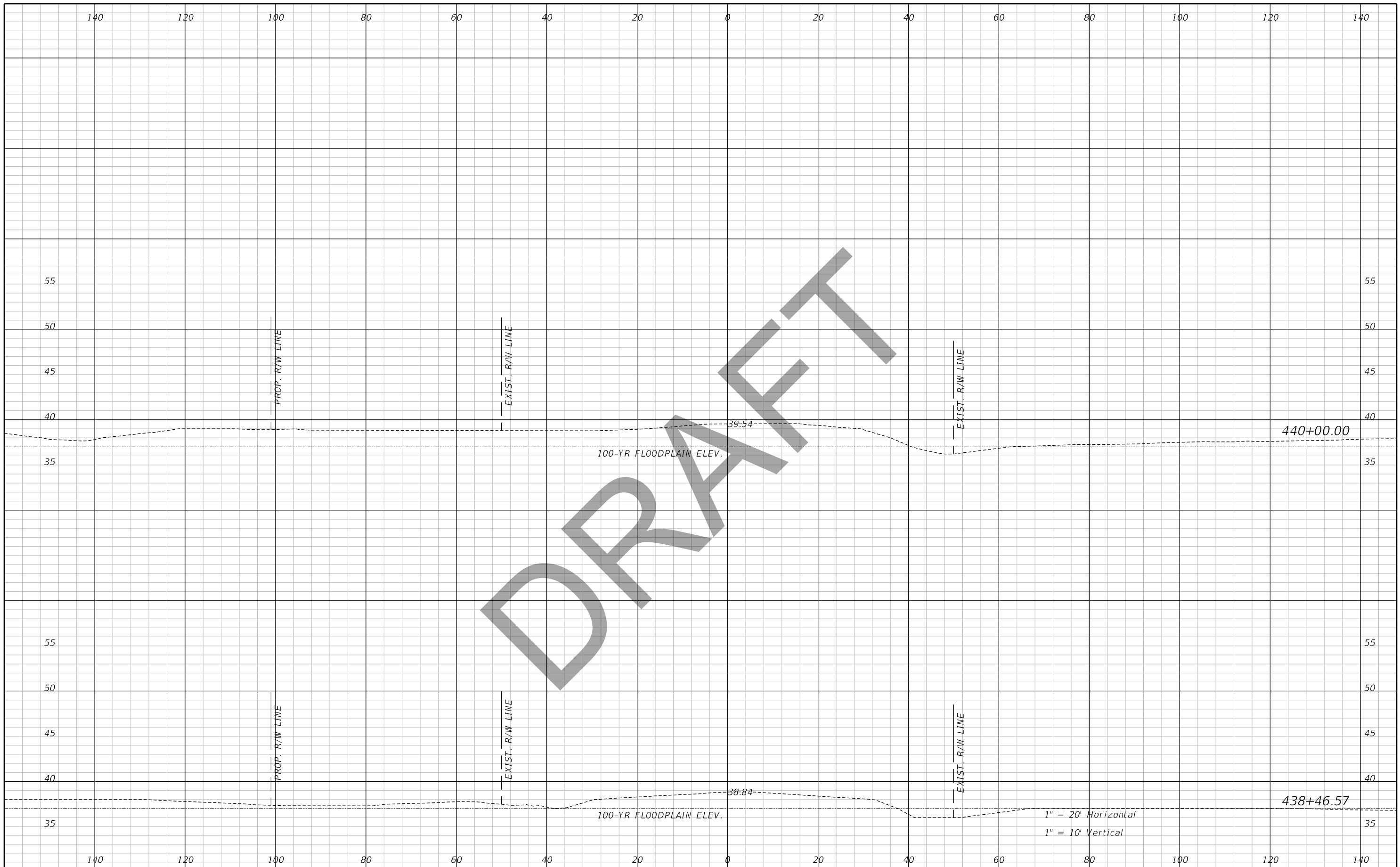
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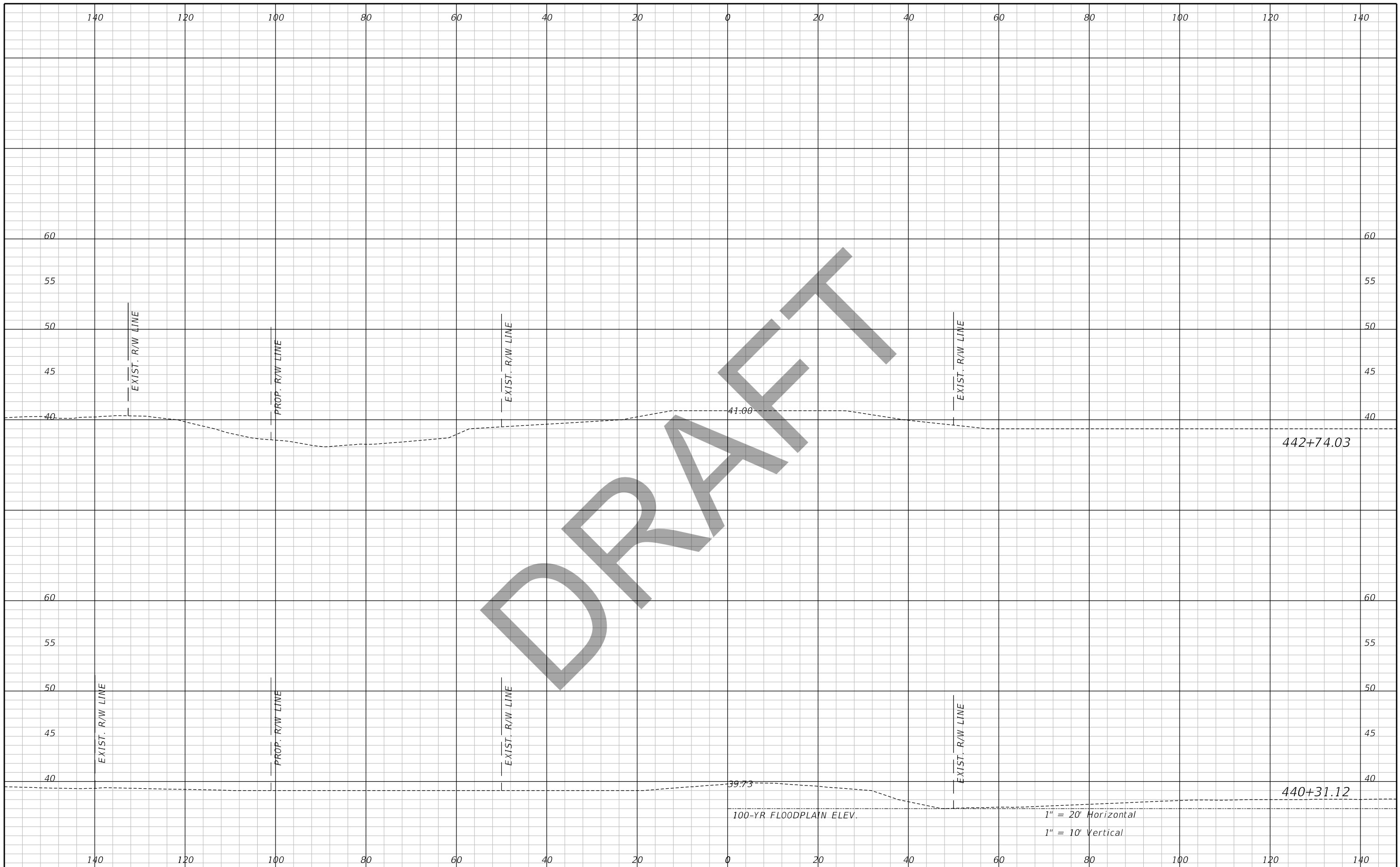
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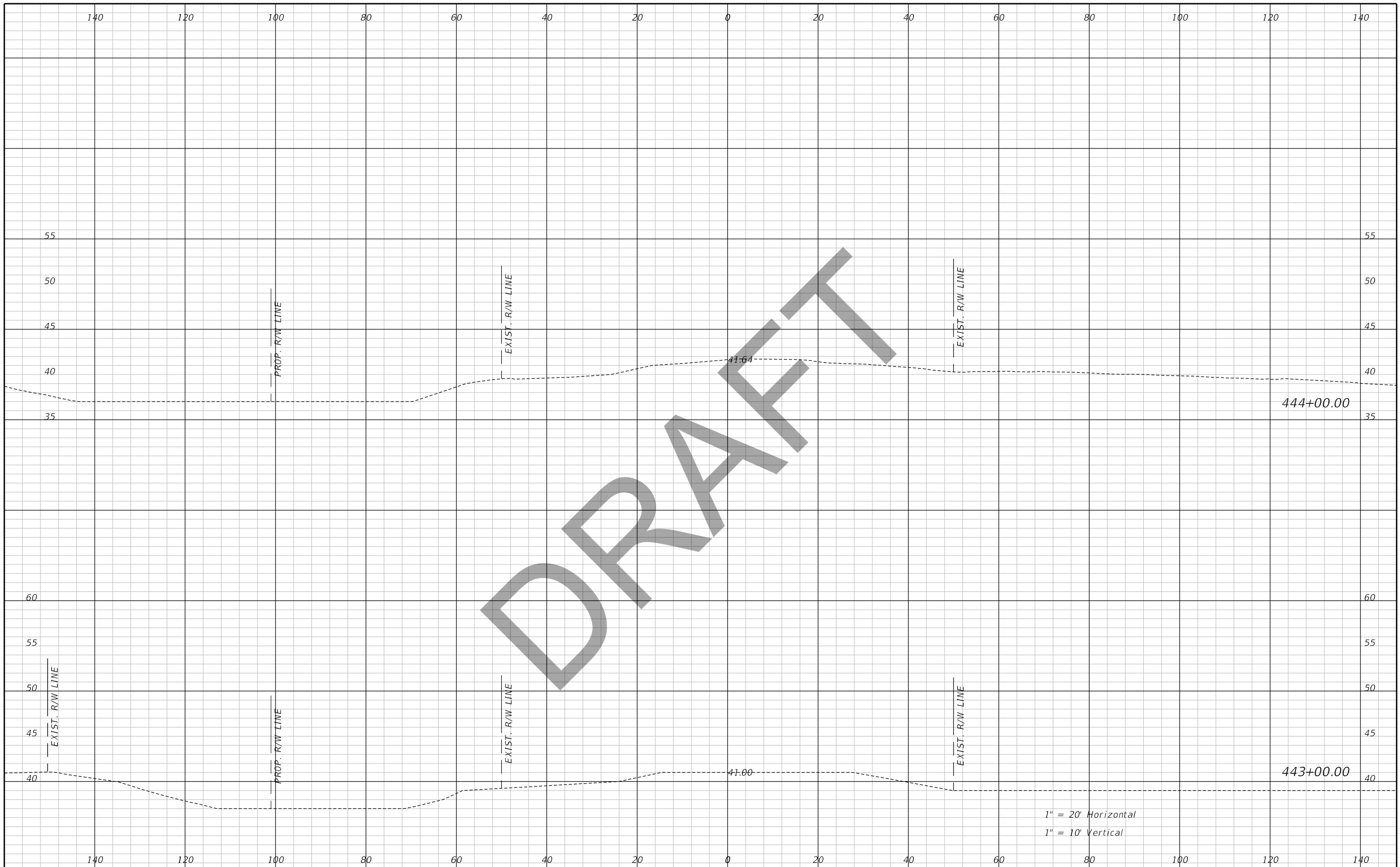
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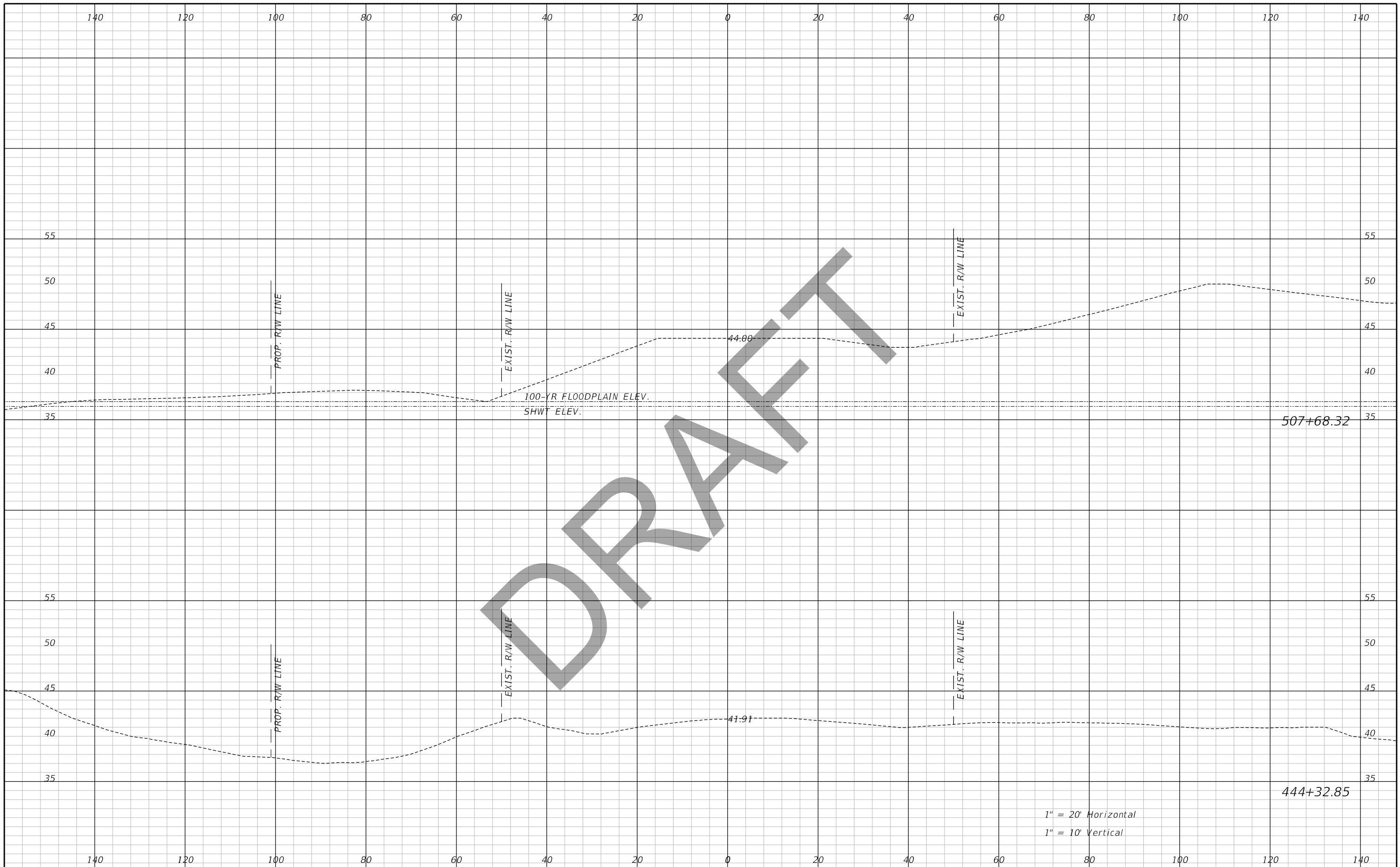
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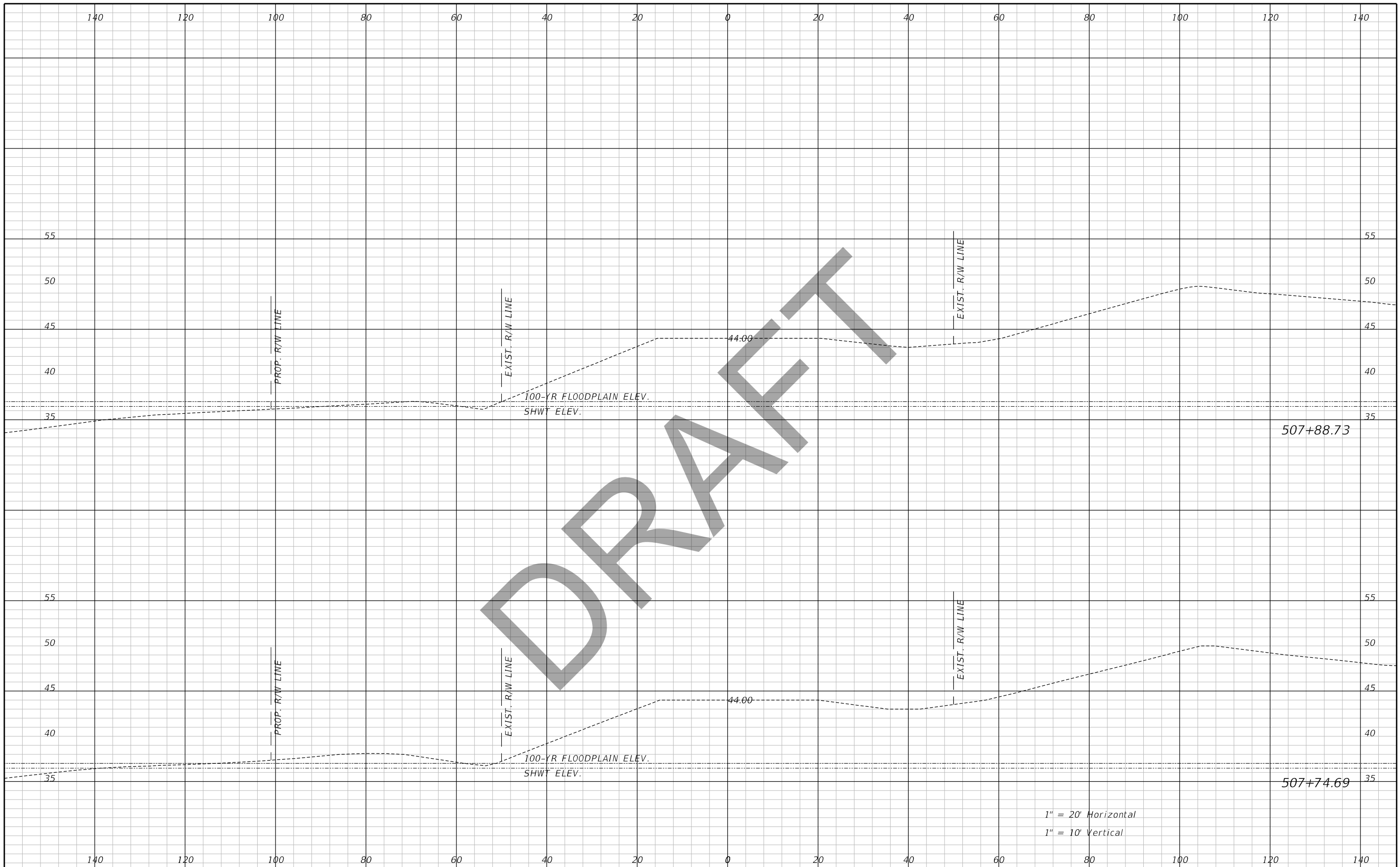
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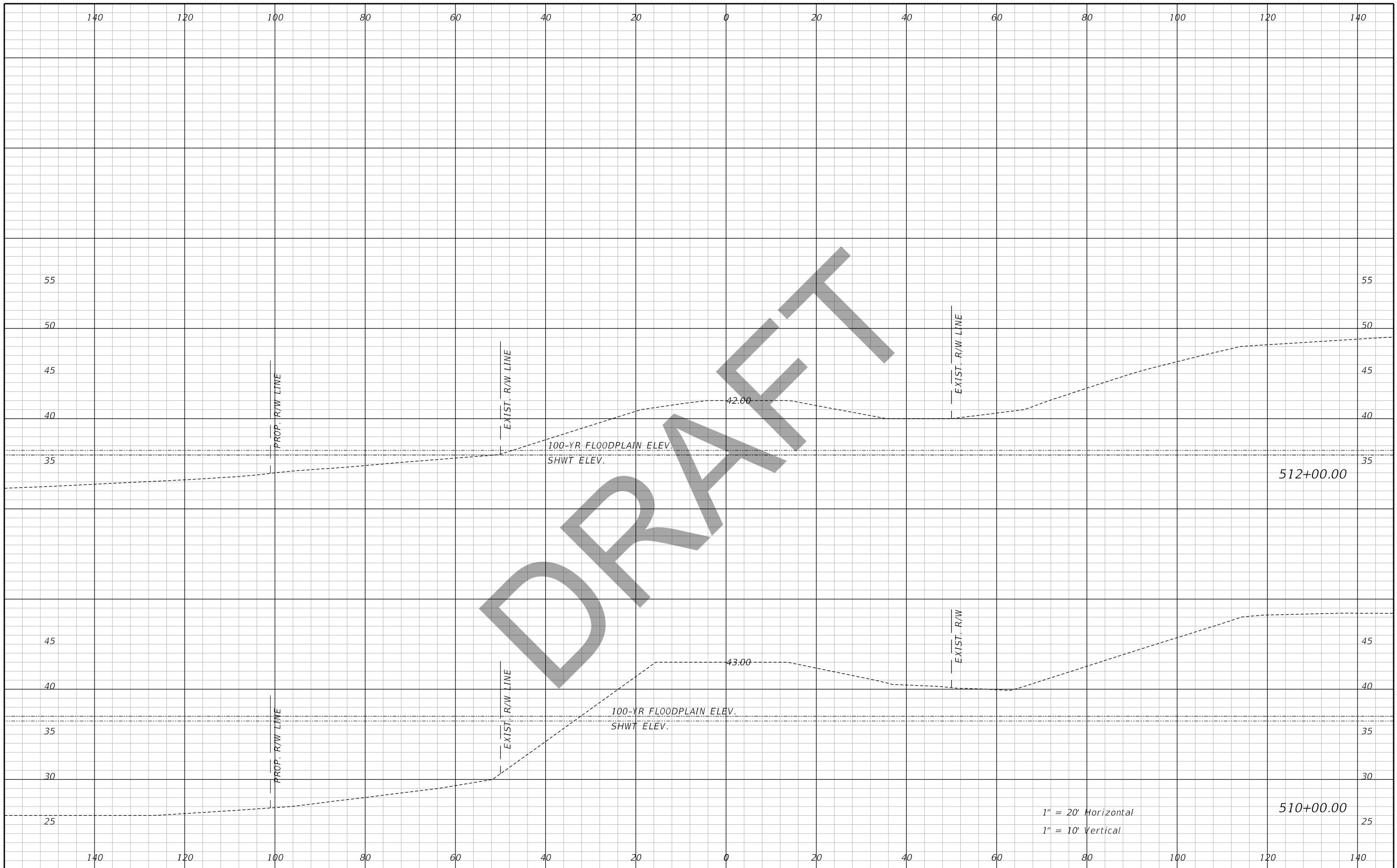
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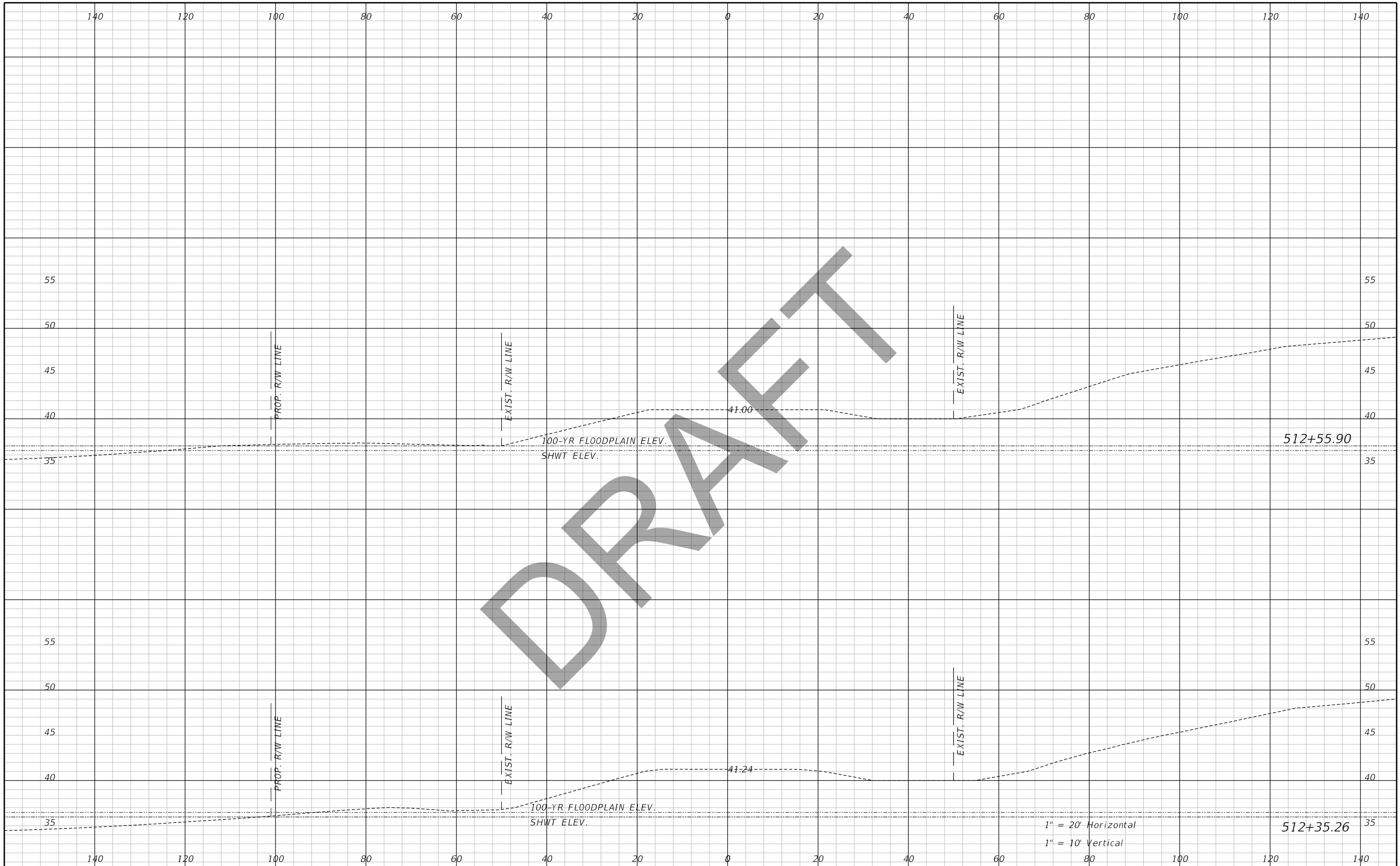
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DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 301	HILLSBOROUGH PASCO	255796-1

**FLOODPLAIN IMPACT &
COMPENSATION**

SHEET NO.

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 5J-17.062, F.A.C.

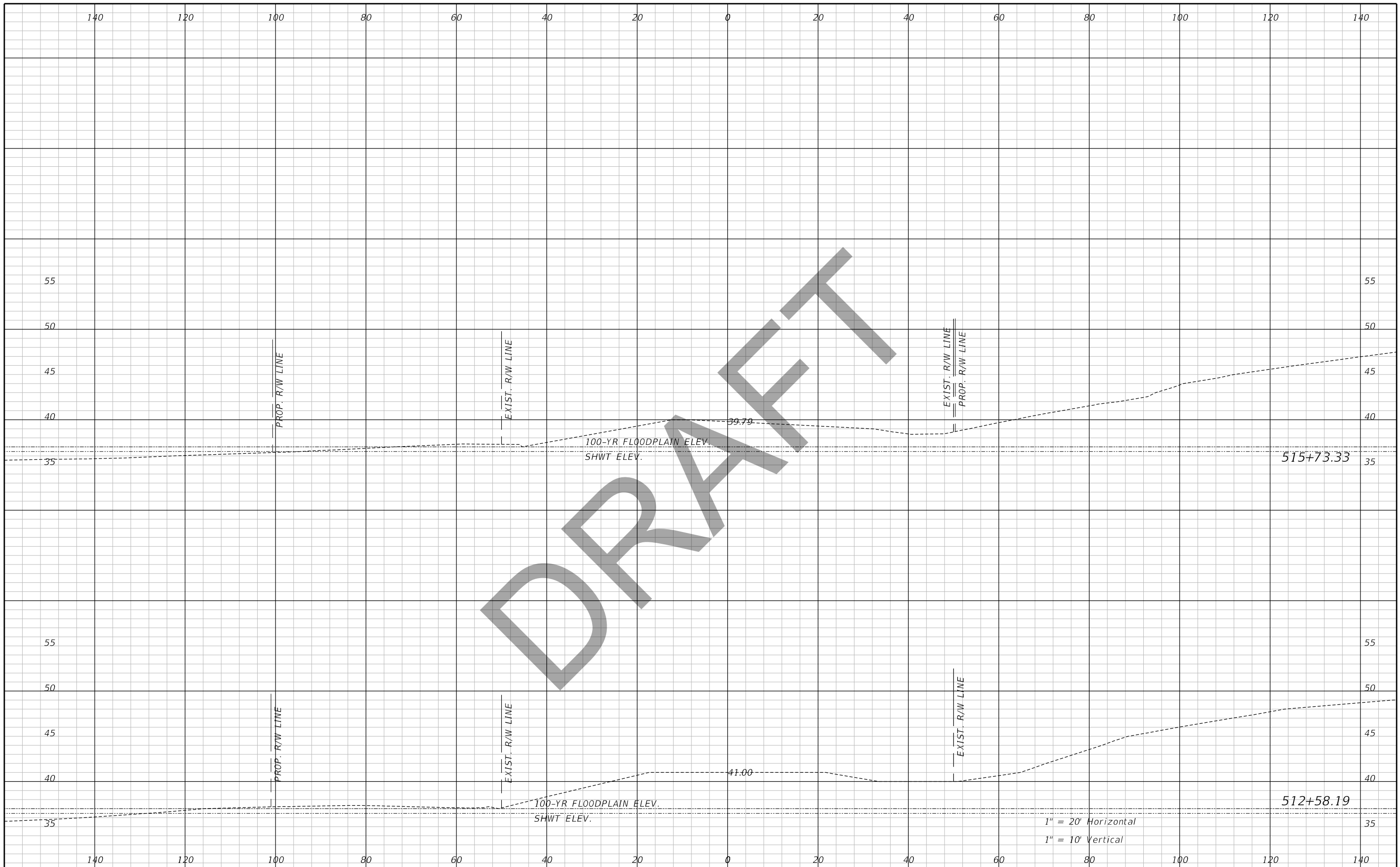


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1" = 20' Horizontal
1" = 10' Vertical

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DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
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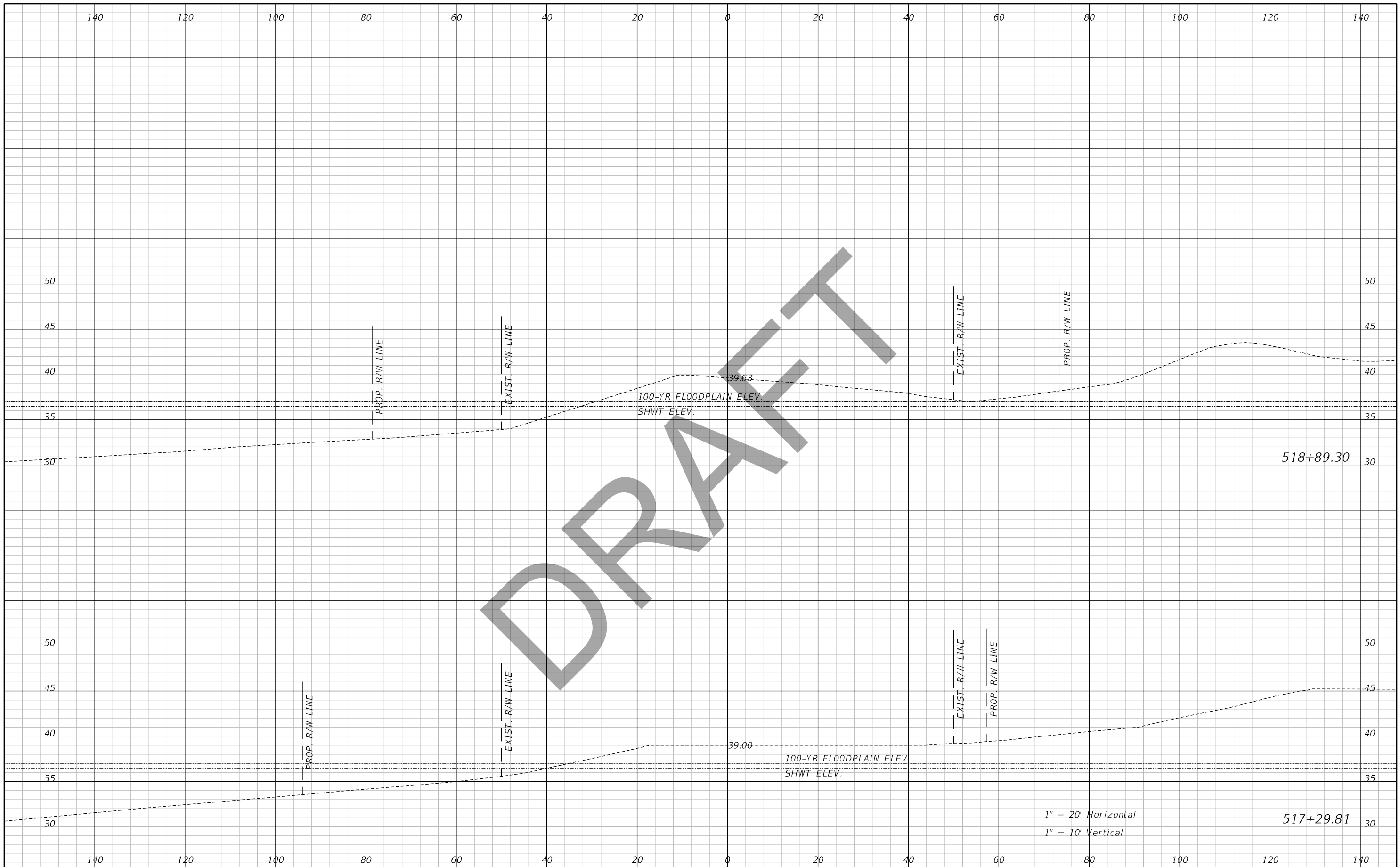
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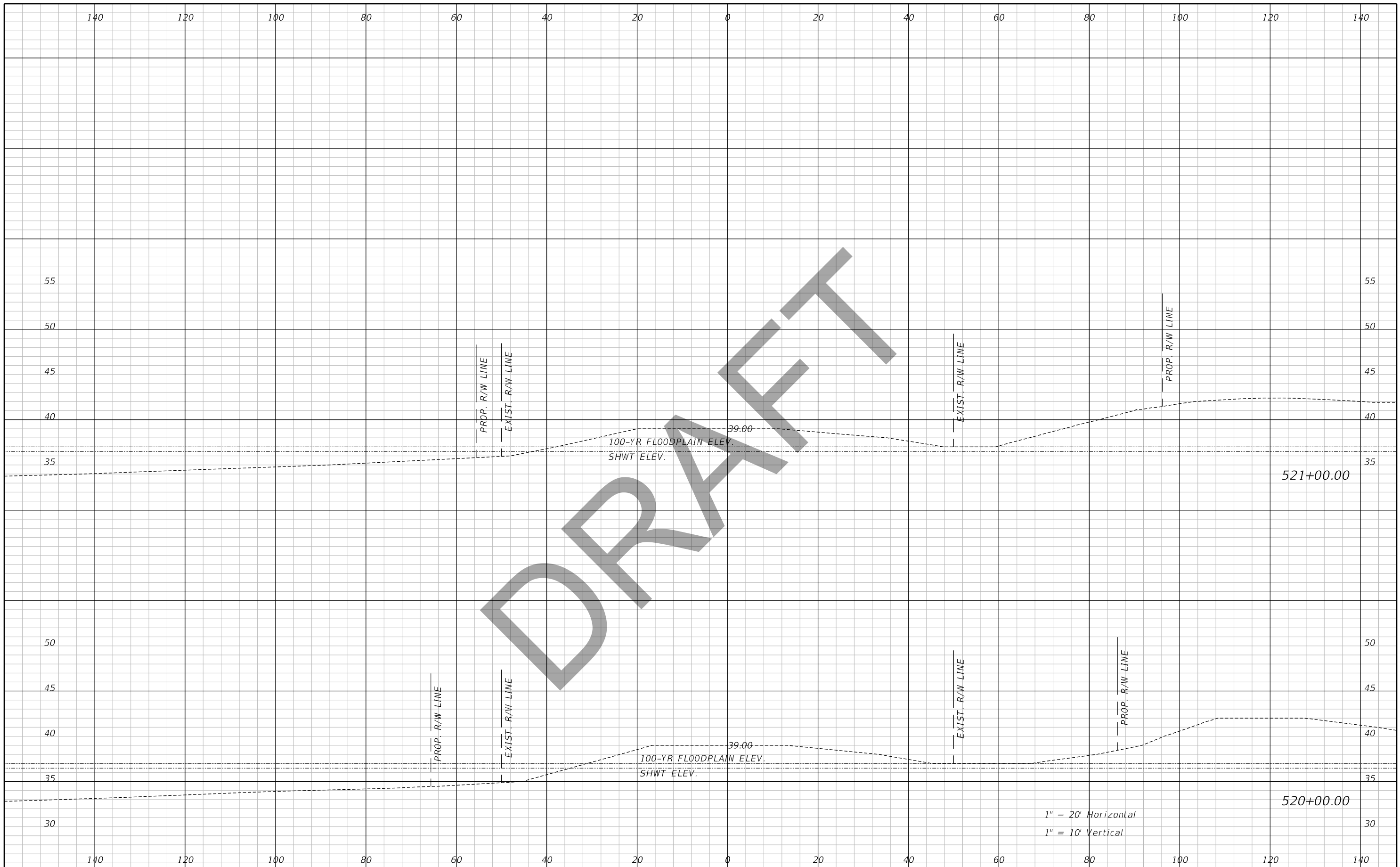
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DATE	DESCRIPTION	DATE	DESCRIPTION					
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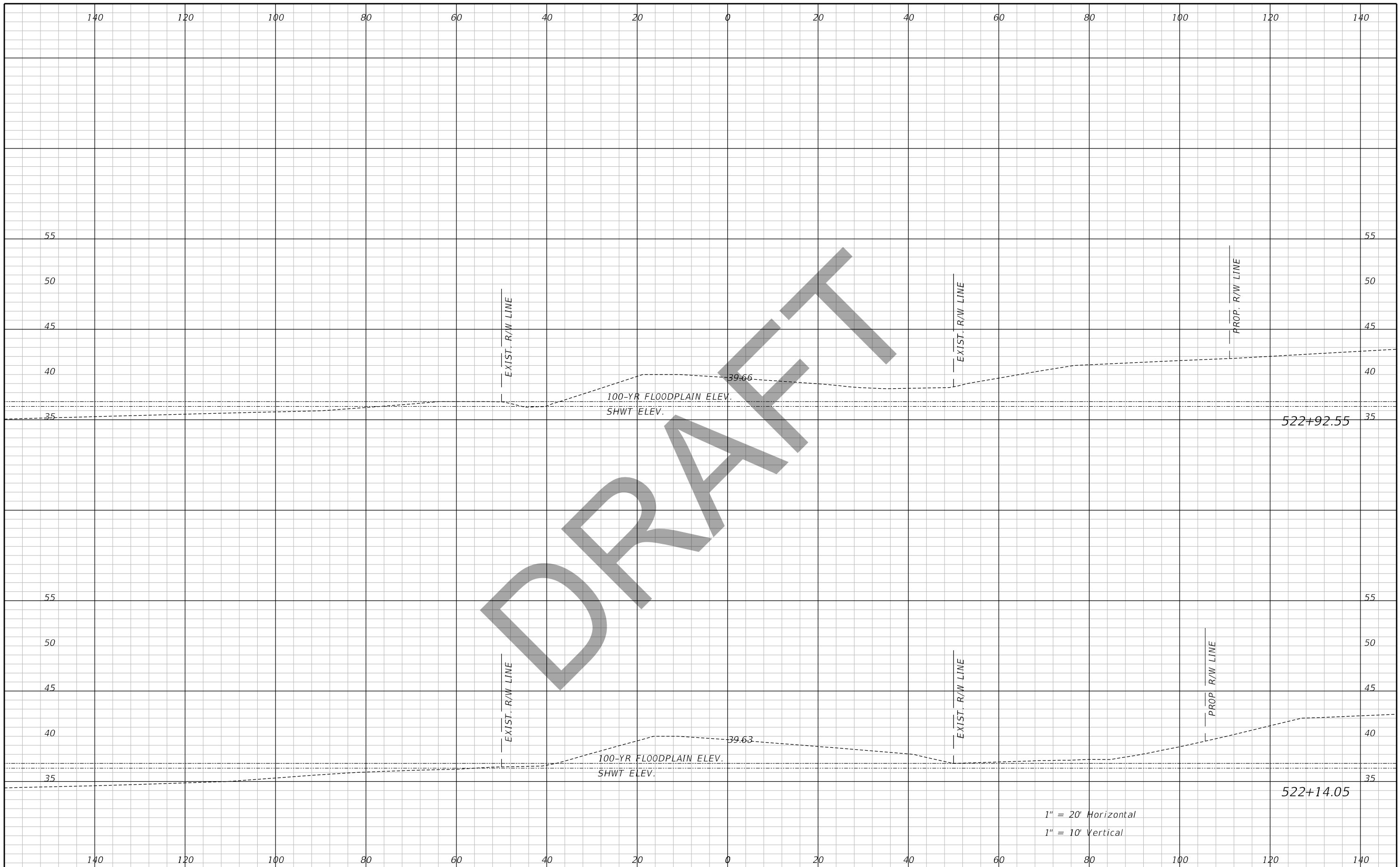
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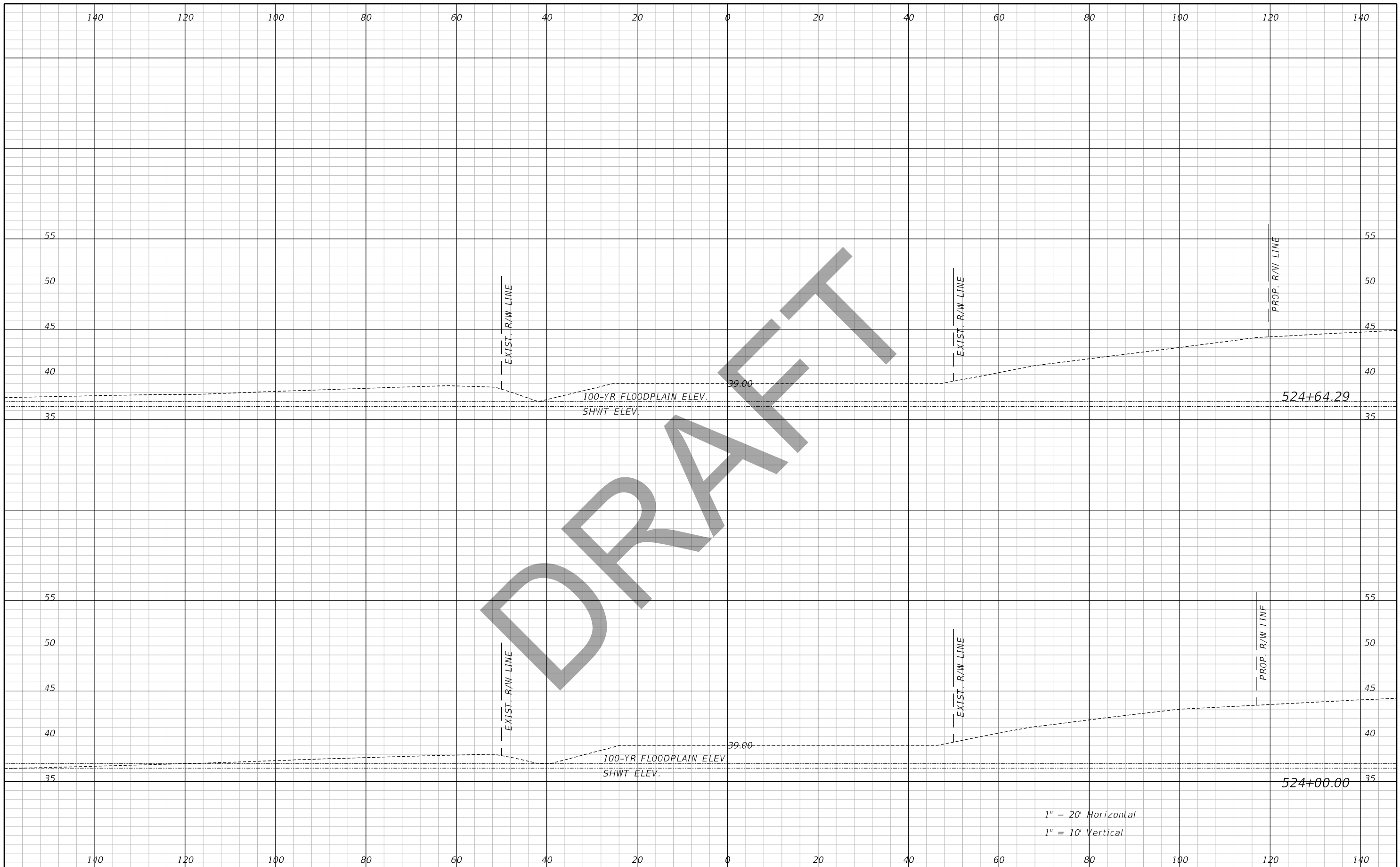
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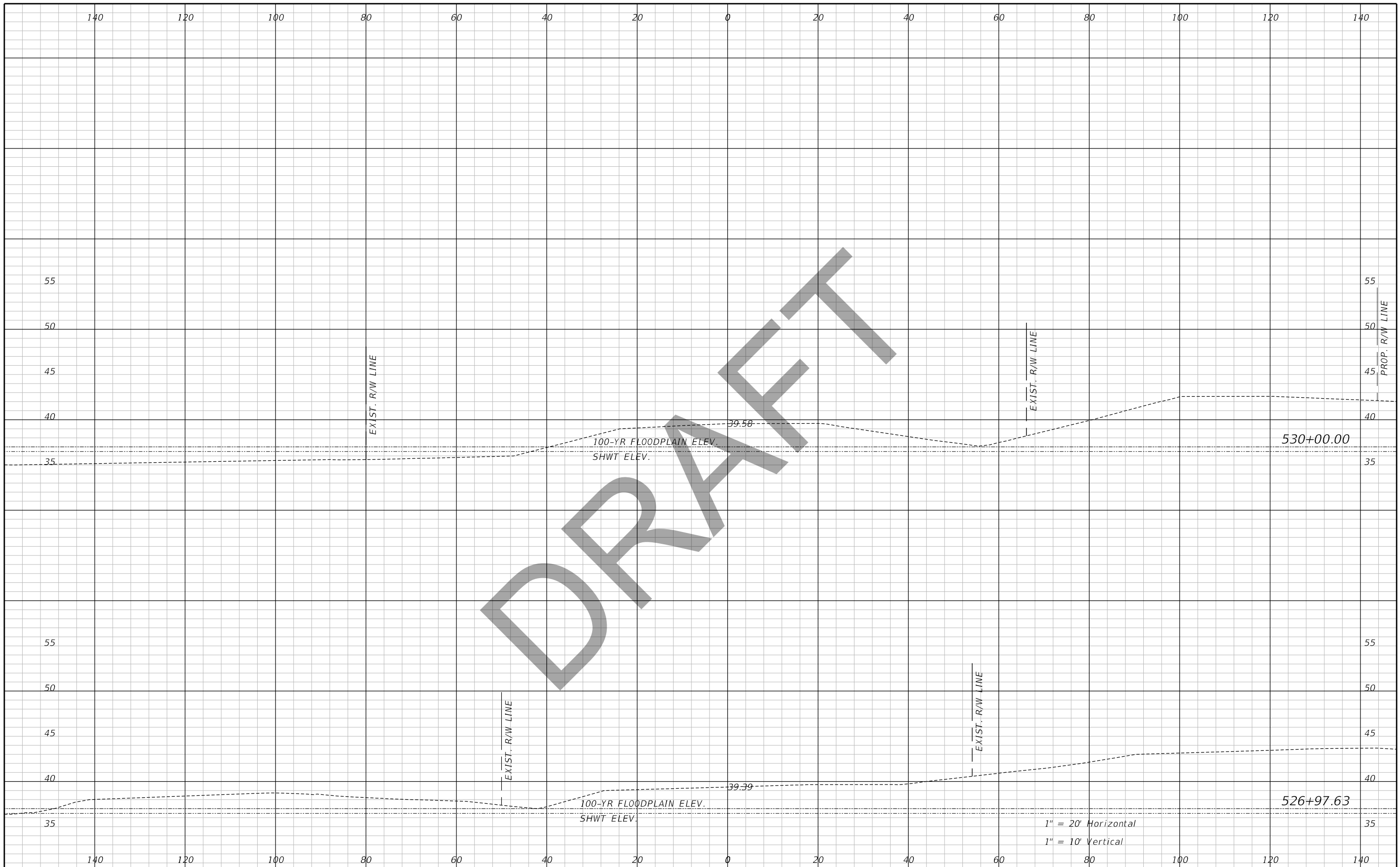
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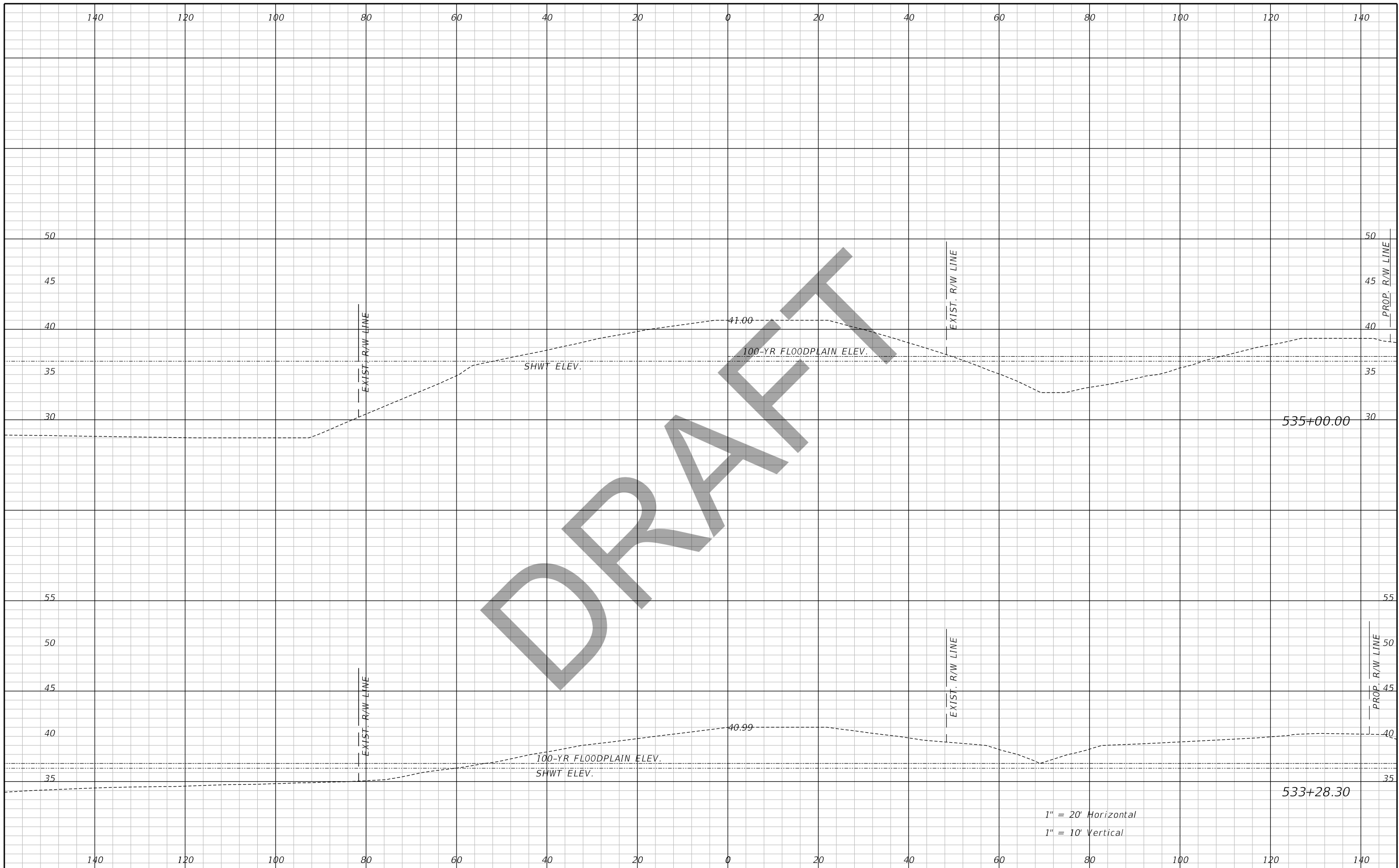
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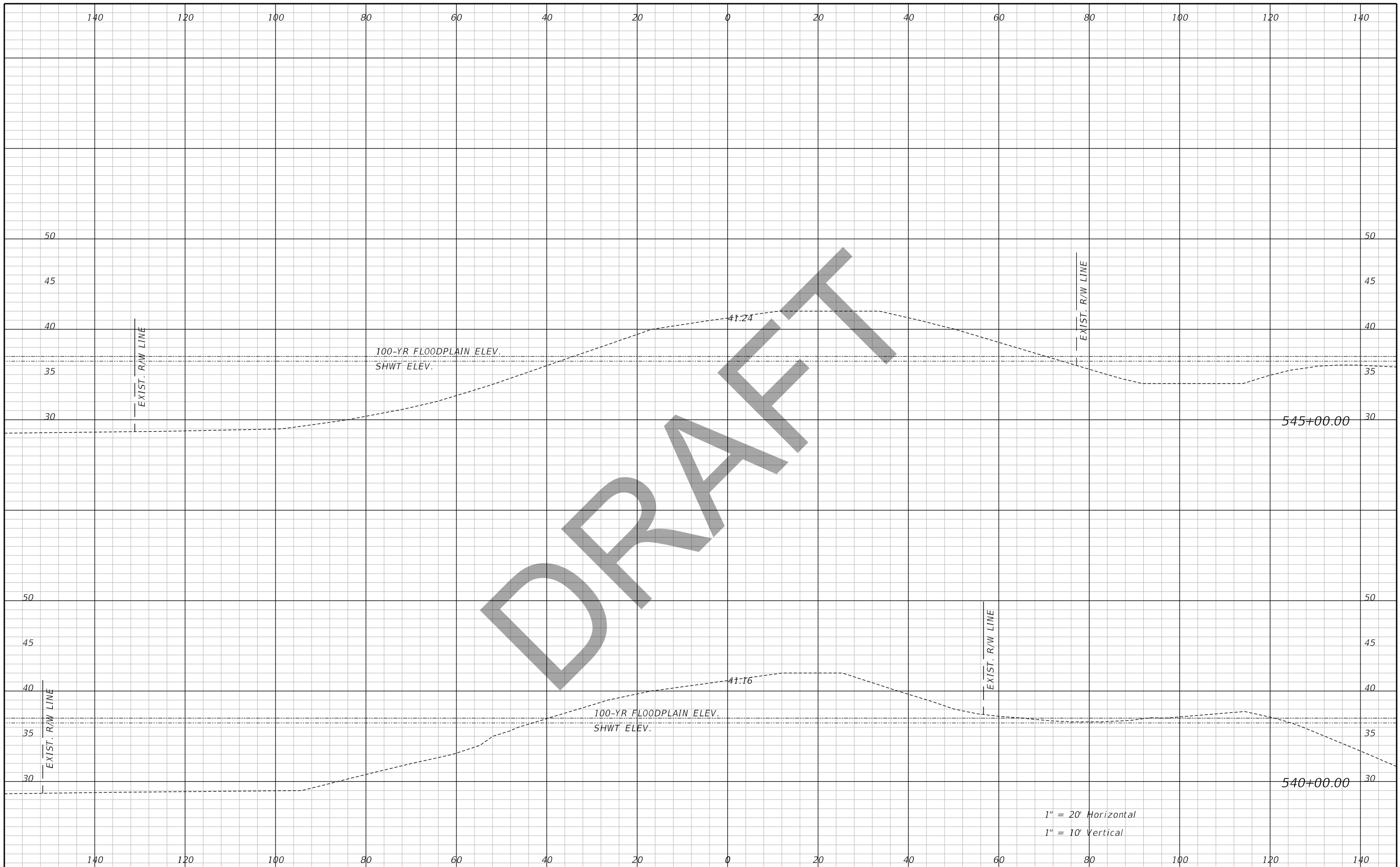
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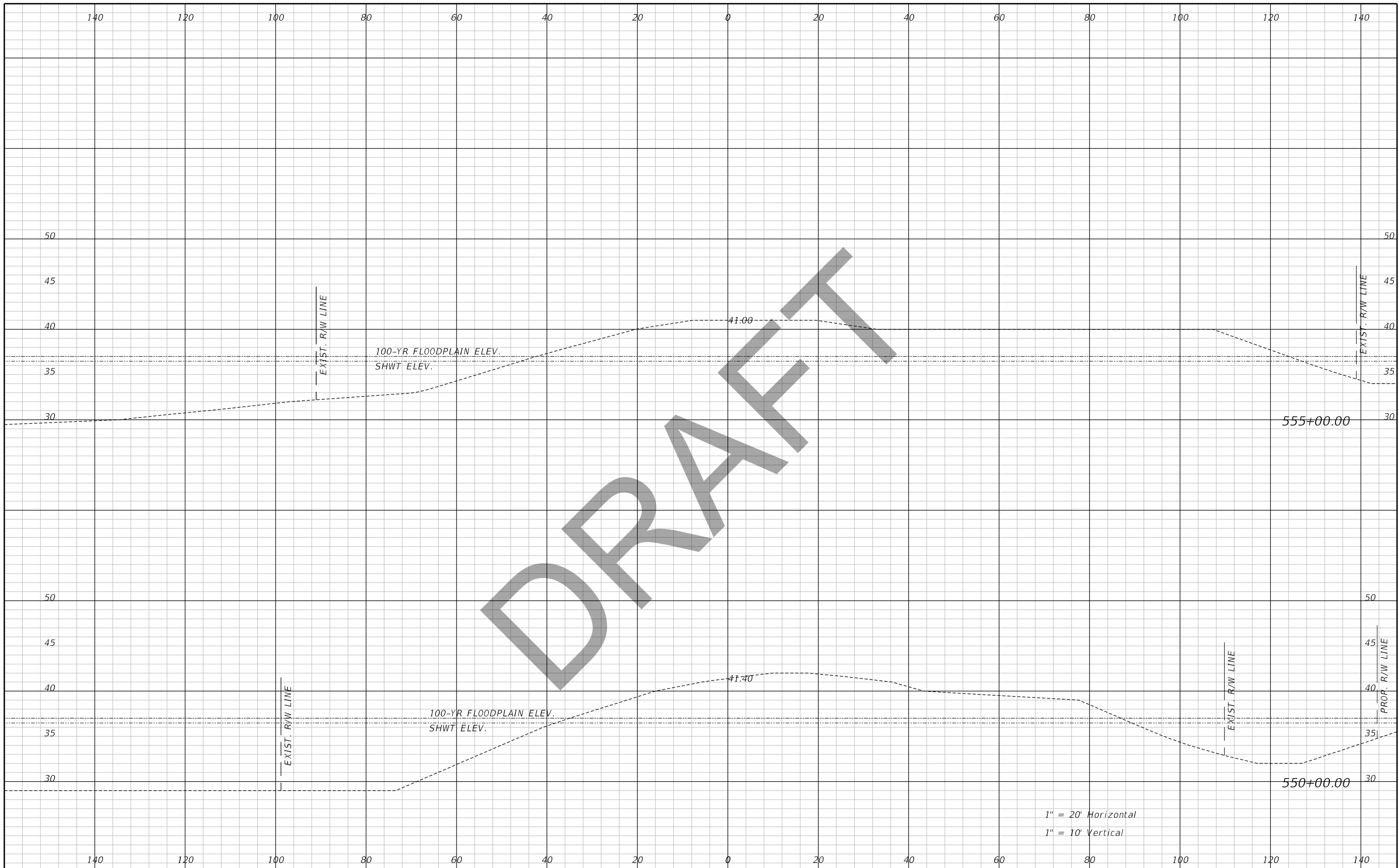
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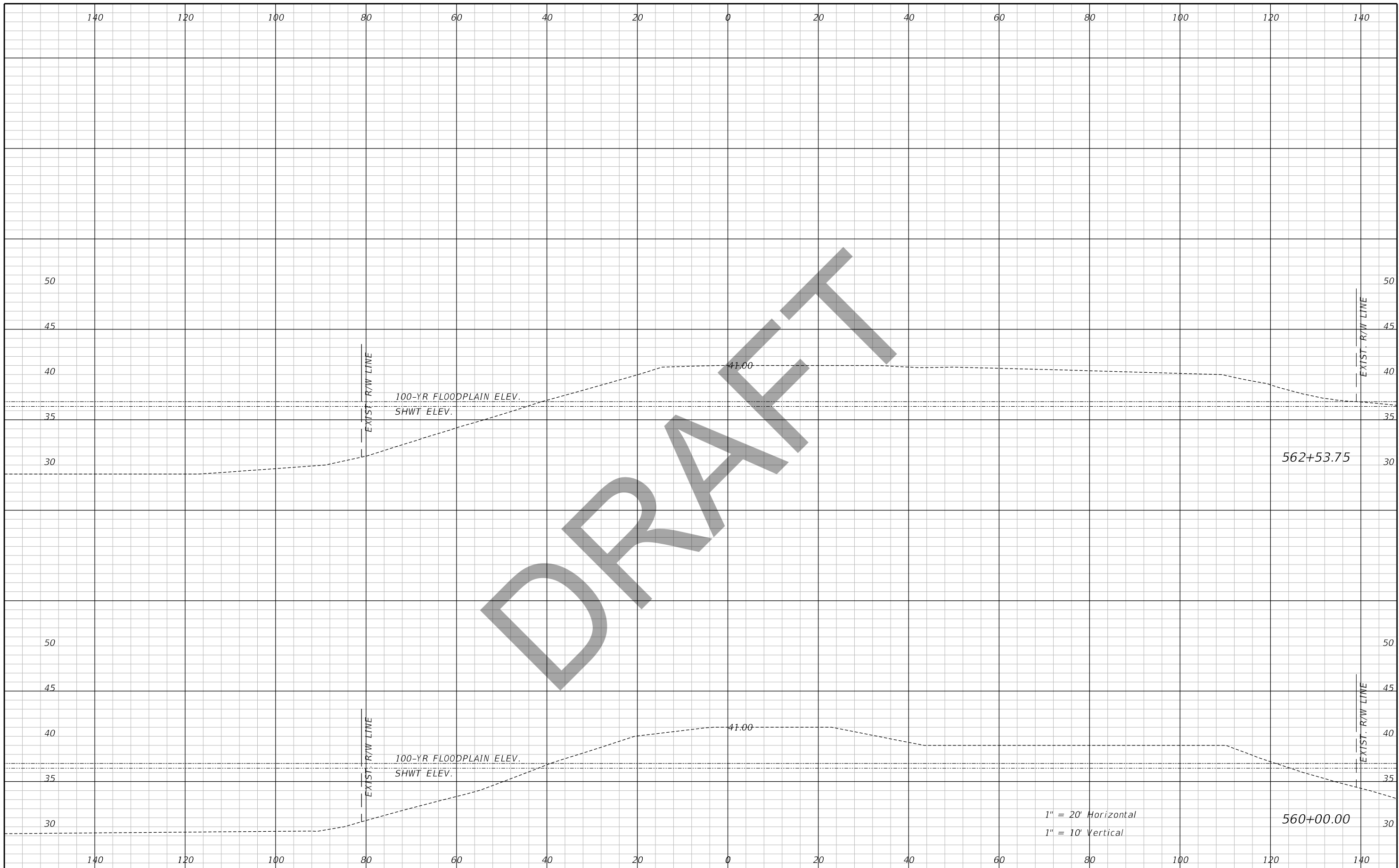
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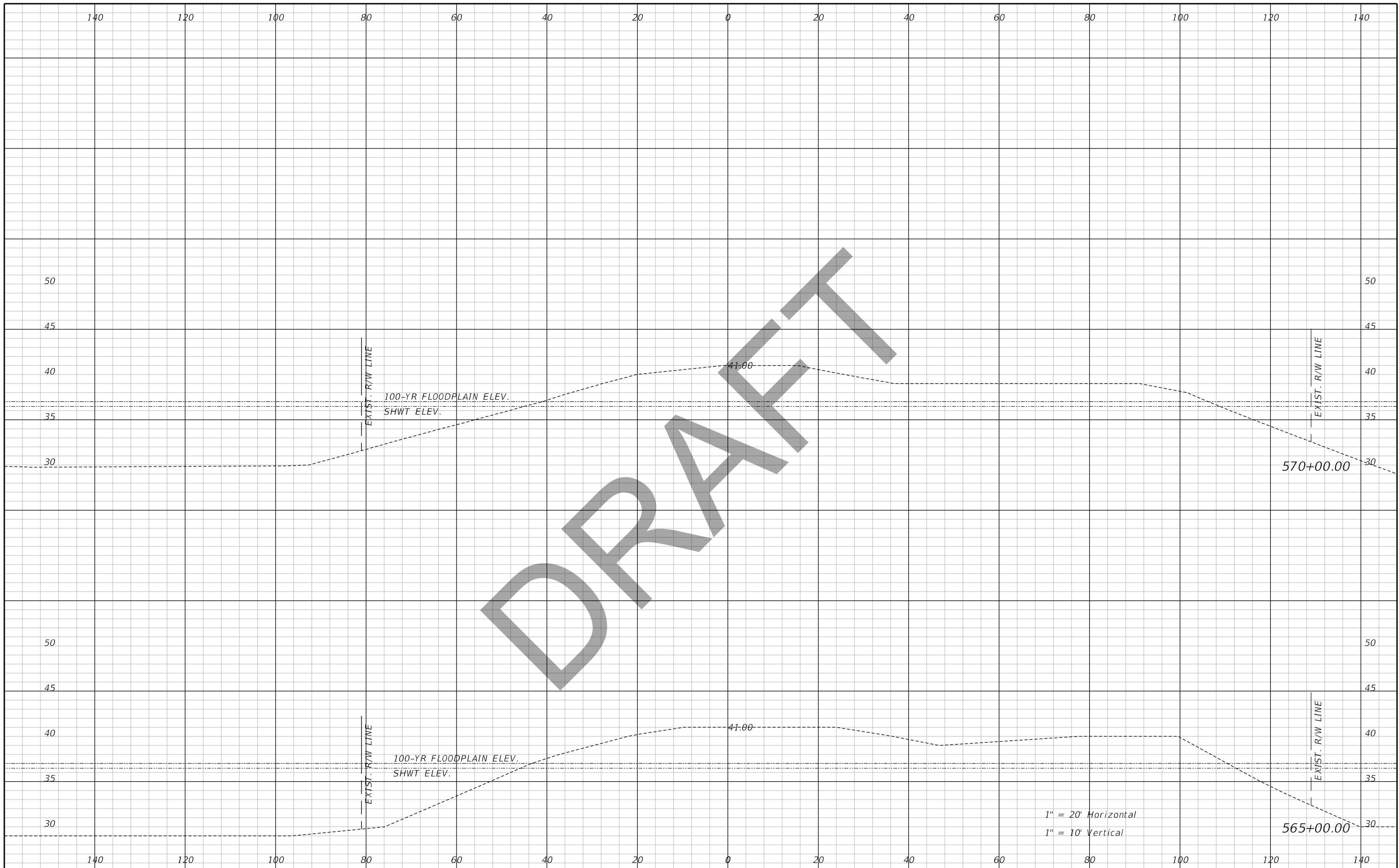
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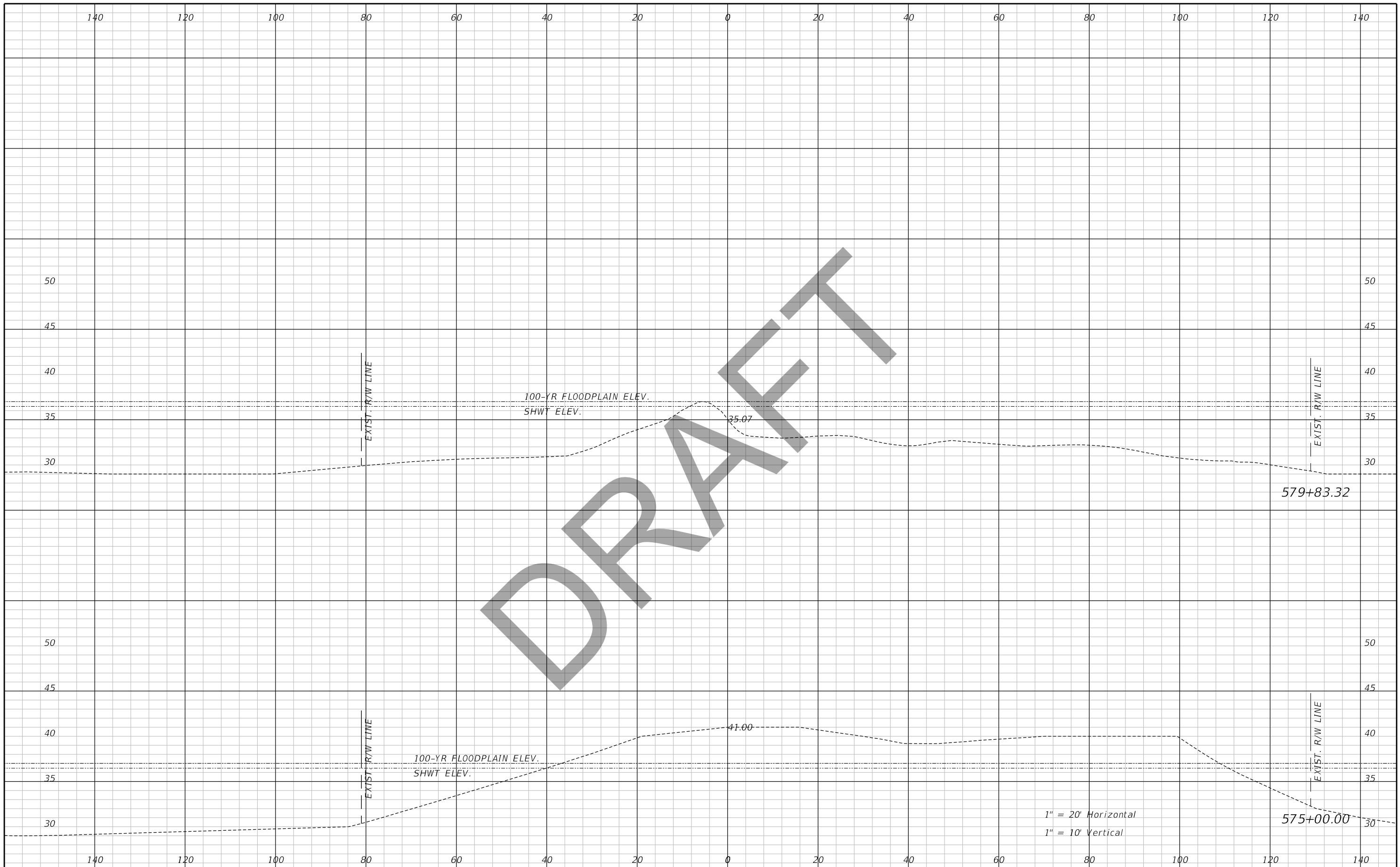
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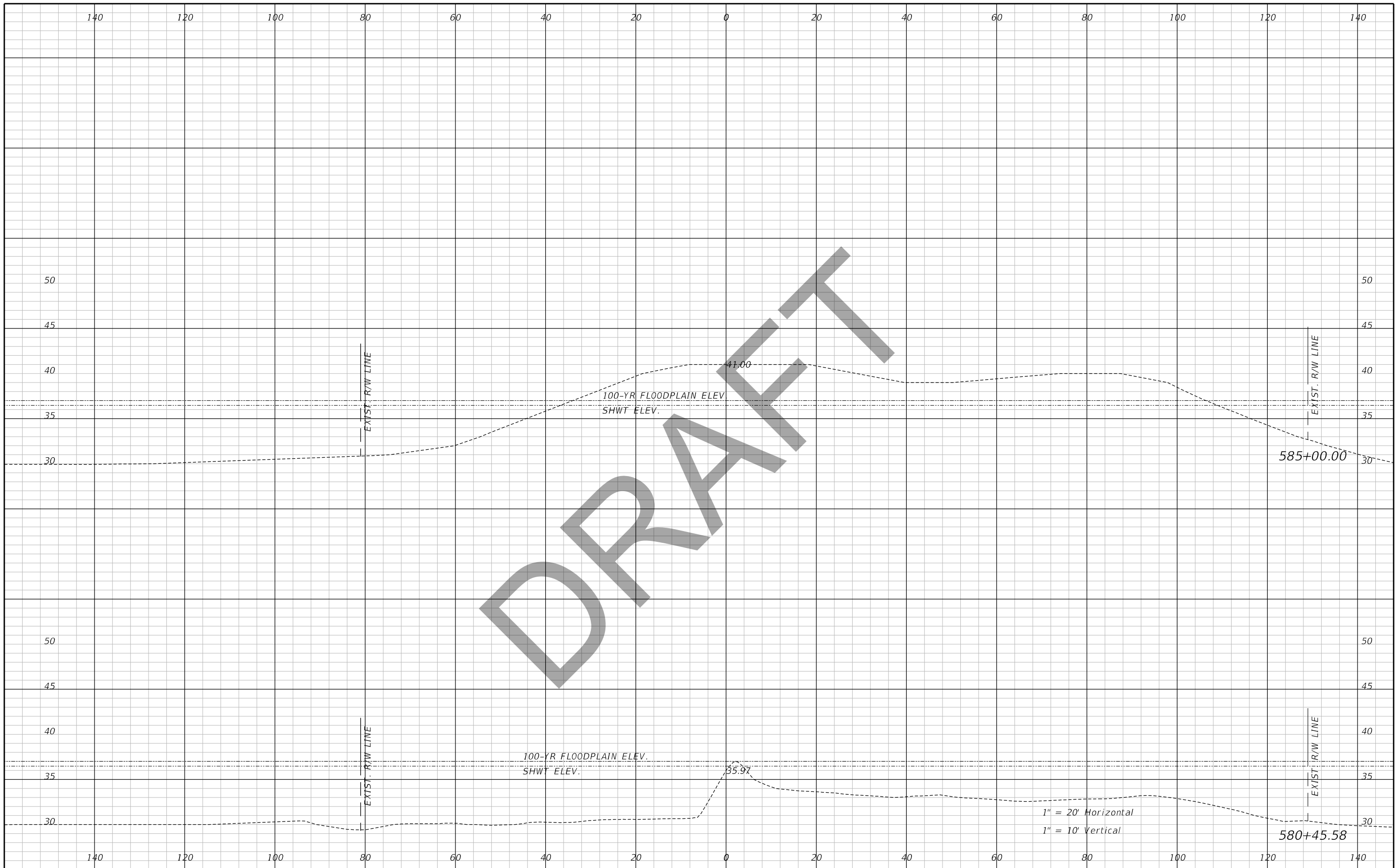
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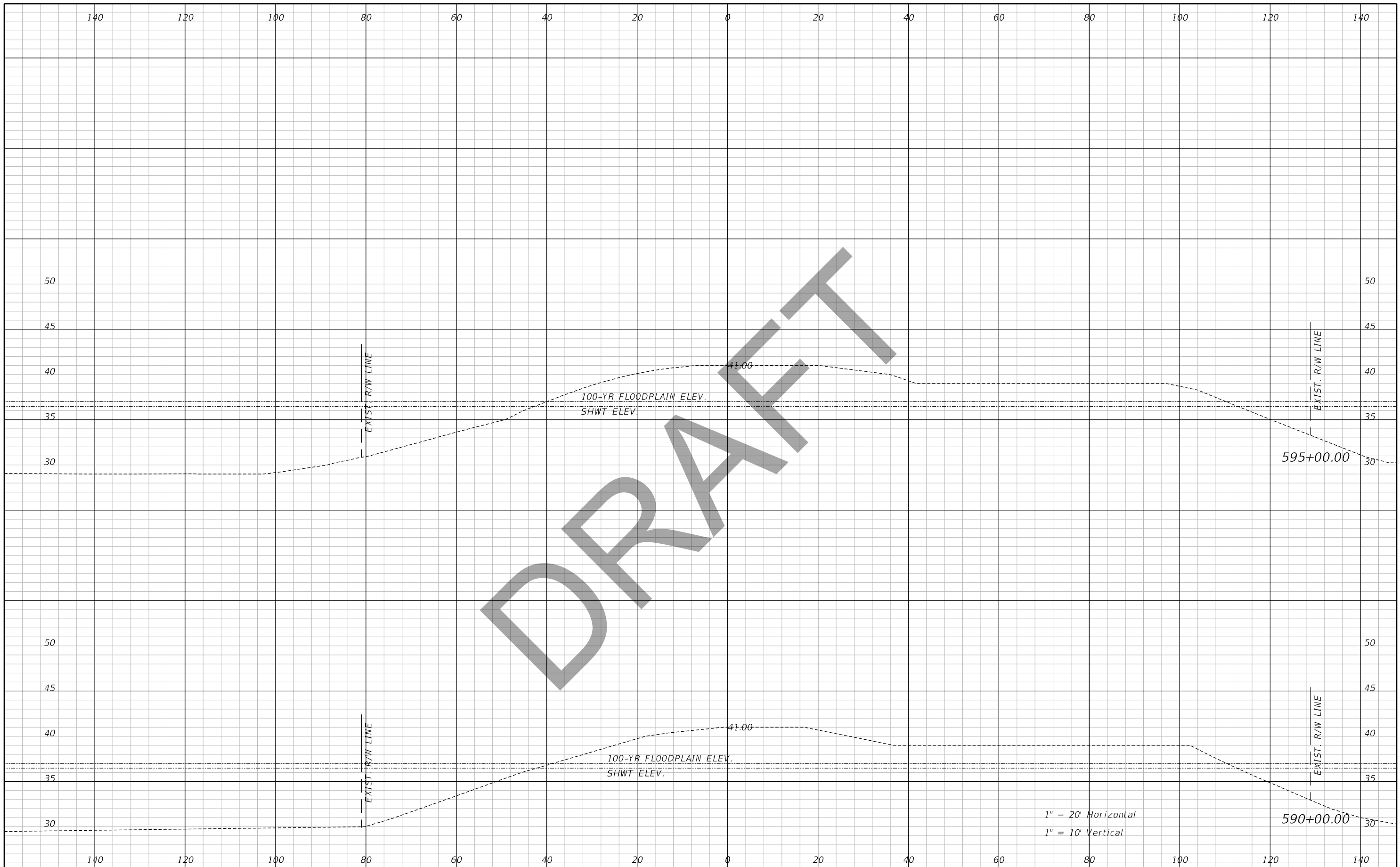
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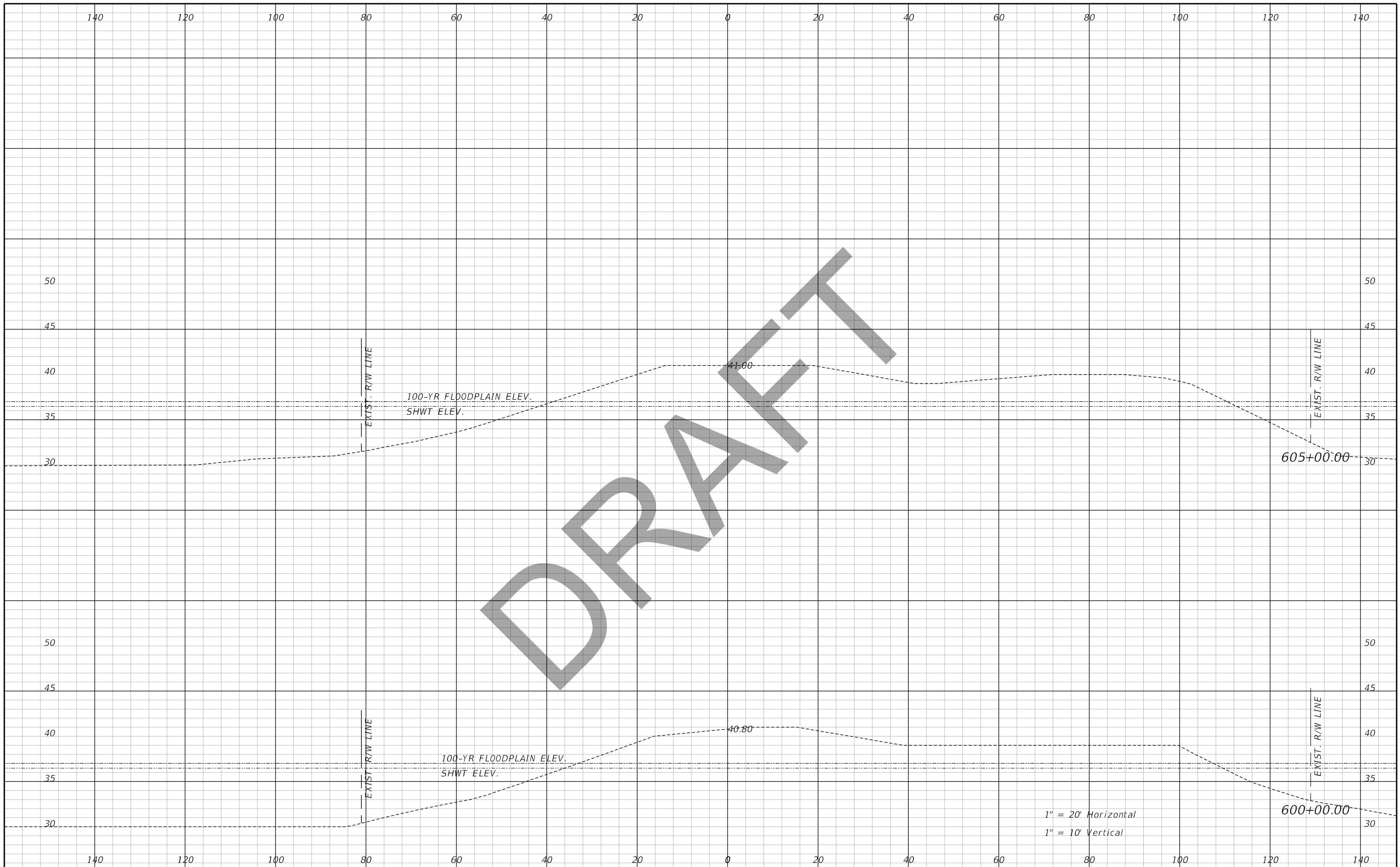
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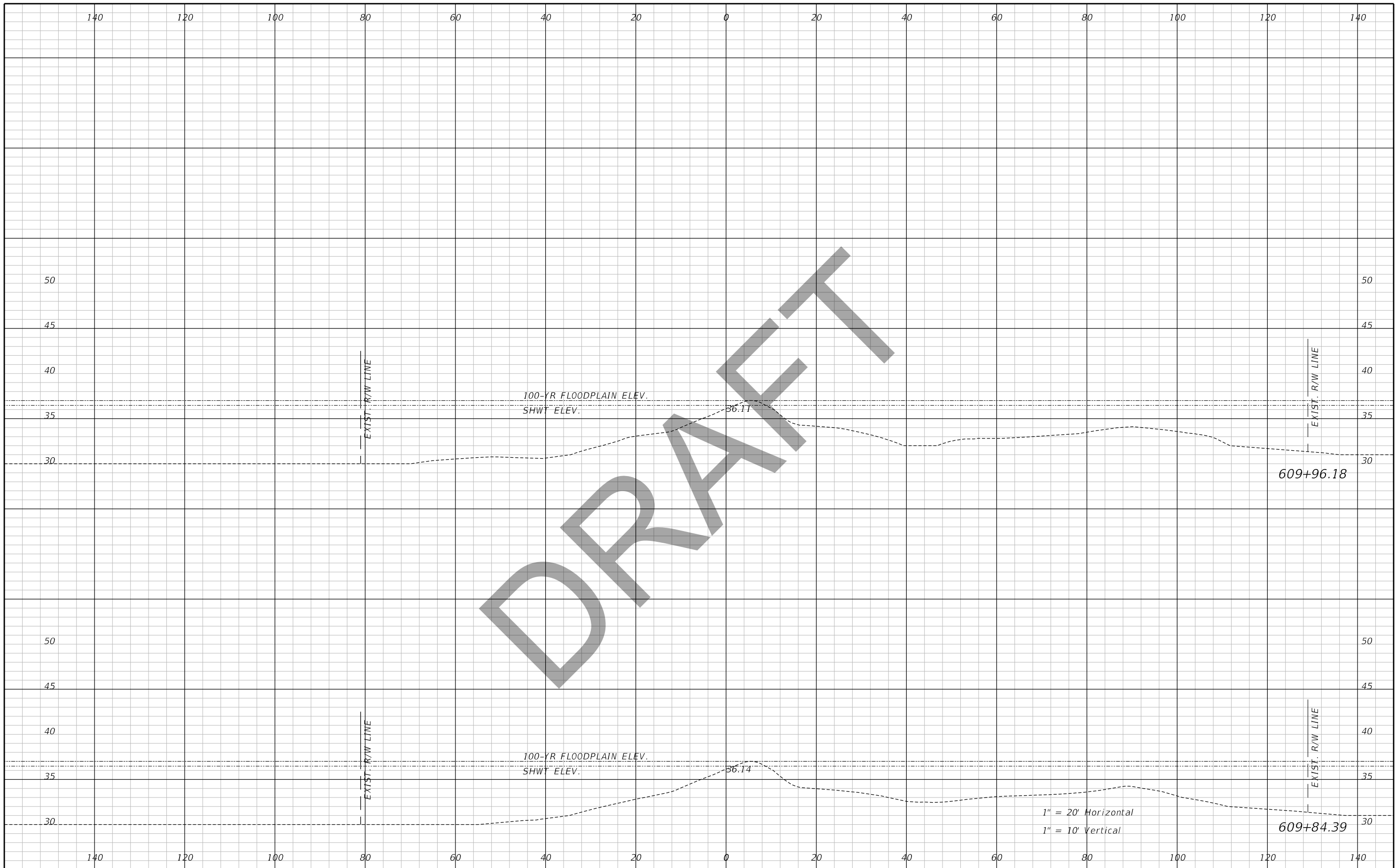
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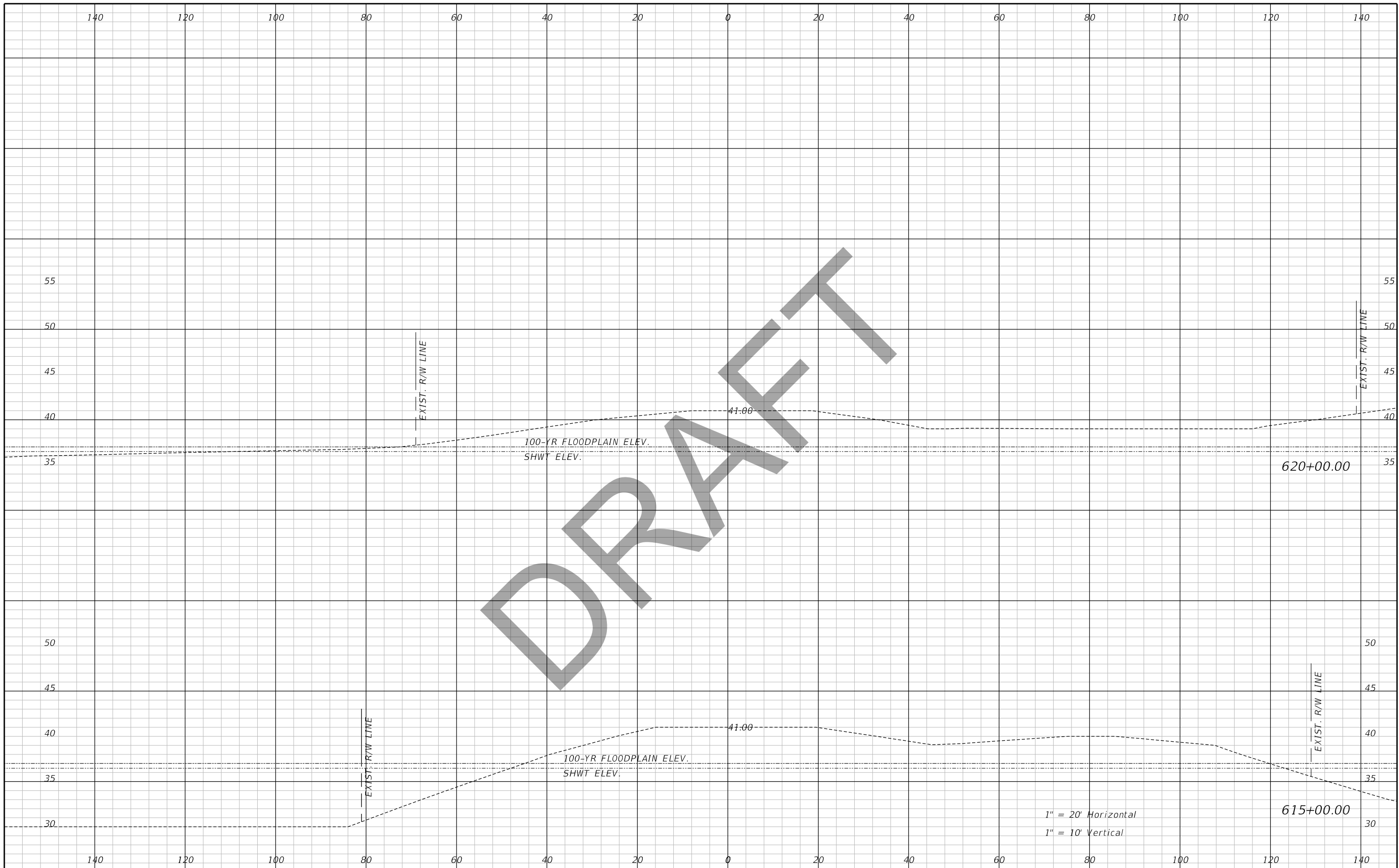
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US 301	HILLSBOROUGH PASCO	255796-1

**FLOODPLAIN IMPACT &
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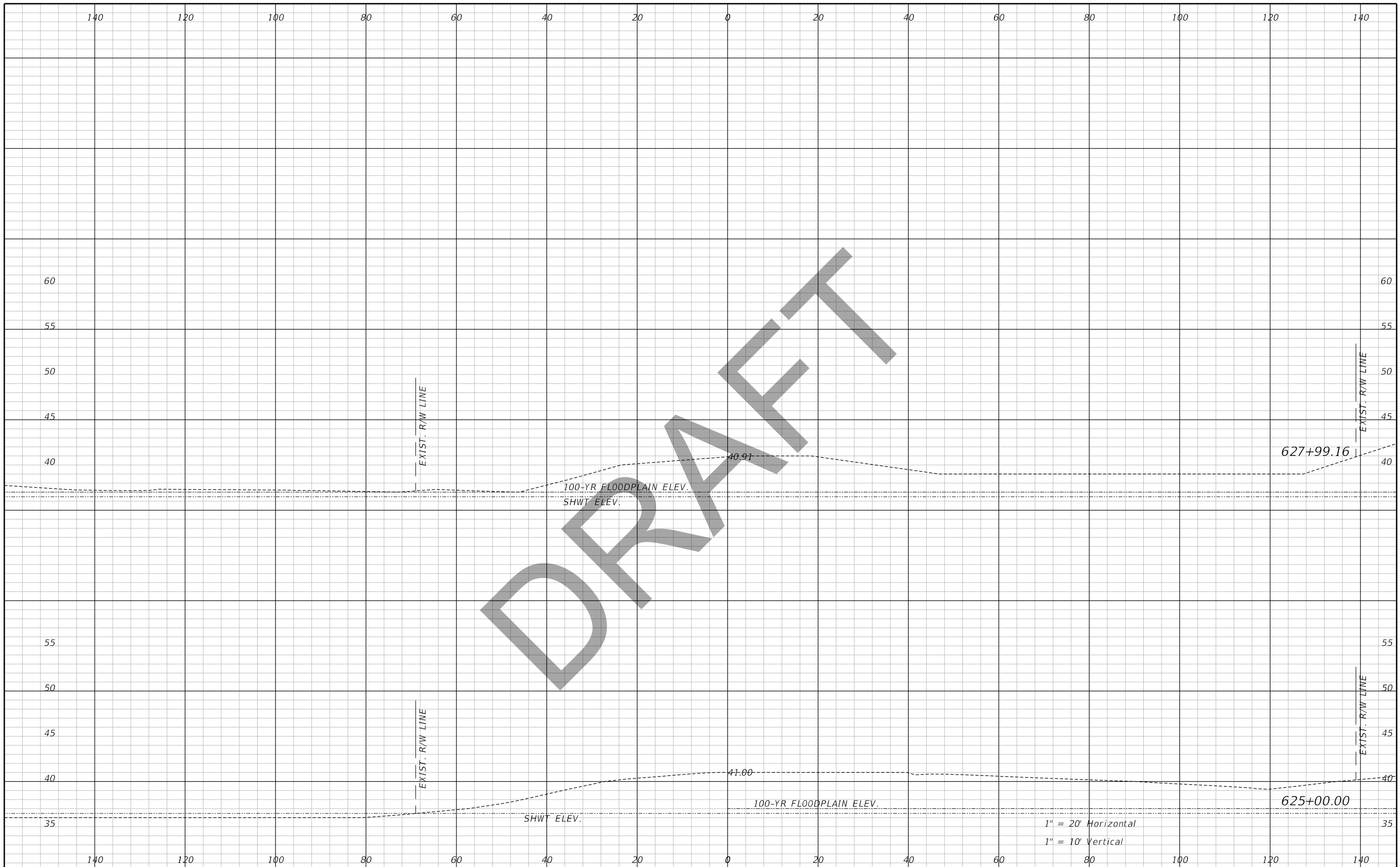
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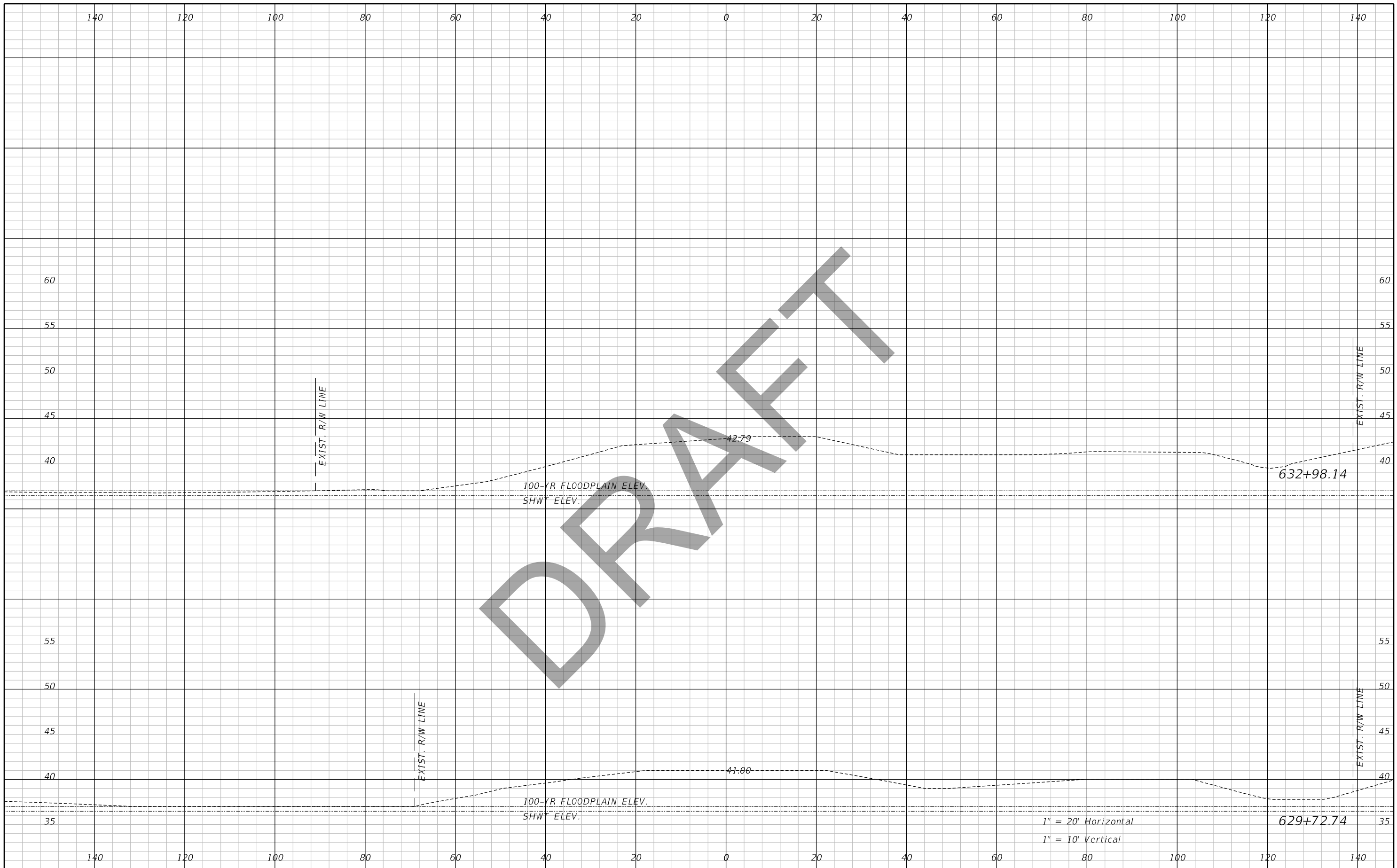
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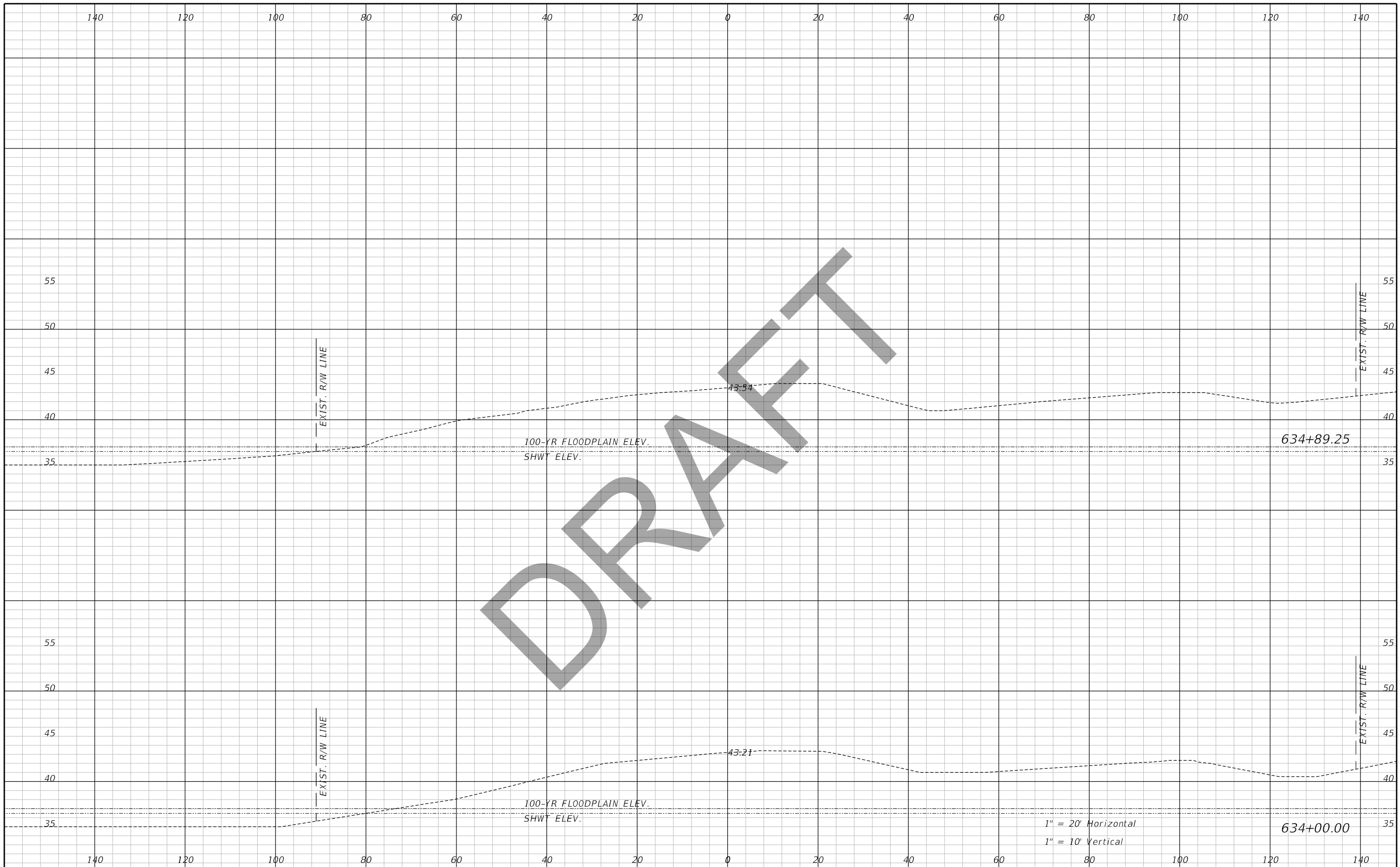
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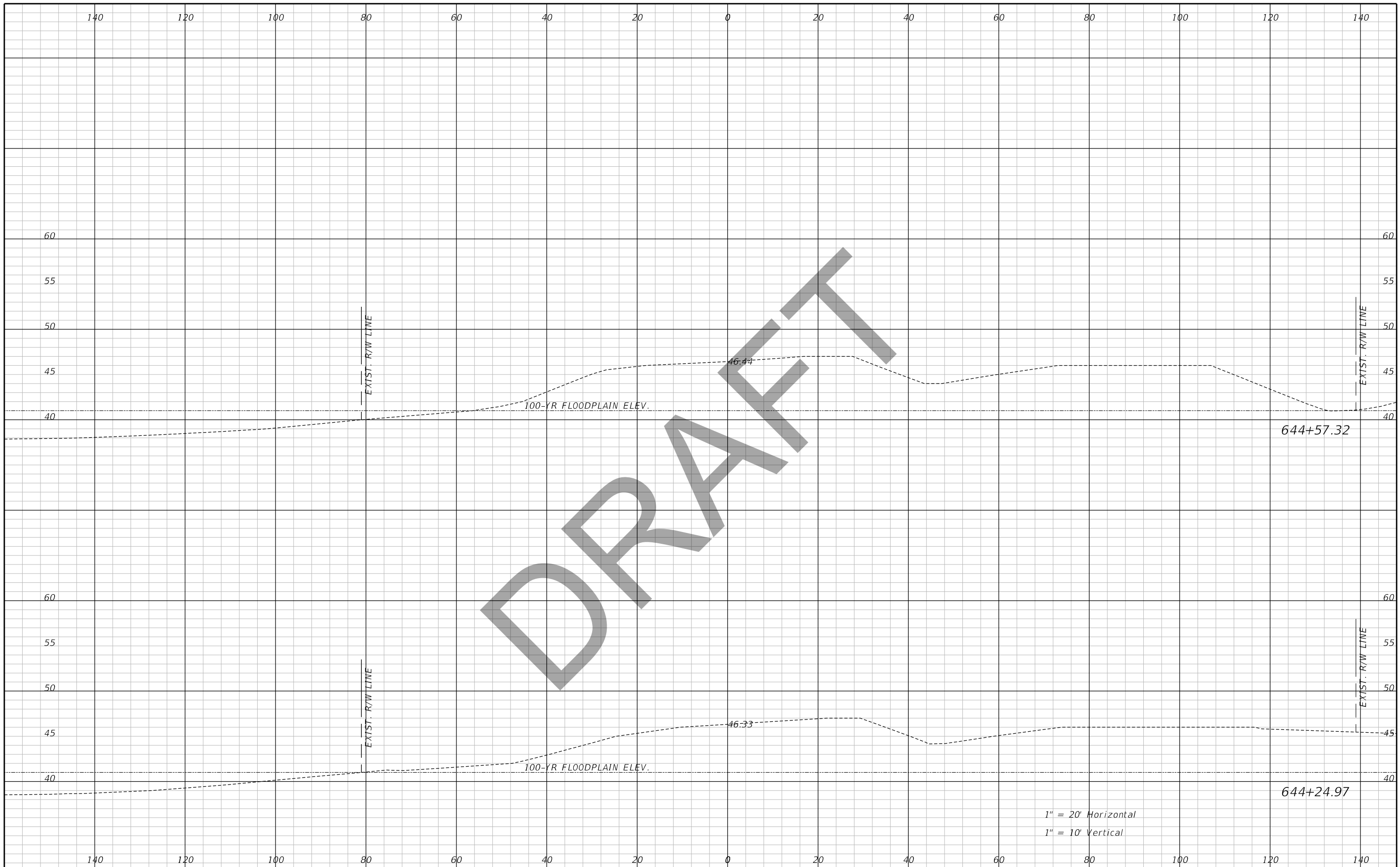
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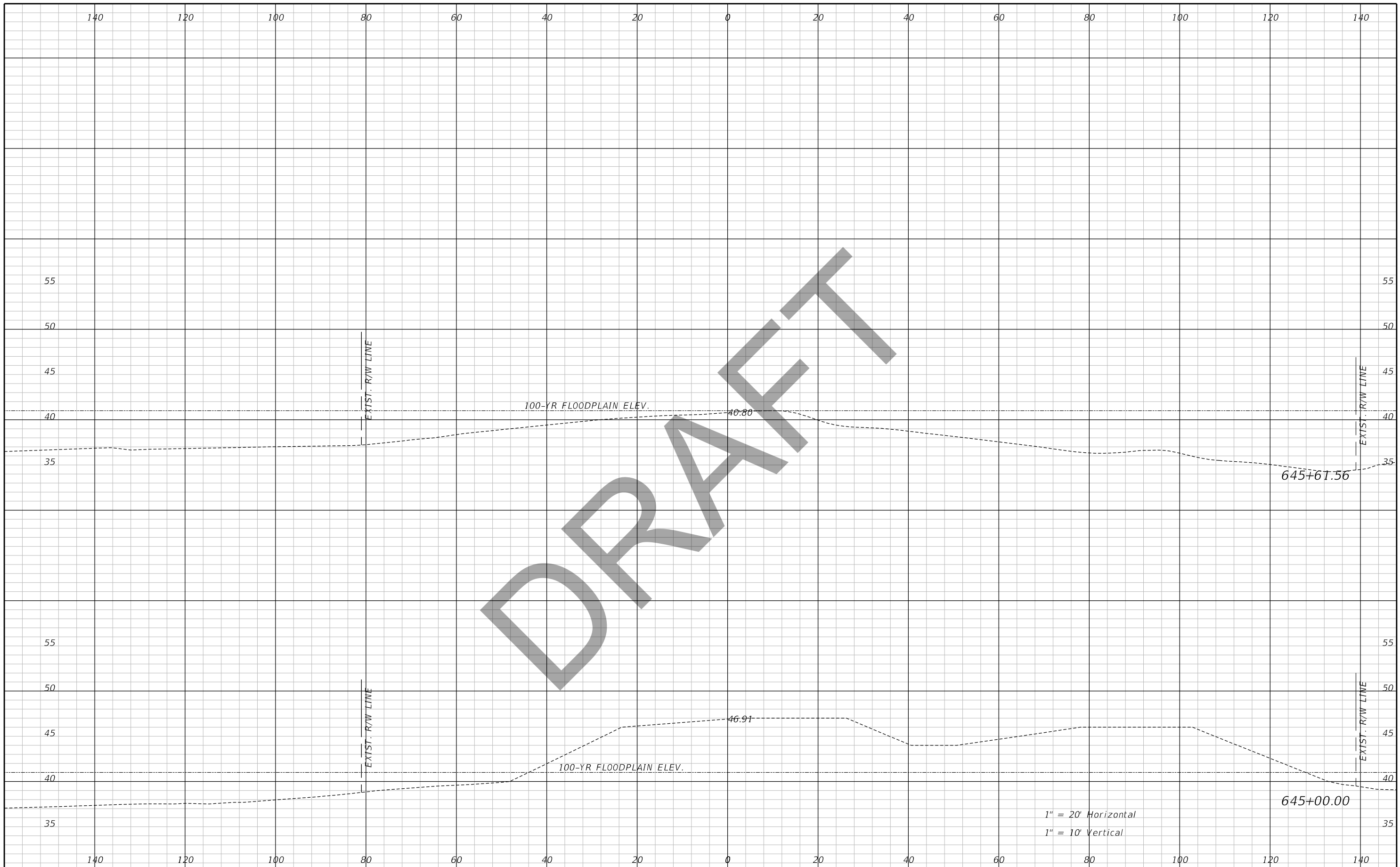
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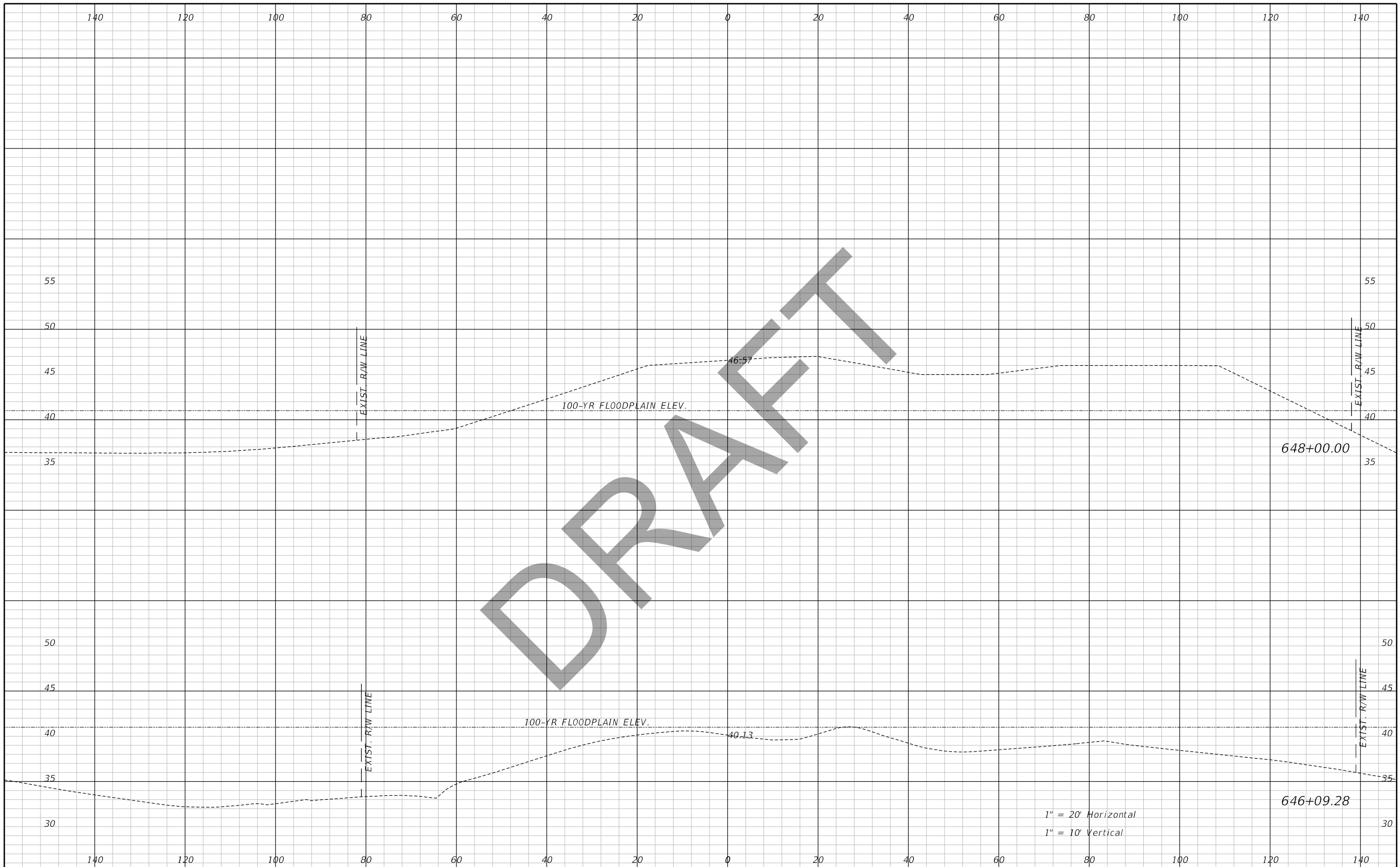
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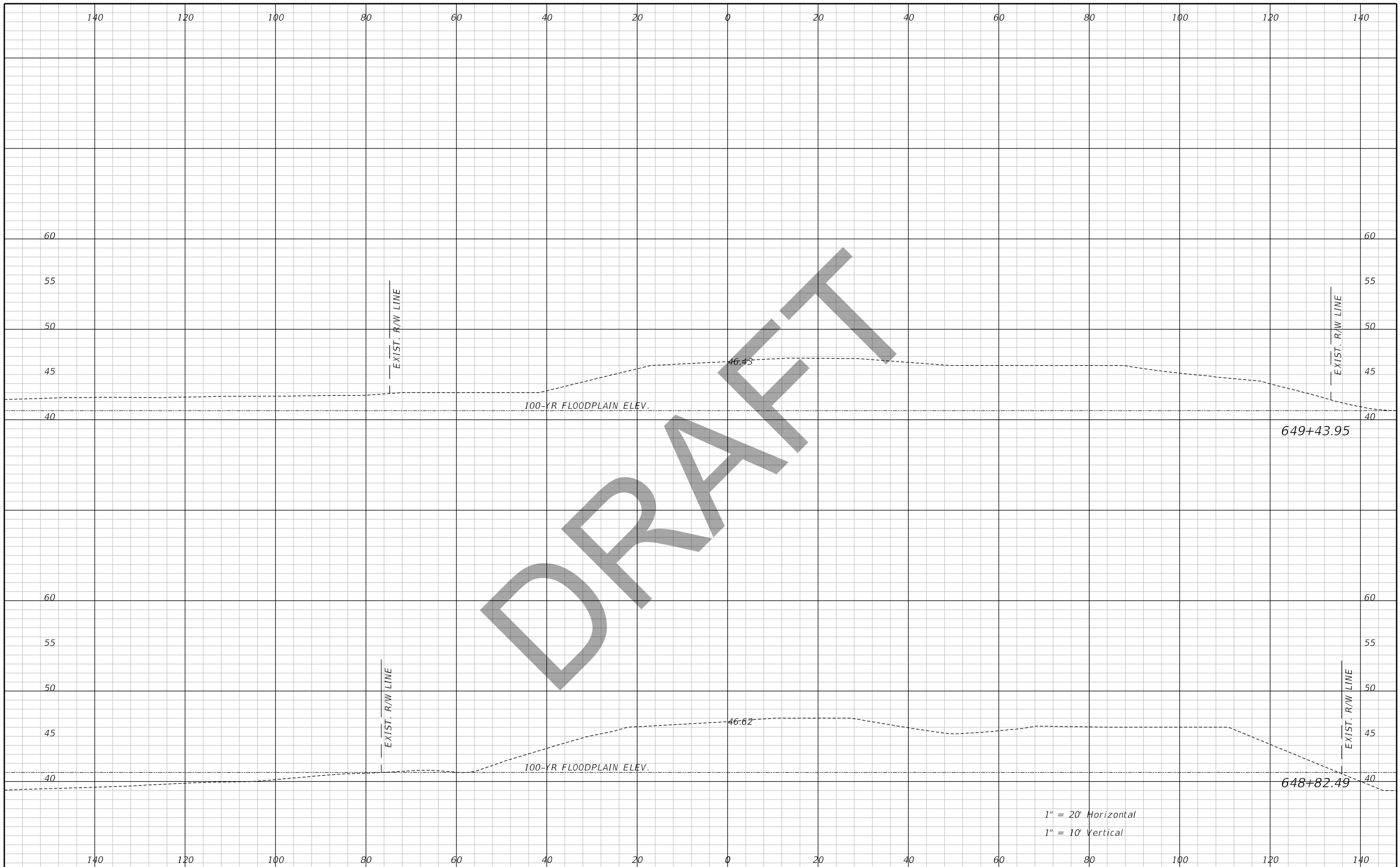
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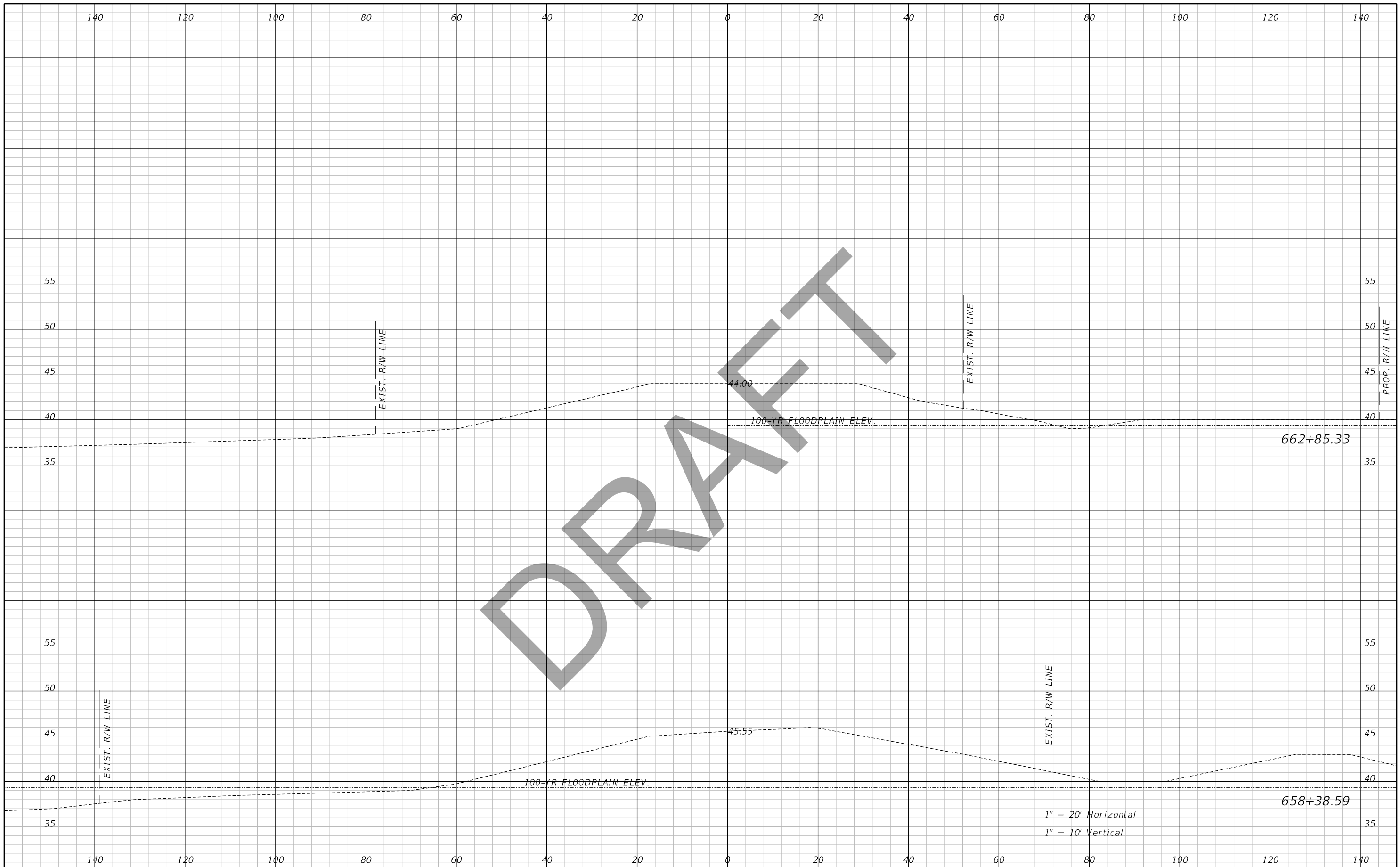
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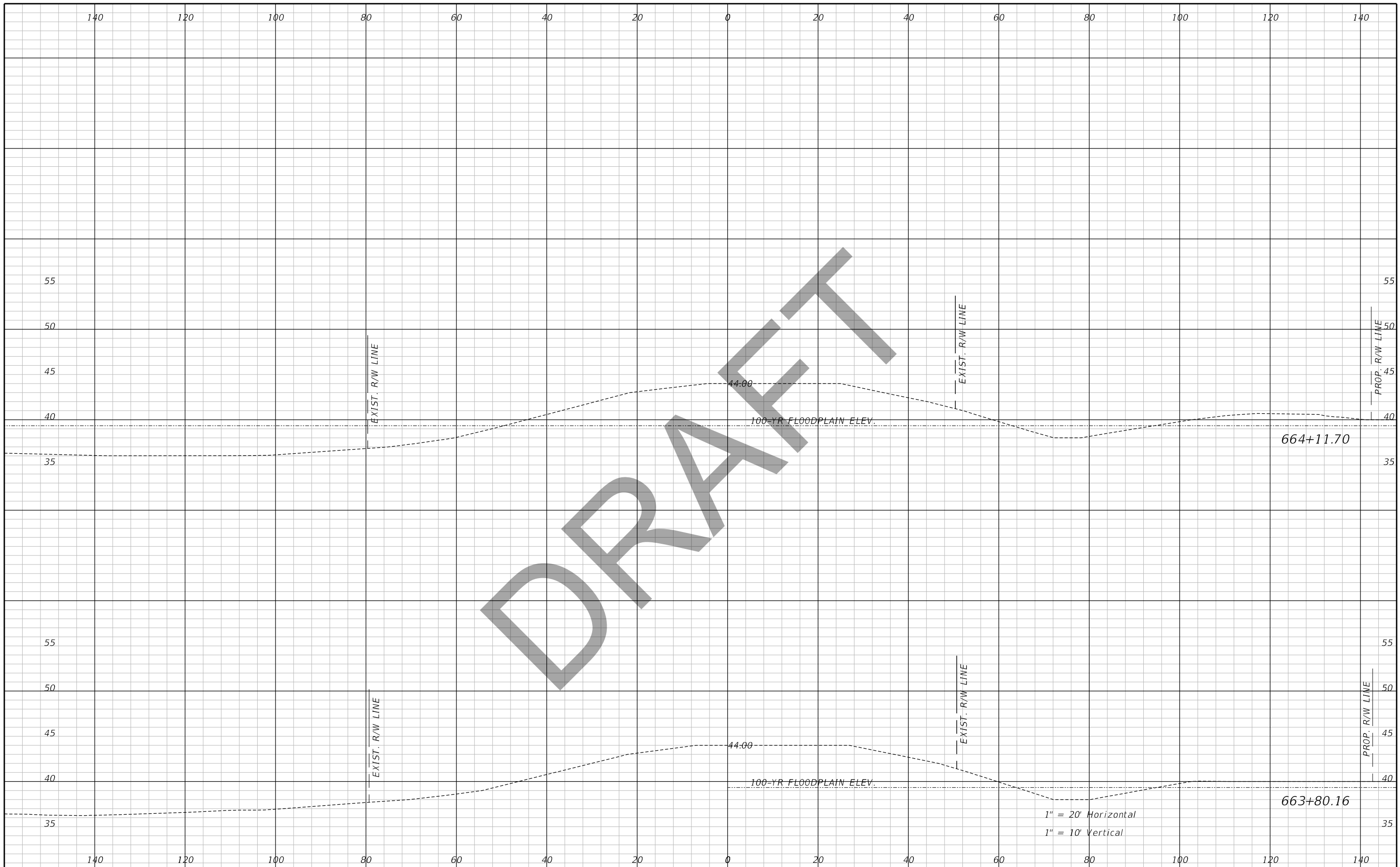


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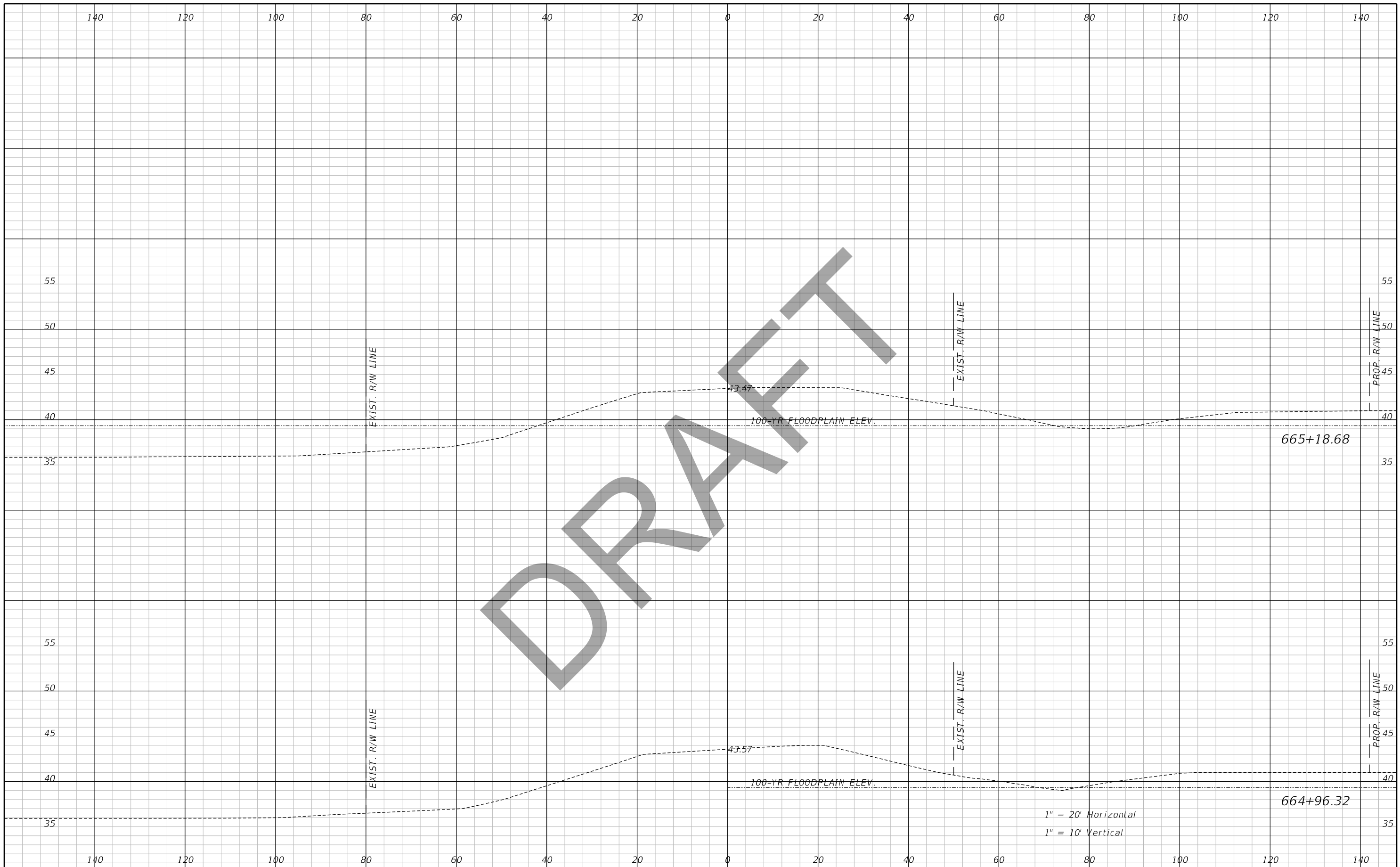
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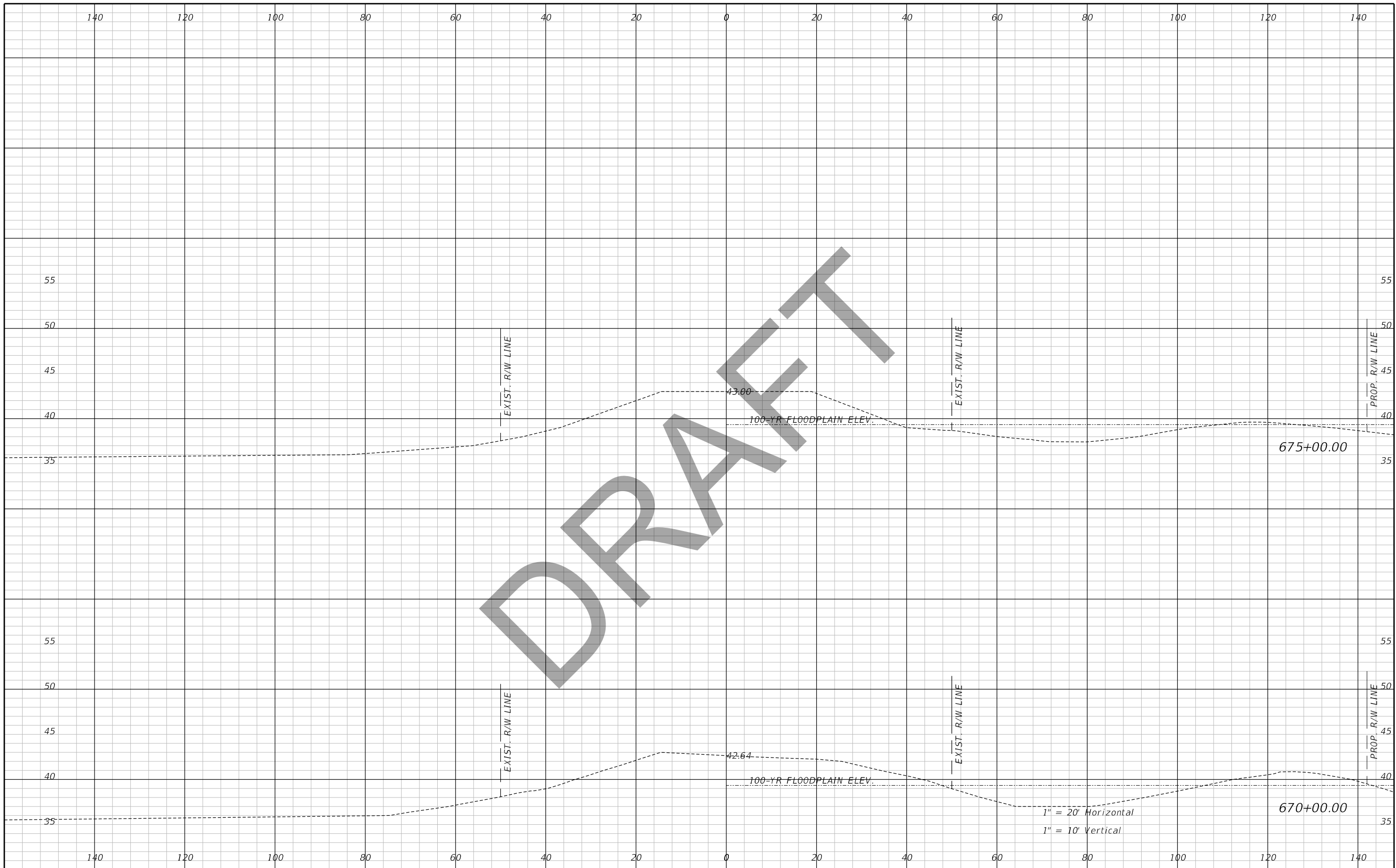
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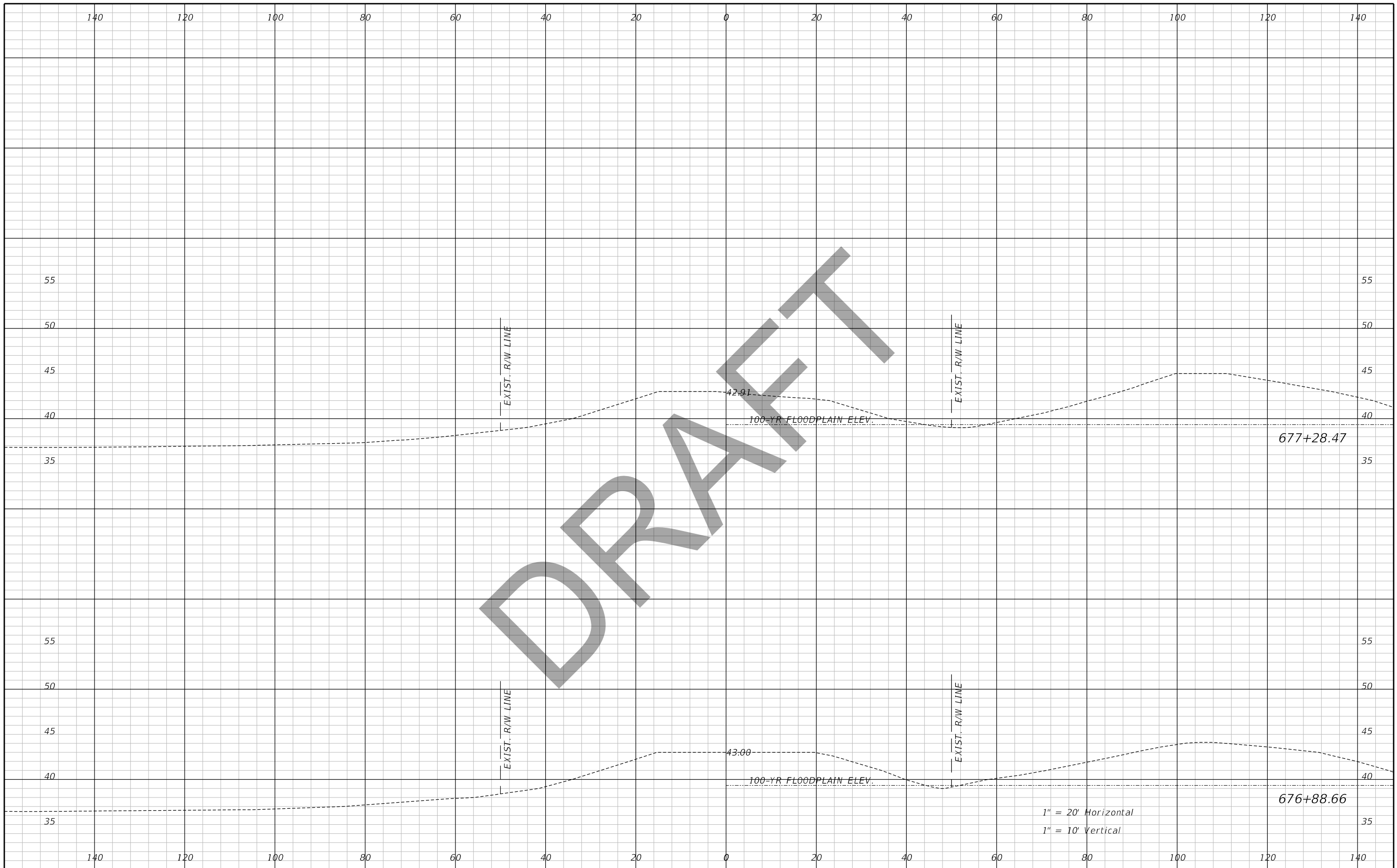
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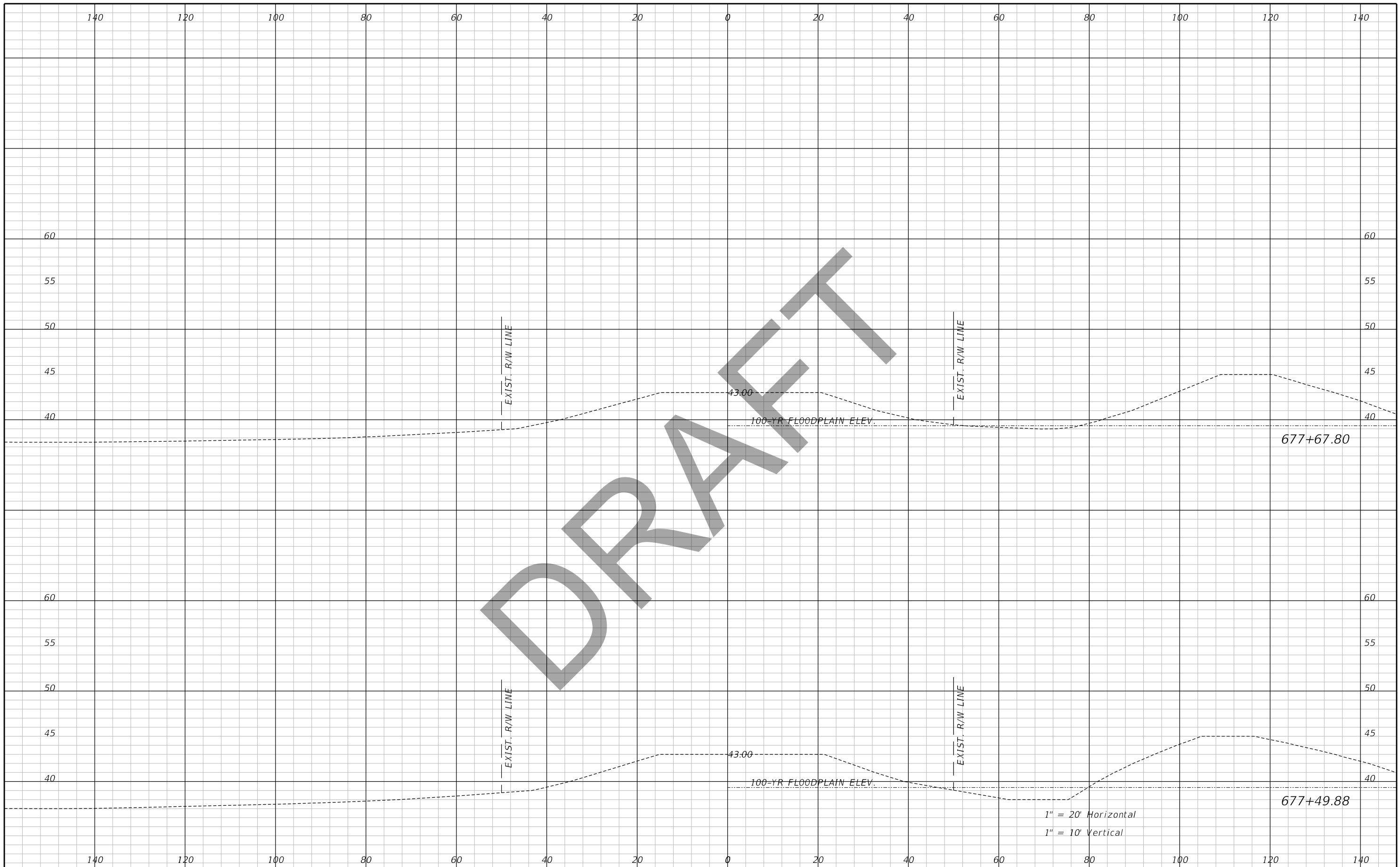
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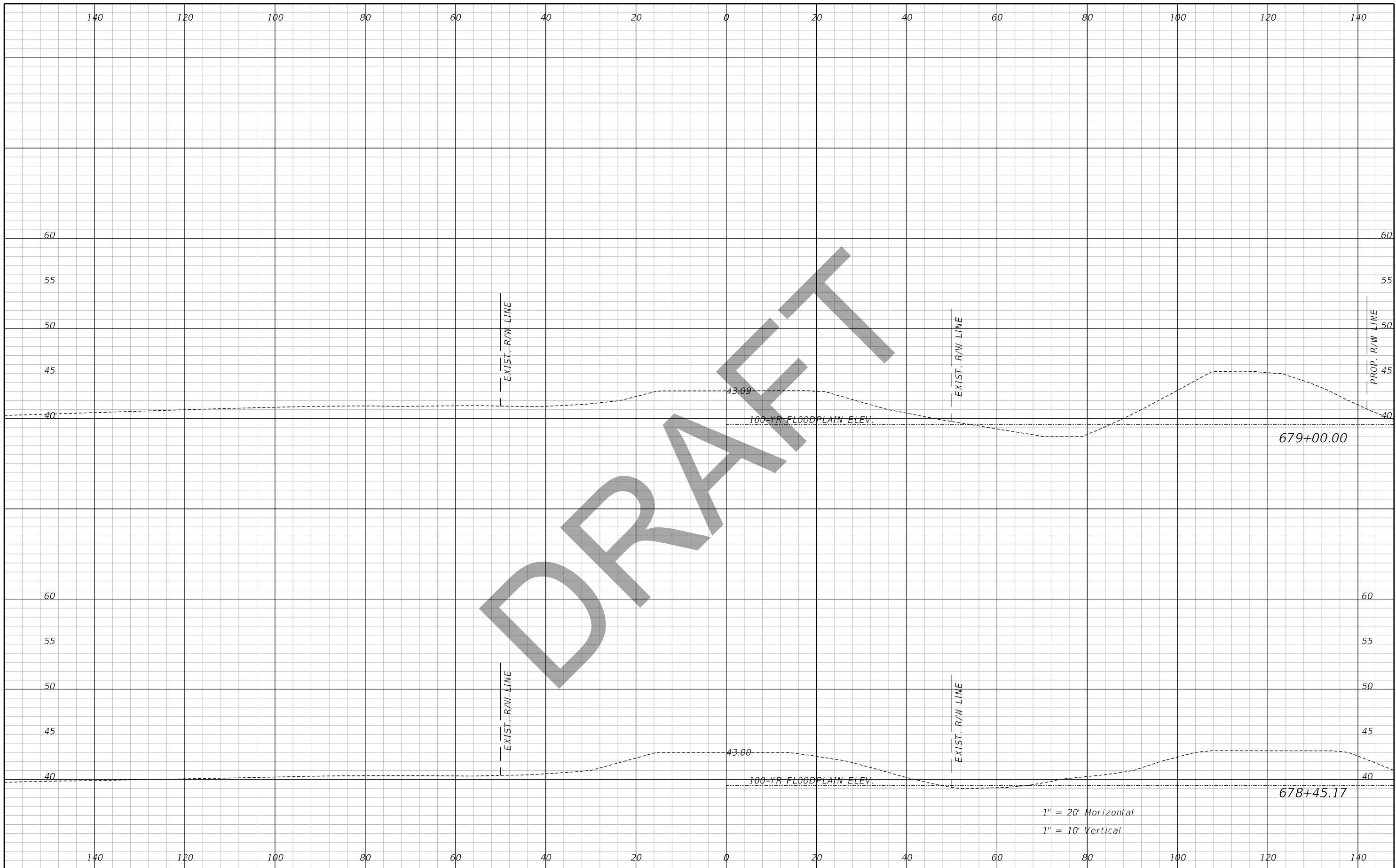
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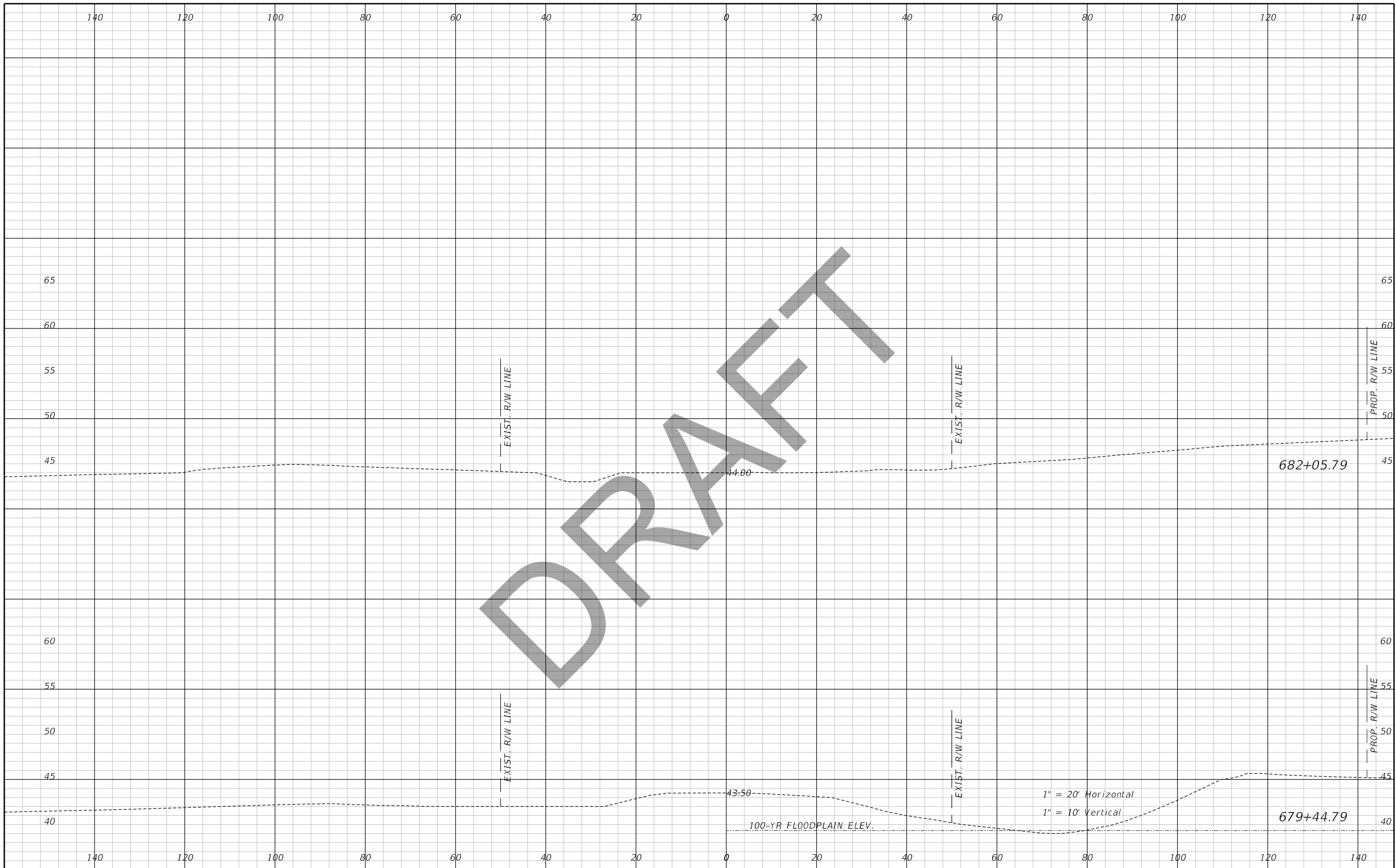
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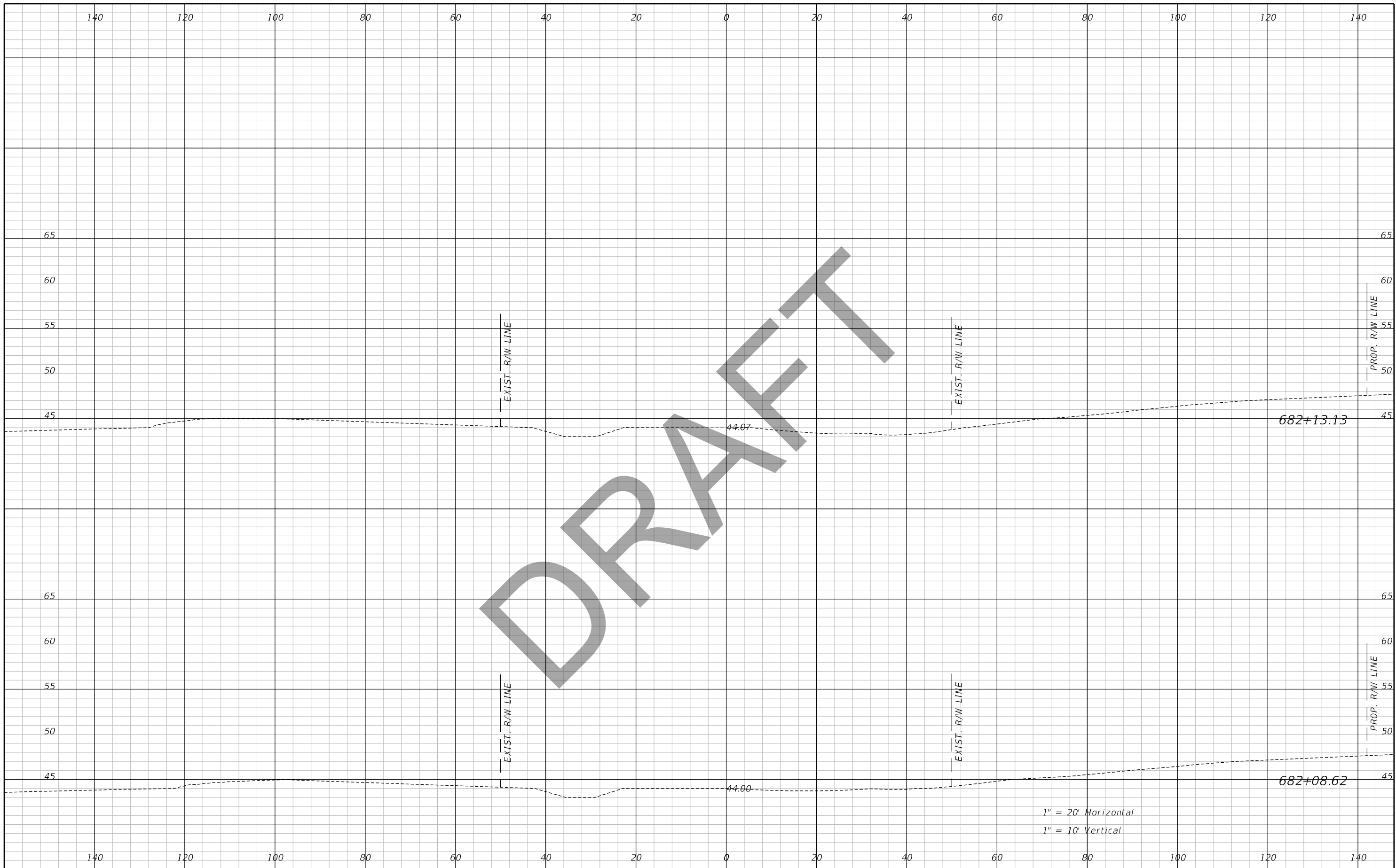
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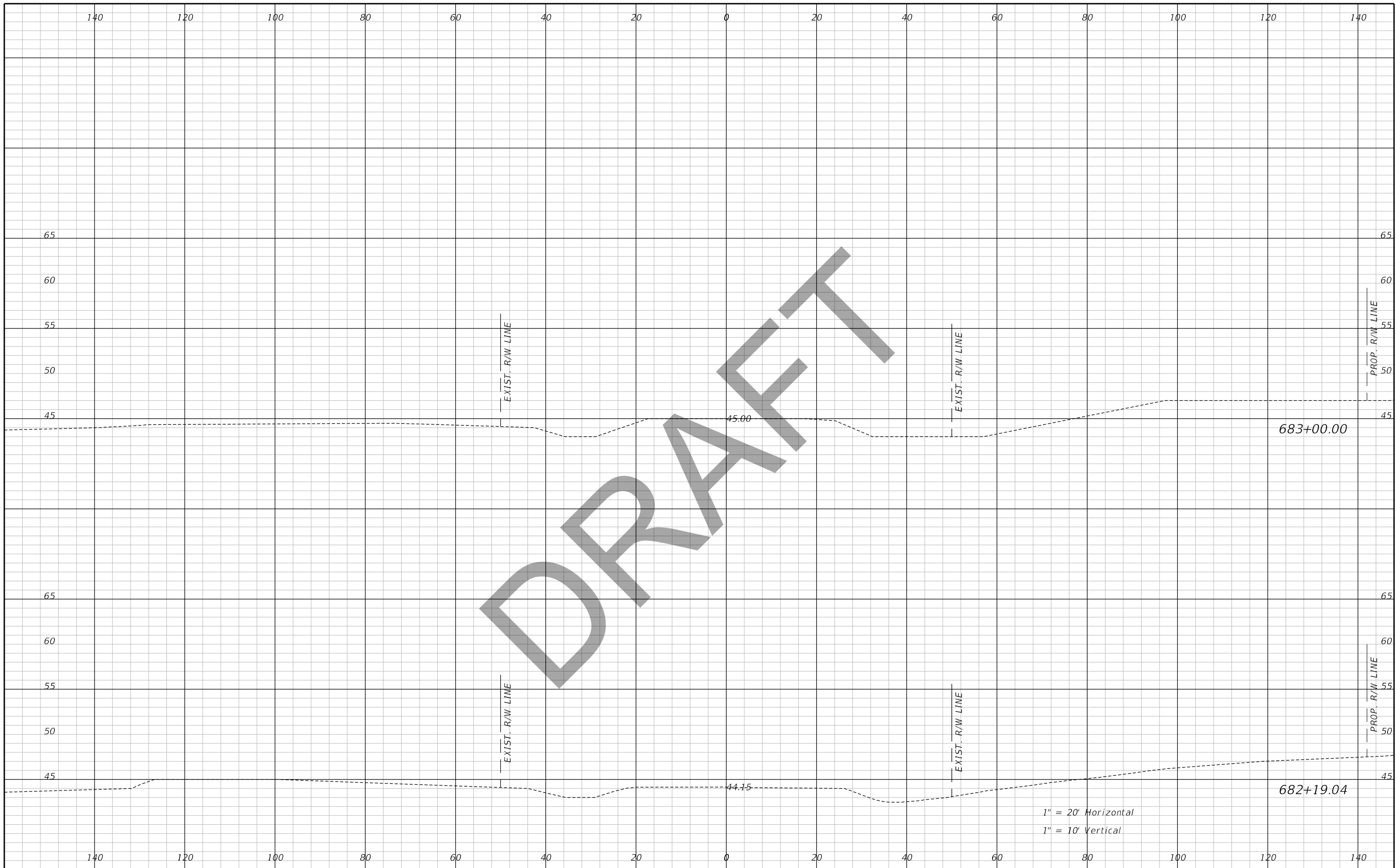
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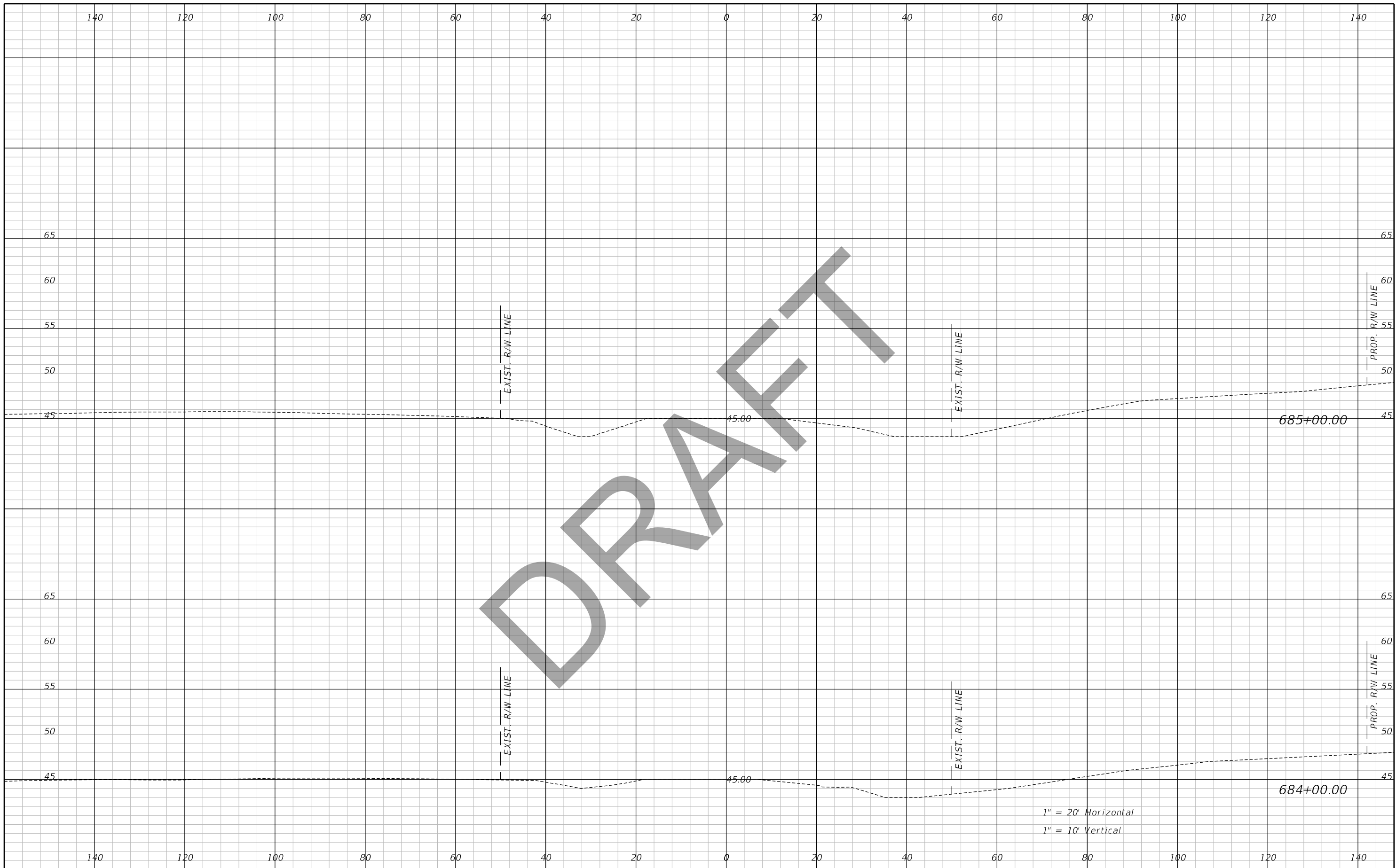
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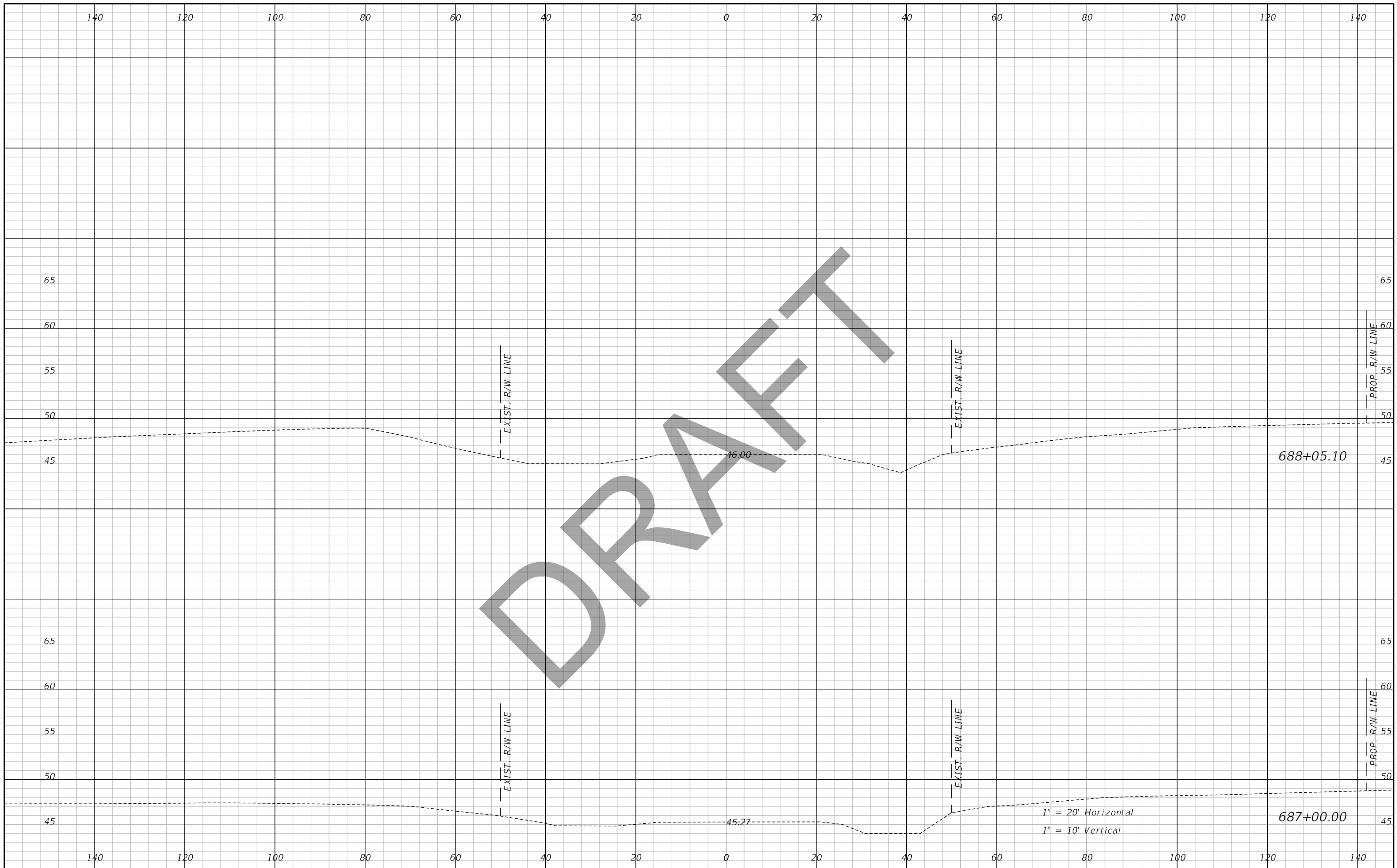
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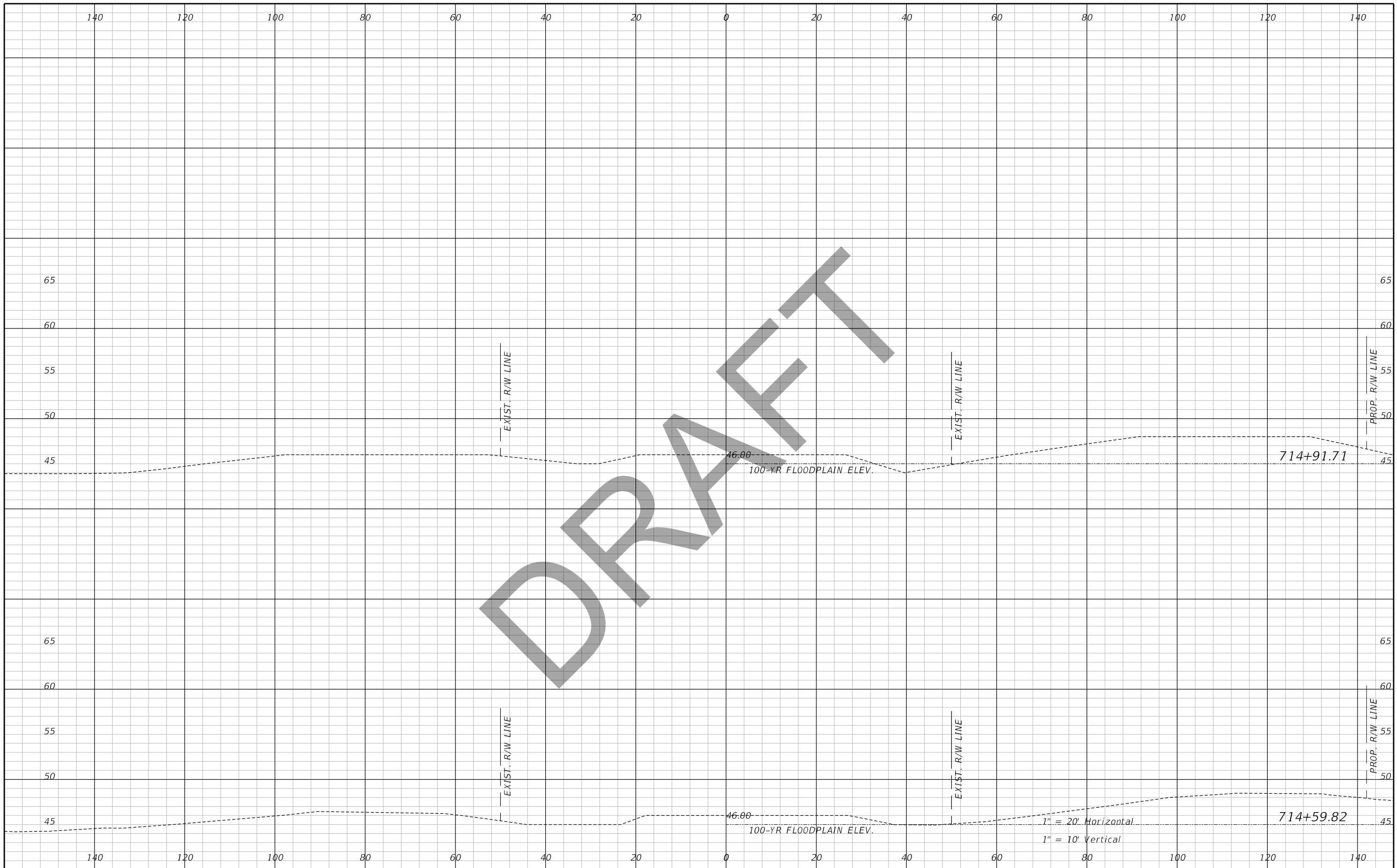
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				US 301	HILLSBOROUGH PASCO	255796-1		



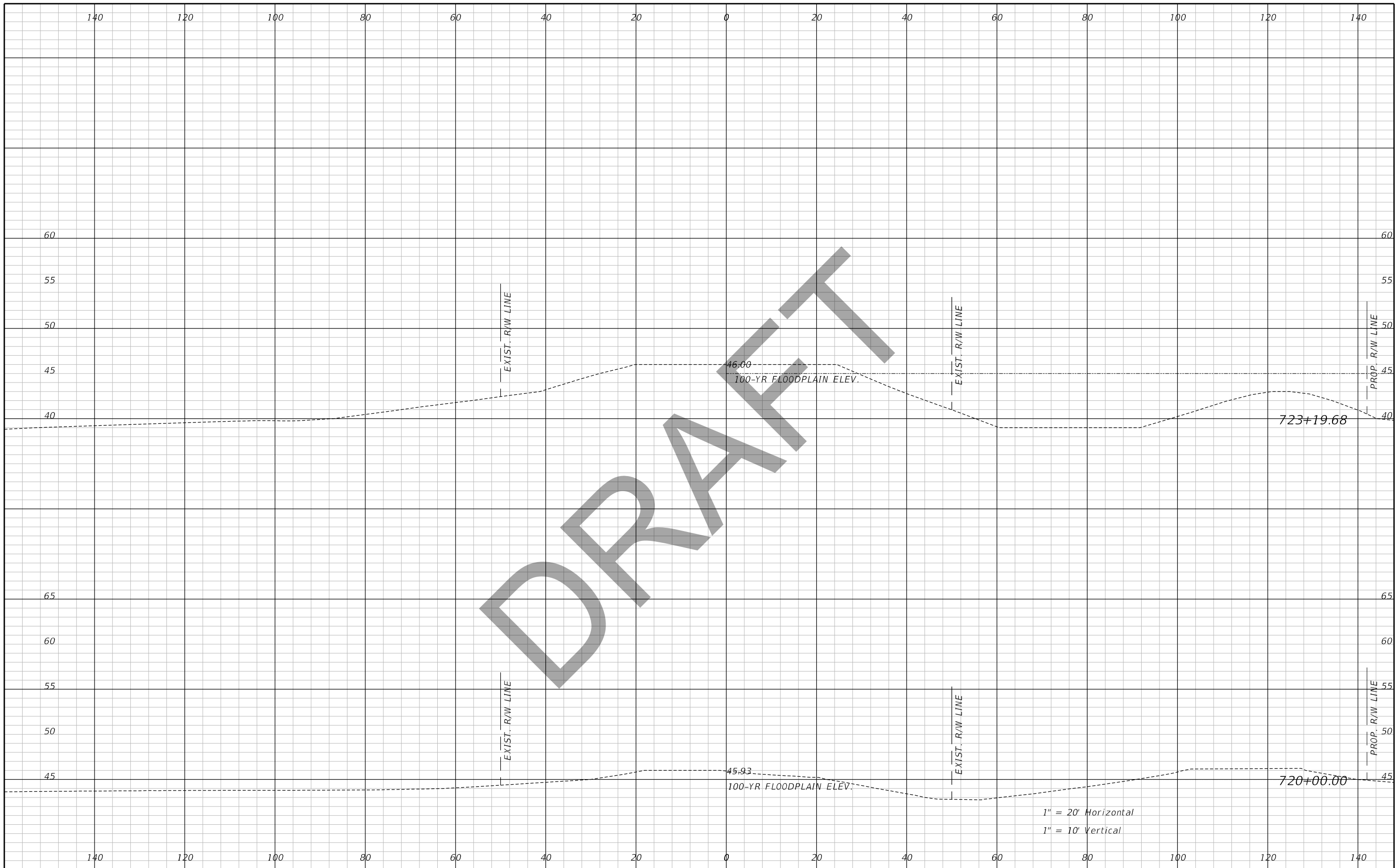
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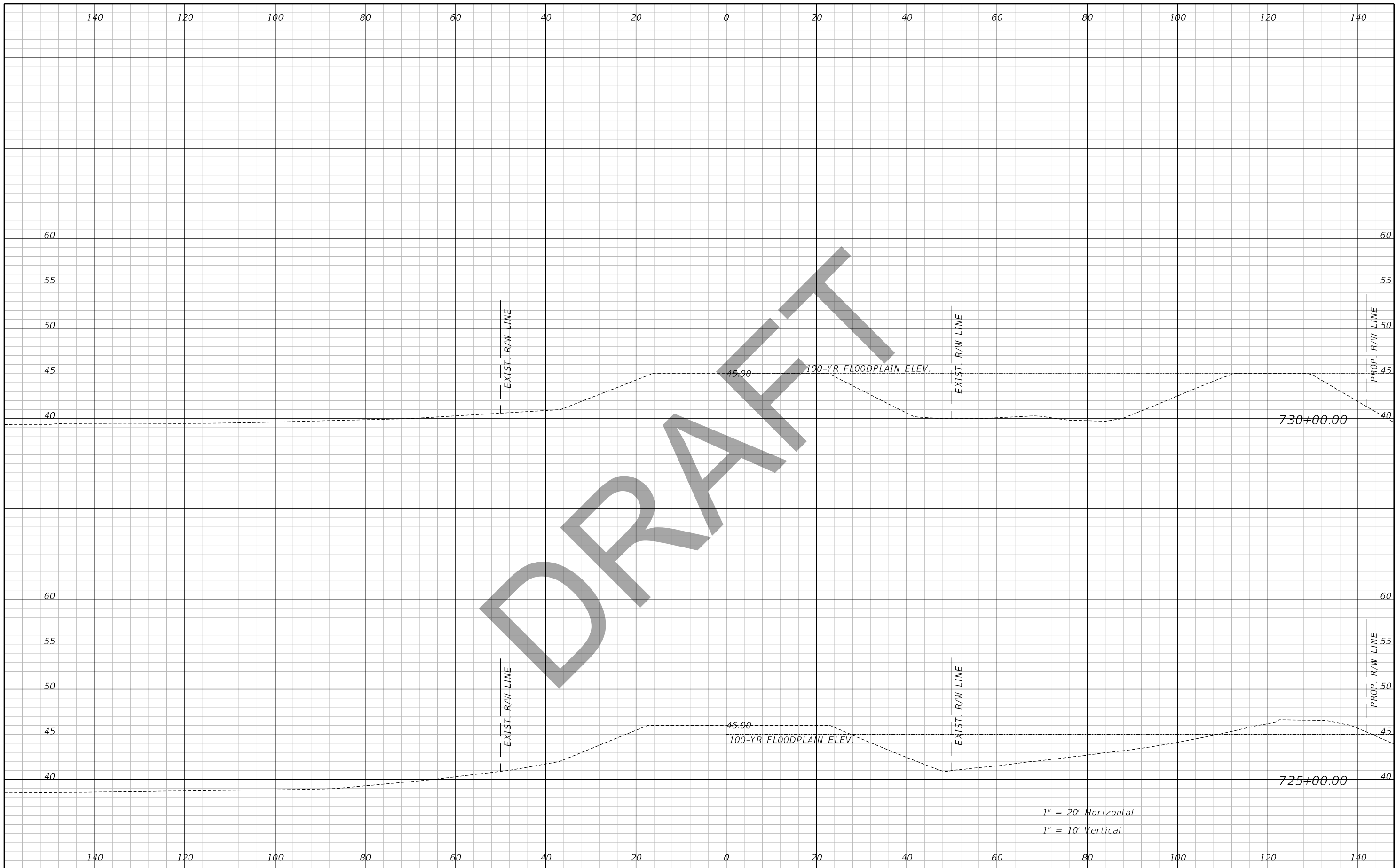
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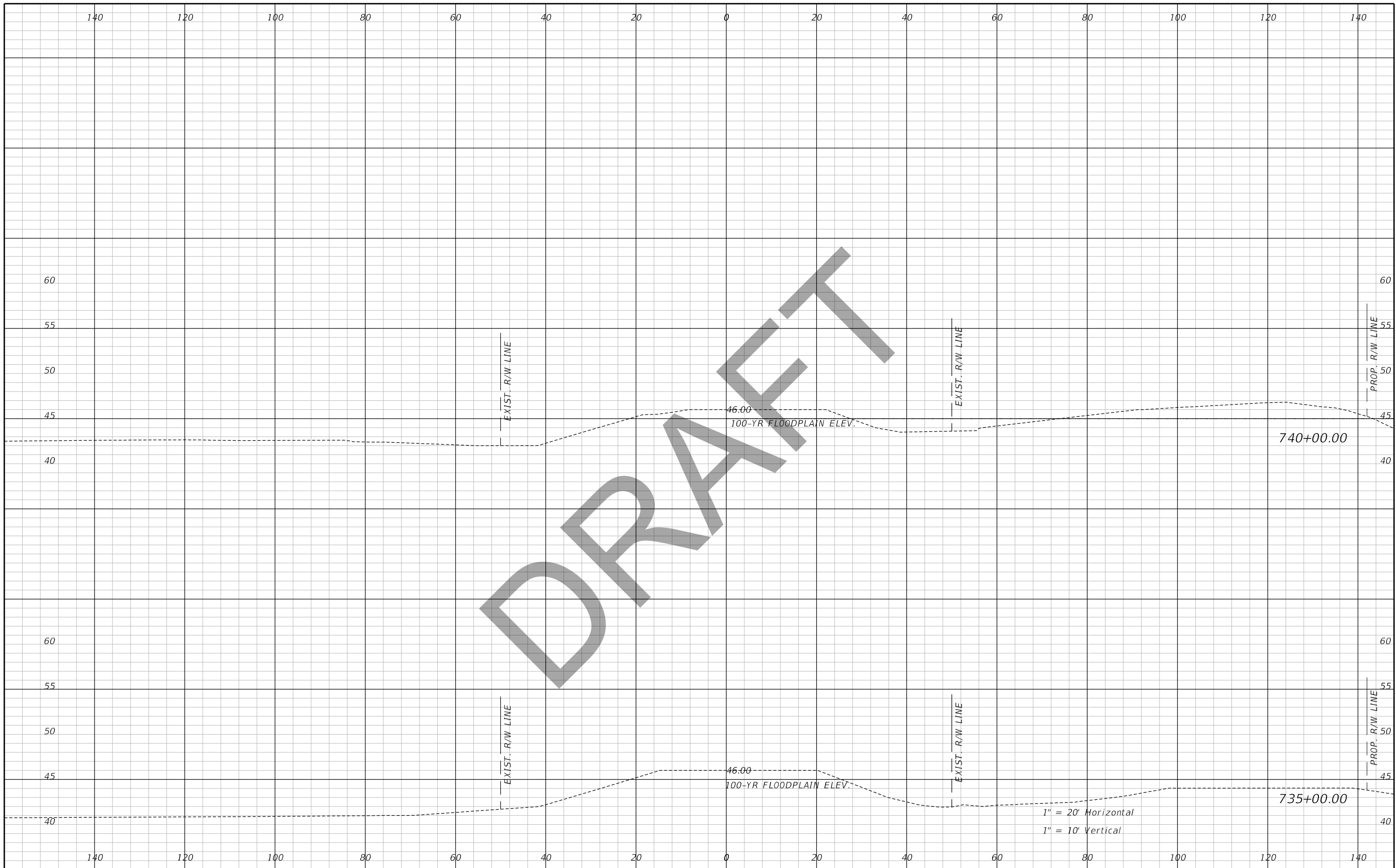
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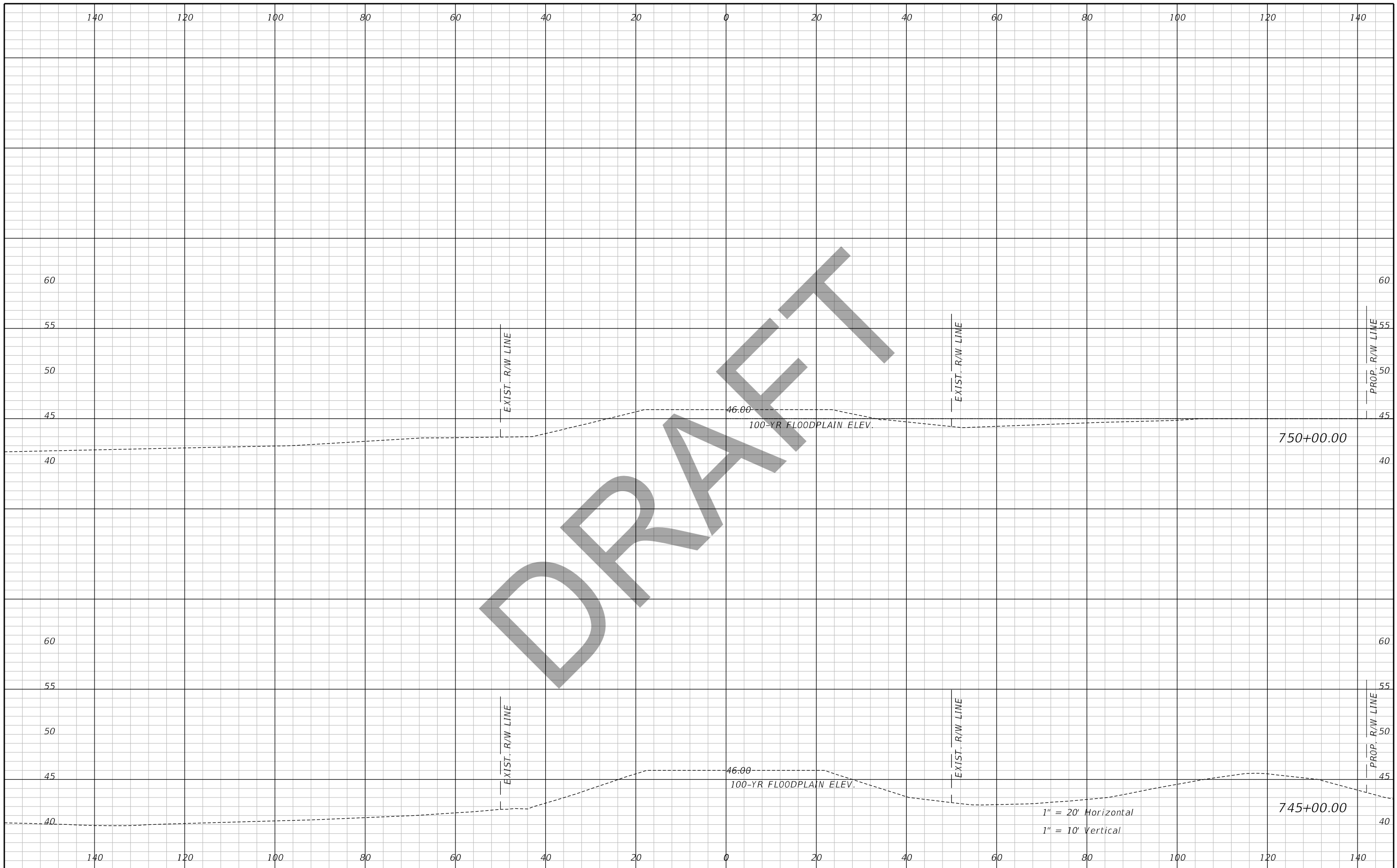
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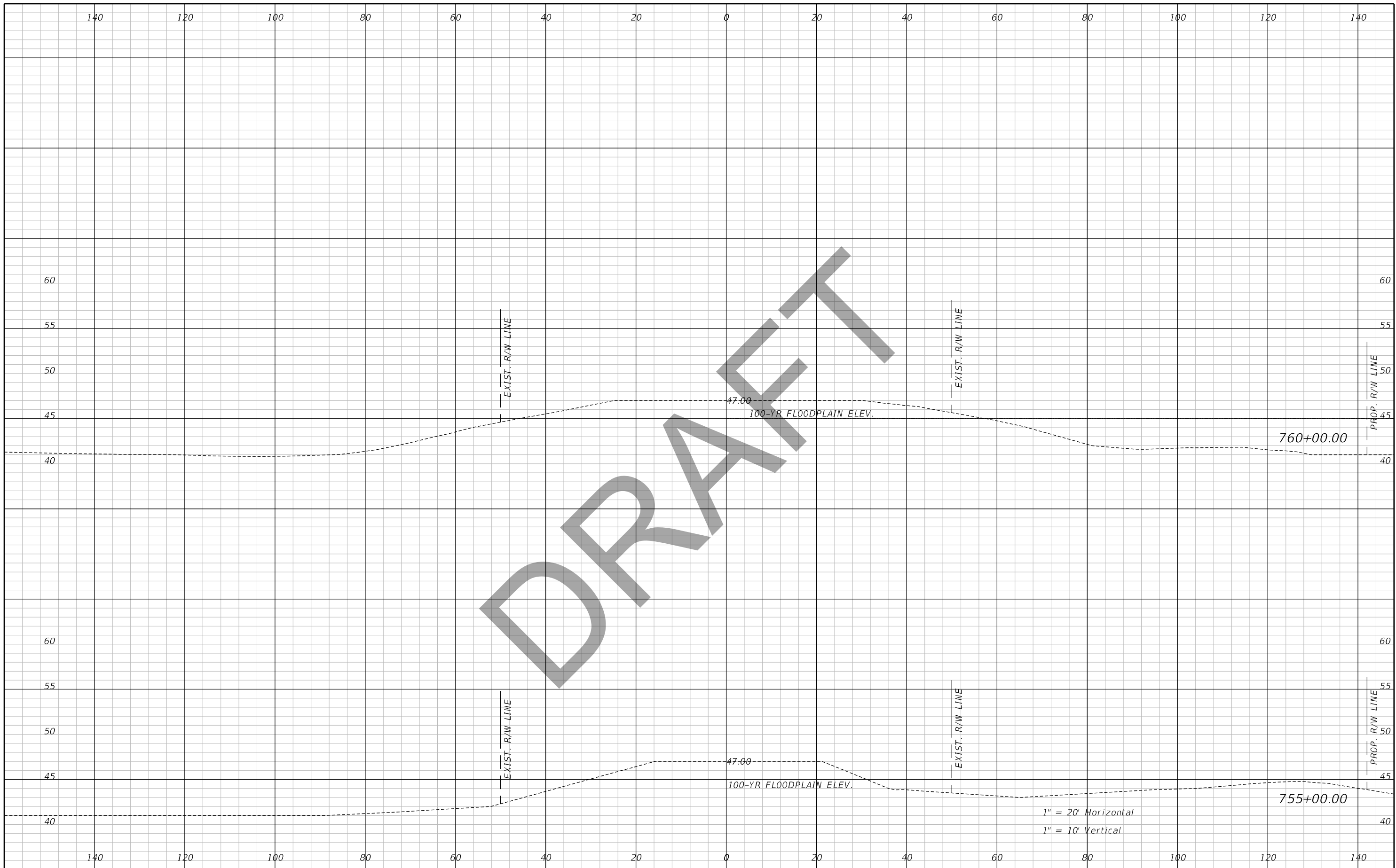
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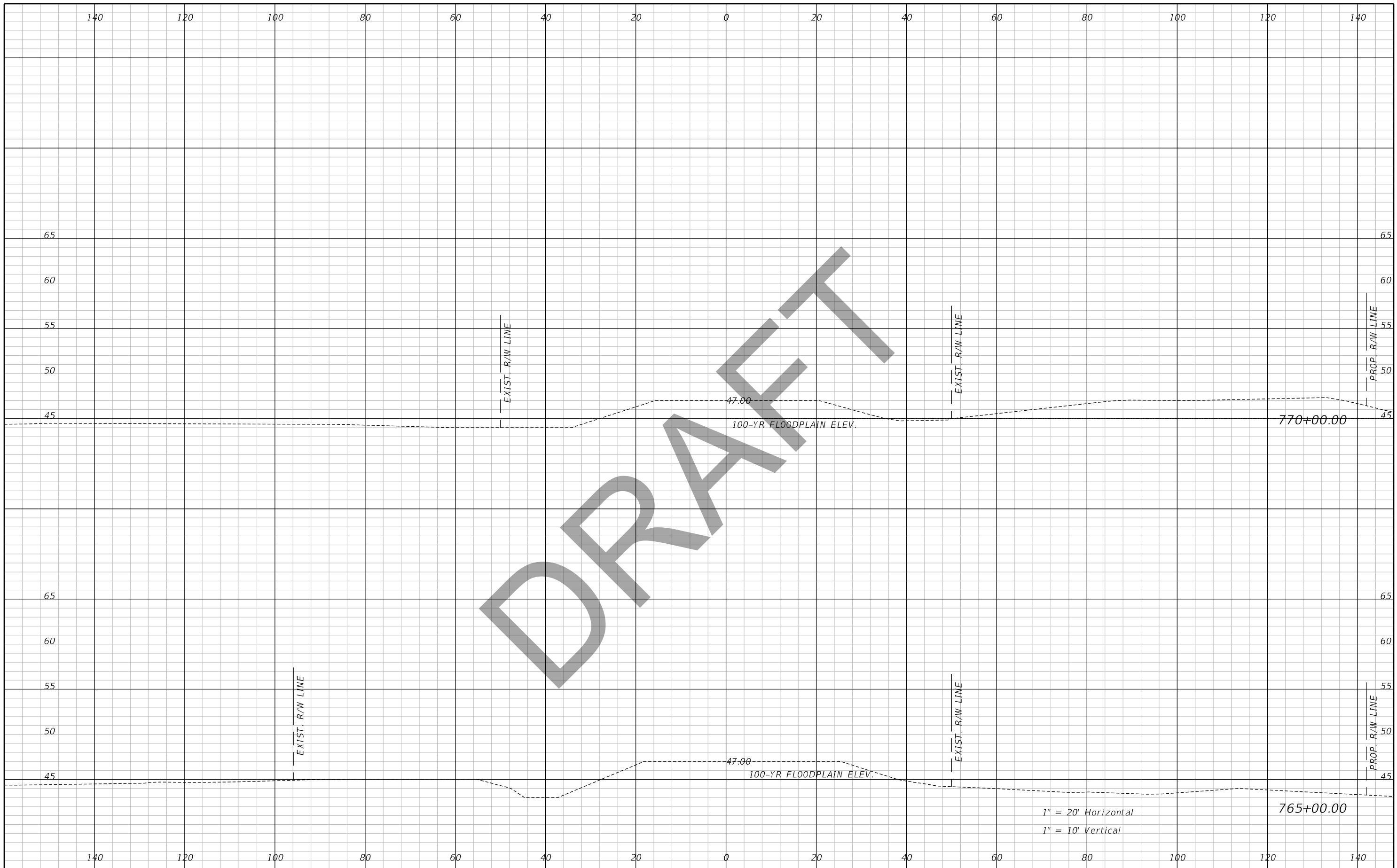
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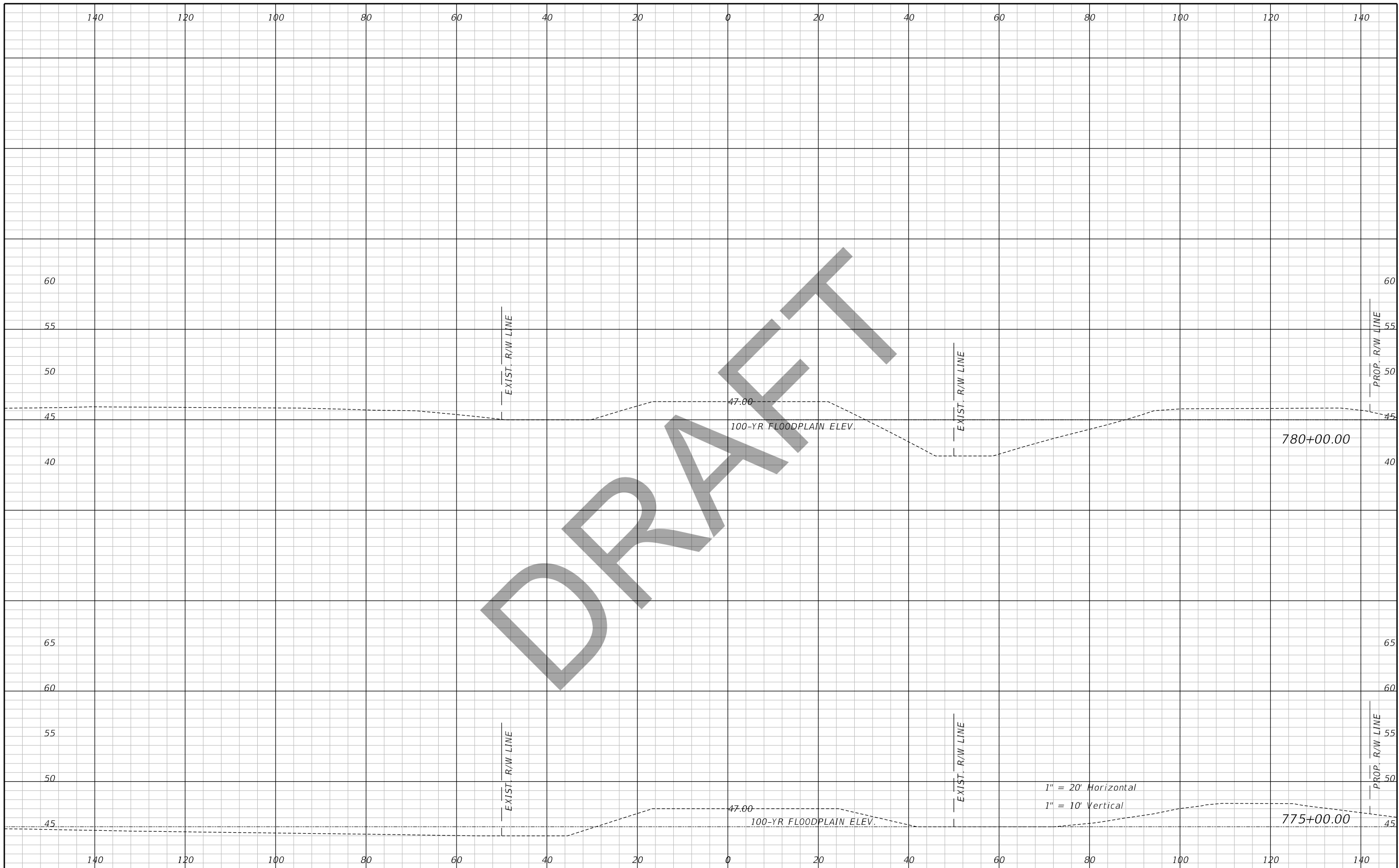
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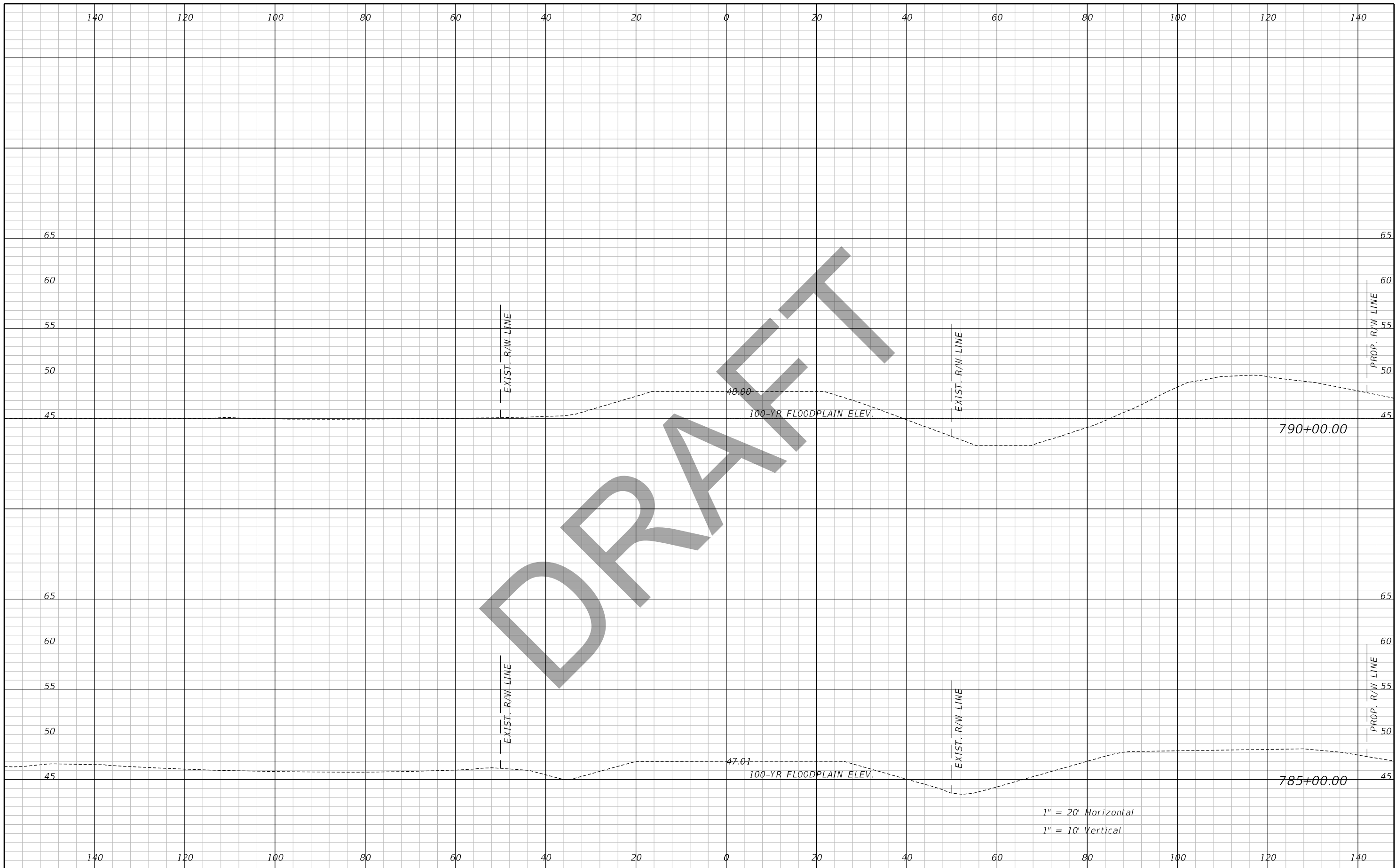
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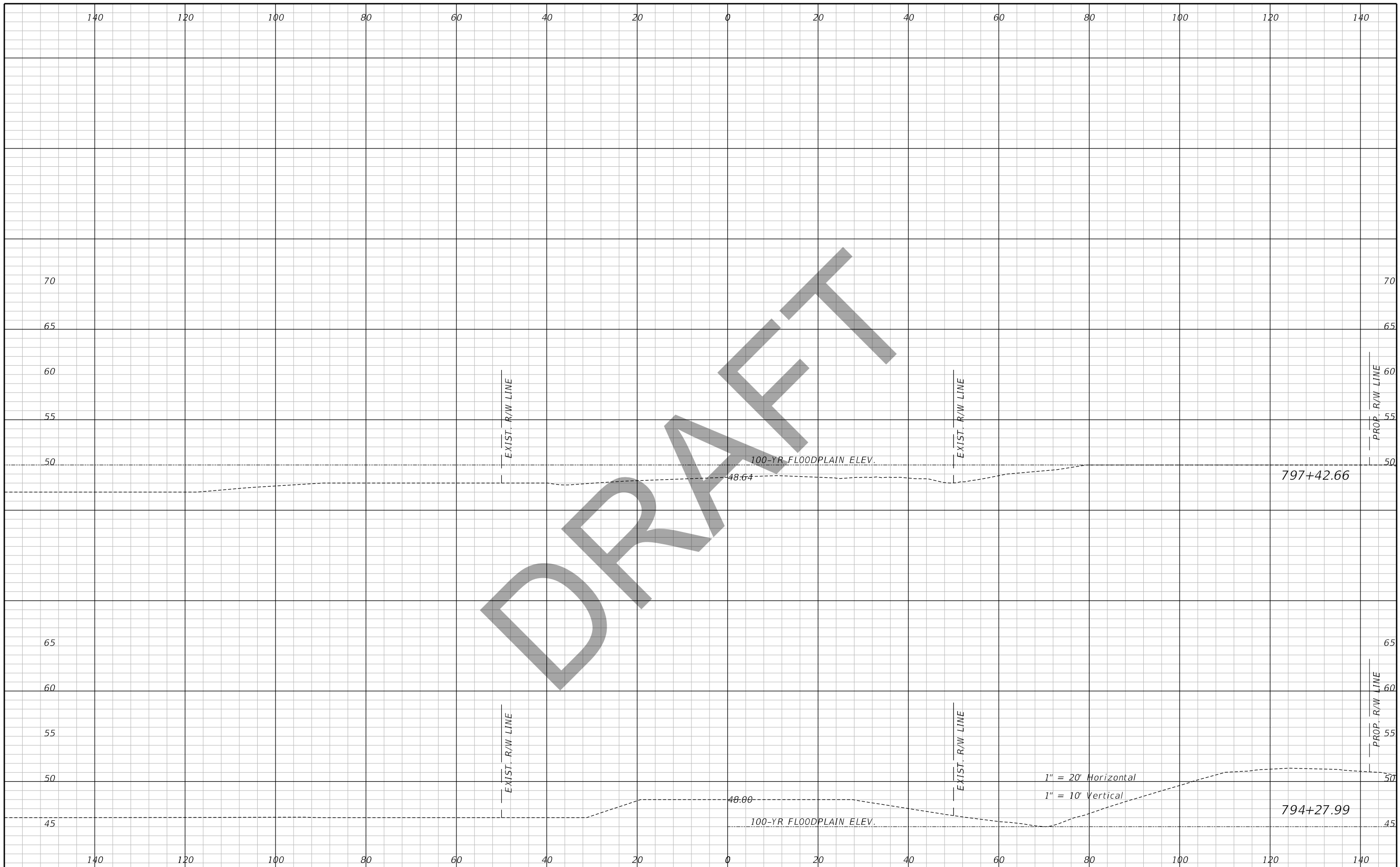
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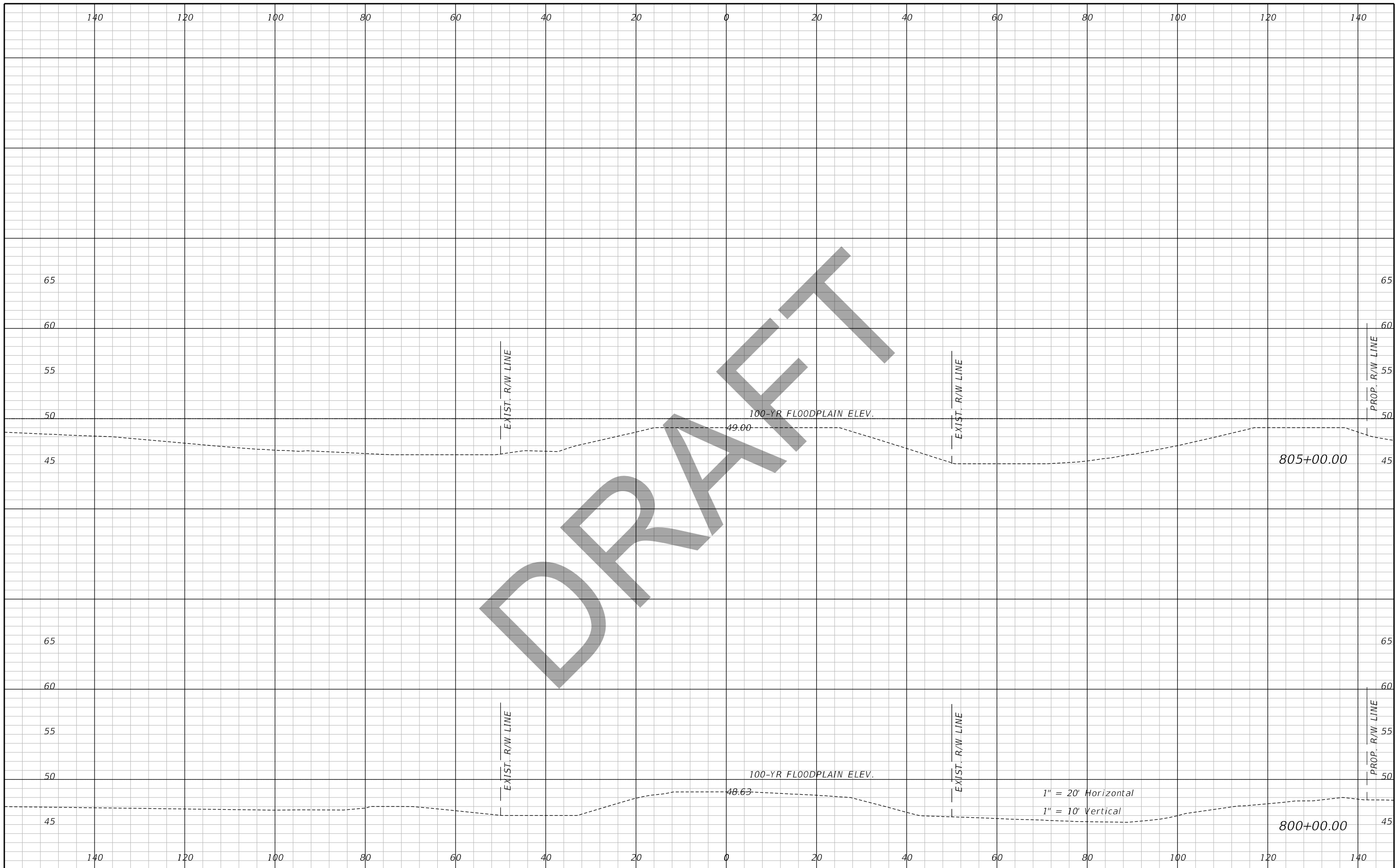
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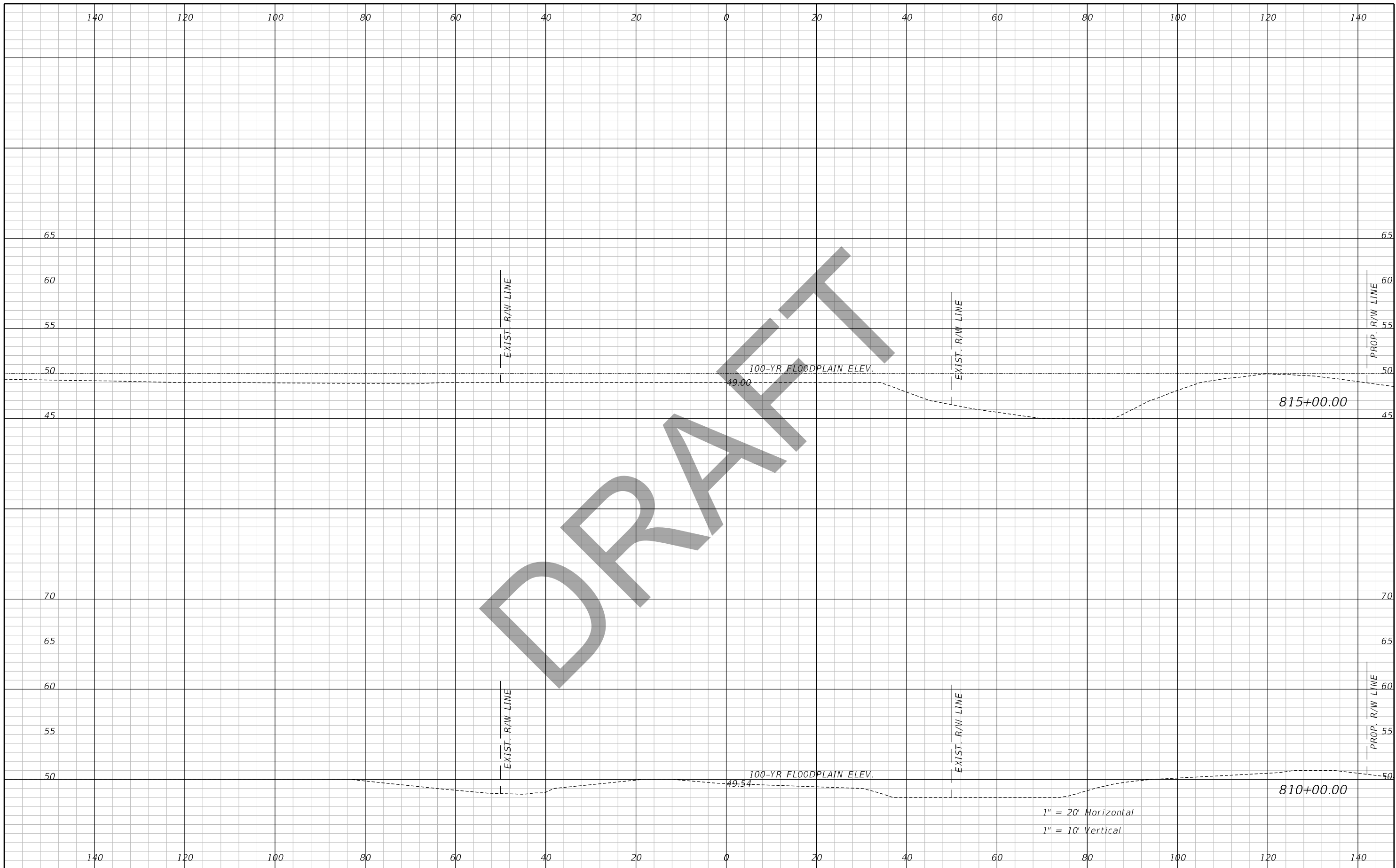
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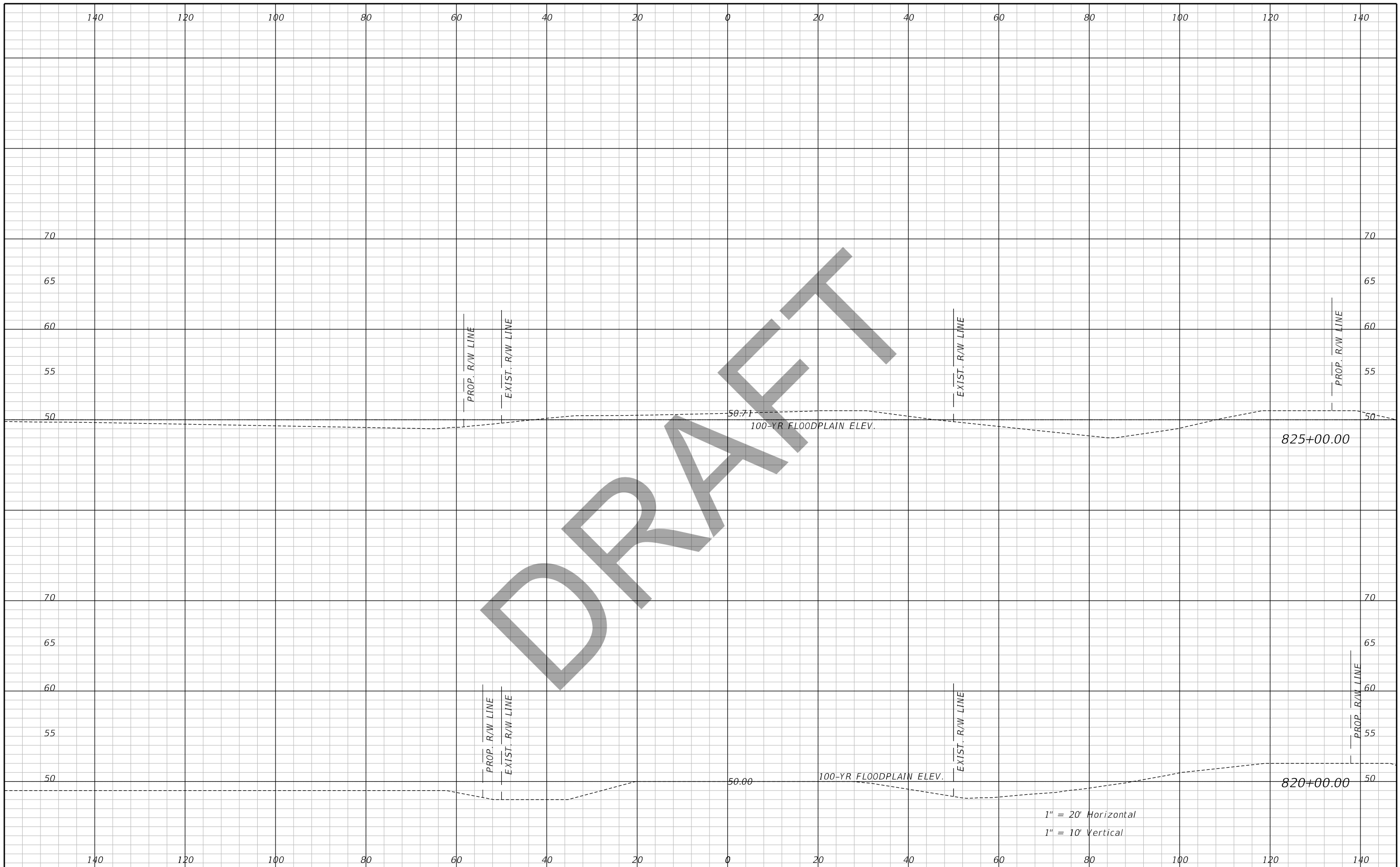
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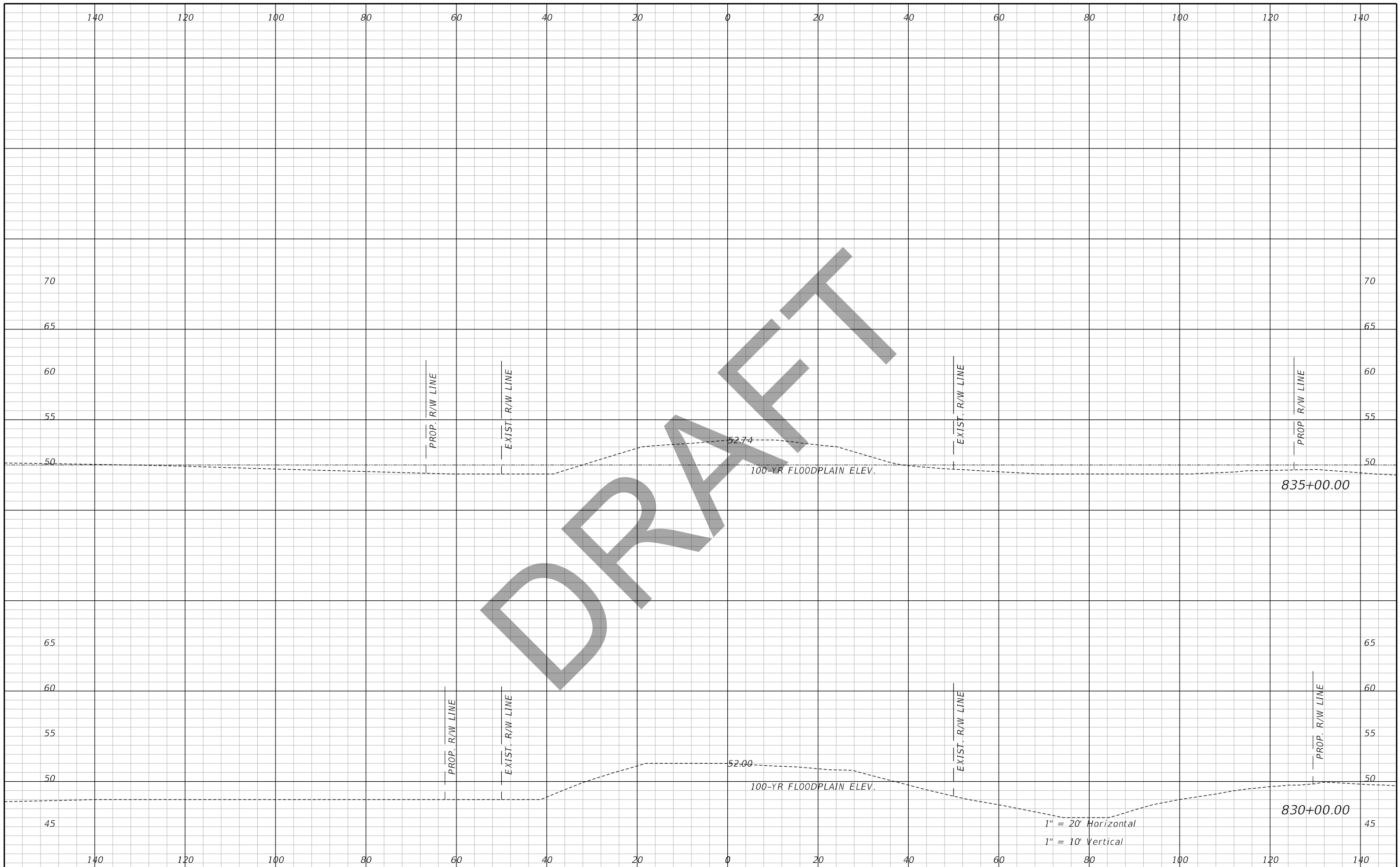
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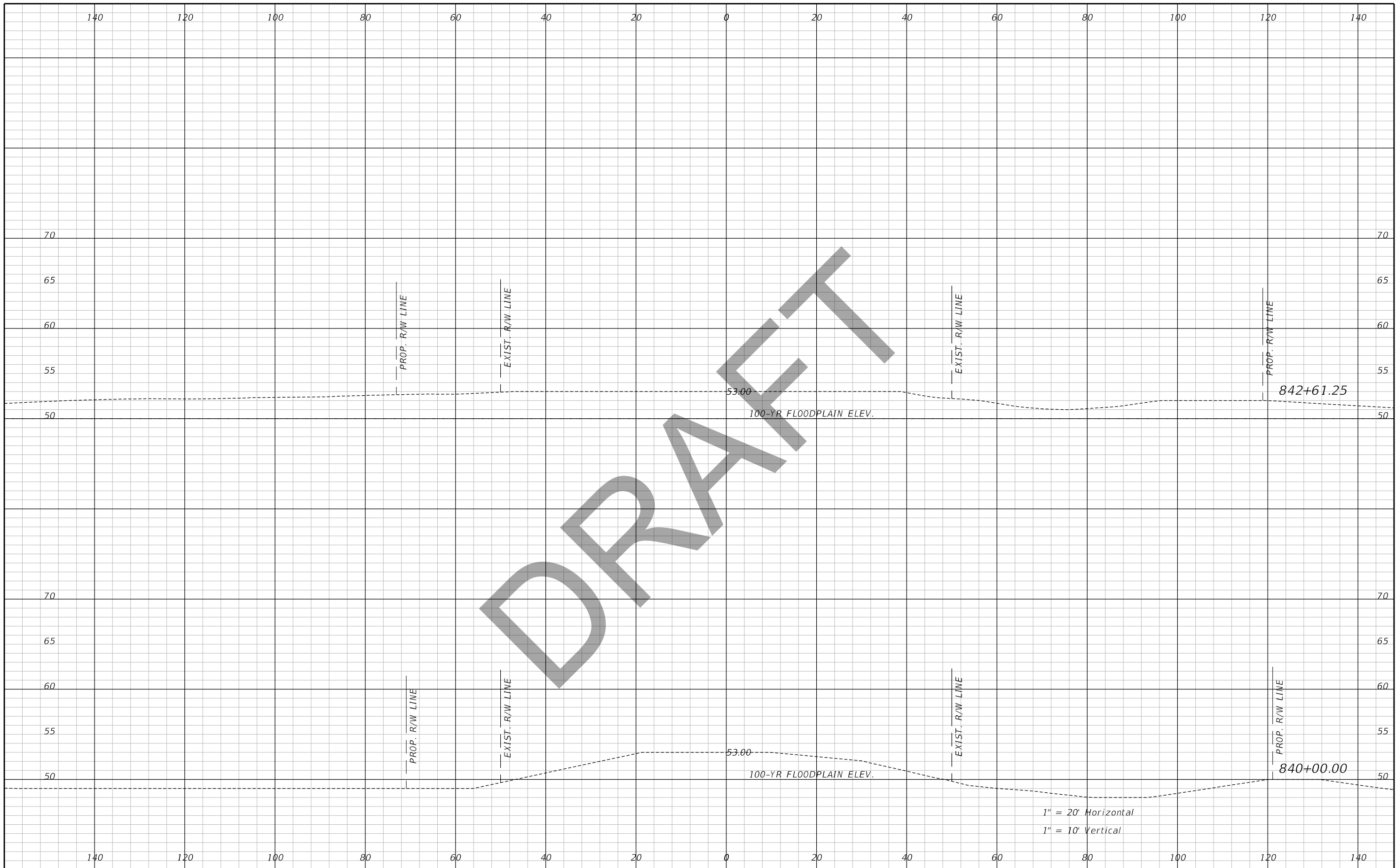
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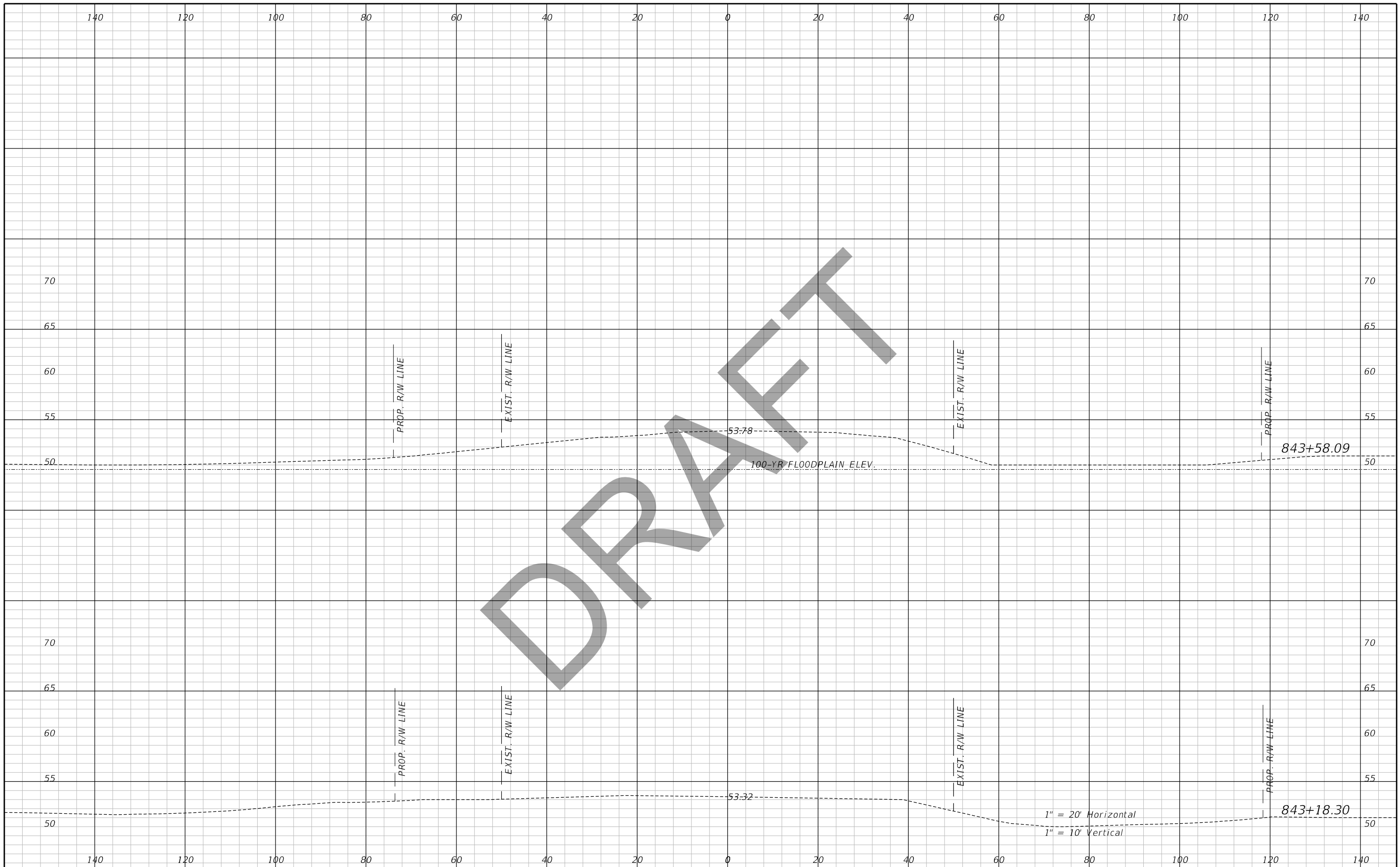
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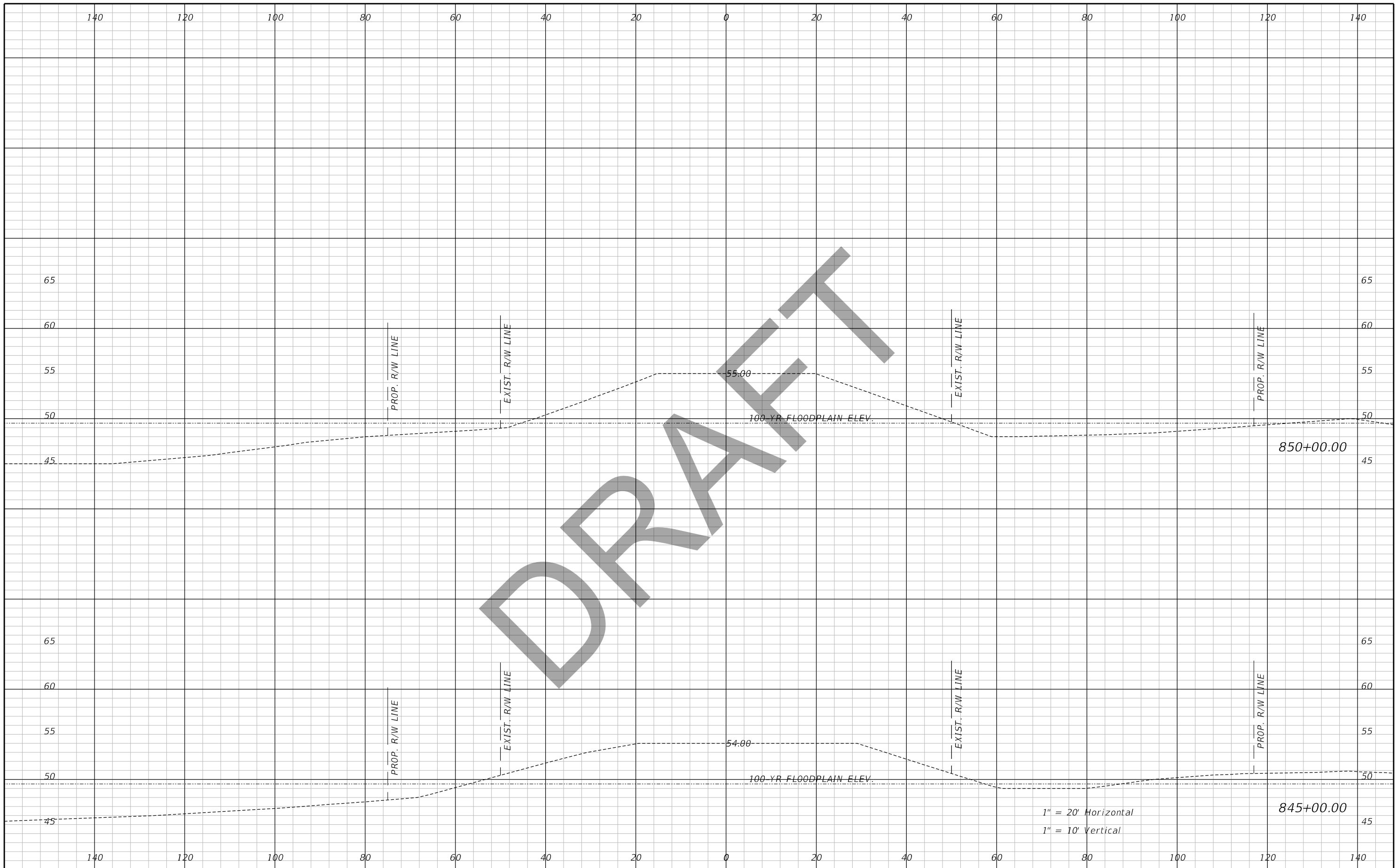
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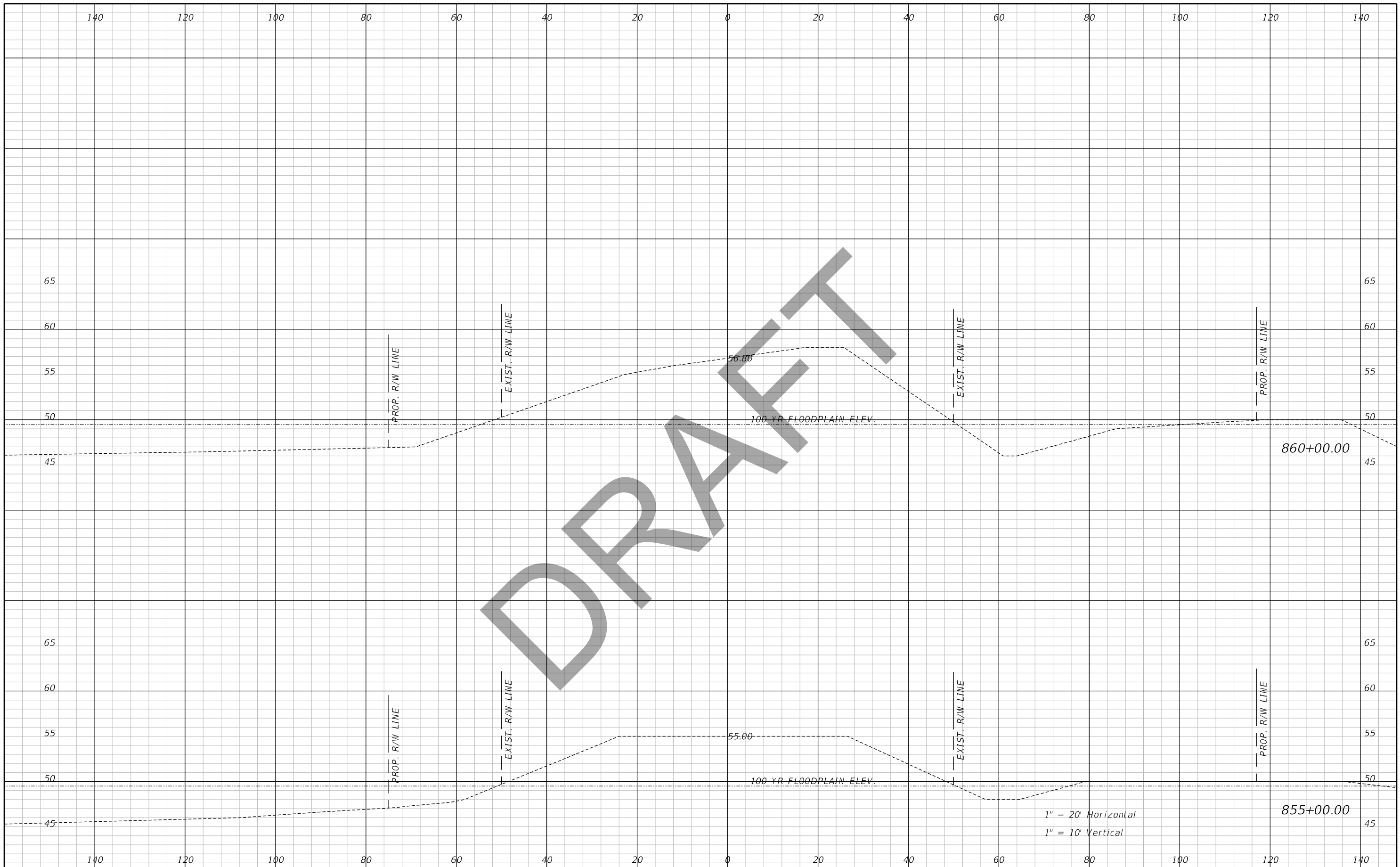
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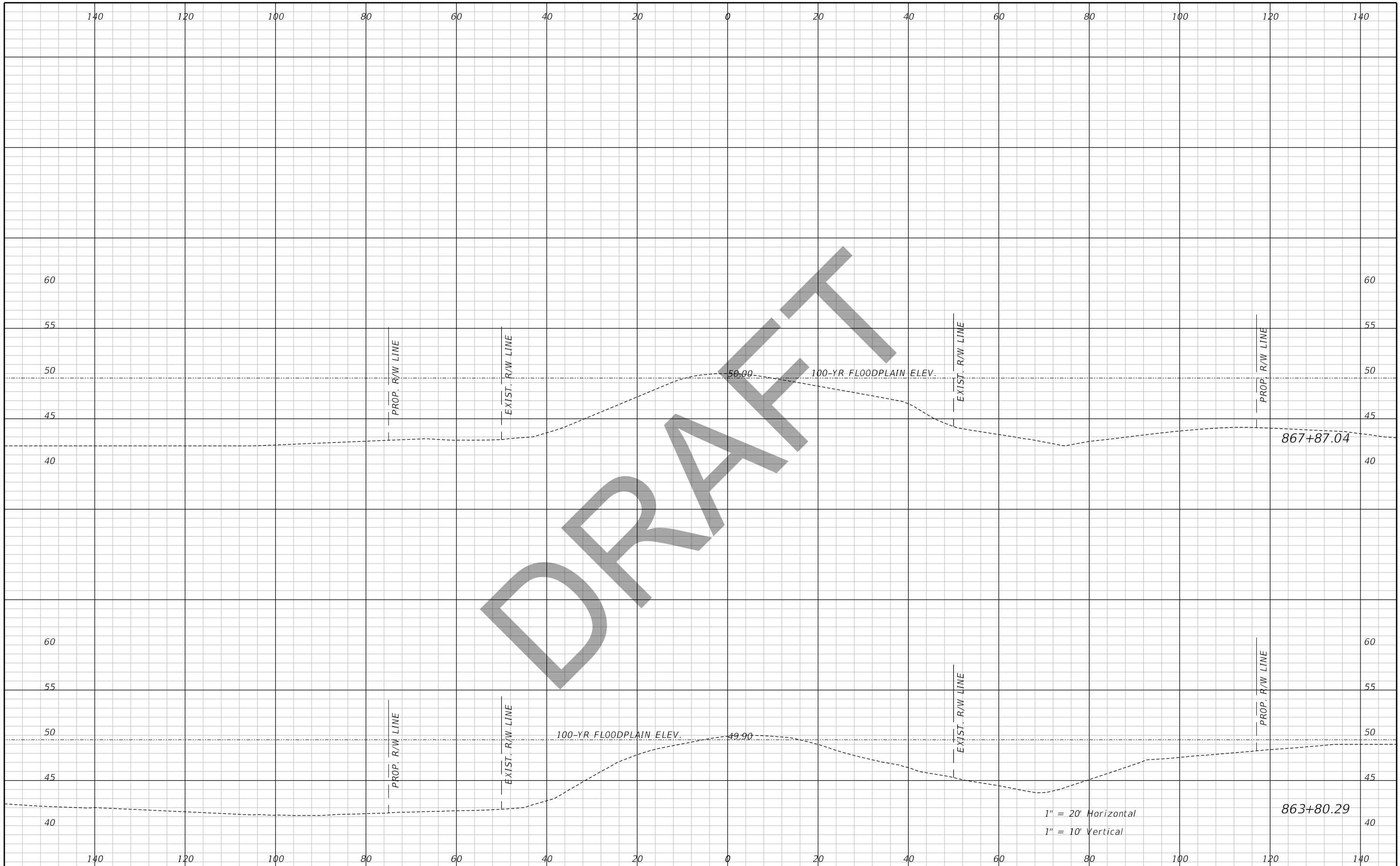


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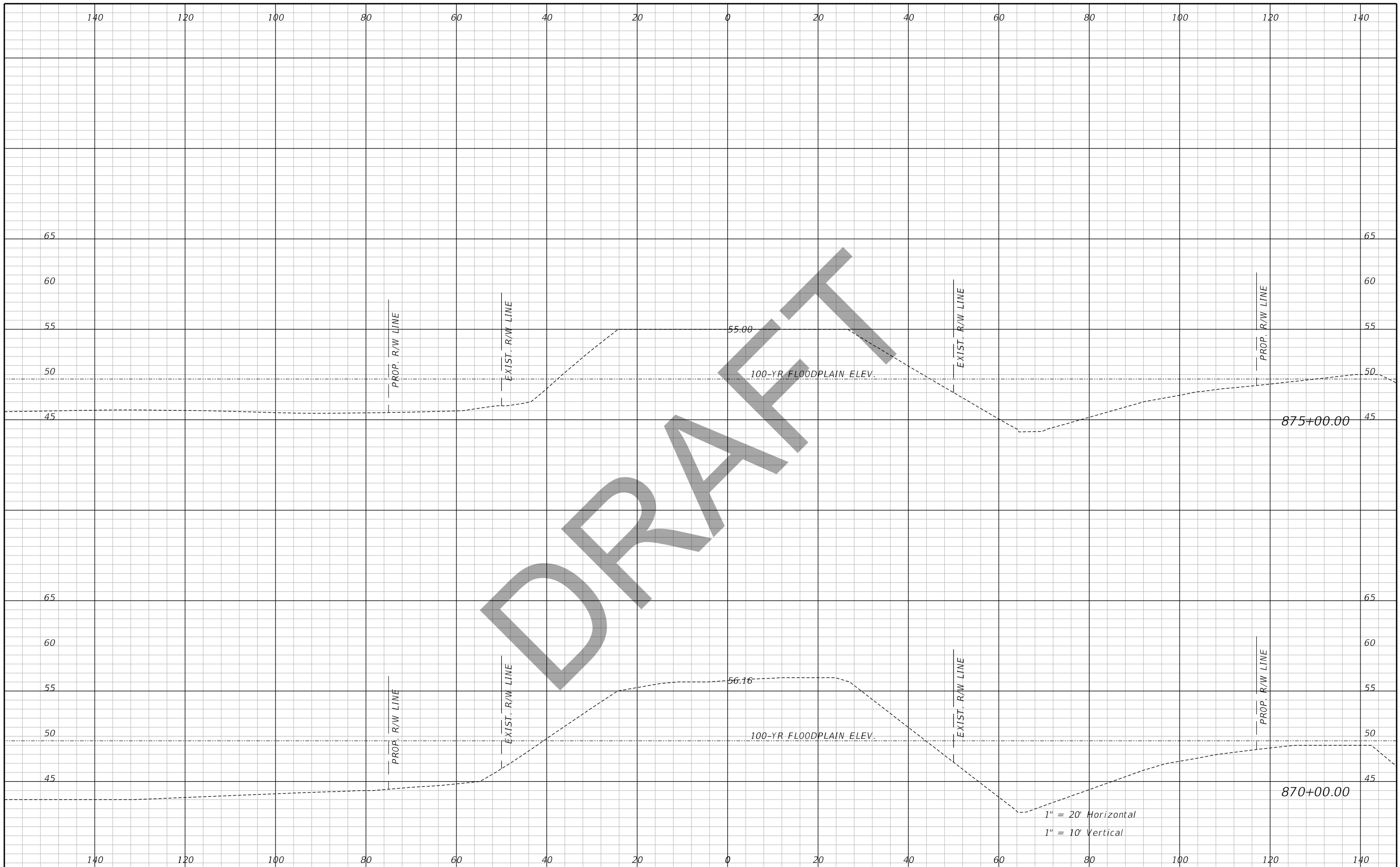
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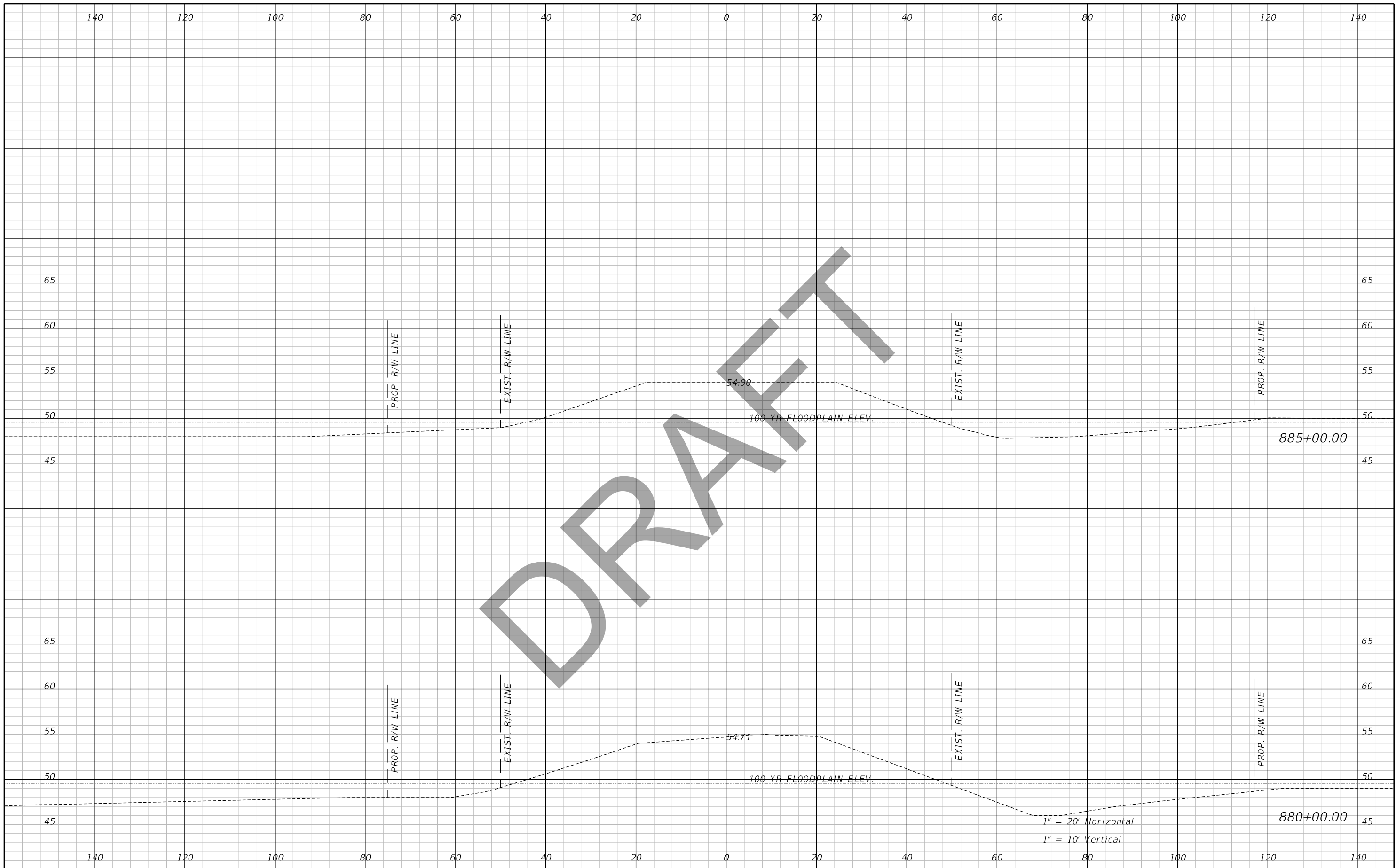
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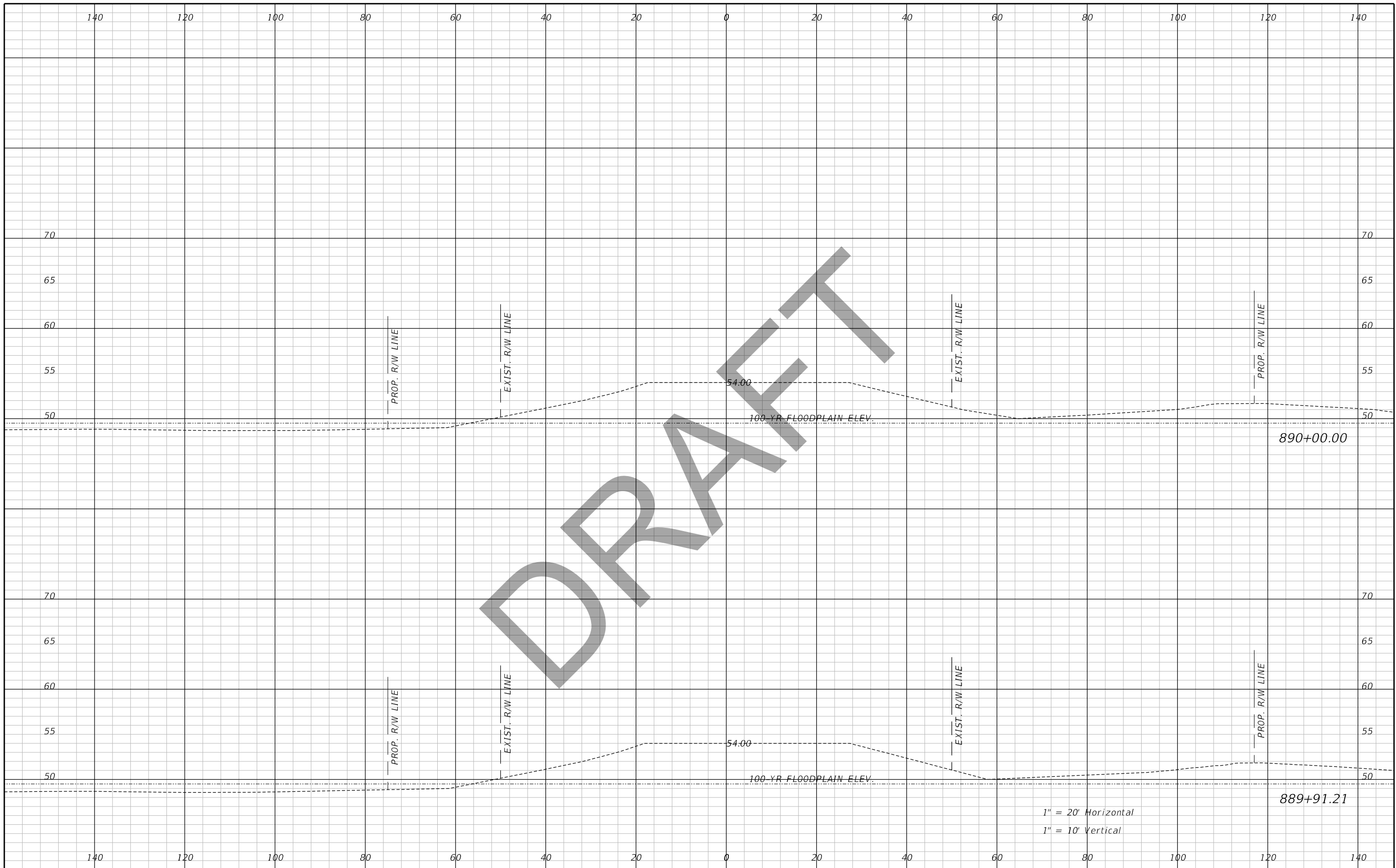
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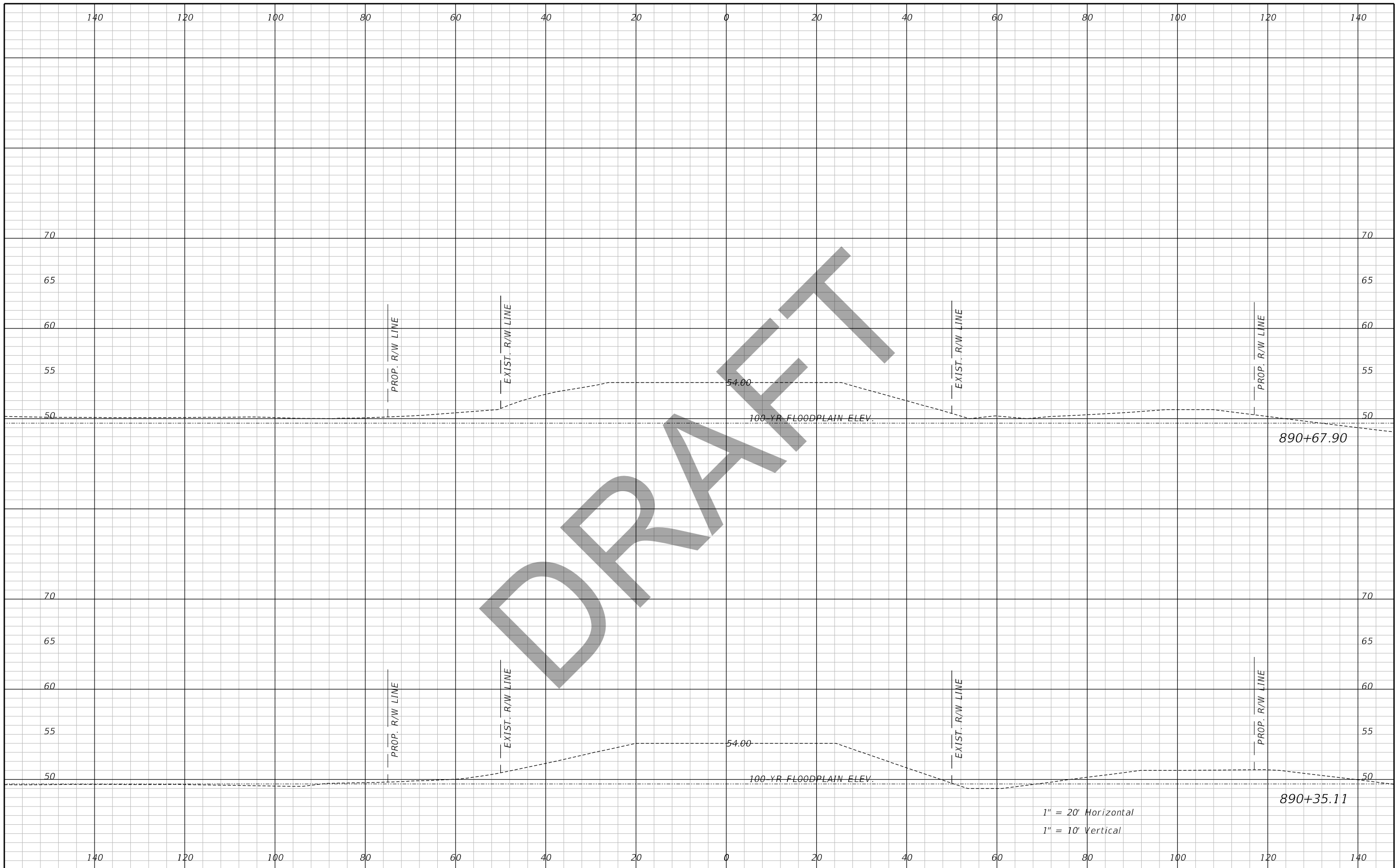
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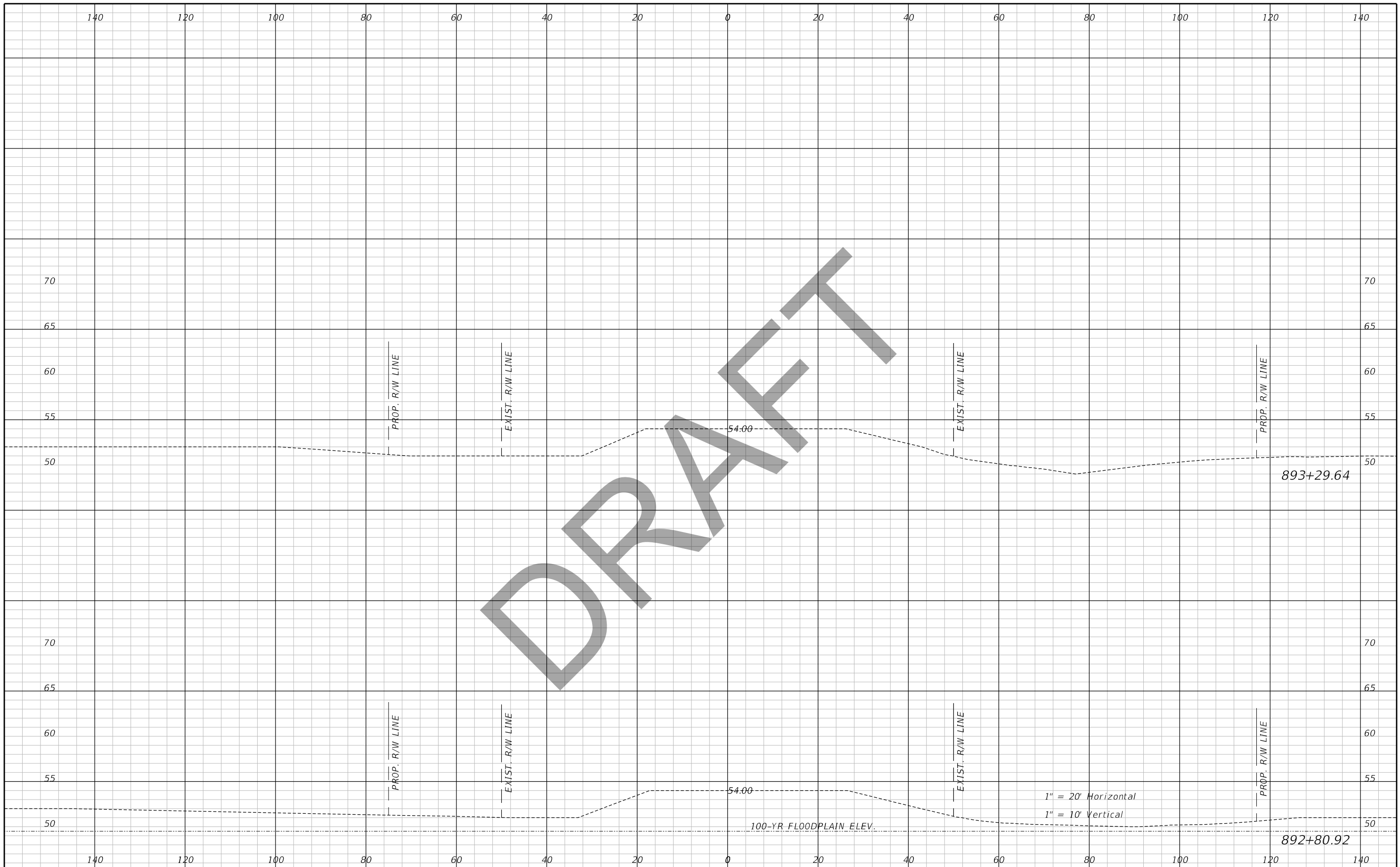
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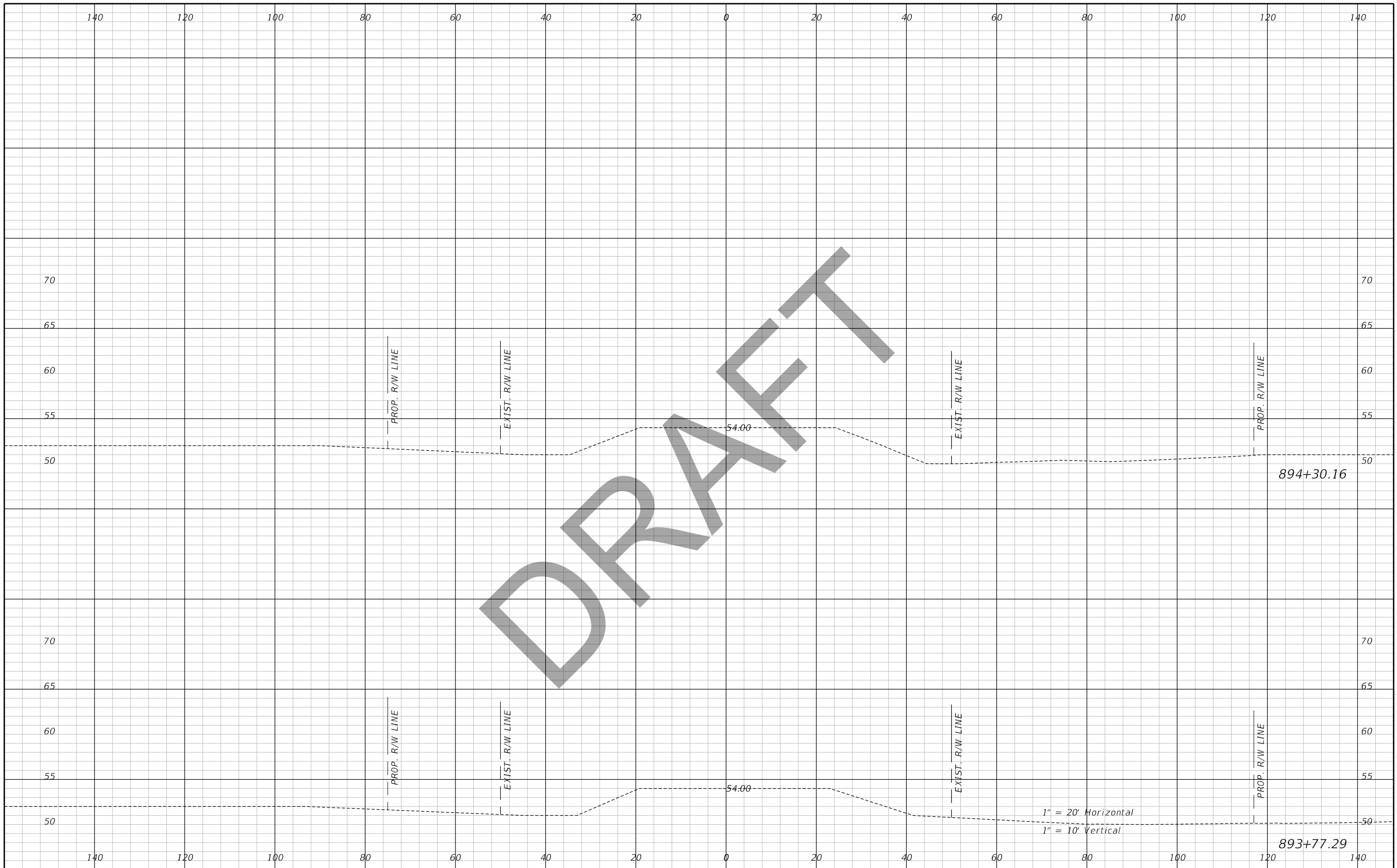
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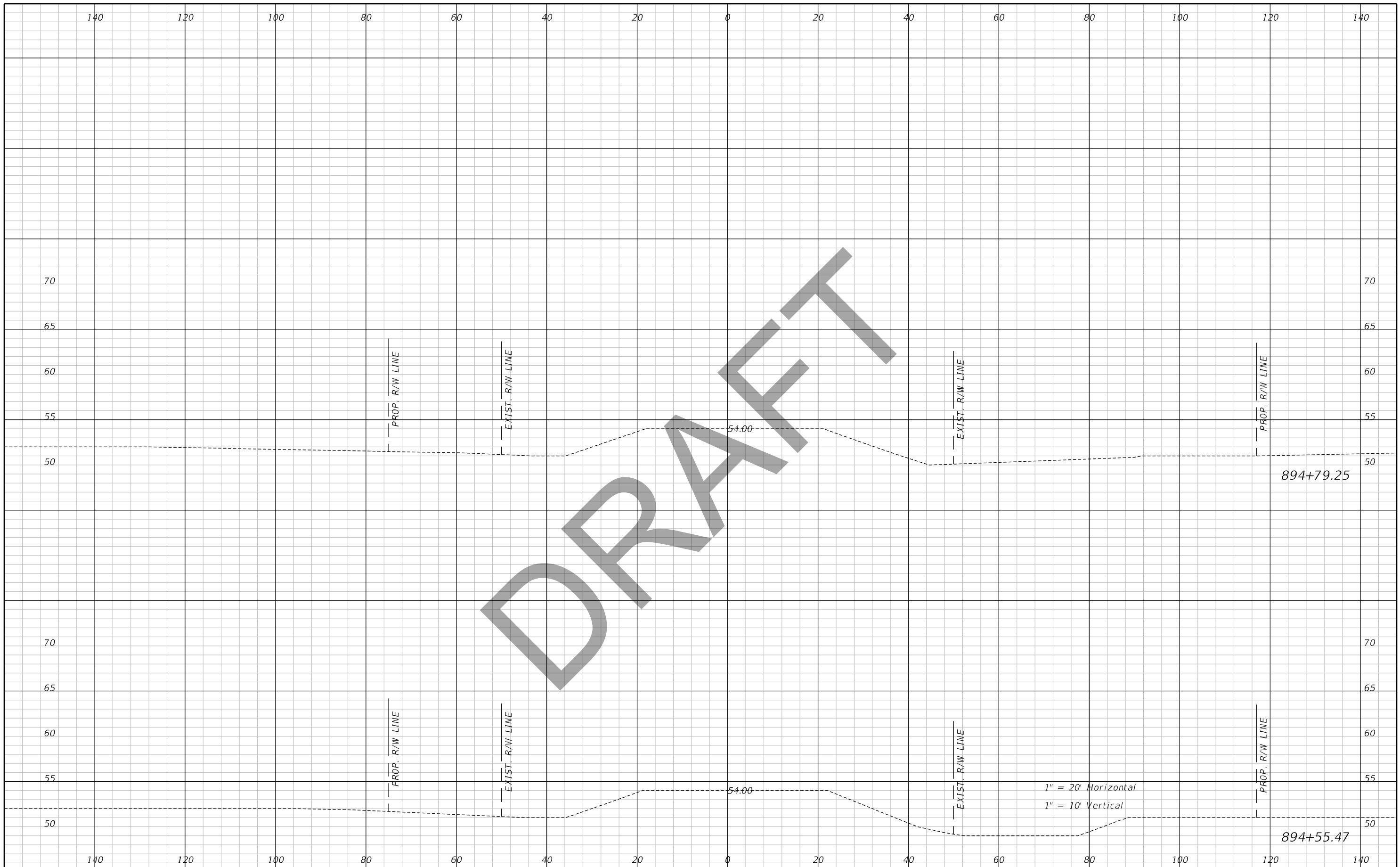
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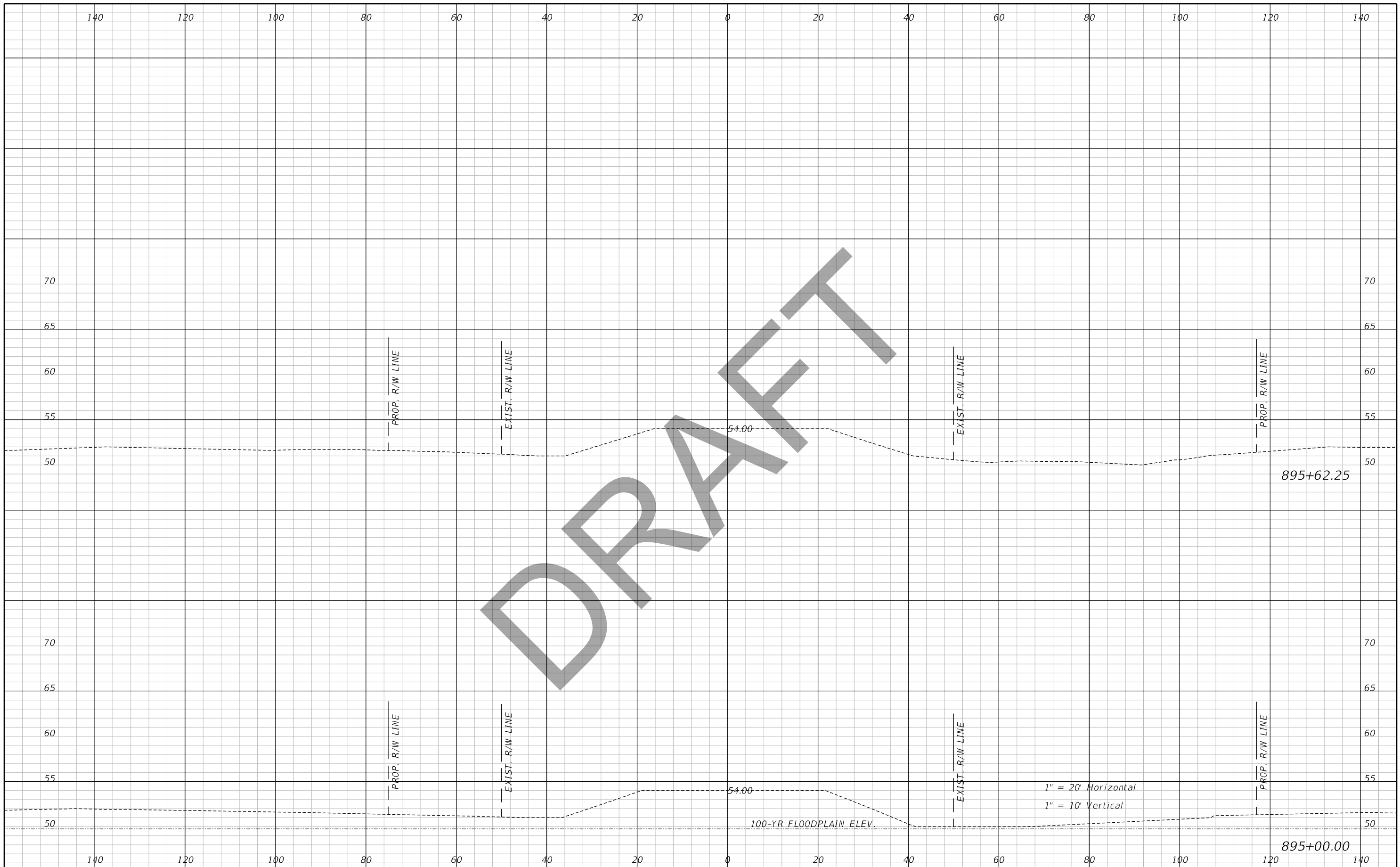
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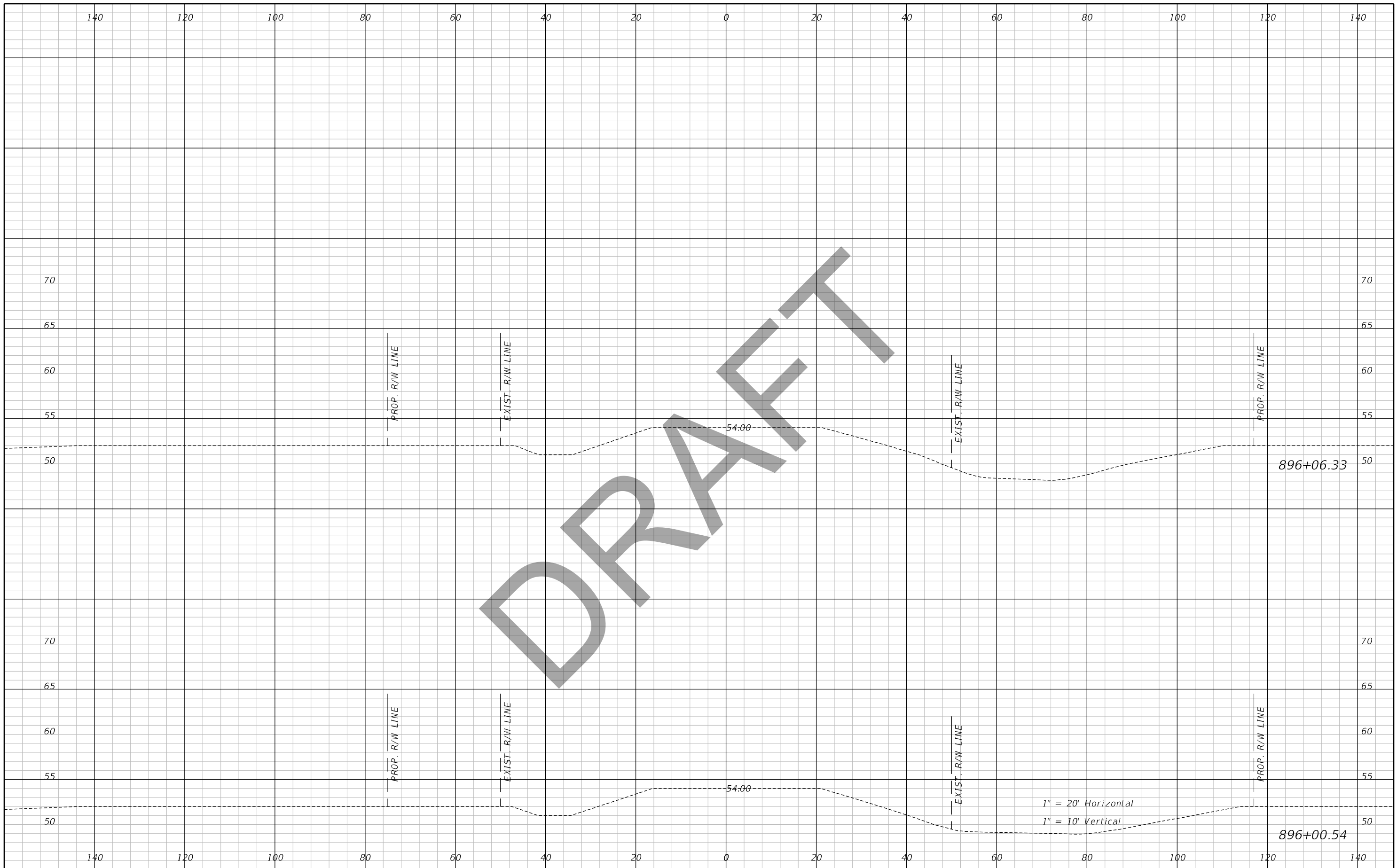
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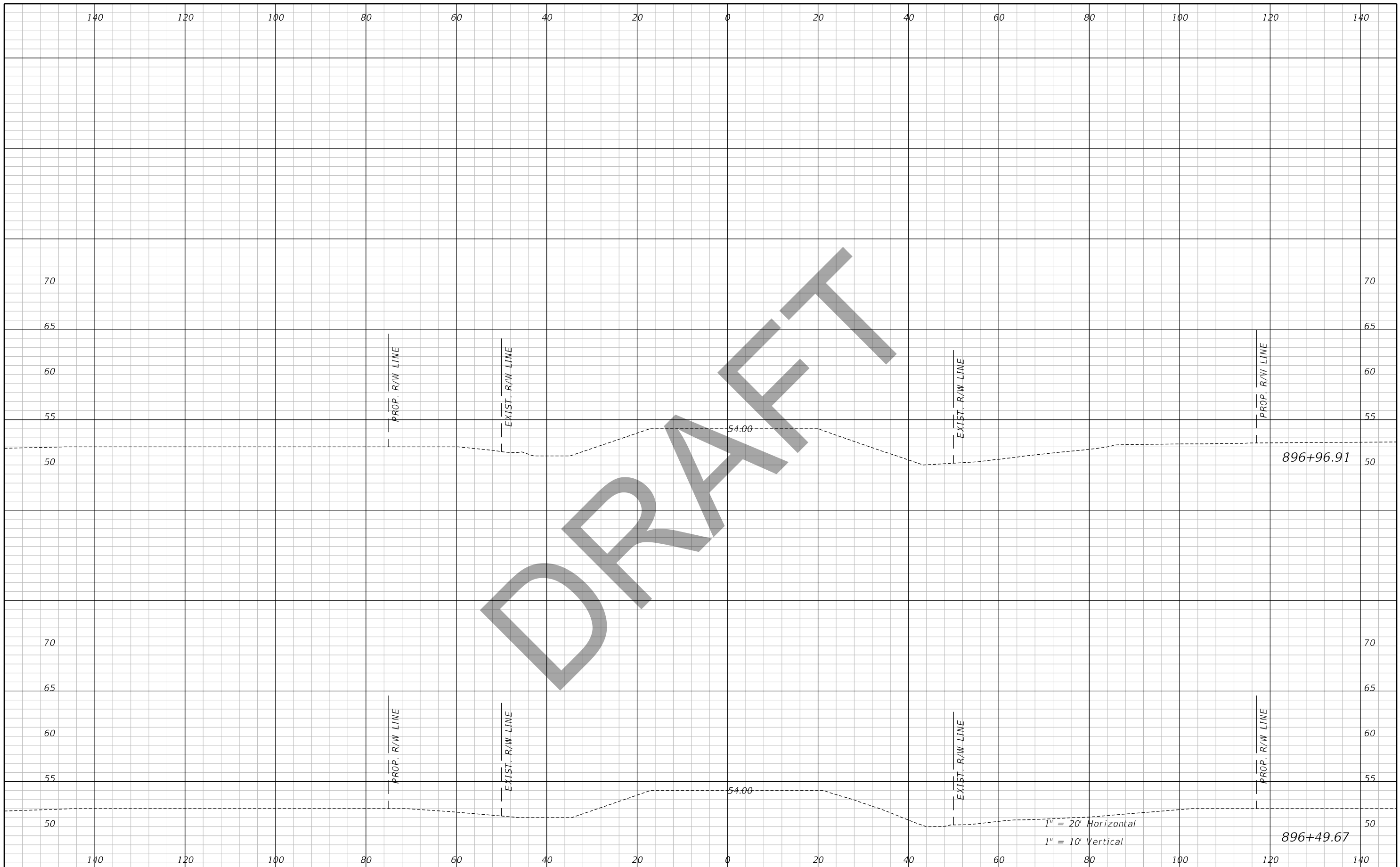
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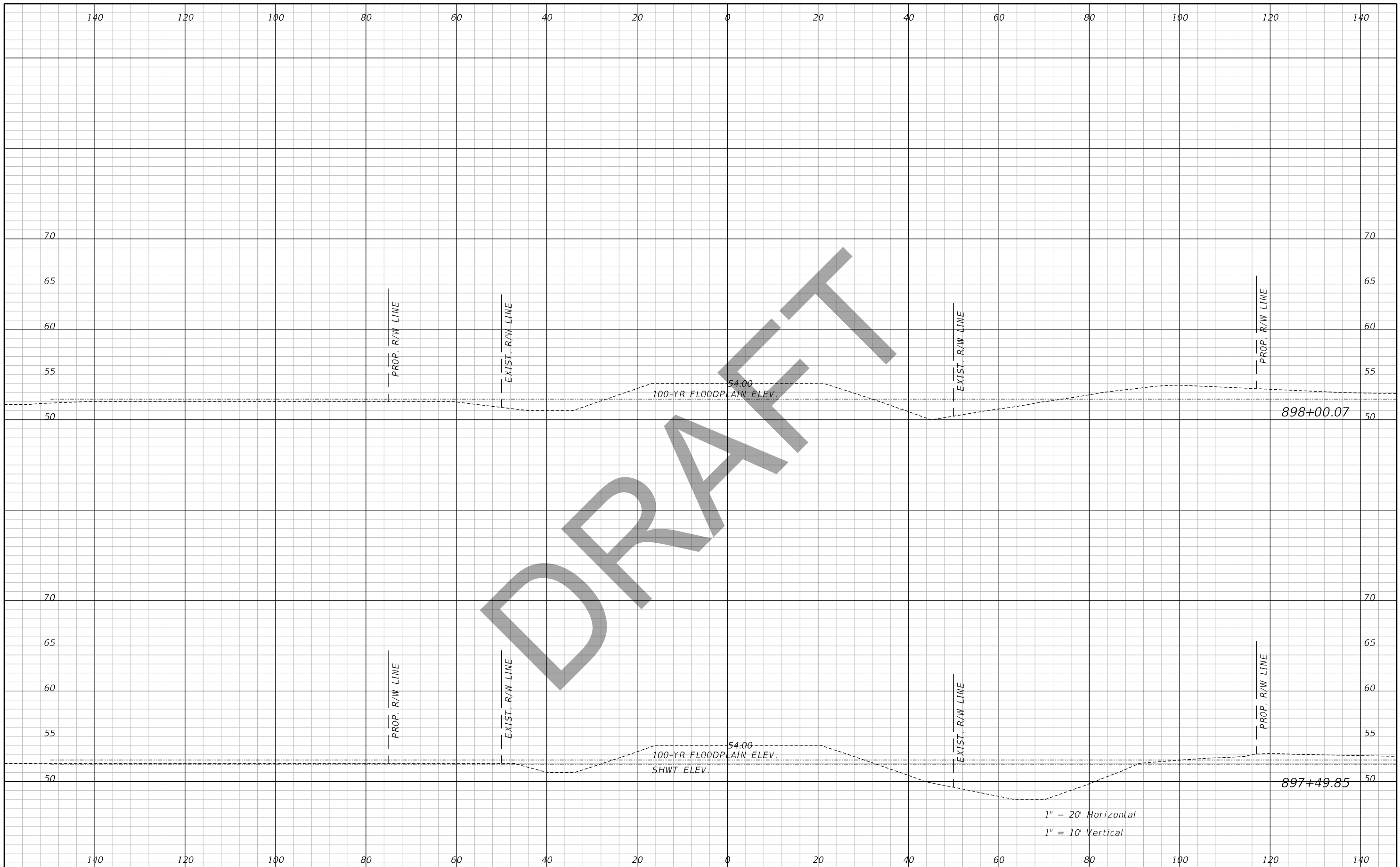
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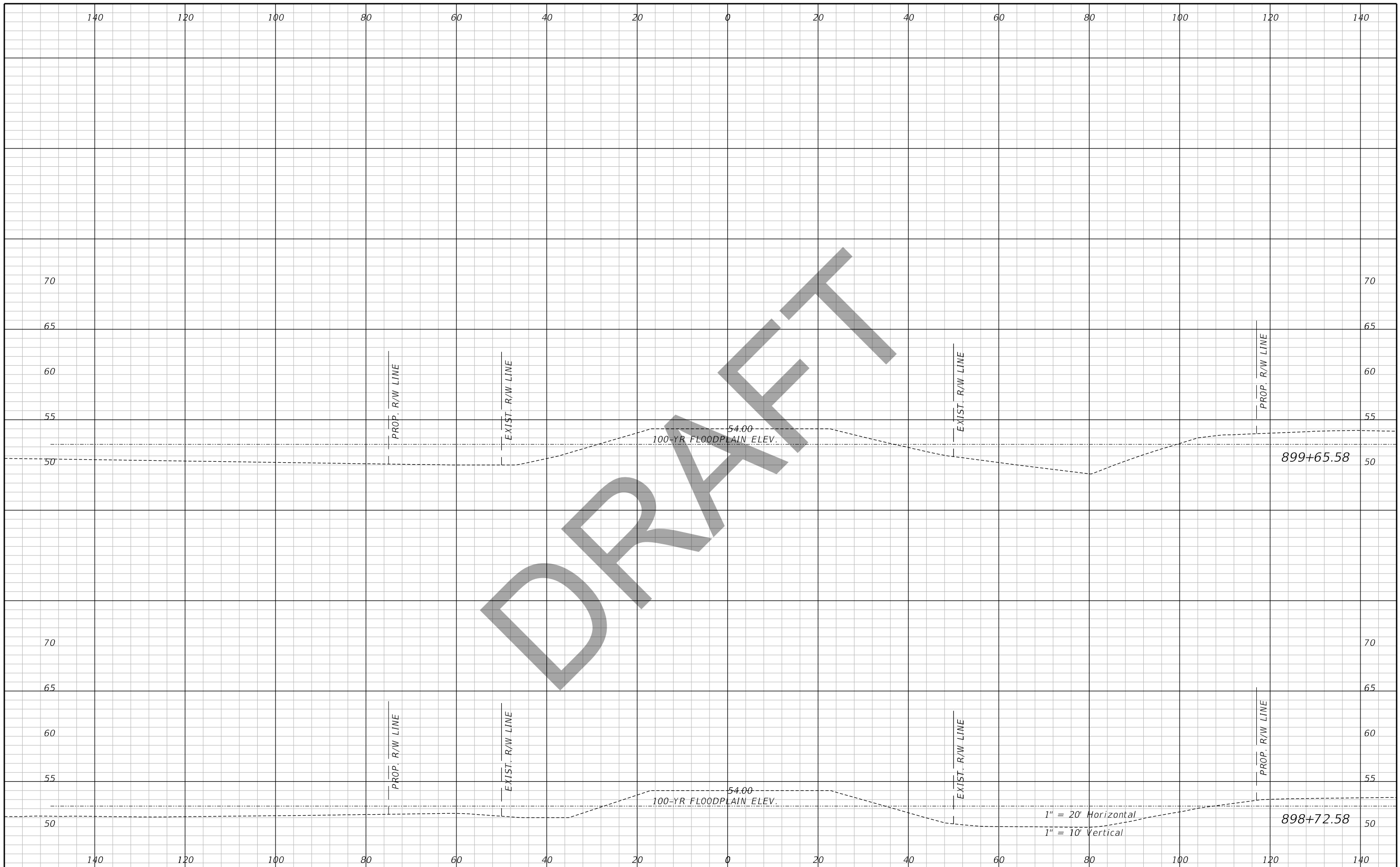
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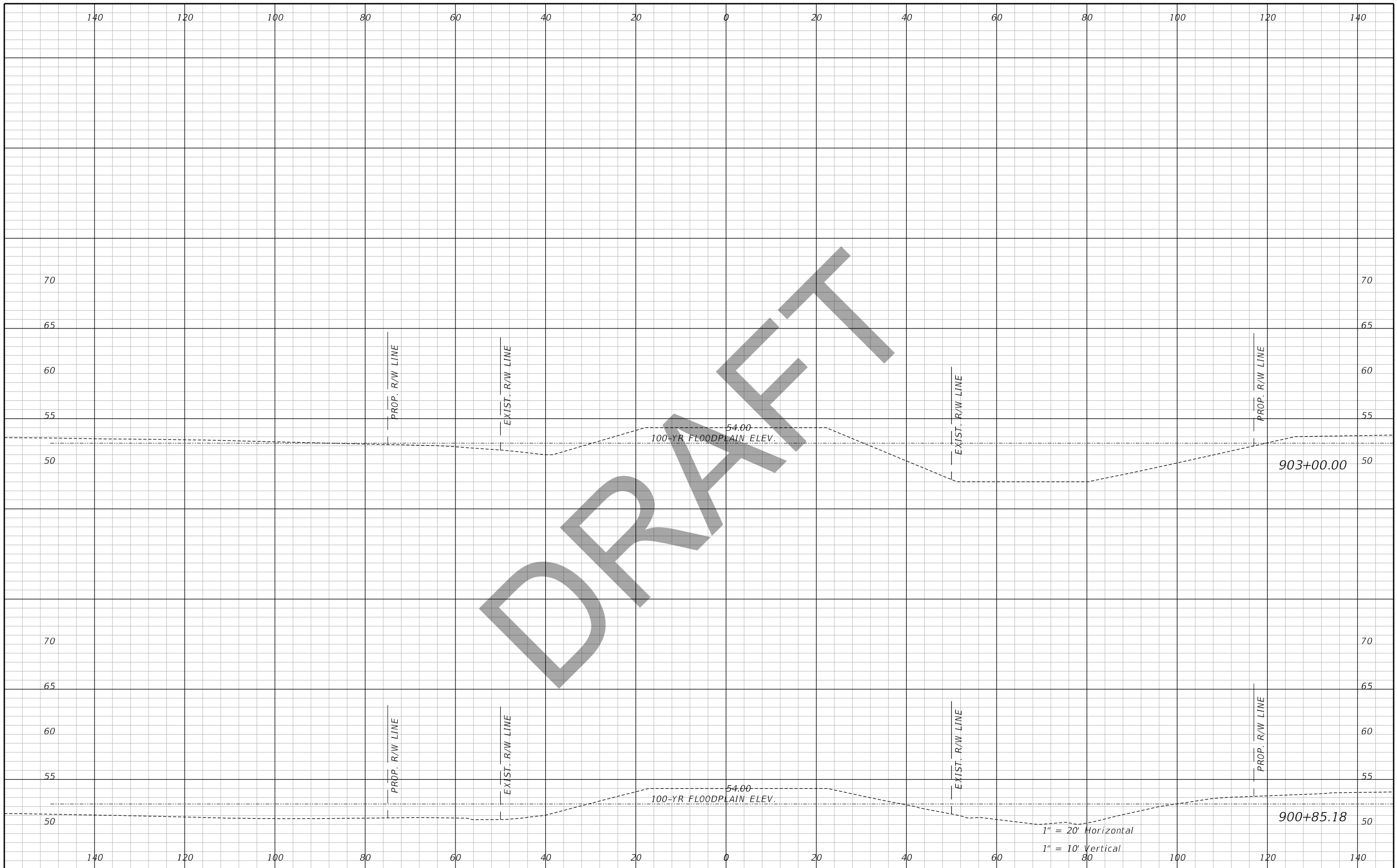
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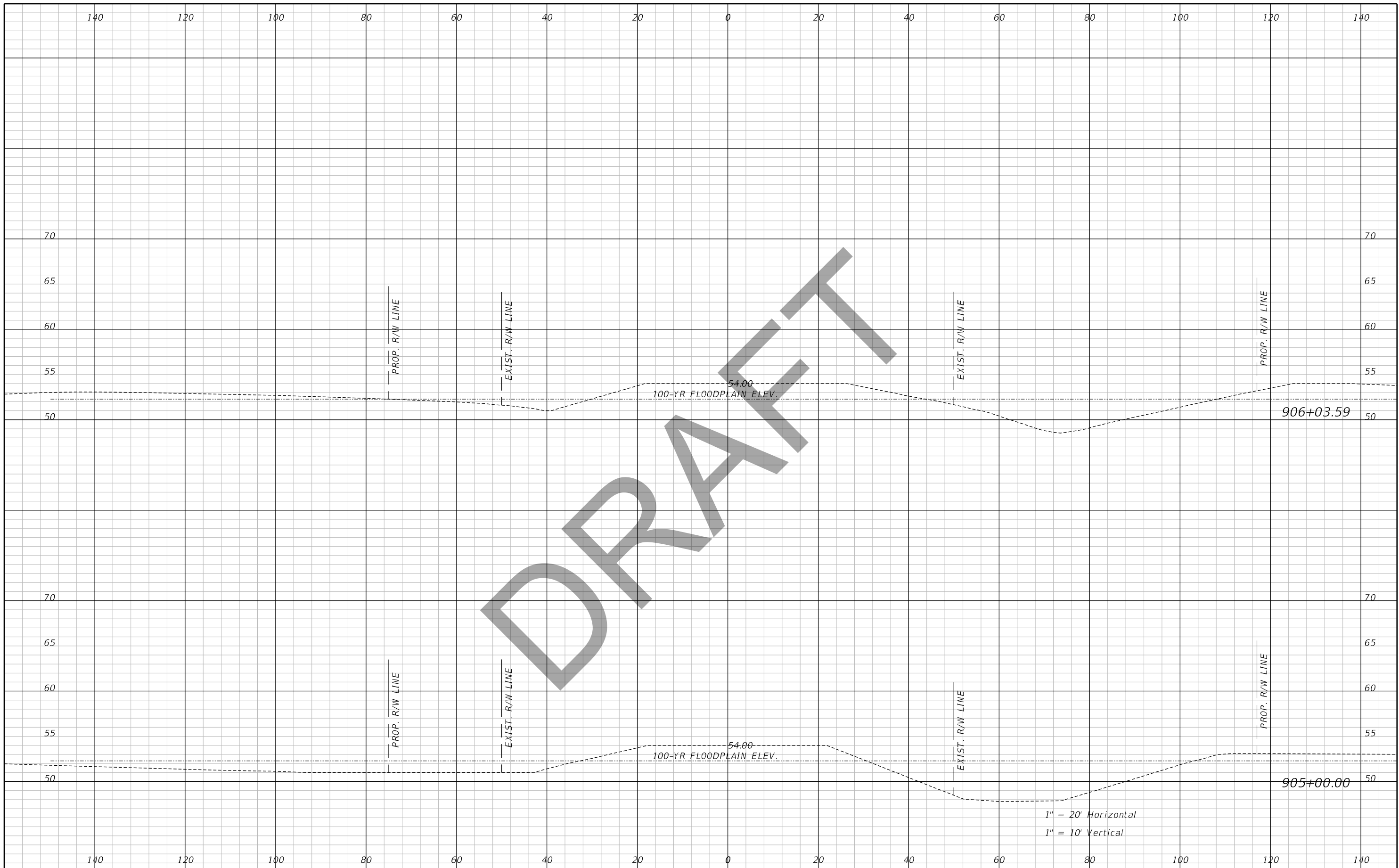
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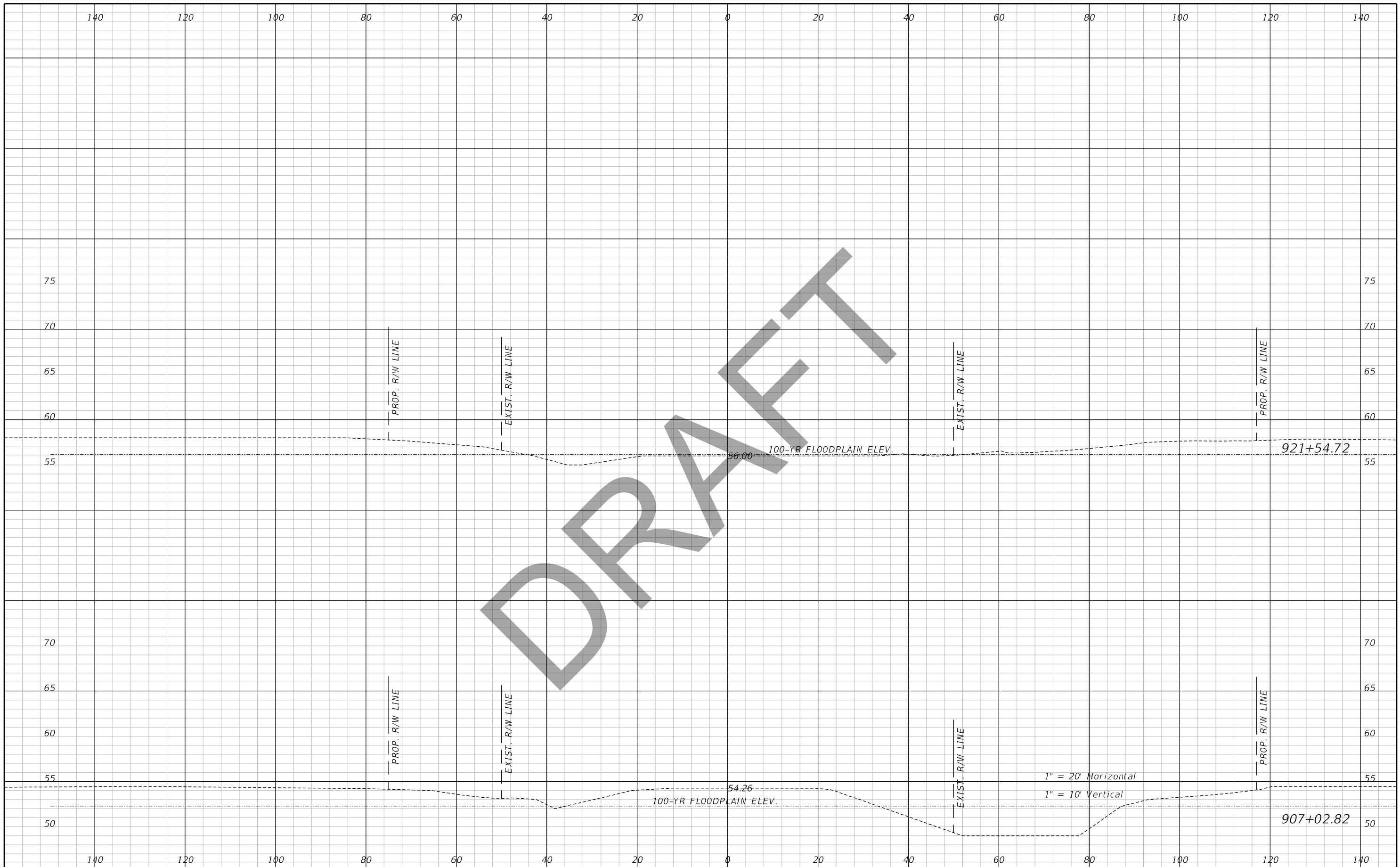
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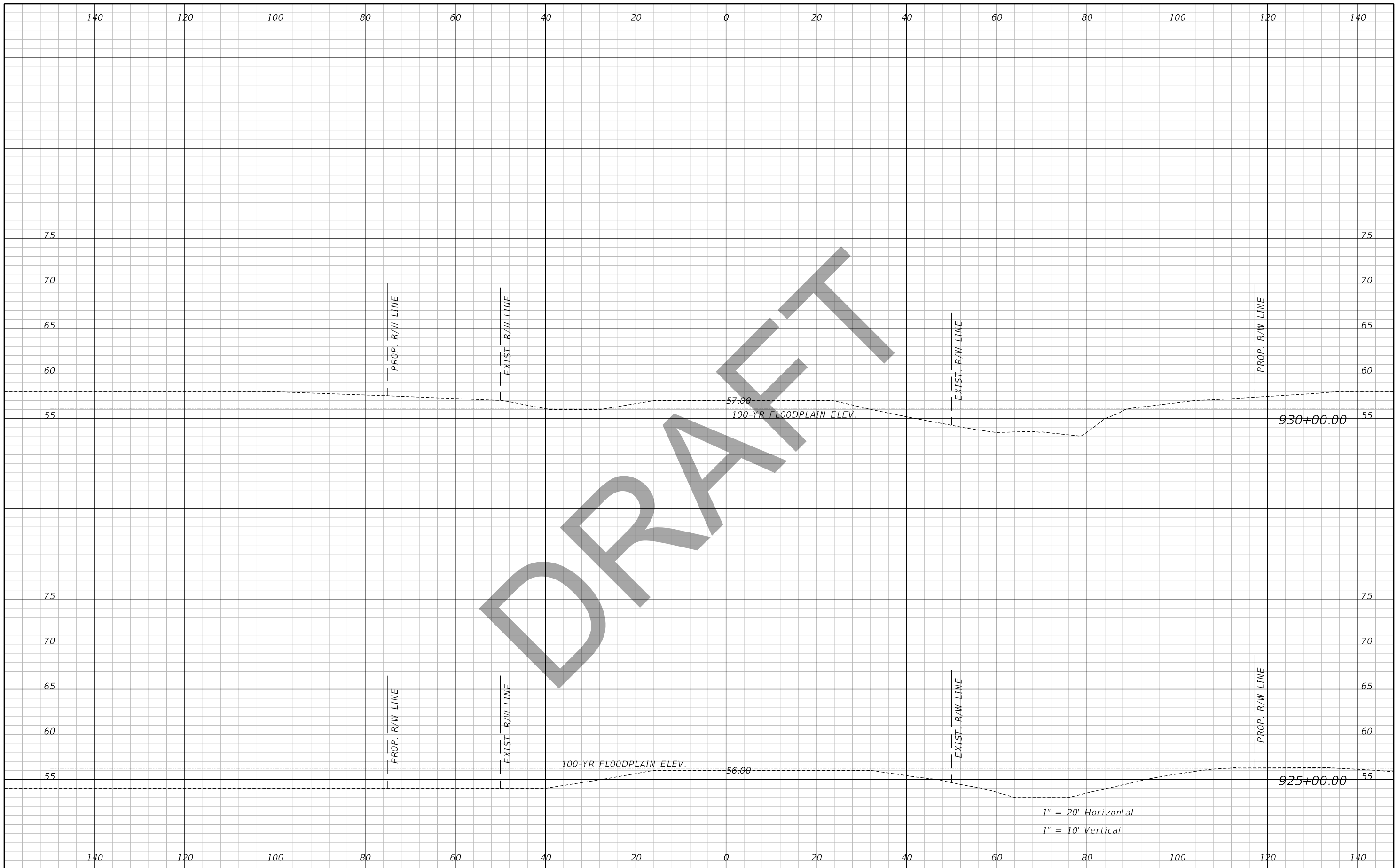
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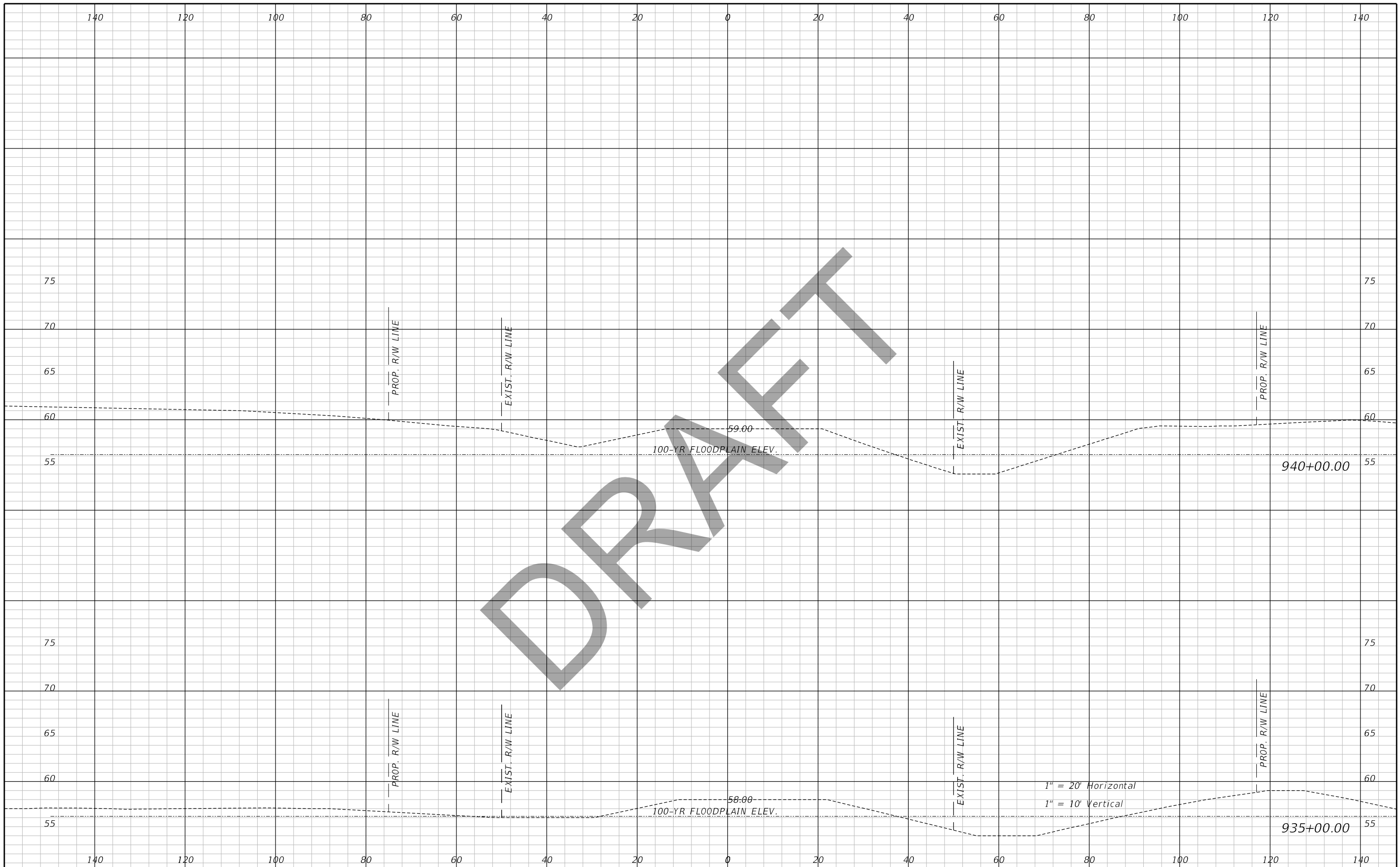
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US 301	HILLSBOROUGH PASCO	255796-1

**FLOODPLAIN IMPACT &
COMPENSATION**

SHEET NO.

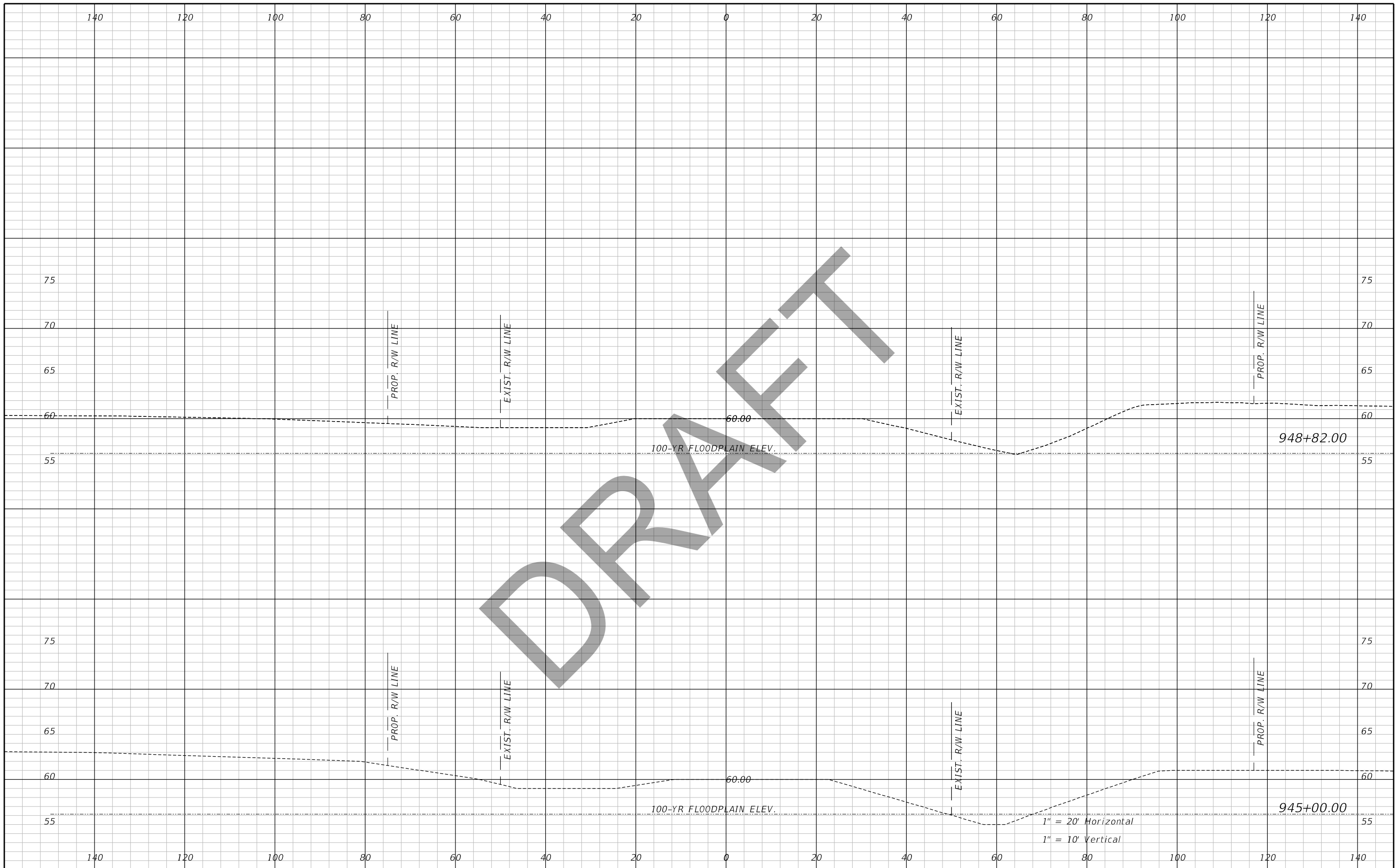


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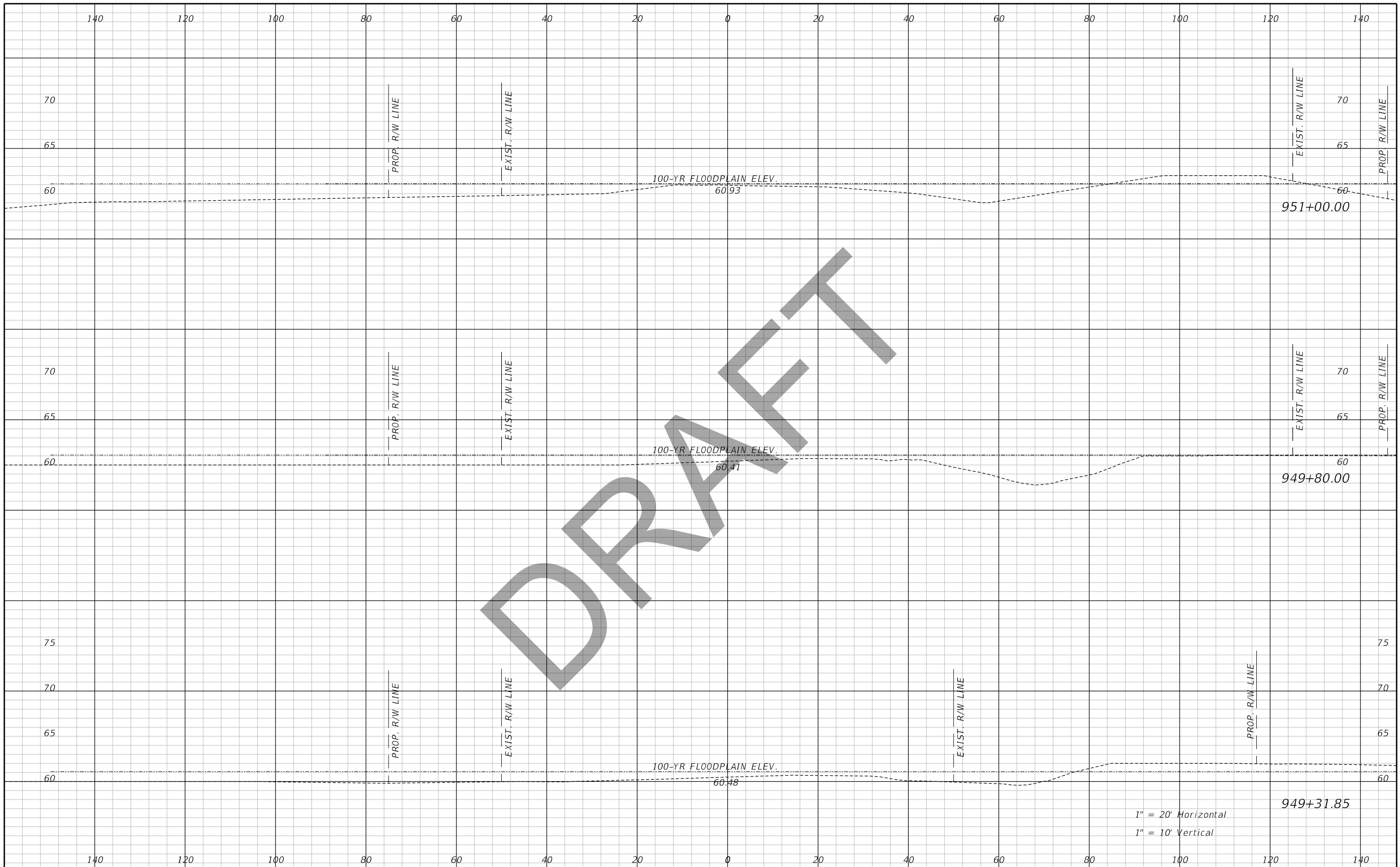
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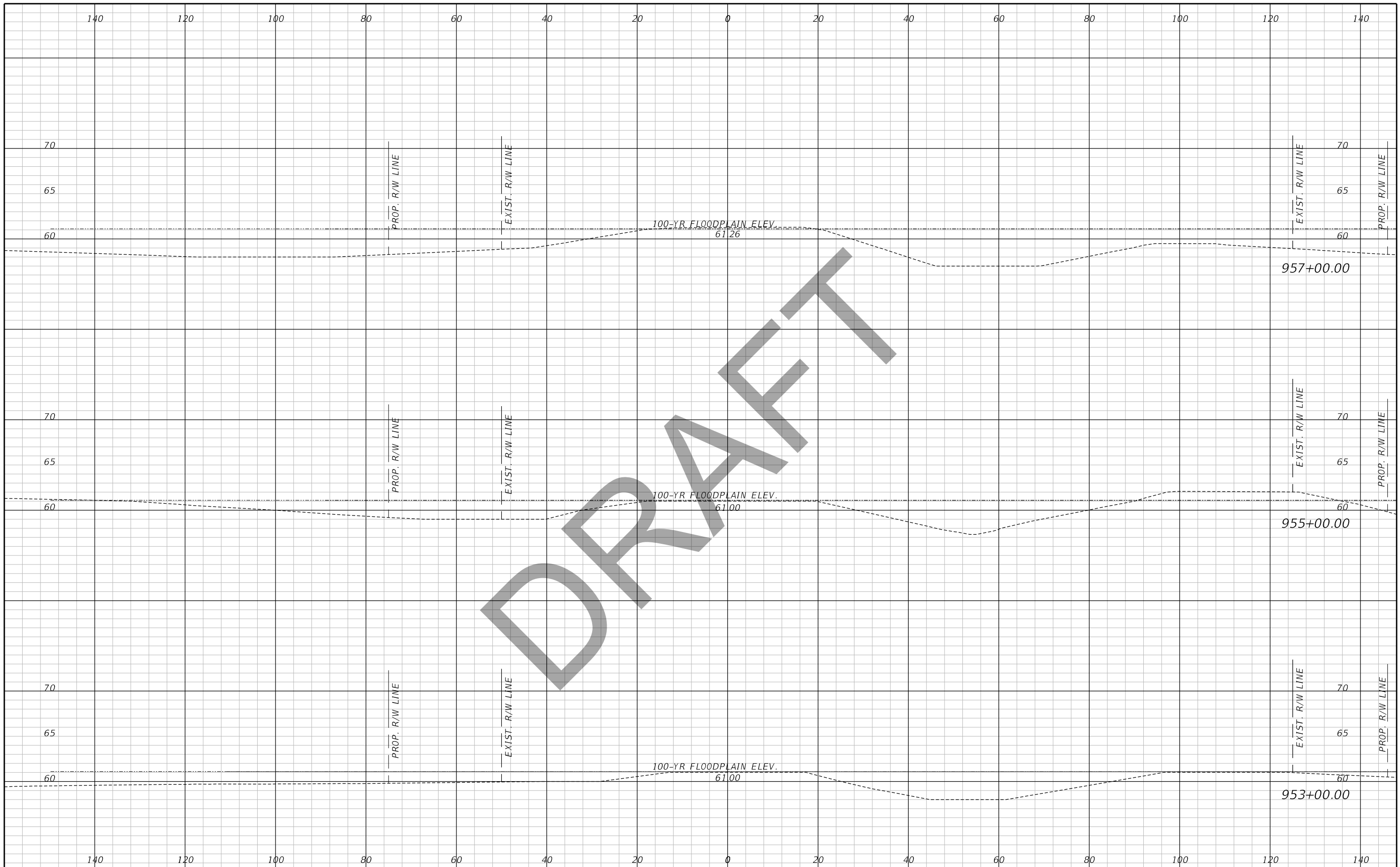
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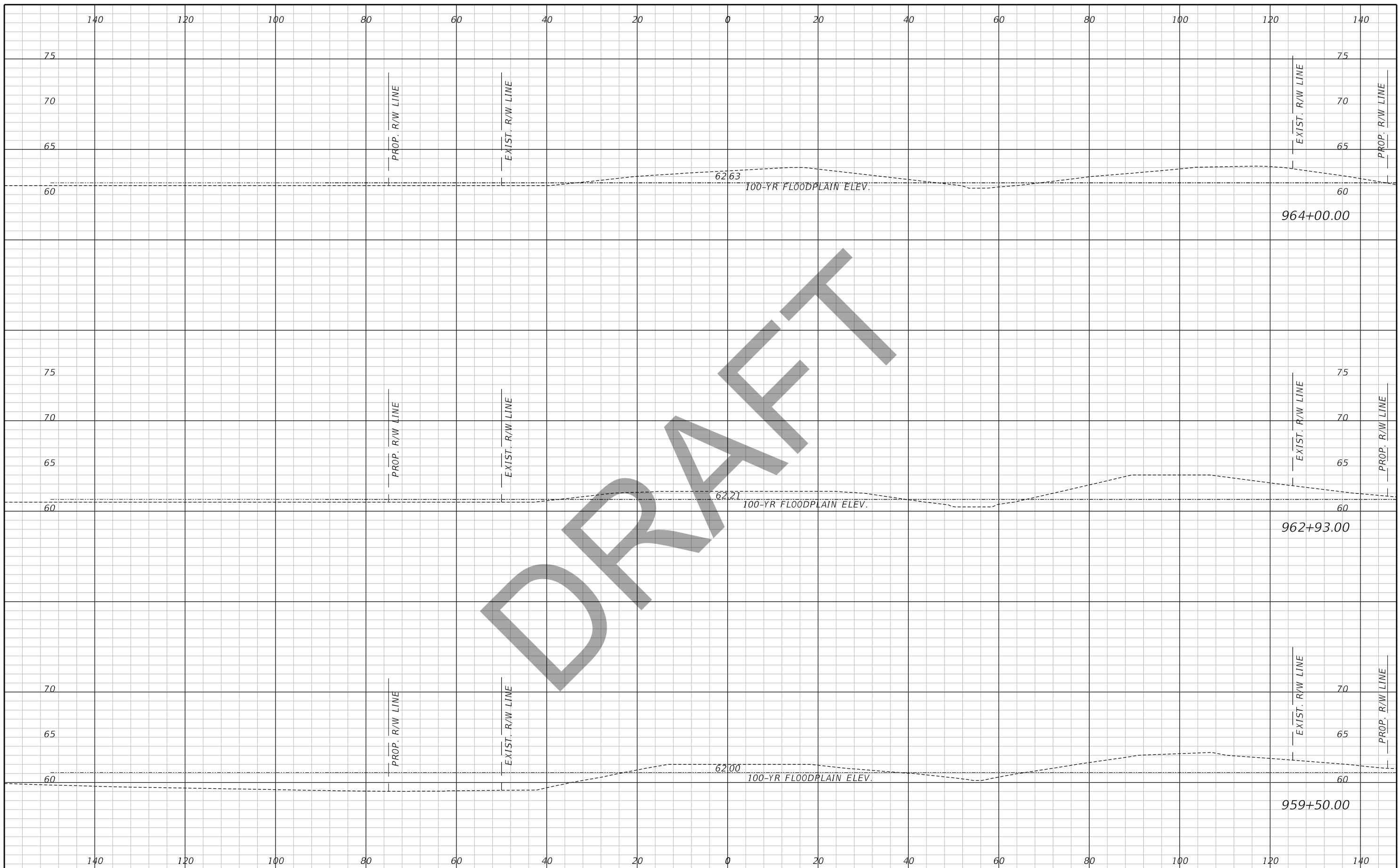
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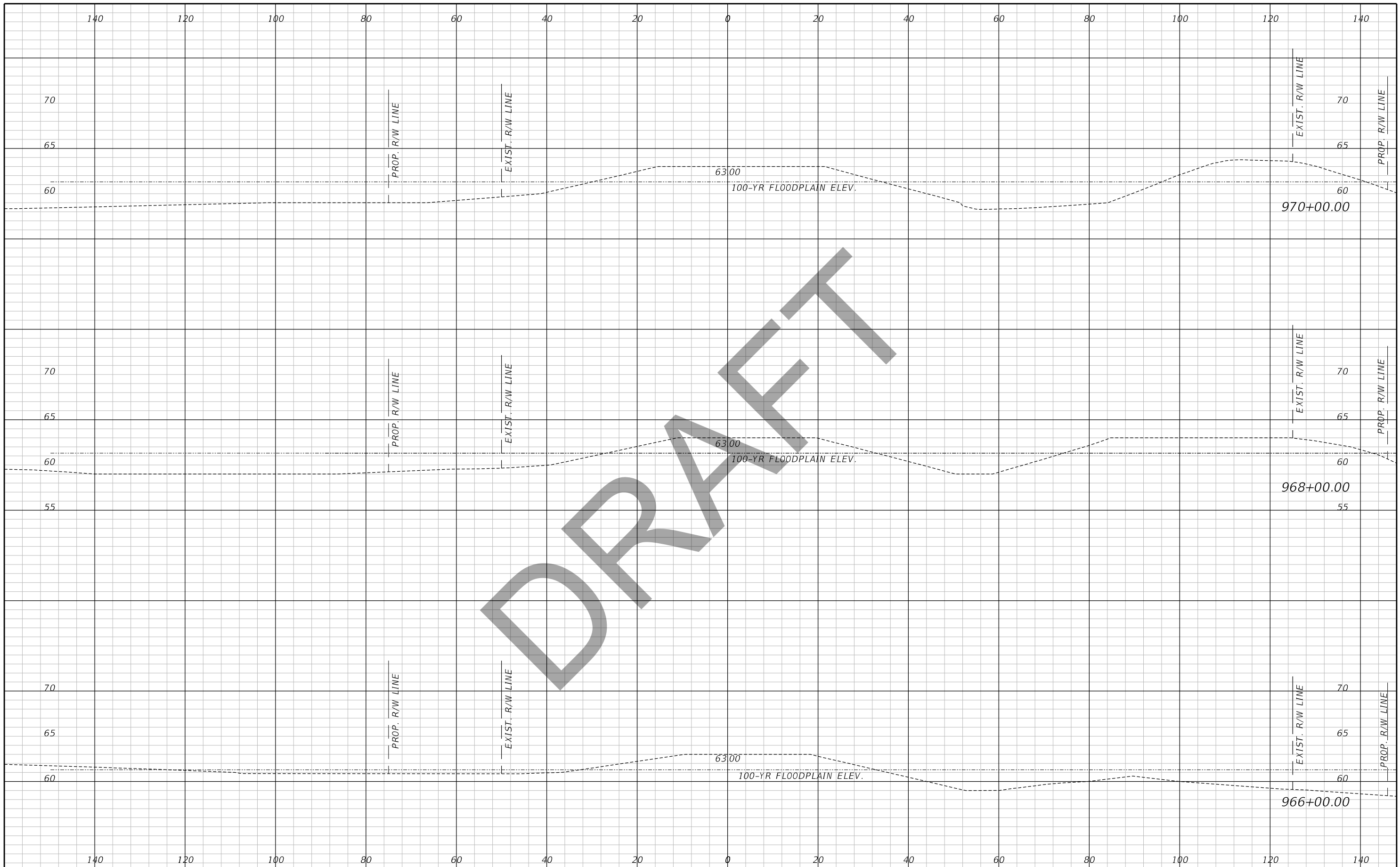
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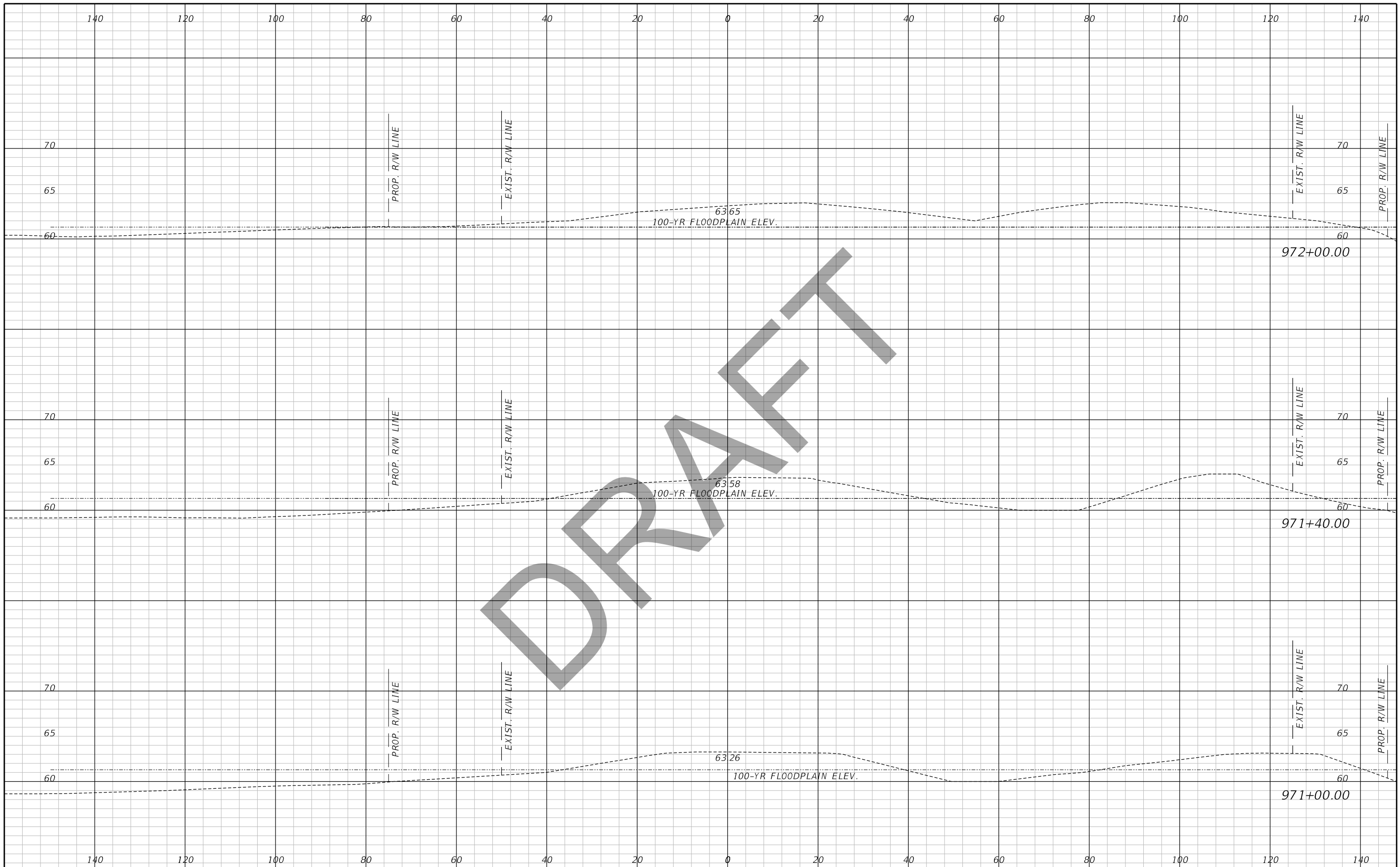
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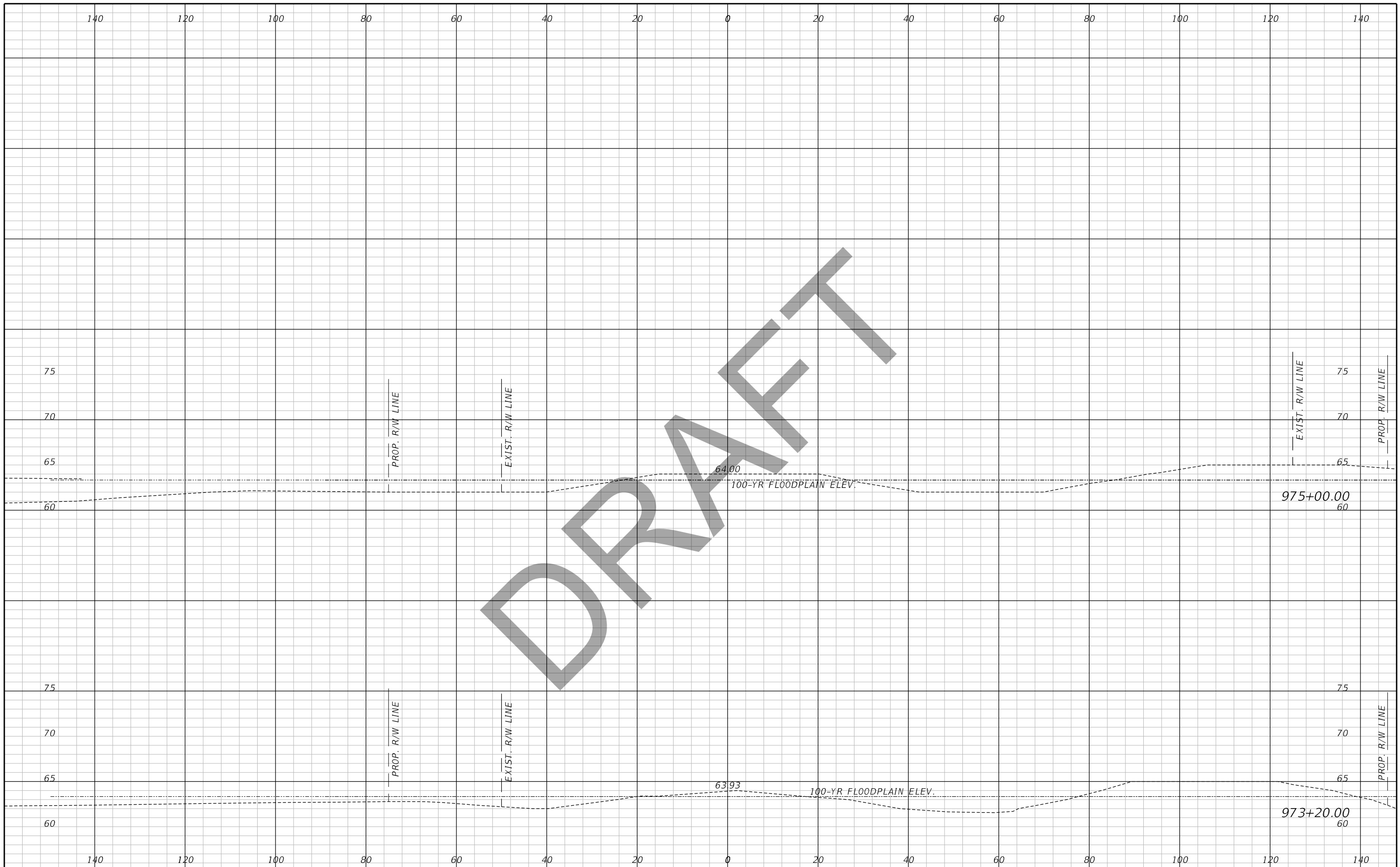
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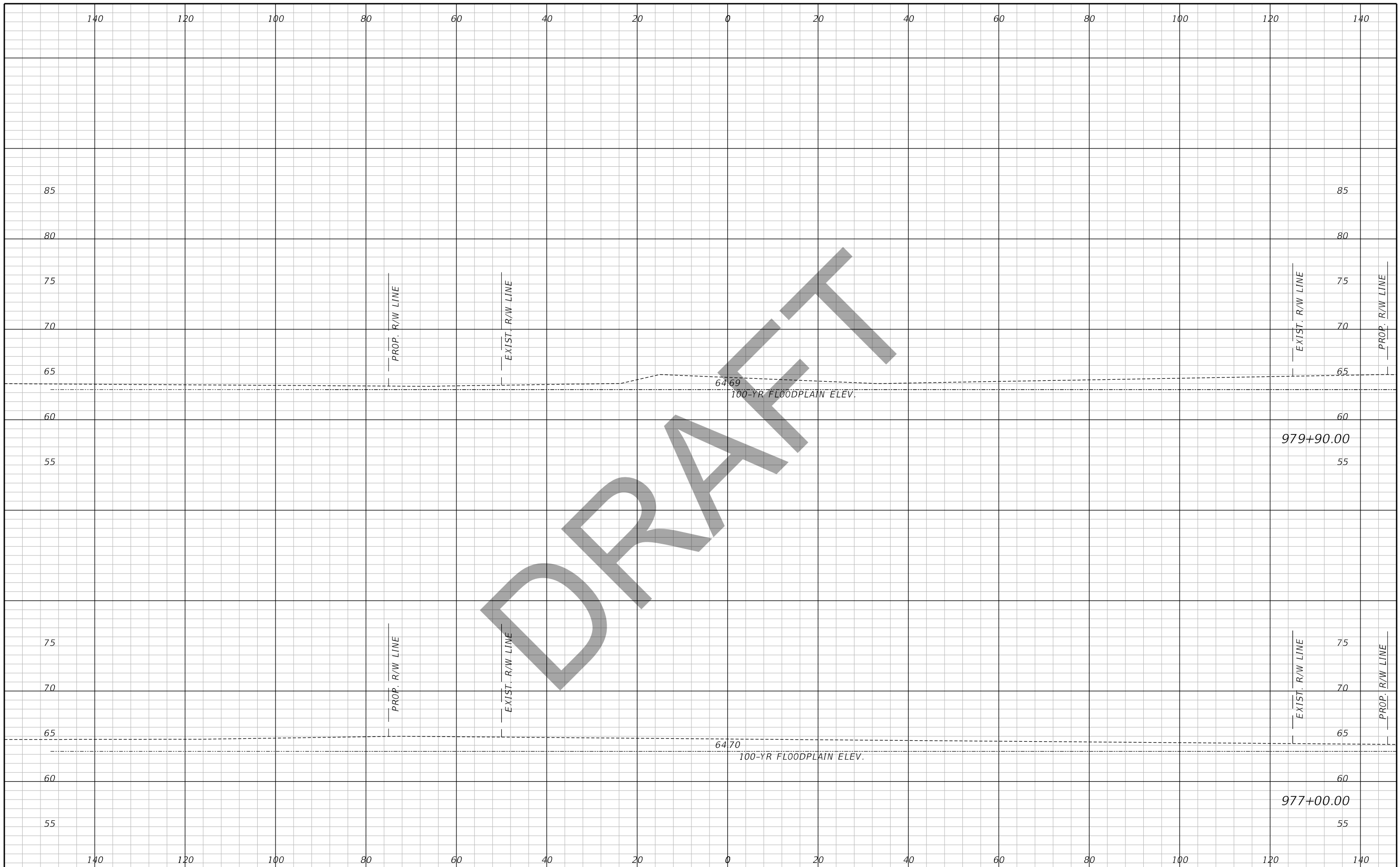
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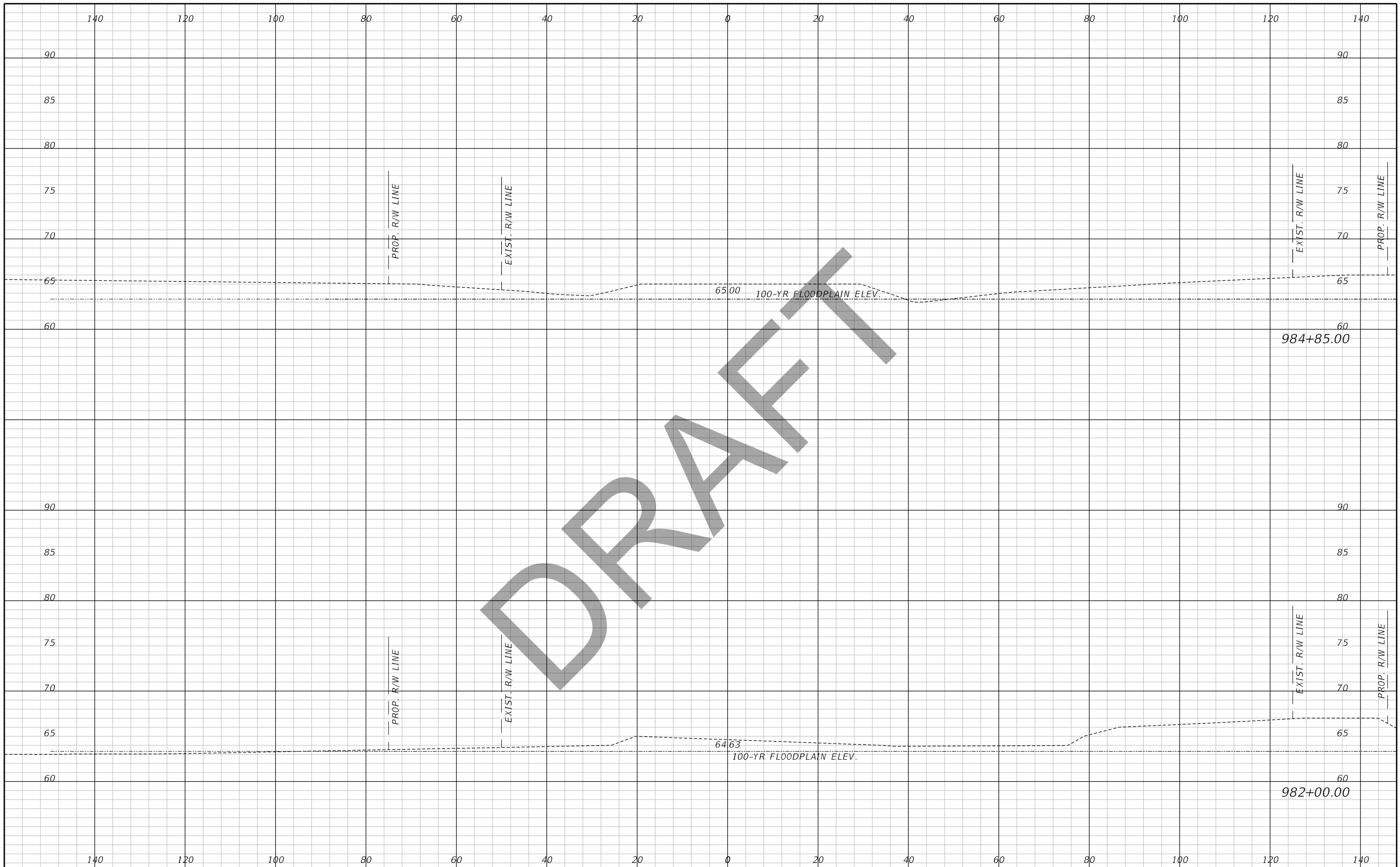
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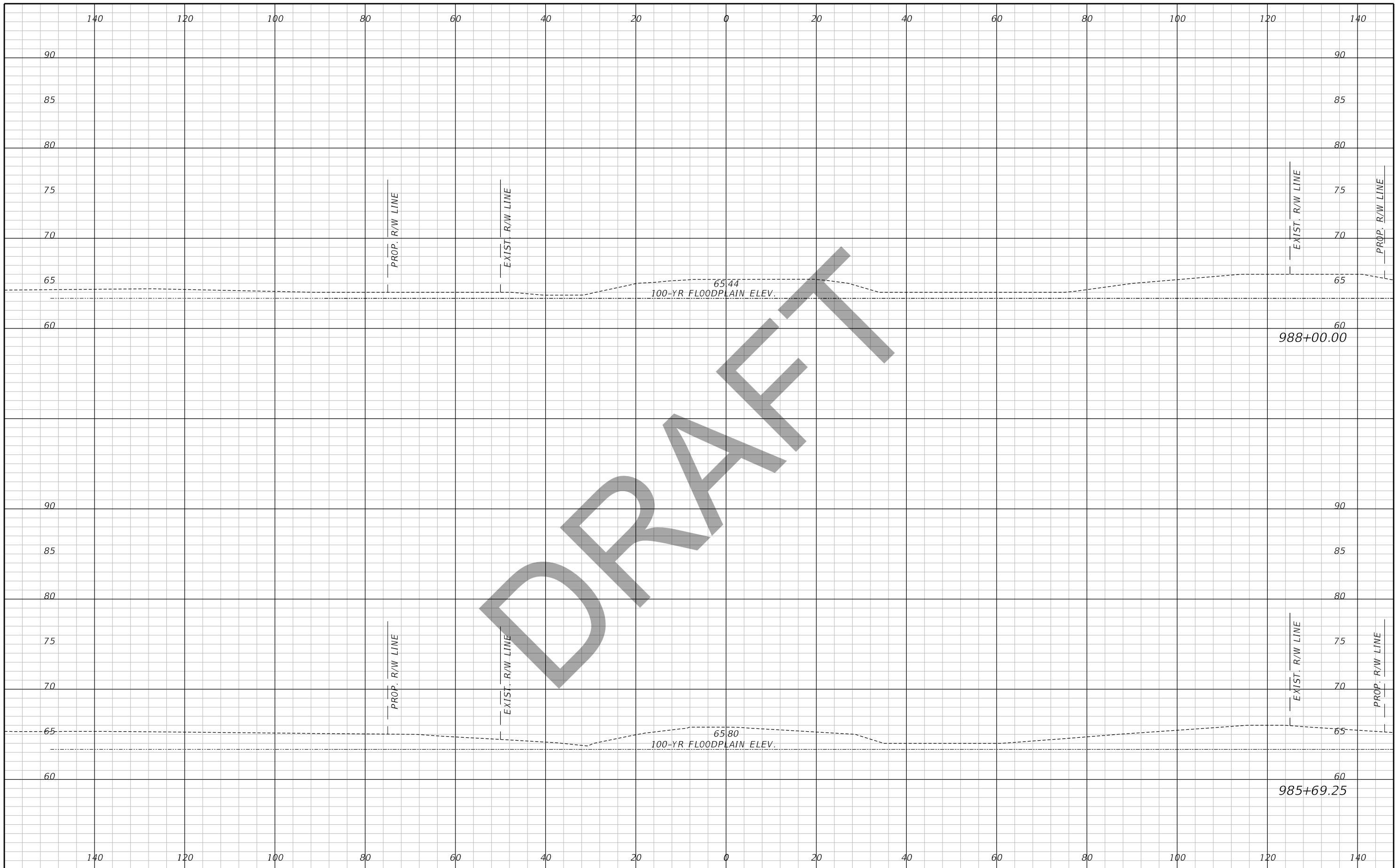
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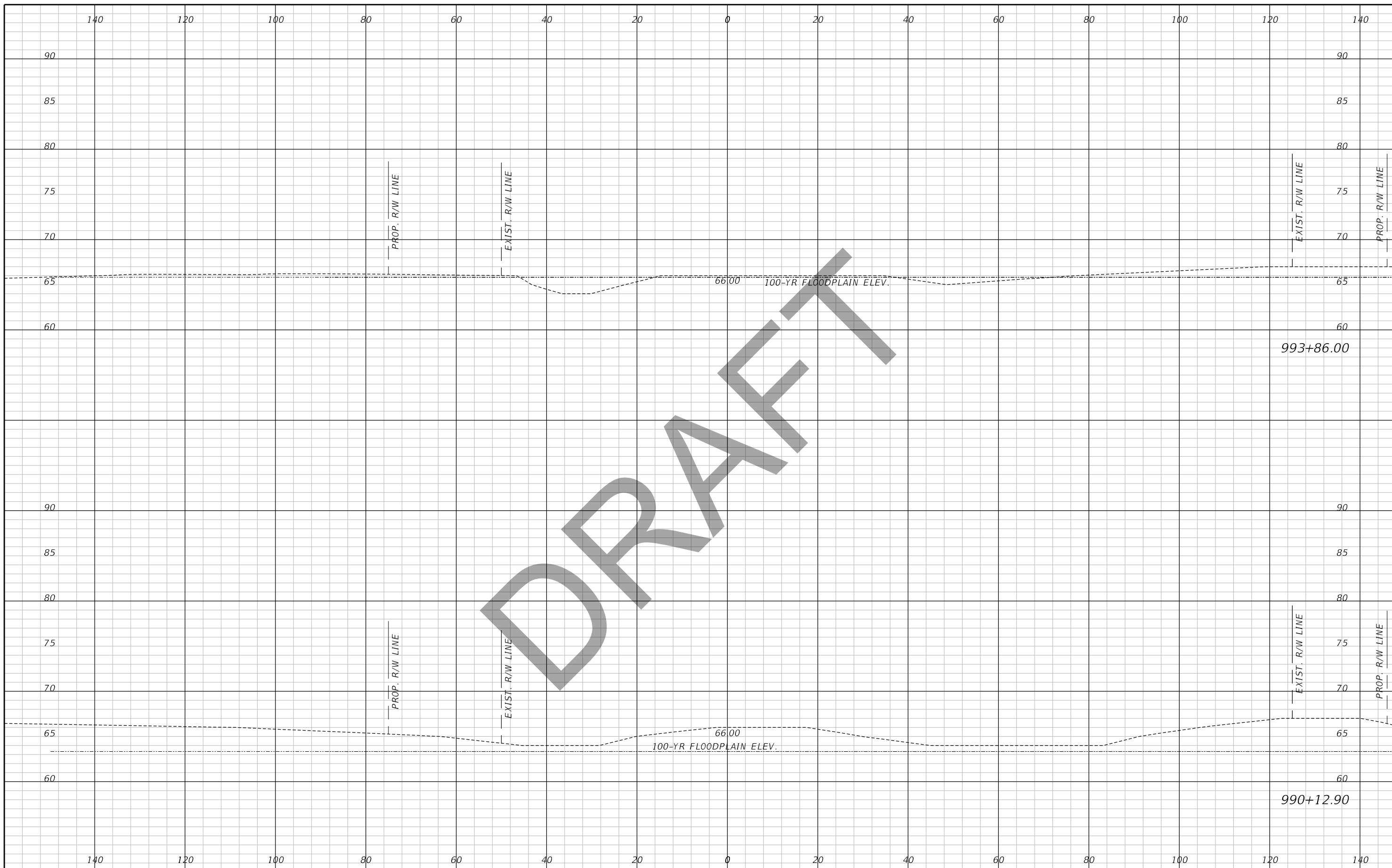
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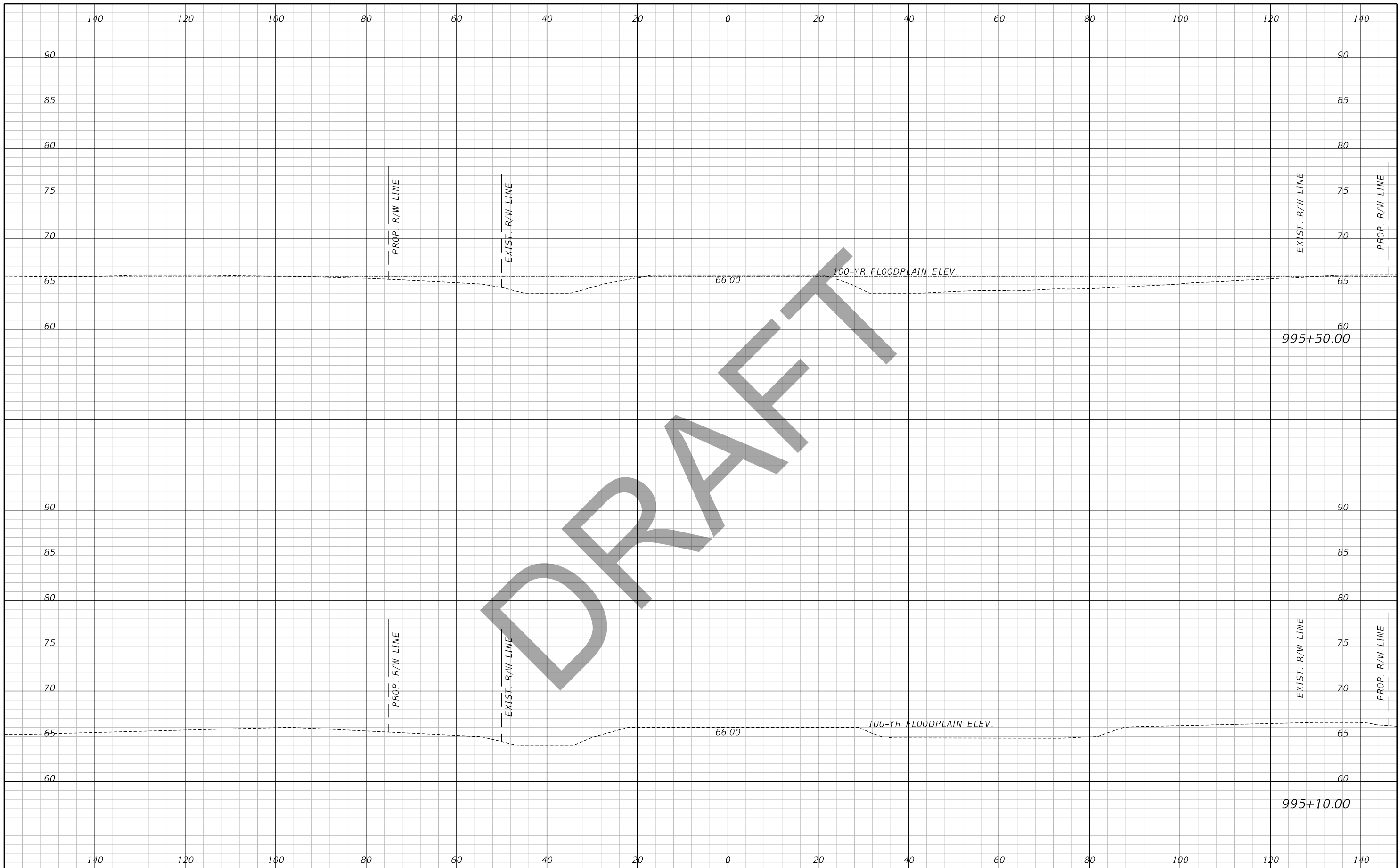
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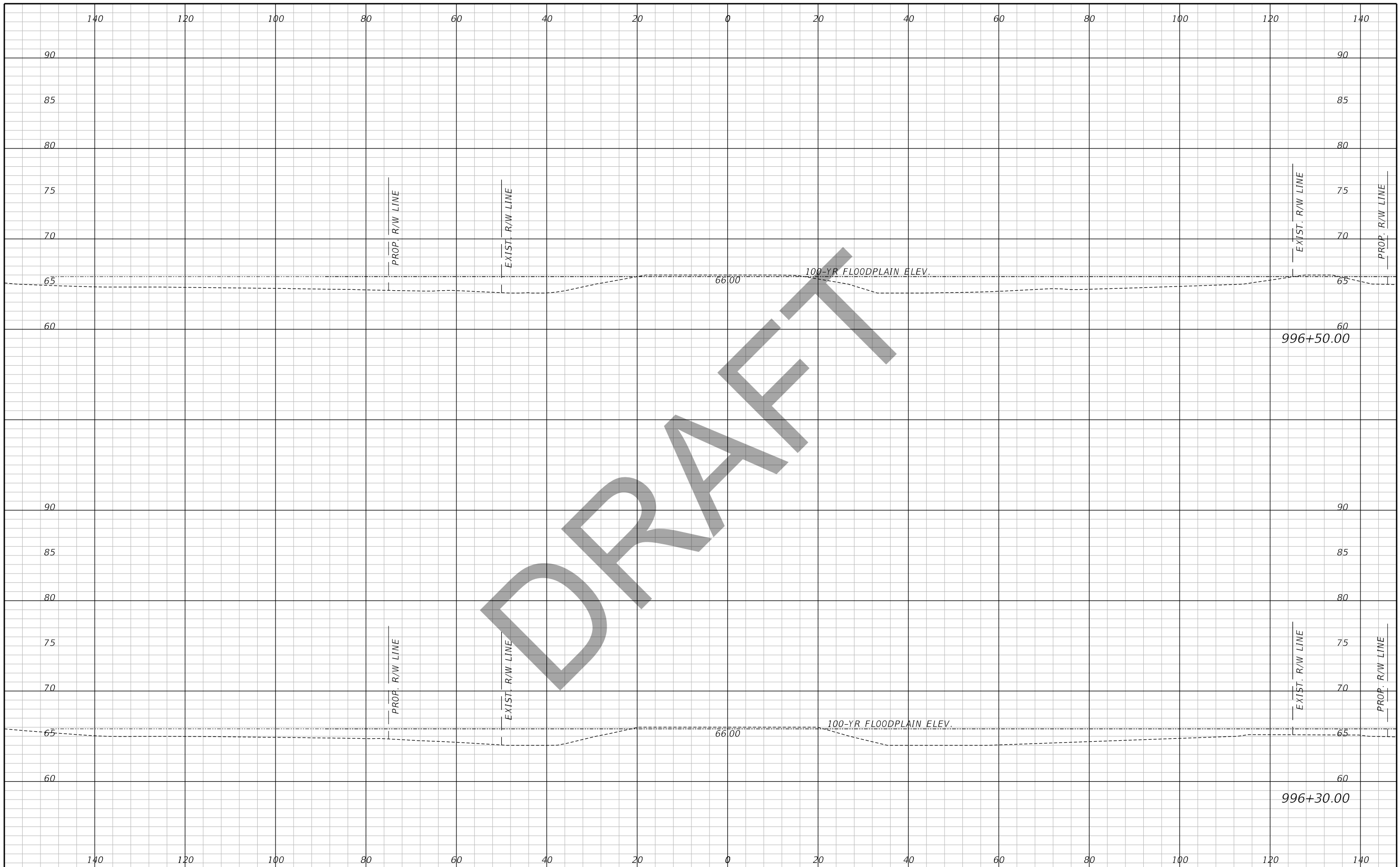
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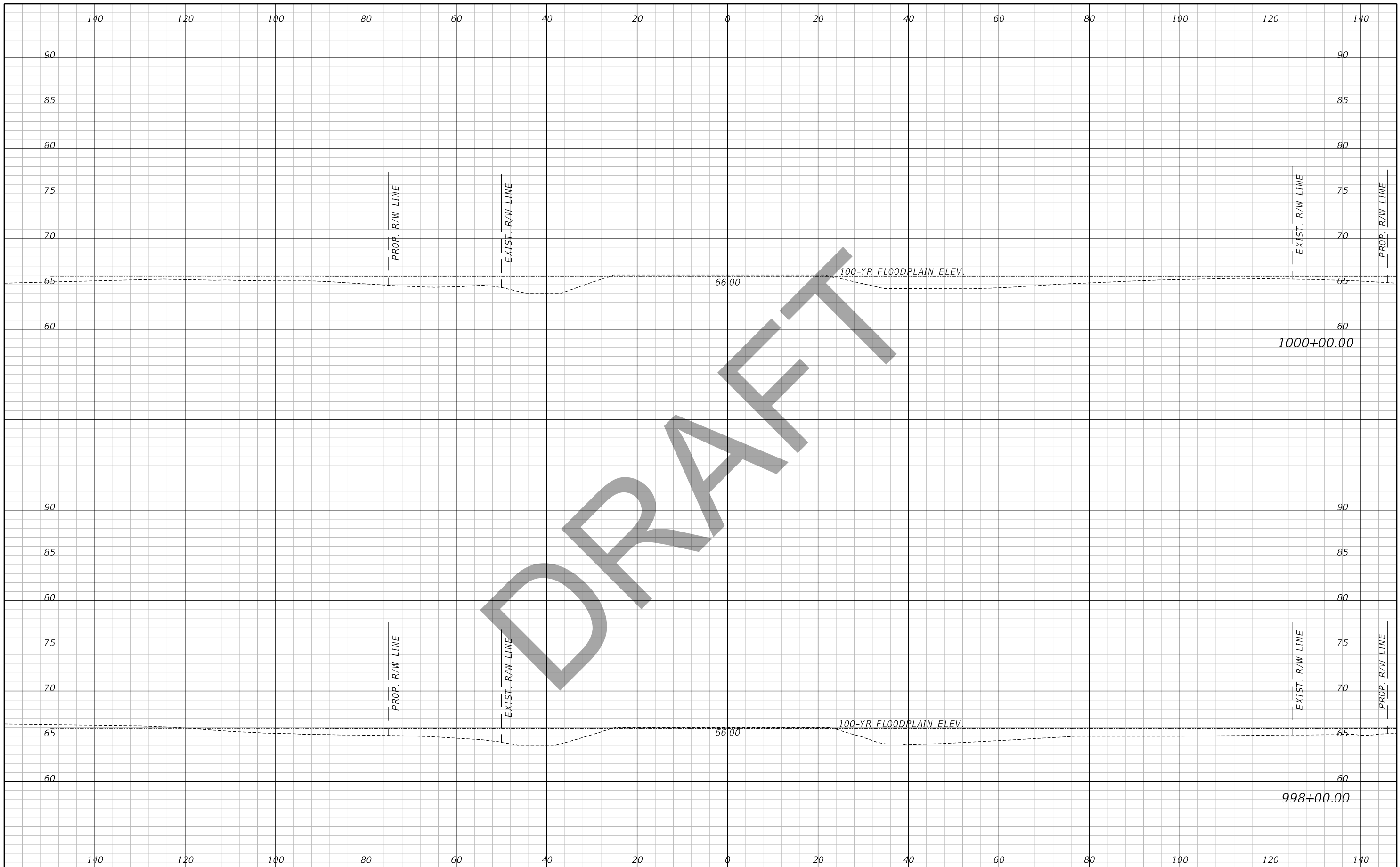
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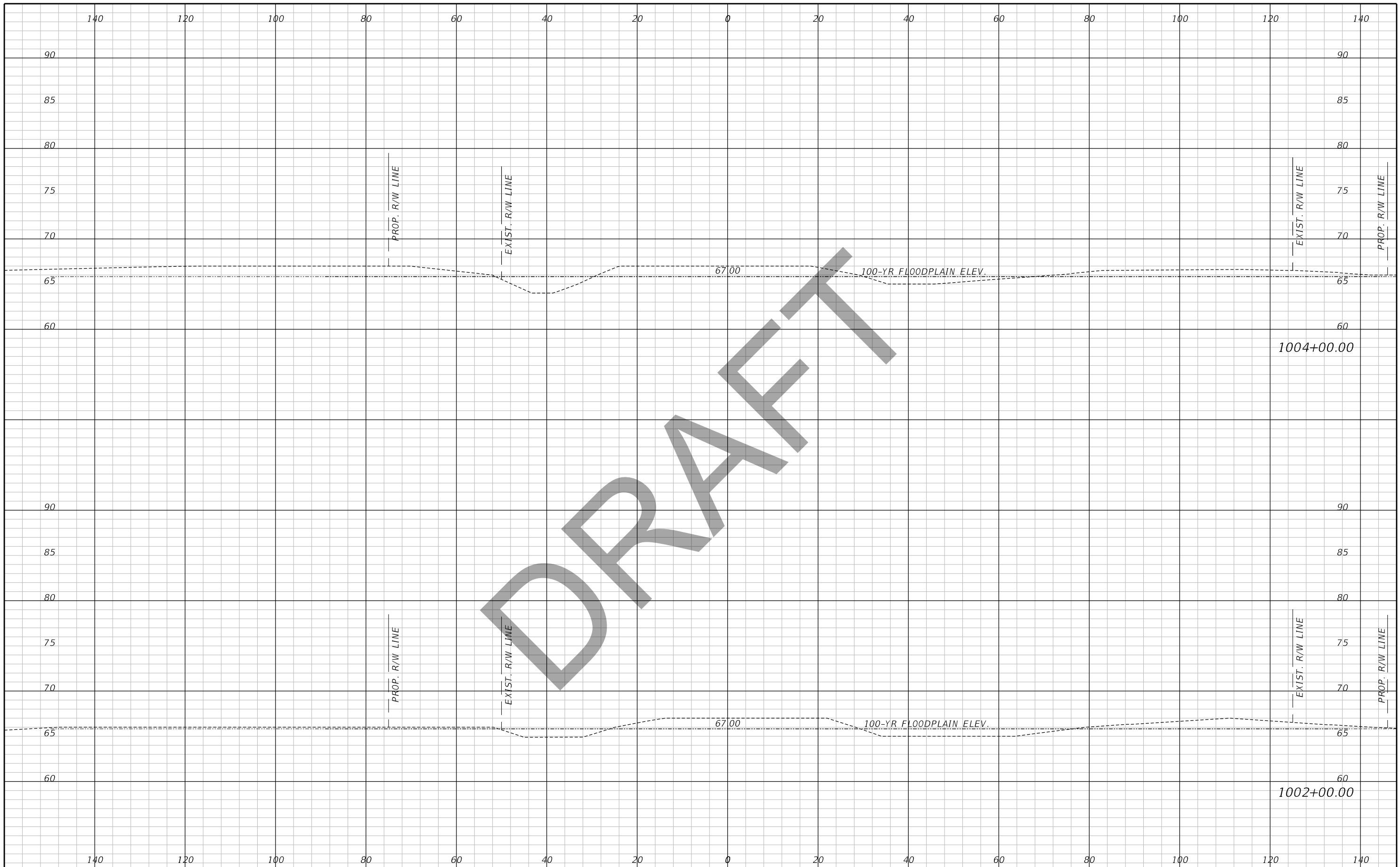
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APPENDIX E

Pond Alternatives Evaluation Matrix

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US 301 PD&E STUDY



Inwood Consulting Engineers, Inc.
 3000 Dovera Drive, Suite 200, Oviedo FL32765
 (407) 971-8850 phone (407) 971-8955 fax

BASIN 1 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Pond Type	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable DHW _{25yr/24hr} (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Outfall Location	Roadway Drainage Area Excluding Pond (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
Basin 1 Alt. A	Sta. 1372+50 (Lt.) Parcel No. U-08-28-20-ZZZ-000001-99230.0; U-08-28-20-ZZZ-000001-99180.0	41.00	Wet Detention	Taveres-Millhopper Fine Sands, 0-5 percent slopes (A)	33.00	43.00	2000	40.00	8.00	Wetland System	13.77	5.33	0.32	2.22	2.54
Basin 1 Alt. B	Sta. 1375+00 (Rt.) Parcel No. U-08-28-20-ZZZ-000001-99360.0; U-08-28-20-ZZZ-000001-99340.0; U-08-28-20-ZZZ-000001-99360.1	43.00	Wet Detention	Candler Fine Sand, 0-5 percent slopes (A)	33.00	43.00	2000	40.00	8.00	Wetland System	13.77	5.25	0.00	2.01	2.01
Basin 1 Alt. C	Sta. 1376+00 (Lt.) Parcel No. U-08-28-20-ZZZ-000001-99420.0	38.00	Wet Detention	Candler Fine Sand, 0-5 percent slopes (A)	33.00	43.00	2000	38.00	6.00	Wetland System	13.77	5.53	0.23	2.52	2.75

IMPACT & COST ANALYSIS

Alternatives	Pond Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Wetland Impact Cost	Protected Species and Habitat Impact Risk	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Area of Parcels (Including Non-Impacted Area) (ac)	Total Pond Costs	Rankings
Basin 1 Alt. A	0.00	X	Low-Moderate	0.00	\$0	Low	Medium	N	Low Density Residential	Residential 1 Unit Per Acre	3.05	\$1,269,294	1
Basin 1 Alt. B	0.29	X	Low-Moderate	0.00	\$0	Low	Medium	Y	Low Density Residential	Residential 1 Unit Per Acre	2.56	\$2,112,721	3
Basin 1 Alt. C	3.03	X	Low-Moderate	0.00	\$0	Low	Medium	N	Low Density Residential, Commercial	Residential 1 Unit Per Acre	3.85	\$1,290,583	2

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, potential remediation of contaminated sites, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations, sodding and any potential impermeable liners. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. The right-of-way cost estimates are a budget tool used by the Department to estimate total acquisition costs associated with each pond size and to budget to appropriate funds for acquisition. Right-of-way cost estimates are not real estate appraisals and do not reflect market value. In addition, FDOT uses appraisals that comply with the Uniform Standards of Professional Appraisal Practice (USPAP) for acquisition purposes.

The potential occurrence of any listed species within each proposed pond site was valued as low, medium, or high based on FLUCFCS type, FNAI reports, and data gathered during field reviews. A determination of low was given for areas that are developed and exhibited minimal to no available habitat for listed species. A determination of medium was given for areas where suitable habitat was identified within one quarter mile of the pond site, or suboptimal habitat was observed within the pond site. A determination of high was given for direct observations of listed species, or areas with greater than one mile of contiguous suitable habitat.

US 301 PD&E STUDY



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BASIN 3 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Pond Type	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable DHW _{25yr/24hr} (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Outfall Location	Roadway Drainage Area Excluding Pond (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
Basin 3 Alt. A	Sta. 1418+00 (Lt.) Parcel No. U-09-28-20-ZZZ-000001-99680.1	38.00	Wet Detention	Taveres-Millhopper Fine Sands, 0-5 percent slopes (A)	33.00	38.00	2500	36.00	4.00	Wetland System	30.07	4.65	0.75	3.86	4.61
Basin 3 Alt. B	Sta. 1425+00 (Lt.) Parcel No. U-09-28-20-24J-000000-00002.0; U-09-28-20-24J-000000-00003.0; U-09-28-20-24J-000000-00004.0; U-09-28-20-24J-000000-00005.0; U-09-28-20-ZZZ-000001-99530.0	40.00	Wet Detention	Taveres-Millhopper Fine Sands, 0-5 percent slopes (A)	33.00	38.00	1600	38.00	6.00	Wetland System	30.07	3.96	0.00	2.73	2.73
Basin 3 Alt. C	Sta. 1441+00 (Lt.) Parcel No. U-09-28-20-24F-00000-A0000.0; U-09-28-20-5HJ-000002-00001.0; U-09-28-20-5HJ-000002-00002.0; U-09-28-20-5HJ-000000-C0000.0; U-09-28-20-5HJ-000003-00010.0	39.00	Wet Detention	Taveres-Millhopper Fine Sands, 0-5 percent slopes (A)	33.00	38.00	2800	38.00	6.00	Wetland System	30.07	3.36	0.00	5.31	5.31

IMPACT & COST ANALYSIS

Alternatives	Pond Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Wetland Impact Cost	Protected Species and Habitat Impact Risk	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Area of Parcels (Including Non-Impacted Area) (ac)	Total Pond Costs	Rankings
Basin 3 Alt. A	0.00	AE	Low-Moderate	0.00	\$0	Low	Medium	N	Medium Density Residential (FLUCFCS 120)	Residential Open Space	16.22	\$1,199,420	1
Basin 3 Alt. B	0.00	X	Low-Moderate	0.00	\$0	Low	Medium	N	Medium Density Residential (FLUCFCS 120)	Single Family Residential	2.81	\$2,707,218	3
Basin 3 Alt. C	0.00	X	High	0.00	\$0	Low	No	N	Medium Density Residential (FLUCFCS 120)	Single Family Residential	5.72	\$2,118,177	2

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, potential remediation of contaminated sites, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations, sodding and any potential impermeable liners. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. The right-of-way cost estimates are a budget tool used by the Department to estimate total acquisition costs associated with each pond size and to budget to appropriate funds for acquisition. Right-of-way cost estimates are not real estate appraisals and do not reflect market value. In addition, FDOT uses appraisals that comply with the Uniform Standards of Professional Appraisal Practice (USPAP) for acquisition purposes.

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US 301 PD&E STUDY



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(407) 971-8850 phone (407) 971-8955 fax

BASIN 4 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Pond Type	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable DHW _{25yr/24hr} (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Outfall Location	Roadway Drainage Area Excluding Pond (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
Basin 4 Alt. A	Sta. 1472+00 (Lt.) Parcel No. U-03-28-20-ZZZ-000001-95250.0	40.00	Dry Retention	Seffner Fine Sand (A)	35.00	43.00	100	39.00	5.00	Wetland System	13.83	5.47	0.00	3.11	3.11
Basin 4 Alt. B	Sta. 1476+50 (Lt.) Parcel No. U-03-28-20-ZZZ-000001-95250.0; U-03-28-20-ZZZ-000001-95150.0	41.00	Wet Detention	Candler Fine Sand, 0-5 percent slopes (A)	33.00	43.00	1000	41.00	8.50	Wetland System	13.83	6.00	0.00	2.31	2.31
Basin 4 Alt. C	Sta. 1485+00 (Rt.) Parcel No. U-03-28-20-ZZZ-000001-95260.0; U-03-28-20-ZZZ-000001-95340.0; U-03-28-20-ZZZ-000001-95130.0	41.00	Wet Detention (Expanding C-10 East Alt. 2)	Basinger, Holopaw, and Samsula Soils, depressional (A/D)	32.00	43.00	2100	35.85	8.00	Wetland System	13.83	4.36	0.00	*Shared Use with Permitted Borrow Pit	

IMPACT & COST ANALYSIS

Alternatives	Pond Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Wetland Impact Cost	Protected Species and Habitat Impact Risk	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Area of Parcels (Including Non-Impacted Area) (ac)	Total Pond Costs	Rankings
Basin 4 Alt. A	0.00	X	Low-Moderate	0.00	\$0	High	No	N	Hardwood Conifer Mixed	Residential Open Space	5.51	\$1,172,044	1
Basin 4 Alt. B	0.00	X	Low-Moderate	0.00	\$0	Low	Low	N	Medium Density Residential, Commerical	Single Family Residential	2.88	\$1,970,019	2
Basin 4 Alt. C	0.00	X	Moderate	0.00	\$0	High	Low	N	Open Land, Pastures, Reservoirs	Single Family Residential	41.57	\$4,202,300	3

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, potential remediation of contaminated sites, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations, sodding and any potential impermeable liners. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. The right-of-way cost estimates are a budget tool used by the Department to estimate total acquisition costs associated with each pond size and to budget the appropriate funds for acquisition. Right-of-way cost estimates are not real estate appraisals and do not reflect market value. In addition, FDOT uses appraisals that comply with the Uniform Standards of Professional Appraisal Practice (USPAP) for acquisition purposes.

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US 301 PD&E STUDY



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(407) 971-8850 phone (407) 971-8955 fax

BASIN 5 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Pond Type	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable DHW _{25yr/24hr} (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Outfall Location	Roadway Drainage Area Excluding Pond (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
Basin 5 Alt. A	Sta. 1545+00 (Rt.) Parcel No. U-02-28-20-ZZZ-000001-94500.0; U-02-28-20-ZZZ-000001-94460.0	42.00	Wet Detention	Chobee Sandy Loam, frequently flooded (C/D); Taveres-Millhopper Fine Sands (A)	33.00	41.00	1000	39.50	7.50	Wetland System	46.46	7.90	0.16	3.11	3.27
Basin 5 Alt. B	Sta. 1550+00 (Rt.) Parcel No. U-02-28-20-ZZZ-000001-94500.0; U-02-28-20-ZZZ-000001-94410.0	39.00	Wet Detention	Taveres-Millhopper Fine Sands (A); Candler Fine Sands, 0-5 percent slopes (A)	33.00	41.00	1000	39.00	7.00	Wetland System	38.79	8.20	0.10	3.18	3.28
Basin 5 Alt. C	Sta. 1565+00 (Rt.) Parcel No. U-02-28-20-ZZZ-000001-94480.0; U-02-28-20-ZZZ-000001-94420.0	38.00	Wet Detention	Taveres-Millhopper Fine Sands (A)	33.00	41.00	1000	38.00	6.00	Wetland System	38.79	6.85	0.36	3.20	3.56

IMPACT & COST ANALYSIS

Alternatives	Pond Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Wetland Impact Cost	Protected Species and Habitat Impact Risk	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Area of Parcels (Including Non-Impacted Area) (ac)	Total Pond Costs	Rankings
Basin 5 Alt. A	0.00	X	High	2.06	\$227,373	High	Medium	N	Forest Wetland, Open Land	Single Family Residential	1.96	\$923,684	3
Basin 5 Alt. B	0.00	X	High	0.67	\$73,951	Medium	Medium	N	Forest Wetland, Open Land	Multi-Family Residential	11.33	\$589,556	1
Basin 5 Alt. C	1.26	AE	Moderate	0.99	\$109,271	High	Medium	N	Forest Wetland and Upland, Ditches	Multi-Family Residential	5.31	\$607,993	2

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, potential remediation of contaminated sites, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations, sodding and any potential impermeable liners. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. The right-of-way cost estimates are a budget tool used by the Department to estimate total acquisition costs associated with each pond size and to budget the appropriate funds for acquisition. Right-of-way cost estimates are not real estate appraisals and do not reflect market value. In addition, FDOT uses appraisals that comply with the Uniform Standards of Professional Appraisal Practice (USPAP) for acquisition purposes.

The potential occurrence of any listed species within each proposed pond site was valued as low, medium, or high based on FLUCFCS type, FNAI reports, and data gathered during field reviews. A determination of low was given for areas that are developed and exhibited minimal to no available habitat for listed species. A determination of medium was given for areas where suitable habitat was identified within one quarter mile of the pond site, or suboptimal habitat was observed within the pond site. A determination of high was given for direct observations of listed species, or areas with greater than one mile of contiguous suitable habitat.

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BASIN 6 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Pond Type	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable DHW _{25yr/24hr} (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Outfall Location	Roadway Drainage Area Excluding Pond (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
Basin 6 Alt. A	Sta. 1585+00 (Rt.) Parcel No. U-36-27-20-ZZZ-000001-93050.1	30.00	Wet Detention	Chobee Sandy Loam (C/D)	30.00	41.00	1000	31.20	2.00	Wetland System	35.34	2.21	0.22	4.22	4.44
Basin 6 Alt. B	Sta. 1600+00 (Rt.) Parcel No. U-36-27-20-ZZZ-000001-93050.1	30.00	Wet Detention	Chobee Sandy Loam (C/D)	30.00	41.00	1000	31.20	2.00	Wetland System	35.34	2.22	0.00	4.23	4.23
Basin 6 Alt. C	Sta. 1610+50 (Rt.) Parcel No. U-36-27-20-ZZZ-000001-93050.1; U-02-28-20-ZZZ-000001-94480.0	30.00	Wet Detention	Chobee Sandy Loam (C/D)	30.00	41.00	1000	31.00	2.00	Wetland System	34.58	2.36	0.17	5.24	5.41

IMPACT & COST ANALYSIS

Alternatives	Pond Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Wetland Impact Cost	Protected Species and Habitat Impact Risk	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Area of Parcels (Including Non-Impacted Area) (ac)	Total Pond Costs	Rankings
Basin 6 Alt. A	5.64	AE	Low	4.22	\$465,783	High	Medium	N	Forest Wetland	Single Family Residential	1.96	\$964,562	2
Basin 6 Alt. B	5.09	AE	Low	4.19	\$462,471	High	Medium	N	Forest Wetland	Multi-Family Residential	11.33	\$997,744	3
Basin 6 Alt. C	0.00	AE	Moderate	2.20	\$242,825	High	Medium	N	Forest Wetland and Upland	Multi-Family Residential	5.31	\$783,545	1

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, potential remediation of contaminated sites, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations, sodding and any potential impermeable liners. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. The right-of-way cost estimates are a budget tool used by the Department to estimate total acquisition costs associated with each pond size and to budget the appropriate funds for acquisition. Right-of-way cost estimates are not real estate appraisals and do not reflect market value. In addition, FDOT uses appraisals that comply with the Uniform Standards of Professional Appraisal Practice (USPAP) for acquisition purposes.

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BASIN 7 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Pond Type	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable DHW _{25yr/24hr} (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Outfall Location	Roadway Drainage Area Excluding Pond (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
Basin 7 Alt.A	Sta. 1661+50 (Rt.) Parcel No. U-30-27-21-9D9-000000-00001.0	44.00	Wet Detention	Basinger, Holopaw, and Samsula Soils, depressional (A/D); Myakka Fine Sand, 0-2 percent slopes	39.00	43.00	1000	42.00	4.00	Wetland System	21.82	3.28	0.00	2.54	2.54
Basin 7 Alt. B	Sta. 1672+50 (Rt.) Parcel No. U-30-27-21-ZZZ-000003-35370.0; U-30-27-21-ZZZ-000003-35380.0; U-30-27-21-ZZZ-000003-35330.0	40.00	Wet Detention	Basinger, Holopaw, and Samsula Soils, depressional (A/D)	39.00	43.00	250	41.00	3.00	Wetland System	21.82	3.21	0.00	3.72	3.72
Basin 7 Alt. C	Sta. 1683+00 (Lt.) Parcel No. U-30-27-21-ZZZ-000003-35560.0; U-30-27-21-ZZZ-000003-35570.0; U-30-27-21-ZZZ-000003-35540.0	42.00	Wet Detention	Arents, nearly level (A)	40.00	43.00	1000	41.75	2.75	Wetland System	21.82	3.52	0.00	4.18	4.18

IMPACT & COST ANALYSIS

Alternatives	Pond Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Wetland Impact Cost	Protected Species and Habitat Impact Risk	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Area of Parcels (Including Non-Impacted Area) (ac)	Total Pond Costs	Rankings
Basin 7 Alt.A	0.00	X	Low-Moderate	0.04	\$4,415	Low	Medium	N	Open Land	Single Family Residential	18.75	\$588,416	1
Basin 7 Alt. B	1.06	X	Low-Moderate	1.96	\$216,335	High	Medium	N	Forest Wetland, Residential	Multi-Family Residential	4.29	\$2,116,093	2
Basin 7 Alt. C	0.00	X	Low	0.00	\$0	Low	Medium	N	Residential	Multi-Family Residential	4.53	\$2,263,433	3

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, potential remediation of contaminated sites, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations, sodding and any potential impermeable liners. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. The right-of-way cost estimates are a budget tool used by the Department to estimate total acquisition costs associated with each pond size and to budget te appropriate funds for acquisition. Right-of-way cost estimates are not real estate appraisals and do not reflect market value. In addition, FDOT uses appraisals that comply with the Uniform Standards of Professional Appraisail Practice (USPAP) for acquisition purposes.

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BASIN 8 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Pond Type	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable DHW _{25yr/24hr} (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Outfall Location	Roadway Drainage Area Excluding Pond (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
Basin 8 Alt. A	Sta. 1717+50 (Rt.) Parcel No. U-19-27-21-ZZZ-000003-28510.0	45.00	Wet Detention	Taveres-Millhopper Fine Sands, 0-5 percent slopes (A)	43.00	46.00	1000	44.75	2.25	Wetland System	28.65	2.00	0.00	2.70	2.70
Basin 8 Alt. B	Sta. 1720+50 (Lt.) Parcel No. U-19-27-21-ZZZ-000003-28570.0	41.00	Wet Detention	Candler Fine Sand, 0-5 percent slopes (A)	40.00	46.00	750	42.00	2.50	Wetland System	28.65	1.98	0.00	2.45	2.45
Basin 8 Alt. C	Sta. 1740+00 (Rt.) Parcel No. U-19-27-21-ZZZ-000003-28510.0	45.00	Wet Detention	Candler Fine Sand, 0-5 percent slopes (A)	43.00	46.00	1500	44.75	2.25	Wetland System	28.65	2.00	0.00	2.56	2.56

IMPACT & COST ANALYSIS

Alternatives	Pond Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Wetland Impact Cost	Protected Species and Habitat Impact Risk	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Area of Parcels (Including Non-Impacted Area) (ac)	Total Pond Costs	Rankings
Basin 8 Alt. A	0.00	X	Low-Moderate	0.00	\$0	Medium	Medium	N	Pine Plantations	Single Family Residential	1.96	\$332,780	2
Basin 8 Alt. B	0.29	AE	Low-Moderate	0.00	\$0	Medium	Medium	N	Forest Upland	Multi-Family Residential	11.33	\$480,383	1
Basin 8 Alt. C	0.50	X	Low-Moderate	0.14	\$15,453	Medium	Medium	N	Pine Plantations, Forest Wet	Multi-Family Residential	5.31	\$412,767	3

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, potential remediation of contaminated sites, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations, sodding and any potential impermeable liners. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. The right-of-way cost estimates are a budget tool used by the Department to estimate total acquisition costs associated with each pond size and to budget te appropriate funds for acquisition. Right-of-way cost estimates are not real estate appraisals and do not reflect market value. In addition, FDOT uses appraisals that comply with the Uniform Standards of Professional Appraisail Practice (USPAP) for acquisition purposes.

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BASIN 9 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Alternatives	Location	Existing Ground Elevation (ft)	Pond Type	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable DHW _{25yr/24hr} (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Outfall Location	Roadway Drainage Area Excluding Pond (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
Basin 9 Alt. A	Sta. 1763+00 (Lt.) Parcel No. U-19-27-21-ZZZ-000003-28450.0	42.00	Wet Detention	Winder Fine Sand (C/D)	42.00	42.00	1500	43.00	2.00	Wetland System	12.34	0.86	0.88	2.20	3.08
Basin 9 Alt. B	Sta. 1770+00 (Lt.) Parcel No. U-20-27-21-ZZZ-000003-28200.0; U-19-27-21-ZZZ-000003-28510.0	44.00	Wet Detention	Felder Fine Sand (A/D)	43.00	48.00	500	44.25	1.75	Wetland System	12.34	0.98	0.00	1.82	1.82
Basin 9 Alt. C	Sta. 1770+00 (Rt.) Parcel No. U-19-27-21-ZZZ-000003-28510.0	44.00	Wet Detention	Winder Fine Sand (C/D)	43.00	48.00	750	44.50	2.00	Wetland System	12.34	1.01	0.00	1.77	1.77

IMPACT & COST ANALYSIS

Alternatives	Pond Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Wetland Impact Cost	Protected Species and Habitat Impact Risk	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Area of Parcels (Including Non-Impacted Area) (ac)	Total Pond Costs	Rankings
Basin 9 Alt. A	0.00	X	Low	2.42	\$267,108	High	Medium	N	Forest Upland and Wetland	Single Family Residential	1.96	\$1,247,975	3
Basin 9 Alt. B	0.00	X	Low-Moderate	0.00	\$0	Low	Medium	N	Residential	Multi-Family Residential	2.60	\$1,215,019	2
Basin 9 Alt. C	2.42	X	Low-Moderate	0.18	\$19,868	Medium	Medium	N	Forest Wetland, Open Land	Multi-Family Residential	5.31	\$249,339	1

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BASIN 10 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Alternatives	Location	Existing Ground Elevation (ft)	Pond Type	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable DHW _{25yr/24hr} (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Outfall Location	Roadway Drainage Area Excluding Pond (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
Basin 10 Alt. A	Sta. 1792+00 (Lt.) Parcel No. U-17-27-21-ZZZ-000003-28140.0	45.00	Wet Detention	Winder Fine Sand (C/D)	44.00	48.00	500	45.50	2.50	Wetland System	24.24	1.81	0.00	2.89	2.89
Basin 10 Alt. B	Sta. 1816+00 (Rt.) Parcel No. U-17-27-21-ZZZ-000003-27910.0	51.00	Wet Detention	Winder Fine Sand (C/D)	48.00	50.00	600	49.00	2.00	Wetland System	24.24	2.16	0.00	Protected Species and Habitat Impacts	

IMPACT & COST ANALYSIS

Alternatives	Pond Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Wetland Impact Cost	Protected Species and Habitat Impact Risk	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Area of Parcels (Including Non-Impacted Area) (ac)	Total Pond Costs	Rankings
Basin 10 Alt. A	0.30	X	Low	0.00	\$0	Low	Medium	N	Residential	Single Family Residential	2.96	\$1,025,705	2
Basin 10 Alt. B	0.92	X	Low	0.57	\$62,914	Medium	Medium	N	Open Land, Forest and Herb Wetland	Multi-Family Residential	11.33	\$535,902	1

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, potential remediation of contaminated sites, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations, sodding and any potential impermeable liners. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. The right-of-way cost estimates are a budget tool used by the Department to estimate total acquisition costs associated with each pond size and to budget to appropriate funds for acquisition. Right-of-way cost estimates are not real estate appraisals and do not reflect market value. In addition, FDOT uses appraisals that comply with the Uniform Standards of Professional Appraisal Practice (USPAP) for acquisition purposes.

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BASIN 12 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Pond Type	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable DHW _{25yr/24hr} (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Outfall Location	Roadway Drainage Area Excluding Pond (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
Basin 12 Alt. A	Sta. 1893+00 (Lt.) Parcel No. U-04-27-21-ZZZ-000003-27460.0	51.00	Wet Detention	Felda Fine Sand (C/D)	49.00	54.00	1500	52.10	3.60	Wetland System	50.17	4.90	0.00	3.72	3.72
Basin 12 Alt. B	Sta. 1895+00 (Rt.) Parcel No. U-04-27-21-ZZZ-000003-27460.0	51.00	Wet Detention	Felda Fine Sand (C/D)	49.00	54.00	1500	52.10	3.60	Wetland System	50.17	4.90	0.00	3.56	3.56

IMPACT & COST ANALYSIS

Alternatives	Pond Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Wetland Impact Cost	Protected Species and Habitat Impact Risk	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Area of Parcels (Including Non-Impacted Area) (ac)	Total Pond Costs	Rankings
Basin 12 Alt. A	0.00	X	Low	0.00	\$0	Medium	Medium	N	Shrubland, Open Land	Single Family Residential	224.08	\$631,356	1
Basin 12 Alt. B	0.01	X	Low	0.00	\$0	Medium	Medium	N	Open Land, Small Forest Upland	Multi-Family Residential	422.60	\$631,856	2

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BASIN 13 ALTERNATIVE POND SITES

ENGINEERING DATA & ANALYSIS

Alternatives	Location	Existing Ground Elevation (ft)	Pond Type	Soil Names & Hydrologic Groups	Estimated SHWT Elevation (ft)	Lowest Edge of Existing Roadway (ft)	Distance From Lowest Edge of Proposed Roadway (ft)	Estimated Allowable DHW _{25yr/24hr} (ft)	Estimated Allowable Treatment & Attenuation Depth (ft)	Outfall Location	Roadway Drainage Area Excluding Pond (ac)	Required Treatment & Attenuation Volume (ac-ft)	Required Pond Access Area (ac)	Required Pond Area (ac)	Required Pond Area Including Access (ac)
Basin 13 Alt. A	Sta. 1939+00 (Lt.) Parcel No. U-04-27-21-ZZZ-000003-27460.0	57.00	Wet Detention	Myakka Fine Sand (A/D)	55.00	59.00	250	58.00	4.00	Wetland System	33.98	7.58	0.00	5.44	5.44
Basin 13 Alt. B	Sta. 1939+00 (Rt.) Parcel No. U-04-27-21-ZZZ-000003-27460.0	59.00	Wet Detention	Myakka Fine Sand (A/D), Basinger, Holopaw, and Samsula Soils, Depressional (C/D)	55.00	59.00	250	57.50	3.50	Wetland System	33.98	7.31	0.00	5.11	5.11
Basin 13 Alt. C	Sta. 1939+00 (Rt.) Parcel No. U-04-27-21-ZZZ-000003-27460.0	57.00	Wet Detention	Myakka Fine Sand (A/D), Basinger, Holopaw, and Samsula Soils, Depressional (C/D)	55.00	59.00	800	57.25	3.25	Wetland System	33.98	7.48	0.00	6.70	6.70

IMPACT & COST ANALYSIS

Alternatives	Pond Floodplain Impacts (ac-ft)	FEMA Floodzone	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Wetland Impact Cost	Protected Species and Habitat Impact Risk	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Existing Land Use	Future Land Use	Total Area of Parcels (Including Non-Impacted Area) (ac)	Total Pond Costs	Rankings
Basin 13 Alt. A	0.00	X	Low-Moderate	0.00	\$0	Medium	No	N	Open Land	Single Family Residential	224.08	\$712,250	1
Basin 13 Alt. B	0.27	X	Low-Moderate	0.48	\$52,980	Medium	No	N	Open Land, Forest Upland and Wetland	Multi-Family Residential	422.60	\$767,721	2
Basin 13 Alt. C	0.27	X	Low	0.48	\$52,980	Medium	No	N	Open Land, Forest Upland and Wetland	Multi-Family Residential	422.60	\$773,121	3

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, potential remediation of contaminated sites, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations, sodding and any potential impermeable liners. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees. The right-of-way cost estimates are a budget tool used by the Department to estimate total acquisition costs associated with each pond size and to budget to appropriate funds for acquisition. Right-of-way cost estimates are not real estate appraisals and do not reflect market value. In addition, FDOT uses appraisals that comply with the Uniform Standards of Professional Appraisal Practice (USPAP) for acquisition purposes.

The potential occurrence of any listed species within each proposed pond site was valued as low, medium, or high based on FLUCFCS type, FNAI reports, and data gathered during field reviews. A determination of low was given for areas that are developed and exhibited minimal to no available habitat for listed species. A determination of medium was given for areas where suitable habitat was identified within one quarter mile of the pond site, or suboptimal habitat was observed within the pond site. A determination of high was given for direct observations of listed species, or areas with greater than one mile of contiguous suitable habitat.

US 301 PD&E STUDY



Inwood Consulting Engineers, Inc.
 3000 Dovera Drive, Suite 200, Oviedo FL32765
 (407) 971-8850 phone (407) 971-8955 fax

FLOODPLAIN COMPENSATION SITES

IMPACT & COST ANALYSIS

Alternatives	Arch. / Historical Impact Potential	Wetland Impacts (ac)	Wetland Impact Cost	Protected Species and Habitat Impact Risk	Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Total Pond Costs
FPC 1	High	0.00	\$0.00	Low	Medium	N	\$1,302,356
FPC 2	Low-Moderate	2.00	\$220,750.00	High	Medium	N	\$1,372,226
FPC 3	Low-Moderate	0.00	\$0.00	Medium	Medium	N	\$1,078,528
FPC 4	High	0.00	\$0.00	Low	Medium	N	\$1,654,035
FPC 5	Low-Moderate	0.95	\$104,856.25	High	Medium	N	\$4,555,741
FPC 6	Low	0.04	\$4,415.00	Medium	Medium	N	\$209,747
FPC 7	Low	0.00	\$0.00	Medium	No	N	\$520,559
FPC 8	Low-Moderate	0.49	\$54,083.75	Medium	No	N	\$865,858

Note: The cost evaluation for the stormwater management facility alternatives in this report include stormwater management facility construction costs, costs associated with wetland impacts, potential remediation of contaminated sites, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing and grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations, sodding and any potential impermeable liners. The associated parcel acquisition cost for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees.

The potential occurrence of any listed species within each proposed pond site was valued as low, medium, or high based on FLUCFCS type, FNAI reports, and data gathered during field reviews and species-specific surveys. A determination of low was given for areas that exhibited minimal to no available habitat for listed species. A determination of medium was given for areas where suitable habitat was identified within one quarter mile of the pond site, or suboptimal habitat was observed within the pond site. A determination of high was given for direct observations of listed species, or areas with greater than one mile of contiguous suitable habitat.

APPENDIX F

Existing Permits

DRAFT



Southwest Florida Water Management District

2379 Broad Street, Brooksville, Florida 34604-6899
(352) 796-7211 or 1-800-423-1476 (FL only)
SUNCOM 628-4150 TDD only 1-800-231-6103 (FL only)
On the Internet at: WaterMatters.org

An Equal
Opportunity
Employer

Bartow Service Office
170 Century Boulevard
Bartow, Florida 33830-7700
(863) 534-1448 or
1-800-492-7862 (FL only)

Sarasota Service Office
6750 Fruitville Road
Sarasota, Florida 34240-9711
(941) 377-3722 or
1-800-320-3503 (FL only)

Tampa Service Office
7601 Highway 301 North
Tampa, Florida 33637-6759
(813) 985-7481 or
1-800-836-0797 (FL only)

January 23, 2013

Riverwood Estates Holdco, LLC
c/o Rizzetta & Co., Inc. Attn: Pete Williams
3434 Colwell Avenue, Suite 200
Tampa, FL 33614

Joseph Asbel
2205 Deer Lane
Zephyrhills, FL 33540

Subject: **Notice of Final Agency Action for Approval
ERP Short Form**

Project Name: Riverwood ERP Conceptual
App ID/Permit No: 675323 / 49027103.012
County: PASCO
Letter Received: December 27, 2012
Expiration Date: January 23, 2018
Sec/Twp/Rge: S27/T26S/R21E

Reference: Chapters 40D-4 and 40, Florida Administrative Code (F.A.C)
Sections 373.4141 and 120.60, Florida Status (F.S)

Dear Permittee(s):

Your request to modify Permit No. 49027103.001 by Short Form has been approved. This modification authorizes:

1. The extension of the expiration date for five (5) years from the issue date of this permit modification.
2. All other terms and conditions of Permit No. 49027103.001, dated March 28, 2006 and entitled Riverwood, apply.

Final approval is contingent upon no objection to the District's action being received by the District within the time frames described in the enclosed Notice of Rights.

Approved construction plans are part of the permit, and construction must be in accordance with these plans. These drawings are available for viewing or downloading through the District's Application and Permit Search Tools located at www.WaterMatters.org/permits.

The District's action in this matter only becomes closed to future legal challenges from members of the public if such persons have been properly notified of the District's action and no person objects to the District's action within the prescribed period of time following the notification. The District does not publish notices of agency action. If you wish to limit the time within which a person who does not receive actual written notice from the District may request an administrative hearing regarding this action, you are strongly encouraged to publish, at your own expense, a notice of agency action in the legal advertisement section of a newspaper of general circulation in the county or counties where the activity will occur. Publishing notice of agency action will close the window for filing a petition for hearing. Legal requirements and instructions for publishing notice of agency action, as well as a noticing form that can be used is available from the District's website at www.WaterMatters.org/permits/noticing.

If you publish notice of agency action, a copy of the affidavit of publishing provided by the newspaper should be sent to the Regulation Division at the District Service Office that services this permit.

If you have questions regarding this modification, please contact Rob McDaniel, at the Tampa Service Office, extension 2039.

Sincerely,

Michelle K. Hopkins, P.E.
Bureau Chief
Environmental Resource Permit Bureau
Regulation Division

Enclosures: Notice of Rights

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Notice of Rights

ADMINISTRATIVE HEARING

1. You or any person whose substantial interests are or may be affected by the District's action may request an administrative hearing on that action by filing a written petition in accordance with Sections 120.569 and 120.57, Florida Statutes (F.S.), Uniform Rules of Procedure Chapter 28-106, Florida Administrative Code (F.A.C.) and District Rule 40D-1.1010, F.A.C. Unless otherwise provided by law, a petition for administrative hearing must be filed with (received by) the District within 21 days of receipt of written notice of agency action. "Written notice" means either actual written notice, or newspaper publication of notice, that the District has taken or intends to take agency action. "Receipt of written notice" is deemed to be the fifth day after the date on which actual notice is deposited in the United States mail, if notice is mailed to you, or the date that actual notice is issued, if sent to you by electronic mail or delivered to you, or the date that notice is published in a newspaper, for those persons to whom the District does not provide actual notice.
2. Pursuant to Subsection 373.427(2)(c), F.S., for notices of agency action on a consolidated application for an environmental resource permit and use of sovereignty submerged lands concurrently reviewed by the District, a petition for administrative hearing must be filed with (received by) the District within 14 days of receipt of written notice.
3. Pursuant to Rule 62-532.430, F.A.C., for notices of intent to deny a well construction permit, a petition for administrative hearing must be filed with (received by) the District within 30 days of receipt of written notice of intent to deny.
4. Any person who receives written notice of an agency decision and who fails to file a written request for a hearing within 21 days of receipt or other period as required by law waives the right to request a hearing on such matters.
5. Mediation pursuant to Section 120.573, F.S., to settle an administrative dispute regarding District action is not available prior to the filing of a petition for hearing.
6. A request or petition for administrative hearing must comply with the requirements set forth in Chapter 28.106, F.A.C. A request or petition for a hearing must: (1) explain how the substantial interests of each person requesting the hearing will be affected by the District's action or proposed action, (2) state all material facts disputed by the person requesting the hearing or state that there are no material facts in dispute, and (3) otherwise comply with Rules 28-106.201 and 28-106.301, F.A.C. Chapter 28-106, F.A.C. can be viewed at www.flrules.org or at the District's website at www.WaterMatters.org/permits/rules.
7. A petition for administrative hearing is deemed filed upon receipt of the complete petition by the District Agency Clerk at the District's Tampa Service Office during normal business hours, which are 8:00 a.m. to 5:00 p.m., Monday through Friday, excluding District holidays. Filings with the District Agency Clerk may be made by mail, hand-delivery or facsimile transfer (fax). The District does not accept petitions for administrative hearing by electronic mail. Mailed filings must be addressed to, and hand-delivered filings must be delivered to, the Agency Clerk, Southwest Florida Water Management District, 7601 US Hwy. 301, Tampa, FL 33637-6759. Faxed filings must be transmitted to the District Agency Clerk at (813) 987-6746. Any petition not received during normal business hours shall be filed as of 8:00 a.m. on the next business day. The District's acceptance of faxed petitions for filing is subject to certain conditions set forth in the District's Statement of Agency Organization and Operation, available for viewing at www.WaterMatters.org/about.

JUDICIAL REVIEW

1. Pursuant to Sections 120.60(3) and 120.68, F.S., a party who is adversely affected by final District action may seek judicial review of the District's final action. Judicial review shall be sought in the Fifth District Court of Appeal or in the appellate district where a party resides or as otherwise provided by law.
2. All proceedings shall be instituted by filing an original notice of appeal with the District Agency clerk within 30 days after the rendition of the order being appealed, and a copy of the notice of appeal, accompanied by any filing fees prescribed by law, with the clerk of the court, in accordance with Rules 9.110 and 9.190 of the Florida Rules of Appellate Procedure (Fla. R. App. P.). Pursuant to Fla. R. App. P. 9.020(h), an order is rendered when a signed written order is filed with the clerk of the lower tribunal.

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Southwest Florida Water Management District

2379 Broad Street, Brooksville, Florida 34604-6899
(352) 796-7211 or 1-800-423-1476 (FL only)
SUNCOM 628-4150 TDD only 1-800-231-6103 (FL only)
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Tampa Service Office
7601 Highway 301 North
Tampa, Florida 33637-6759
(813) 985-7481 or
1-800-836-0797 (FL only)

January 02, 2013

Florida Department of Transportation, District 7
Attn: Virginia Creighton
11201 North McKinley Drive
Tampa, FL 33612

Subject: **Notice of Final Agency Action for Approval
ERP General Construction Modification**

Project Name: FDOT - U.S. 301 from South of Tampa Bypass Canal to North of Fowler Avenue
App ID/Permit No: 670742 / 44032128.001
County: HILLSBOROUGH
Sec/Twp/Rge: S17/T28S/R20E, S18/T28S/R20E, S08/T28S/R20E

Dear Permittee(s):

This letter constitutes notice of Final Agency Action for **approval** of the permit referenced above. Final approval is contingent upon no objection to the District's action being received by the District within the time frames described in the enclosed Notice of Rights.

Approved construction plans are part of the permit, and construction must be in accordance with these plans. These drawings are available for viewing or downloading through the District's Application and Permit Search Tools located at www.WaterMatters.org/permits.

The District's action in this matter only becomes closed to future legal challenges from members of the public if such persons have been properly notified of the District's action and no person objects to the District's action within the prescribed period of time following the notification. The District does not publish notices of agency action. If you wish to limit the time within which a person who does not receive actual written notice from the District may request an administrative hearing regarding this action, you are strongly encouraged to publish, at your own expense, a notice of agency action in the legal advertisement section of a newspaper of general circulation in the county or counties where the activity will occur. Publishing notice of agency action will close the window for filing a petition for hearing. Legal requirements and instructions for publishing notice of agency action, as well as a noticing form that can be used is available from the District's website at www.WaterMatters.org/permits/noticing.

If you publish notice of agency action, a copy of the affidavit of publishing provided by the newspaper should be sent to the Regulation Division at the District Service Office that services this permit.

If you have questions, please contact Rob McDaniel, at the Tampa Service Office, extension 2039. For assistance with environmental concerns, please contact Chaz Collins, extension 2092.

Sincerely,

Michelle K. Hopkins, P.E.
Bureau Chief
Environmental Resource Permit Bureau
Regulation Division

Enclosures: Approved Permit w/Conditions Attached
 [Statement of Completion](#)
 Notice of Authorization to Commence Construction
 Notice of Rights
cc: Megan Arasteh, P.E., Florida Department of Transportation

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**SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
ENVIRONMENTAL RESOURCE
GENERAL CONSTRUCTION MODIFICATION
PERMIT NO. 44032128.001**

EXPIRATION DATE: January 02, 2018

PERMIT ISSUE DATE: January 02, 2013

This permit is issued under the provisions of Chapter 373, Florida Statutes, (F.S.), and the Rules contained in Chapters 40D-4 and 40D-40, Florida Administrative Code, (F.A.C.). The permit authorizes the Permittee to proceed with the construction of a surface water management system in accordance with the information outlined herein and shown by the application, approved drawings, plans, specifications, and other documents, attached hereto and kept on file at the Southwest Florida Water Management District (District). Unless otherwise stated by permit specific condition, permit issuance constitutes certification of compliance with state water quality standards under Section 401 of the Clean Water Act, 33 U.S.C. 1341. All construction, operation and maintenance of the surface water management system authorized by this permit shall occur in compliance with Florida Statutes and Administrative Code and the conditions of this permit.

PROJECT NAME: FDOT - U.S. 301 from South of Tampa Bypass Canal to North of Fowler Avenue

GRANTED TO: Florida Department of Transportation, District 7
Attn: Virginia Creighton
11201 North McKinley Drive
Tampa, FL 33612

OTHER PERMITTEES: N/A

ABSTRACT: This permit is for the modification of a surface water management system permitted under Environmental Resource Permit (ERP) No. 44032128.000, entitled DOT - US 301 - Tampa Bypass Canal to Fowler. Only the stormwater management facilities within Basins G and H are affected by this modification. The Engineer-Of-Record has provided calculations demonstrating the 25-year/24-hour peak discharge rate will not be exceeded for either basin in the post-development condition. Calculations were also provided for Basin H demonstrating the pre/post volumetric difference for the 100-year/24-hour storm will be retained with the stormwater management facilities. Water quality requirements will continue to be met consistent with the original permit.

OP. & MAIN. ENTITY: Florida Department of Transportation, District 7

OTHER OP. & MAIN. ENTITY: N/A

COUNTY: HILLSBOROUGH

SEC/TWP/RGE: S17/T28S/R20E, S18/T28S/R20E, S08/T28S/R20E

**TOTAL ACRES OWNED
OR UNDER CONTROL:**

76.00

PROJECT SIZE: 76.00 Acres

LAND USE: Road Projects

DATE APPLICATION FILED: September 06, 2012

AMENDED DATE: N/A

I. Water Quantity/Quality

POND No.	Area Acres @ Top of Bank	Treatment Type
1335Rt	0.21	ON-LINE RETENTION
1335Lt	0.30	ON-LINE RETENTION
1339Rt	0.12	ON-LINE RETENTION
1344Rt	0.46	ON-LINE RETENTION
1349Rt	0.17	ON-LINE RETENTION
1359Rt	0.04	ON-LINE RETENTION
1360Lt	0.04	ON-LINE RETENTION
H-1Lt	0.13	ON-LINE RETENTION
H-1Rt	0.16	ON-LINE RETENTION
H-2	0.15	ON-LINE RETENTION
H-3	0.25	ON-LINE RETENTION
	Total: 2.03	

Water Quantity/Quality Comments:

Within Basin G Ponds 1341Rt and 2384Rt have been eliminated. Seven other ponds have been slightly resized. Basin G was modeled in ICPR and the 25-year/24-hour peak discharge rate has been reduced from 4.4 cfs (previously permitted) to 2.2 cfs.

Within Basin H Pond H-1 was separated into Ponds H-1Lt and H-1Rt. Pond H-1Lt will overflow to H-1Rt via new control structure S-303. Ponds H-2 and H-3 have been expanded while H-4 has been eliminated. Basin H was modeled in ICPR and the 25-year/24-hour peak discharge rate has been reduced from 10.2 cfs (existing condition) to 8.8 cfs. The 100-yr pre/post volume difference was calculated as 0.41 ac-ft. The project will provide 0.44 ac-ft of storage in 4 ponds and one special ditch located at Station 1374+50Lt.

A mixing zone is not required.

A variance is not required.

II. 100-Year Floodplain

Encroachment (Acre-Feet of fill)	Compensation (Acre-Feet of excavation)	Compensation Type	Encroachment Result* (feet)
0.00	0.00	No Encroachment	N/A

Floodplain Comments:

There is no floodplain encroachment associated with this project.

*Depth of change in flood stage (level) over existing receiving water stage resulting from floodplain encroachment caused by a project that claims Minimal Impact type of compensation.

III. Environmental Considerations

Wetland/Other Surface Water Information

Wetland/Other Surface Water Name	Total Acres	Not Impacted Acres	Permanent Impacts		Temporary Impacts	
			Acres	Functional Loss*	Acres	Functional Loss*
WL100	1.72	1.72	0.00	0.00	0.00	0.00
WL 400	4.36	4.36	0.00	0.00	0.00	0.00
Tampa Bypass Canal	3.44	2.50	0.94	0.00	0.00	0.00
SW 300	0.30	0.22	0.08	0.00	0.00	0.00
SW 200	0.03	0.01	0.02	0.00	0.00	0.00
Total:	9.85	8.81	1.04	0.00	0.00	0.00

* For impacts that do not require mitigation, their functional loss is not included.

Wetland/Other Surface Water Comments:

The project area for this ERP modification contains 6.12 acres of wetlands (FLUCCS 616 and 617) and 3.77 acres of other surface waters (FLUCCS 510) that have been previously approved and reported in ERP 44032128.000, entitled DOT-US 301- Tampa Bypass Canal to Fowler, issued September 26, 2007. This permit modification does not authorize any wetland or other surface water impacts or change any of the previously authorized wetland or other surface water impacts.

Mitigation Information

Mitigation is not required.

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Specific Conditions

1. If the ownership of the project area covered by the subject permit is divided, with someone other than the Permittee becoming the owner of part of the project area, this permit shall terminate, pursuant to Rule 40D-1.6105, F.A.C. In such situations, each land owner shall obtain a permit (which may be a modification of this permit) for the land owned by that person. This condition shall not apply to the division and sale of lots or units in residential subdivisions or condominiums.
2. Unless specified otherwise herein, two copies of all information and reports required by this permit shall be submitted to the Regulation Department at the District Service Office that services this permit. The permit number, title of report or information and event (for recurring report or information submittal) shall be identified on all information and reports submitted.
3. The Permittee shall retain the design engineer, or other professional engineer registered in Florida, to conduct on-site observations of construction and assist with the as-built certification requirements of this project. The Permittee shall inform the District in writing of the name, address and phone number of the professional engineer so employed. This information shall be submitted prior to construction.
4. Within 30 days after completion of construction of the permitted activity, the Permittee shall submit to the Regulation Department at the District Service Office that services this permit a written statement of completion and certification by a registered professional engineer or other appropriate individual as authorized by law, utilizing the required Statement of Completion and Request for Transfer to Operation Entity form identified in Chapter 40D-1, F.A.C., and signed, dated, and sealed as-built drawings. The as-built drawings shall identify any deviations from the approved construction drawings.
5. The District reserves the right, upon prior notice to the Permittee, to conduct on-site research to assess the pollutant removal efficiency of the surface water management system. The Permittee may be required to cooperate in this regard by allowing on-site access by District representatives, by allowing the installation and operation of testing and monitoring equipment, and by allowing other assistance measures as needed on site.
6. Wetland buffers shall remain in an undisturbed condition except for approved drainage facility construction/maintenance.
7. The following boundaries, as shown on the approved construction drawings, shall be clearly delineated on the site prior to initial clearing or grading activities:
 - a. wetland and surface water areas
 - b. wetland buffers
 - c. limits of approved wetland impactsThe delineation shall endure throughout the construction period and be readily discernible to construction and District personnel.
8. All Wetland boundaries shown on the approved construction drawings shall be binding upon the Permittee and the District.
9. All construction is prohibited within the permitted project area until the Permittee acquires legal ownership or legal control of the project area as delineated in the permitted construction drawings.
10. The Permittee, the Florida Department of Transportation, shall submit to the District a site-specific plan for

erosion and sediment control best management practices, pursuant to Section 104, F.D.O.T. Standard Specifications for Road and Bridge Construction. The Permittee shall submit this plan and receive District approval prior to construction commencement.

11. For dry bottom retention systems, the retention area(s) shall become dry within 72 hours after a rainfall event. If a retention area is regularly wet, this situation shall be deemed to be a violation of this permit.
12. The operation and maintenance entity shall submit inspection reports in the form required by the District, in accordance with the following schedule.

For systems utilizing retention or wet detention, the inspections shall be performed five (5) years after operation is authorized and every five (5) years thereafter.

13. This modification, Construction Permit No.44032128.001, amends the previously issued Construction Permit No. 44032128.000, and adds conditions. All other original permit conditions remain in effect.
14. If limestone bedrock is encountered during construction of the surface water management system, the District must be notified and construction in the affected area shall cease .
15. The Permittee shall notify the District of any sinkhole development in the surface water management system within 48 hours of discovery and must submit a detailed sinkhole evaluation and repair plan for approval by the District within 30 days of discovery.
16. The District, upon prior notice to the Permittee, may conduct on-site inspections to assess the effectiveness of the erosion control barriers and other measures employed to prevent violations of state water quality standards and avoid downstream impacts. Such barriers or other measures should control discharges, erosion, and sediment transport during construction and thereafter. The District will also determine any potential environmental problems that may develop as a result of leaving or removing the barriers and other measures during construction or after construction of the project has been completed. The Permittee must provide any remedial measures that are needed.
17. This permit is issued based upon the design prepared by the Permittee's consultant. If at any time it is determined by the District that the Conditions for Issuance of Permits in Rules 40D-4.301 and 40D-4.302, F.A.C., have not been met, upon written notice by the District, the Permittee shall obtain a permit modification and perform any construction necessary thereunder to correct any deficiencies in the system design or construction to meet District rule criteria. The Permittee is advised that the correction of deficiencies may require re-construction of the surface water management system.

GENERAL CONDITIONS

1. The general conditions attached hereto as Exhibit "A" are hereby incorporated into this permit by reference and the Permittee shall comply with them.

Michelle K. Hopkins, P.E.

Authorized Signature

EXHIBIT A

GENERAL CONDITIONS:

1. All activities shall be implemented as set forth in the plans, specifications and performance criteria as approved by this permit. Any deviation from the permitted activity and the conditions for undertaking that activity shall constitute a violation of this permit.
2. This permit or a copy thereof, complete with all conditions, attachments, exhibits, and modifications, shall be kept at the work site of the permitted activity. The complete permit shall be available for review at the work site upon request by District staff. The permittee shall require the contractor to review the complete permit prior to commencement of the activity authorized by this permit.
3. For general permits authorizing incidental site activities, the following limiting general conditions shall also apply:
 - a. If the decision to issue the associated individual permit is not final within 90 days of issuance of the incidental site activities permit, the site must be restored by the permittee within 90 days after notification by the District. Restoration must be completed by re-contouring the disturbed site to previous grades and slopes re-establishing and maintaining suitable vegetation and erosion control to provide stabilized hydraulic conditions. The period for completing restoration may be extended if requested by the permittee and determined by the District to be warranted due to adverse weather conditions or other good cause. In addition, the permittee shall institute stabilization measures for erosion and sediment control as soon as practicable, but in no case more than 7 days after notification by the District.
 - b. The incidental site activities are commenced at the permittee's own risk. The Governing Board will not consider the monetary costs associated with the incidental site activities or any potential restoration costs in making its decision to approve or deny the individual environmental resource permit application. Issuance of this permit shall not in any way be construed as commitment to issue the associated individual environmental resource permit.
4. Activities approved by this permit shall be conducted in a manner which does not cause violations of state water quality standards. The permittee shall implement best management practices for erosion and a pollution control to prevent violation of state water quality standards. Temporary erosion control shall be implemented prior to and during construction, and permanent control measures shall be completed within 7 days of any construction activity. Turbidity barriers shall be installed and maintained at all locations where the possibility of transferring suspended solids into the receiving waterbody exists due to the permitted work. Turbidity barriers shall remain in place at all locations until construction is completed and soils are stabilized and vegetation has been established. Thereafter the permittee shall be responsible for the removal of the barriers. The permittee shall correct any erosion or shoaling that causes adverse impacts to the water resources.
5. Water quality data for the water discharged from the permittee's property or into the surface waters of the state shall be submitted to the District as required by the permit. Analyses shall be performed according to procedures outlined in the current edition of Standard Methods for the Examination of Water and Wastewater by the American Public Health Association or Methods for Chemical Analyses of Water and Wastes by the U.S. Environmental Protection Agency. If water quality data are required, the permittee shall provide data as required on volumes of water discharged, including total volume discharged during the days of sampling and total monthly volume dis-charged from the property or into surface waters of the state.
6. District staff must be notified in advance of any proposed construction dewatering. If the dewatering activity is likely to result in offsite discharge or sediment transport into wetlands or surface waters, a written dewatering plan must either have been submitted and approved with the permit application or submitted to the District as a permit prior to the dewatering event as a permit modification. A water use permit may be required prior to any use exceeding the thresholds in Chapter 40D-2, F.A.C.

7. Stabilization measures shall be initiated for erosion and sediment control on disturbed areas as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 7 days after the construction activity in that portion of the site has temporarily or permanently ceased.
8. Off-site discharges during construction and development shall be made only through the facilities authorized by this permit. Water discharged from the project shall be through structures having a mechanism suitable for regulating upstream stages. Stages may be subject to operating schedules satisfactory to the District.
9. The permittee shall complete construction of all aspects of the surface water management system, including wetland compensation (grading, mulching, planting), water quality treatment features, and discharge control facilities prior to beneficial occupancy or use of the development being served by this system.
10. The following shall be properly abandoned and/or removed in accordance with the applicable regulations:
 - a. Any existing wells in the path of construction shall be properly plugged and abandoned by a licensed well contractor.
 - b. Any existing septic tanks on site shall be abandoned at the beginning of construction.
 - c. Any existing fuel storage tanks and fuel pumps shall be removed at the beginning of construction.
11. All surface water management systems shall be operated to conserve water in order to maintain environmental quality and resource protection; to increase the efficiency of transport, application and use; to decrease waste; to minimize unnatural runoff from the property and to minimize dewatering of offsite property .
12. At least 48 hours prior to commencement of activity authorized by this permit, the permittee shall submit to the District a written notification of commencement indicating the actual start date and the expected completion date.
13. Each phase or independent portion of the permitted system must be completed in accordance with the permitted plans and permit conditions prior to the occupation of the site or operation of site infrastructure located within the area served by that portion or phase of the system. Each phase or independent portion of the system must be completed in accordance with the permitted plans and permit conditions prior to transfer of responsibility for operation and maintenance of that phase or portion of the system to a local government or other responsible entity.
14. Within 30 days after completion of construction of the permitted activity, the permittee shall submit a written statement of completion and certification by a registered professional engineer or other appropriate individual as authorized by law, utilizing the required Statement of Completion and Request for Transfer to Operation Entity form identified in Chapter 40D-1, F.A.C. Additionally, if deviation from the approved drawings are discovered during the certification process the certification must be accompanied by a copy of the approved permit drawings with deviations noted.
15. This permit is valid only for the specific processes, operations and designs indicated on the approved drawings or exhibits submitted in support of the permit application. Any substantial deviation from the approved drawings, exhibits, specifications or permit conditions, including construction within the total land area but outside the approved project area(s), may constitute grounds for revocation or enforcement action by the District, unless a modification has been applied for and approved. Examples of substantial deviations include excavation of ponds, ditches or sump areas deeper than shown on the approved plans.
16. The operation phase of this permit shall not become effective until the permittee has complied with the requirements of the conditions herein, the District determines the system to be in compliance with the permitted plans, and the entity approved by the District accepts responsibility for operation and maintenance of the system. The permit may not be transferred to the operation and maintenance entity approved by the

District until the operation phase of the permit becomes effective. Following inspection and approval of the permitted system by the District, the permittee shall request transfer of the permit to the responsible operation and maintenance entity approved by the District, if different from the permittee. Until a transfer is approved by the District, the permittee shall be liable for compliance with the terms of the permit.

17. Should any other regulatory agency require changes to the permitted system, the District shall be notified of the changes prior to implementation so that a determination can be made whether a permit modification is required.
18. This permit does not eliminate the necessity to obtain any required federal, state, local and special District authorizations including a determination of the proposed activities' compliance with the applicable comprehensive plan prior to the start of any activity approved by this permit.
19. This permit does not convey to the permittee or create in the permittee any property right, or any interest in real property, nor does it authorize any entrance upon or activities on property which is not owned or controlled by the permittee, or convey any rights or privileges other than those specified in the permit and Chapter 40D-4 or Chapter 40D-40, F.A.C.
20. The permittee shall hold and save the District harmless from any and all damages, claims, or liabilities which may arise by reason of the activities authorized by the permit or any use of the permitted system.
21. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding unless a specific condition of this permit or a formal determination under section 373.421(2), F.S., provides otherwise.
22. The permittee shall notify the District in writing within 30 days of any sale, conveyance, or other transfer of ownership or control of the permitted system or the real property at which the permitted system is located. All transfers of ownership or transfers of a permit are subject to the requirements of Rule 40D-4.351, F.A.C. The permittee transferring the permit shall remain liable for any corrective actions that may be required as a result of any permit violations prior to such sale, conveyance or other transfer.
23. Upon reasonable notice to the permittee, District authorized staff with proper identification shall have permission to enter, inspect, sample and test the system to insure conformity with District rules, regulations and conditions of the permits.
24. If historical or archaeological artifacts are discovered at any time on the project site, the permittee shall immediately notify the District and the Florida Department of State, Division of Historical Resources.
25. The permittee shall immediately notify the District in writing of any previously submitted information that is later discovered to be inaccurate.

SOUTHWEST FLORIDA
WATER MANAGEMENT DISTRICT

NOTICE OF
AUTHORIZATION
TO COMMENCE CONSTRUCTION

FDOT - U.S. 301 from South of Tampa Bypass Canal to North of Fowler Avenue
PROJECT NAME

Road Projects
PROJECT TYPE

HILLSBOROUGH
COUNTY

S17/T28S/R20E, S18/T28S/R20E, S08/T28S/R20E
SEC(S)/TWP(S)/RGE(S)

Florida Department of Transportation, District 7
PERMITTEE See permit for additional permittees

APPLICATION ID/PERMIT NO: 670742 / 44032128.001

DATE ISSUED: January 02, 2013



Michelle K. Hopkins, P.E.

Issuing Authority

THIS NOTICE SHOULD BE CONSPICUOUSLY
DISPLAYED AT THE SITE OF THE WORK

Notice of Rights

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JUDICIAL REVIEW

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2. All proceedings shall be instituted by filing an original notice of appeal with the District Agency clerk within 30 days after the rendition of the order being appealed, and a copy of the notice of appeal, accompanied by any filing fees prescribed by law, with the clerk of the court, in accordance with Rules 9.110 and 9.190 of the Florida Rules of Appellate Procedure (Fla. R. App. P.). Pursuant to Fla. R. App. P. 9.020(h), an order is rendered when a signed written order is filed with the clerk of the lower tribunal.

DRAFT



Southwest Florida Water Management District

2379 Broad Street, Brooksville, Florida 34604-6899
(352) 796-7211 or 1-800-423-1476 (FL only)
SUNCOM 628-4150 TDD only 1-800-231-6103 (FL only)
On the Internet at: WaterMatters.org

An Equal
Opportunity
Employer

Bartow Service Office
170 Century Boulevard
Bartow, Florida 33830-7700
(863) 534-1448 or
1-800-492-7862 (FL only)

Sarasota Service Office
6750 Fruitville Road
Sarasota, Florida 34240-9711
(941) 377-3722 or
1-800-320-3503 (FL only)

Tampa Service Office
7601 Highway 301 North
Tampa, Florida 33637-6759
(813) 985-7481 or
1-800-836-0797 (FL only)

January 16, 2013

Florida Department of Transportation
Attn: Virginia Creighton
11201 North McKinley Drive, MS 7-1300
Tampa, FL 33612

Subject: **Notice of Final Agency Action for Approval
ERP Short Form**

Project Name: DOT - US 301 - Tampa Bypass Canal to Fowler
App ID/Permit No: 675187 / 44032128.002
County: HILLSBOROUGH
Letter Received: December 21, 2012
Expiration Date: January 16, 2018
Sec/Twp/Rge: S19/T28S/R20E, S17/T28S/R20E, S18/T28S/R20E,
S08/T28S/R20E

Reference: Chapters 40D-4 and 40, Florida Administrative Code (F.A.C)
Sections 373.4141 and 120.60, Florida Status (F.S)

Dear Permittee(s):

Your request to modify Environmental Resource Permit (ERP) No. 44032128.000 by Short Form has been approved. This modification authorizes:

1. The extension of the expiration date for five (5) years from the issue date of this permit modification.
2. All other terms and conditions of Permit No. 44032128.000, dated September 26, and entitled DOT - US 301 - Tampa Bypass Canal to Fowler, apply.

Final approval is contingent upon no objection to the District's action being received by the District within the time frames described in the enclosed Notice of Rights.

Approved construction plans are part of the permit, and construction must be in accordance with these plans. These drawings are available for viewing or downloading through the District's Application and Permit Search Tools located at www.WaterMatters.org/permits.

The District's action in this matter only becomes closed to future legal challenges from members of the public if such persons have been properly notified of the District's action and no person objects to the District's action within the prescribed period of time following the notification. The District does not publish notices of agency action. If you wish to limit the time within which a person who does not receive actual written notice from the District may request an administrative hearing regarding this action, you are strongly encouraged to publish, at your own expense, a notice of agency action in the legal advertisement section of a newspaper of general circulation in the county or counties where the activity will occur. Publishing notice of agency action will close the window for filing a petition for hearing. Legal requirements and instructions for publishing notice of agency action, as well as a noticing form that can be used is available from the District's website at www.WaterMatters.org/permits/noticing.

If you publish notice of agency action, a copy of the affidavit of publishing provided by the newspaper should be sent to the Regulation Division at the District Service Office that services this permit.

If you have questions regarding this modification, please contact Scott VanOrsdale, at the Tampa Service Office, extension 6002.

Sincerely,

Michelle K. Hopkins, P.E.
Bureau Chief
Environmental Resource Permit Bureau
Regulation Division

Enclosures: Notice of Rights

cc: Meagan Arasteh, P.E., Florida Department of Transportation

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Notice of Rights

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1. Pursuant to Sections 120.60(3) and 120.68, F.S., a party who is adversely affected by final District action may seek judicial review of the District's final action. Judicial review shall be sought in the Fifth District Court of Appeal or in the appellate district where a party resides or as otherwise provided by law.
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Tampa Service Office
7601 Highway 301 North
Tampa, Florida 33637-6759
(813) 985-7481 or
1-800-836-0797 (FL only)

January 02, 2013

Riverwood Estates Holdco, LLC
c/o Rizzetta & Co., Inc. Attn: Pete Williams
3434 Colwell Avenue, Suite 200
Tampa, FL 33614

Subject: **Notice of Final Agency Action for Approval
ERP Short Form**

Project Name: Riverwood Intersection Improvements US 301
App ID/Permit No: 675324 / 44027103.010
County: PASCO
Letter Received: December 27, 2012
Expiration Date: January 02, 2018
Sec/Twp/Rge: S28/T26S/R21E, S33/T26S/R21E, S27/T26S/R21E

Reference: Chapters 40D-4 and 40, Florida Administrative Code (F.A.C.)
Sections 373.4141 and 120.60, Florida Status (F.S.)

Dear Permittee(s):

Your request to modify Construction Permit No. 49027103.003 by Short Form has been approved. This modification authorizes:

1. The extension of the expiration date for five (5) years from the issue date of this permit modification.
2. All other terms and conditions of Construction Permit No. 49027103.003, issued September 28, 2006, and entitled Riverwood Intersection Improvements US 301 apply.

Final approval is contingent upon no objection to the District's action being received by the District within the time frames described in the enclosed Notice of Rights.

Approved construction plans are part of the permit, and construction must be in accordance with these plans. These drawings are available for viewing or downloading through the District's Application and Permit Search Tools located at www.WaterMatters.org/permits.

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If you publish notice of agency action, a copy of the affidavit of publishing provided by the newspaper

should be sent to the Regulation Division at the District Service Office that services this permit.

If you have questions regarding this modification, please contact Buddy Wood, at the Tampa Service Office, extension 2030.

Sincerely,

Michelle K. Hopkins, P.E.
Bureau Chief
Environmental Resource Permit Bureau
Regulation Division

Enclosures: Notice of Rights

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Notice of Rights

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APPENDIX G

Cultural Resources Desktop Analysis

DRAFT

**PRELIMINARY CULTURAL RESOURCE ASSESSMENT
PROBABILITY ANALYSIS
TECHNICAL MEMORANDUM**

**PROPOSED STORMWATER MANAGEMENT FACILITIES (SMF) &
FLOODPLAIN COMPENSATION (FPC) SITES
US 301 (Gall Boulevard) from Fowler Avenue to Future SR 56
Hillsborough & Pasco Counties, Florida**

**ETDM Number: 14194
WPI Segment Number: 255796-1**

Prepared for:

**Florida Department of Transportation
District Seven
11201 North McKinley Drive
Tampa, Florida 33612-6456**

June 2021

**PRELIMINARY CULTURAL RESOURCE ASSESSMENT
PROBABILITY ANALYSIS
TECHNICAL MEMORANDUM**

**PROPOSED STORMWATER MANAGEMENT FACILITIES (SMF) &
FLOODPLAIN COMPENSATION (FPC) SITES
US 301 (Gall Boulevard) from Fowler Avenue to Future SR 56
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**ETDM Number: 14194
WPI Segment Number: 255796-1**

Prepared for:

**Florida Department of Transportation
District Seven
11201 North McKinley Drive
Tampa, Florida 33612-6456**

Prepared by:

**Archaeological Consultants, Inc.
8110 Blaikie Court, Suite A
Sarasota, Florida 34240**

In association with:

**AIM Engineering & Surveying, Inc.
3802 Corporex Park Drive
Tampa, Florida 33619**

June 2021

1.0 INTRODUCTION

The purpose of this study was to determine, preliminarily, if any significant or potentially significant cultural resources, including archaeological sites and historic resources, will be impacted by the construction of a total 45 proposed Stormwater Management Facilities (SMF) and Floodplain Compensation (FPC) sites associated with improvements to US 301 from Fowler Avenue to future SR 56 in Hillsborough and Pasco Counties (**Figure 1**). Known or potentially significant cultural resources are defined as those sites that are listed, determined eligible, or considered potentially eligible for listing in the National Register of Historic Places (NRHP). All work was conducted in compliance with the provisions of the *National Historic Preservation Act of 1966* (Public Law 89-665), as amended, and the implementing regulations 36 CFR 800, as well as with the provisions contained in the revised Chapter 267, *Florida Statutes (FS)*.

The study methodology included a review of Florida Master Site File (FMSF) records, NRHP listings, relevant cultural resource assessment survey (CRAS) reports, the U.S. Department of Agriculture's (USDA) Soil Survey of Hillsborough County, Florida (USDA 1952, 1989) and Pasco County (USDA 1982), as well as the United States Geological Survey (USGS) Plant City West, Thonotosassa, and Zephyrhills quadrangle maps (USGS 1977a, 1977b, 1983). Relevant CRAS reports included the Project Development and Environment (PD&E) Study for US 301 from Fowler Avenue to Proposed SR 56 (Archaeological Consultants, Inc. [ACI] 20017a), as well as over 30 CRAS's conducted within one half mile.

As a result of the preliminary study, there are four previously recorded archaeological sites partially or wholly within proposed SMF/FPC sites and four adjacent (**Figures 2-5**). Most of the SMF/FPC sites have a low to moderate archaeological potential; however, several have either a low, moderate, or high potential for the discovery of additional archaeological sites or for evidence of previously recorded sites. There are seven (7) previously recorded historic resources identified within and/or adjacent to the proposed SMF/FPC sites. These include four buildings (8HI01701, 8HI01702, 8HI13507, & 8HI13510) and three linear resources (8HI13600, 8HI14624, & 8PA02675). Approximately ten new historic resources, 45 years of age or older, are located within or adjacent to the proposed SMF/FPC sites. This information is summarized in **Tables 2 and 3** and **Figures 2-5**.

In conclusion, no proposed SMF/FPC site should be avoided due to cultural resource issues. Following the selection of preferred SMF/FPC sites, systematic archaeological field survey is recommended; historical/architectural field survey is also recommended.

2.0 PREVIOUS CULTURAL RESOURCE ASSESSMENT SURVEYS

Between 1976 and 2019, numerous archaeological and historical/architectural surveys were conducted within one mile of the US 301 project Area of Potential Effects (APE). In addition to this section of US 301 being surveyed in 2017 by ACI (ACI 2017a), other surveys in the general area include those associated with the Hillsborough River and other wetlands (Daniel 1979; Deming 1976; HDR Engineering 1993; Hughes 2004; Newman 2001; Prendergast 2017; Saionz 2019), State Parks (Cockrell 2001; Willams and Grange 1979; PanAmerican 2003), transmission lines (Austin 1991; Piper 1990), gas line corridors (Athens 1992; Chance 1991; Coughlin 2010; Labadia 2000), roadway projects (ACI 2012, 2015, 2017b; Chambless 2016; Deming 1997; Janus Research 1996), private property (ACI 2004; Almy 1998a, 1998b; Austin 2000; Driscoll et al. 2002; Janus Research 2017; PanAmerican 2002; Stuebe and White 1997), Cell Towers (Deming 2000), trails (Austin 2001; Hughes 2003), and a historic resources survey (Streelman 2005).



Figure 1. Location of the proposed SMF/FPC Sites, Hillsborough and Pasco Counties.

3.0 DESCRIPTION OF KNOWN ARCHAEOLOGICAL AND HISTORIC RESOURCES AND SITE POTENTIAL

Archaeological Sites: The FMSF search indicated that 34 previously recorded archaeological sites are located within one half mile of the proposed SFM/FPC sites, of which eight are located within or adjacent (**Table 1; Figures 2-5**). These eight sites are depicted by green shading in **Table 2**. Many of the earlier recorded sites were discovered or reported recorded by students from the University of South Florida.

The previously recorded sites include mounds, artifact/lithic scatters, fort, trestle, campsites, historic refuse, and isolated artifacts. The lithic scatters were typically recorded as culturally indeterminate or were dated to the Archaic period. There also are a few sites with Weeden Island and Safety Harbor components. 8HI00112, Fort Alabama/Fort Foster, a Seminole War period fort, was listed on the NRHP in 1972. The State Historic Preservation Officer (SHPO) has evaluated 10 sites as ineligible for listing in the NRHP and five as having insufficient information; 18 sites have not been evaluated.

Table 1. Previously recorded archaeological sites located within one half mile of the proposed SMF/FPC sites (those within or adjacent to the project APE are shaded green).

FMSF #	Site Name	Site Type(s)	Culture(s)	Reference	SHPO Eval
HI00043	Flint Creek	Artifact scatter;	Archaic; Weeden Island; 20th century	Daniel et al. 1979; Driscoll et al. 2004; Hughes 2003; Williams and Grange 1979	Ineligible
HI00077	Logging Woods 1	Lithic scatter	Indeterminate	FMSF	Not Evaluated
HI00112	Fort Alabama / Fort Foster	Fort	Post-1821	Baker 1974; Baust 2003; FMSF ; Schene 1974	Listed 1972
HI00305	Hillsborough River Basin C 3	Artifact scatter	Archaic	Deming 1976	Not Evaluated
HI00396	Kelson	Lithic scatter	Indeterminate	Deming 1976	Not Evaluated
HI00398	Chapman	Lithic scatter	Indeterminate	FMSF	Not Evaluated
HI00405	Hogue	Lithic scatter	Indeterminate	FMSF	Not Evaluated
HI00428	Crawford	Lithic scatter	Indeterminate	Deming 1976	Not Evaluated
HI00429	Spada Grove	Lithic scatter	Indeterminate	Deming 1976	Not Evaluated
HI00441	Indian Canal	Campsite; artifact scatter; habitation	Archaic	FMSF	Not Evaluated
HI00488	Deep Pit	Lithic scatter	Archaic	FMSF	Not Evaluated
HI00489	Round Sink	Lithic scatter	Archaic	FMSF	Not Evaluated
HI00490	Iron Gate	Lithic scatter	Archaic	FMSF	Not Evaluated
HI00491	Sand Rock	Lithic scatter	Archaic	FMSF	Not Evaluated

FMSF #	Site Name	Site Type(s)	Culture(s)	Reference	SHPO Eval
HI00492	Sand Field	Lithic scatter	Archaic	FMSF	Not Evaluated
HI00493	Radio Tower	Lithic scatter	Archaic	FMSF	Not Evaluated
HI00494	Gas Line	Lithic scatter; historic refuse	Archaic; Post-Archaic	FMSF; Jones 1998	Insufficient Info
HI00495	Cow House East Head	Burial mound; platform mound; quarry; lithic scatter	Archaic; Weeden Island; Safety Harbor	FMSF; Porter 2009	Not Evaluated
HI00498	Cow House Bend	Lithic scatter	Archaic	FMSF	Not Evaluated
HI04051	Van Neste	Artifact scatter	Paleoindian; Early/Middle Archaic	FMSF	Not Evaluated
HI05397	Model Dairy No. 1	Isolated artifact	Indeterminate	HDR Engineering 1993	Ineligible
HI06307	Lake in the Pines	Artifact scatter	Post-Archaic	Steube and White 1997	Not Evaluated
HI11293	Fort King Trail	Campsite	Indeterminate	Carty and Wallace 2008	Ineligible
HI11294	Model Dairy Pasture	Campsite	Indeterminate	Carty and Wallace 2008	Ineligible
HI13597	Holloman's Branch North	Lithic scatter	Indeterminate	ACI 2017	Insufficient Info
HI13598	Zap R	Lithic scatter	Indeterminate	ACI 2017	Insufficient Info
HI13500	Zap PQ	Lithic scatter	Indeterminate	ACI 2017	Insufficient Info
HI13601	T&T Trestle over Holloman's Branch	Trestle	American 20 th Century	ACI 2017	Ineligible
HI13602	T&T Trestle over Two Hole Branch	Trestle	American 20 th Century	ACI 2017	Ineligible
HI14621	Pasture Site	Lithic scatter	Indeterminate	Saionz 2019	Ineligible
HI14622	Trailer Parking 1	Lithic scatter	Indeterminate	Saionz 2019	Ineligible
HI14623	Trailer Parking 2	Lithic scatter	Indeterminate	Saionz 2019	Ineligible
PA02098	Ft. King Hammock	Lithic scatter	Indeterminate	ACI 2004	Ineligible
PA02102	Ft King Rd	Road; Artifact Scatter	Prehistoric Indeterminate; 19 th /20 th century	ACI 2004	Insufficient Info

Given these known patterns of aboriginal settlement, it was anticipated that additional data on the previously recorded sites would be obtained and several areas were considered to have either a high, a moderate, or low to moderate potential for archaeological sites based on soils, elevation, and distance to water. Given the results of the historic research, no historic period archaeological sites, including nineteenth century homesteads, forts, or Indian encampments were expected.

Based upon the results of previous archaeological surveys in the vicinity, an understanding of known patterns of aboriginal settlement in the general region, as well as an examination of the (USDA) Soil

Survey Hillsborough County, Florida (USDA 1952, 1989), and Pasco County (USDA 1982 as well as the USGS quadrangle maps (USGS 1977a, 1977b, 1983), each of the proposed SMF/FPC sites was evaluated for archaeological site potential. Each was reviewed and assigned to one of four site potential categories: low, low to moderate, moderate, and high potential areas.

Historic Resources: Seven historic resources (Table 2; Figures 2 -5) were previously recorded within and/or adjacent to the proposed SMF/FPC sites. These include four buildings (8HI01701, 8HI01702, 8HI13507, & 8HI13510) and three linear resources (8HI13600, 8HI14624, & 8PA02675). An abandoned segment of the Tampa & Thonotosassa Railroad (8HI13600) runs parallel to US 301 in Hillsborough County and is located adjacent to several of the proposed SMF/FPC sites. The rails and ties have been removed from the linear resource and it was determined ineligible for listing in the NRHP by the SHPO. In addition, an abandoned segment of the CSX Branch (8HI14624) is located within the proposed SMC 4C (Shared Use) site. The linear resource was determined ineligible for listing in the NRHP by the SHPO. A recorded segment of US 301 (8PA02675) in Pasco County is located adjacent to several of the proposed SMF/FPC sites. The linear resource was determined ineligible for listing in the NRHP by the SHPO.

Table 2. Previously recorded historic resources located within or adjacent to the proposed SMF/FPC sites.

FMSF No.	Address/ Site Name	Year Built	Style/Type	SHPO Evaluation	Proposed SMF/FPC Sites	Within or Adjacent
8HI11701	9850 Rockhill Road	ca. 1955	Masonry vernacular	Ineligible	SMF 1A	Adjacent
8HI11702	9864 Rockhill Road	ca. 1957	Masonry vernacular	Ineligible	SMF 1A	Within
8HI13507	9870 Rockhill Road	ca. 1958	Masonry vernacular	Ineligible	SMF 1A	Adjacent
8HI13510	9916 E Fowler Avenue	ca. 1960	Masonry vernacular	Ineligible	SMF 1B	Adjacent
8HI13600	Tampa & Thonotosassa Railroad (abandoned)	ca. 1893	Linear Resource	Ineligible	SMC 5A, SMC 5B, SMC 5C	Adjacent
8HI14624	CSX Branch (abandoned)	ca. 1900	Linear Resource	Ineligible	SMF 4C	Within
8PA02675	US 301 (SR 39)	ca. 1900	Linear Resource	Ineligible	FPC 8, FPC 1A (Atkins), SMF 1A (Atkins)	Adjacent

Archaeological Site Potential: Based upon the review of relevant CRAS reports, regional site location predictive models, and other studies (e.g., Austin et al. 1991b; Burger 1982; de Montmollin 1983; Deming 1980; Janus Research 1992, 2004; Weisman and Collins 2004) zones of archaeological probability were determined. New sites, if present, were expected to be lithic or artifact scatters. In general, background research indicated that the majority of Zones of Archaeological Potential (ZAPs) are characterized by land alteration and highly disturbed soil conditions. As a result, during the CRAS field survey, many of the ZAPs may be downgraded to low site potential and tested appropriately.

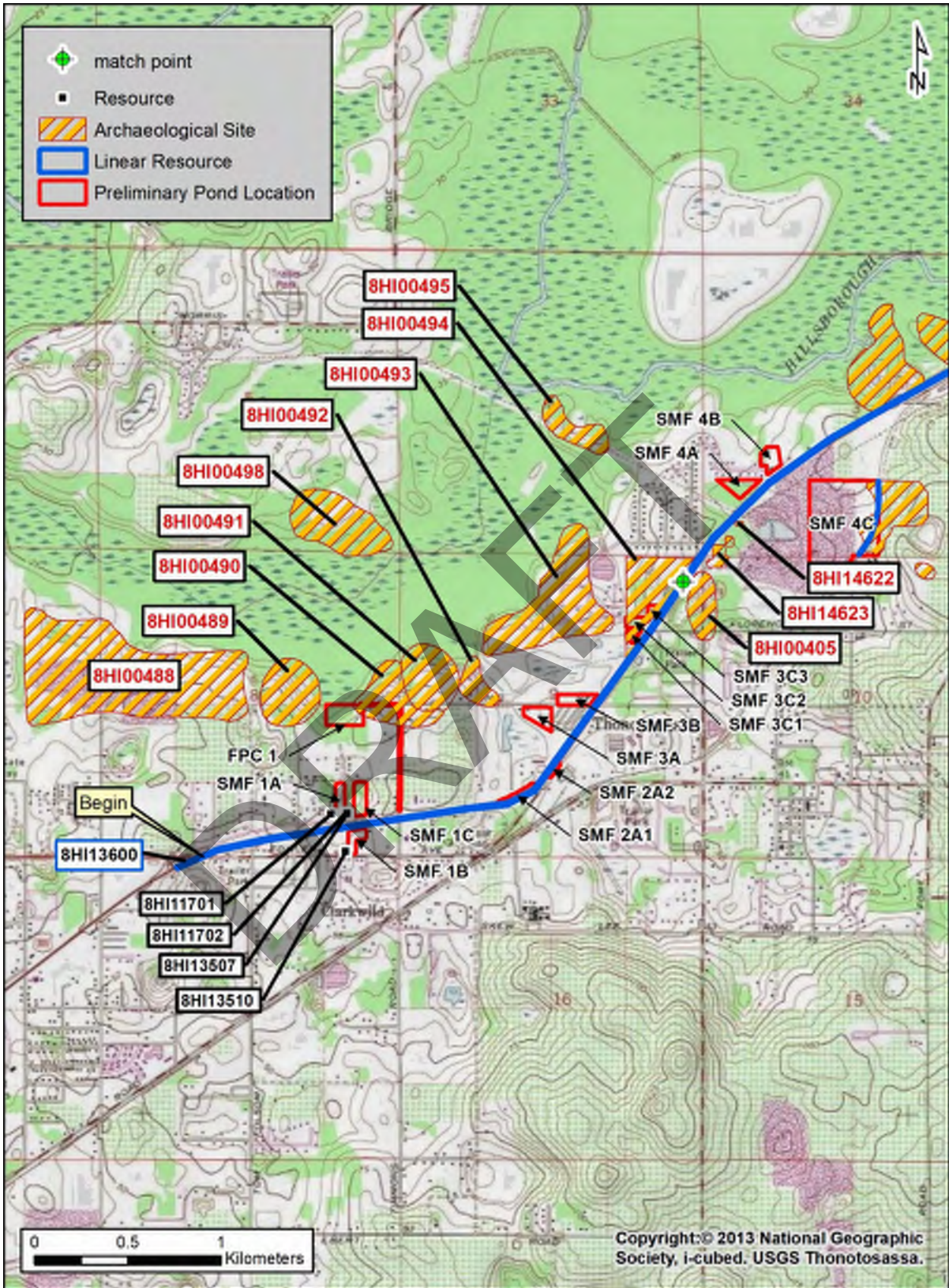


Figure 2. Location of previously recorded cultural resources adjacent to and/or within the proposed SMF/FPC Sites.

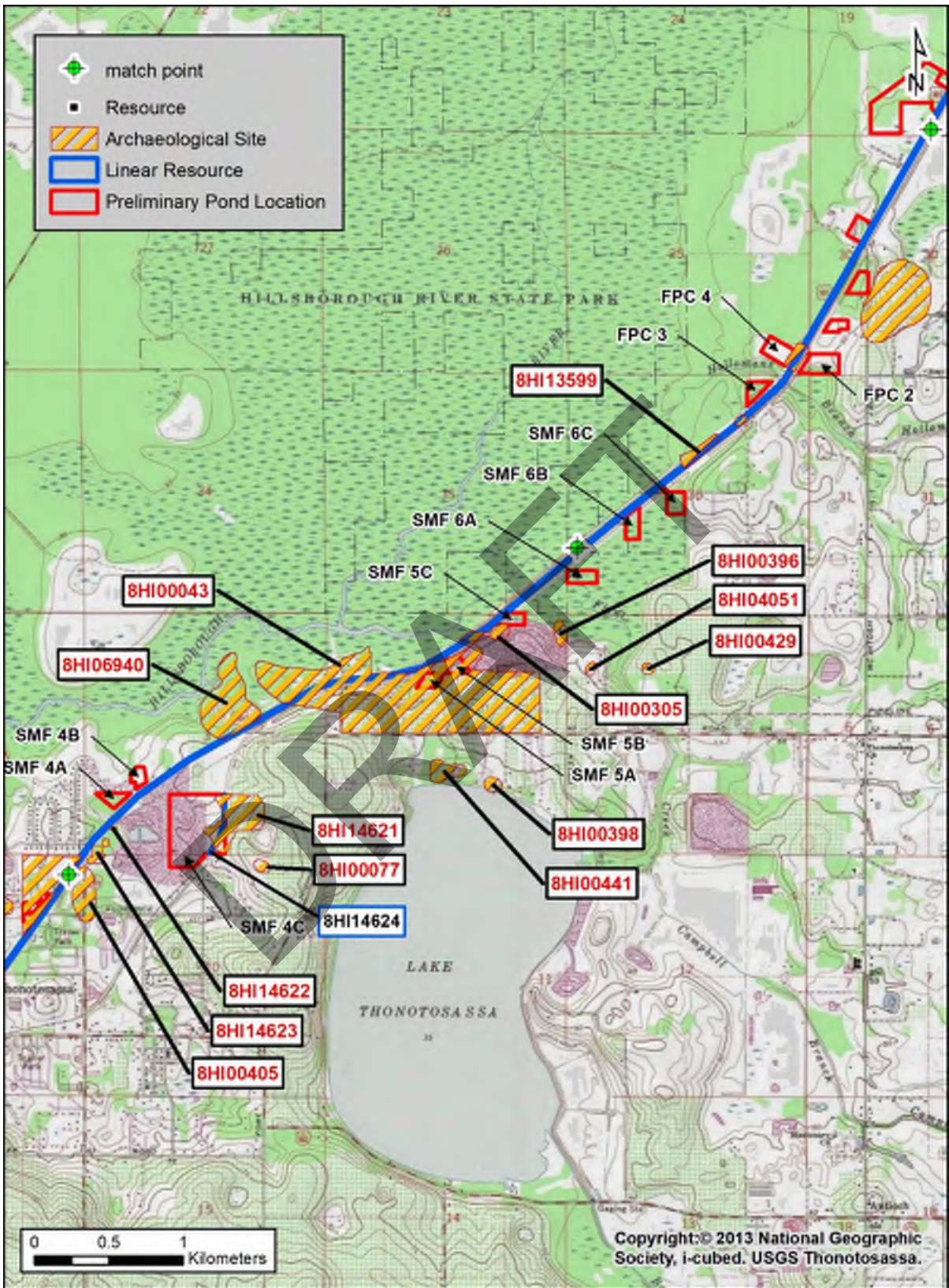


Figure 3. Location of previously recorded cultural resources adjacent to and/or within the proposed SMF/FPC Sites.

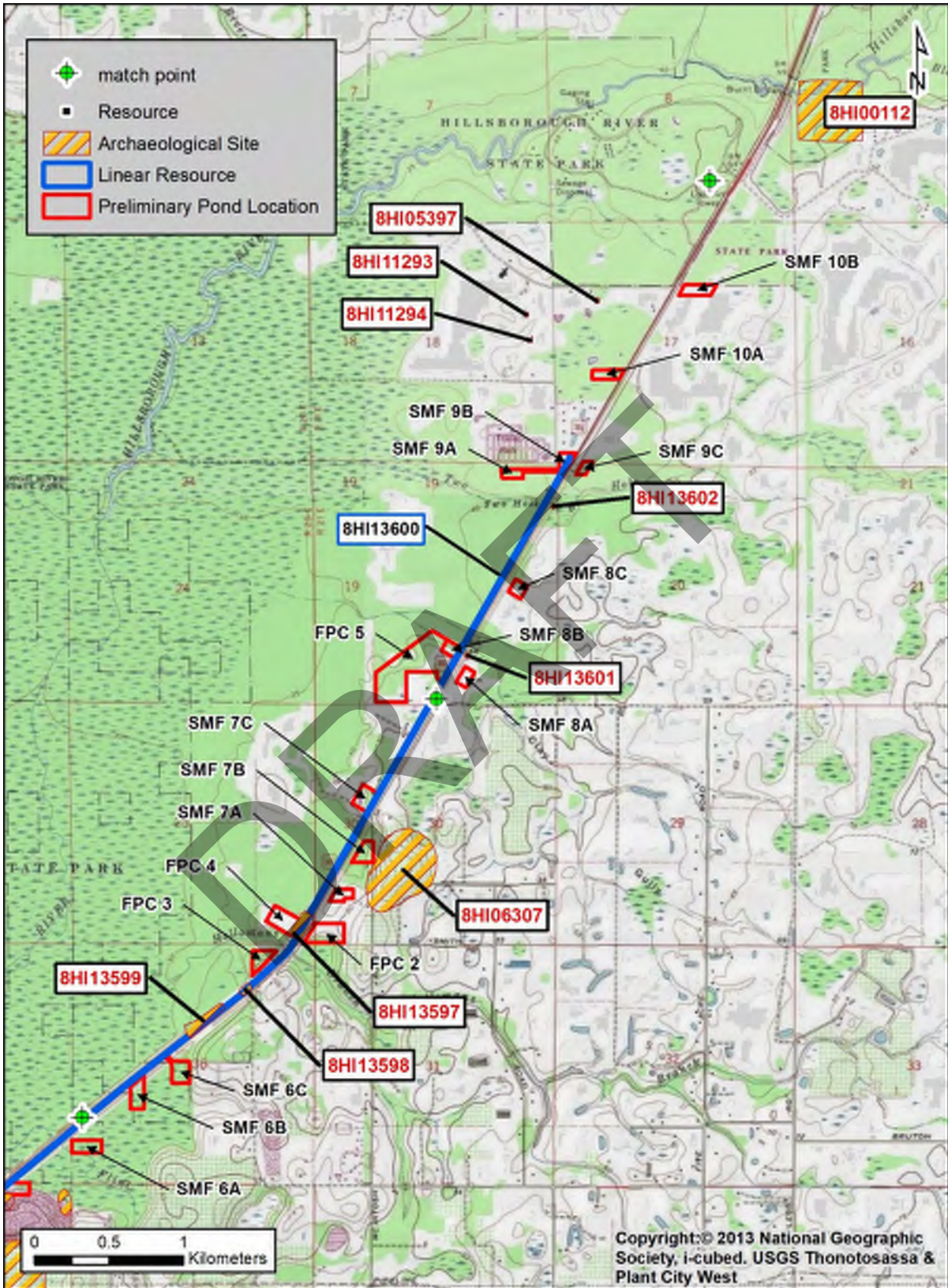


Figure 4. Location of previously recorded cultural resources adjacent to and/or within the proposed SMF/FPC Sites.

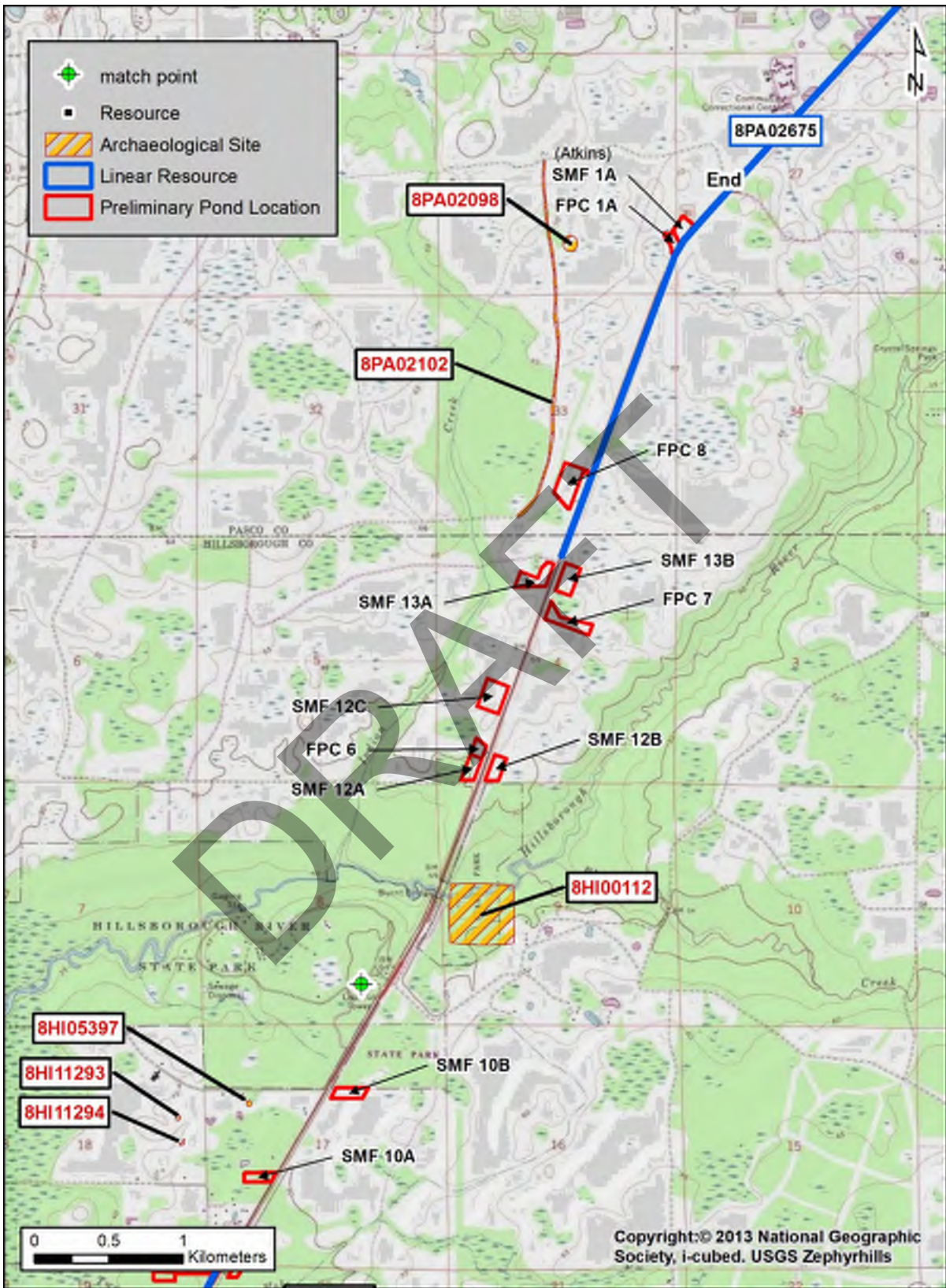


Figure 5. Location of previously recorded cultural resources adjacent to and/or within the proposed SMF/FPC Sites.

Potential Historic Resources: The potential for newly identified historic resources was determined by examining the appropriate USGS quadrangle maps, property appraiser records, historic aerial imagery, and previous ACI CRAS reports of US 301 (ACI 2012 & 2017; Survey Nos. 19174 & 24187). Based on this preliminary research, there are approximately ten (10) newly identified historic resources within or immediately adjacent to the proposed SMF/FPC sites (Henriquez 2021 and Wells 2021). The newly identified resources were built between 1945 and 1975 and include a mobile home park and residential and commercial buildings; none appear potentially eligible for NRHP listing at this preliminary phase of research. In addition, FPC 2 & SMF 7A sites are located on the property of 14003 McIntosh Road with a circa 1961 historic resource; however, the building is not located near the proposed SMF/FPC sites. This information is summarized in **Table 3**.

Table 3. Archaeological and historic data.

SMF/ FPC	ZAP*	Comments (i.e., soils, vegetation, drainage, previously recorded sites, etc.)
SMF 1A	Low - Moderate	Prehistoric Archaeological: no previously recorded sites within or adjacent; on uplands and well-drained soil from freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Moderate	Historical: One previously recorded resource within (8HI11702); Two previously recorded resources adjacent (8HI11701 & 8HI13507)
SMF 1B	Low - Moderate	Prehistoric Archaeological: no previously recorded sites within or adjacent; on uplands and well-drained soil from freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: One previously recorded resource adjacent (8HI13510)
SMF 1C	Low - Moderate	Prehistoric Archaeological: no previously recorded sites within or adjacent; on uplands and well-drained soil from freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: One previously recorded resource adjacent (8HI13507)
FPC 1	High	Prehistoric Archaeological: site 8HI00490 partially within; on uplands and well-drained soil from freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent; one newly identified resource immediately adjacent
SMF 2A1	Low - Moderate	Prehistoric Archaeological: no previously recorded sites within or adjacent; on uplands and well-drained soil from freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent
SMF 2A2	Low - Moderate	Prehistoric Archaeological: no previously recorded sites within or adjacent; on uplands and well-drained soil from freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent
SMF 3A	Low - Moderate	Prehistoric Archaeological: no previously recorded sites within or adjacent; on uplands and well-drained soil from freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent; Two newly identified resources immediately adjacent
SMF 3B	Low - Moderate	Prehistoric Archaeological: no previously recorded sites within or adjacent; on uplands and well-drained soil from freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent

SMF/ FPC	ZAP*	Comments (i.e., soils, vegetation, drainage, previously recorded sites, etc.)
SMF 3C1	High	Prehistoric Archaeological: site HI00494 within
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent
SMF 3C2	High	Prehistoric Archaeological: site HI00494 within
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent
SMF 3C3	High	Prehistoric Archaeological: site HI00494 within
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent
SMF 4A	Low-Moderate	Prehistoric Archaeological: no previously recorded sites within or adjacent; on uplands and well-drained soil adjacent to freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent
SMF 4B	Low - Moderate	Prehistoric Archaeological: no previously recorded sites within or adjacent; on uplands and well-drained soil adjacent to freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent; one newly identified resource within
SMF 4C	Low - Moderate	Prehistoric Archaeological: site 8HI14621 partially within; East half moderate probability, west half low probability and disturbed by mining
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Moderate	Historical: Abandoned segment of the CSX Branch (8HI14624) is located within
SMF 5A	High	Prehistoric Archaeological: site 8HI00043 within
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within; Abandoned segment of the Tampa & Thonotosassa Railroad (8HI13600) is adjacent
SMF 5B	High	Prehistoric Archaeological: site 8HI00043 within
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within; Abandoned segment of the Tampa & Thonotosassa Railroad (8HI13600) is adjacent
SMF 5C	Moderate	Prehistoric Archaeological: no previously recorded sites within; 8HI00305 adjacent; on uplands from freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within; Abandoned segment of the Tampa & Thonotosassa Railroad (8HI13600) is adjacent
SMF 6A	Low	Prehistoric Archaeological: no previously recorded sites within or adjacent; all soils poorly drained and inundated
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within; Abandoned segment of the Tampa & Thonotosassa Railroad (8HI13600) is adjacent
SMF 6B	Low	Prehistoric Archaeological: no previously recorded sites within or adjacent; all soils poorly drained and inundated
	Low	Historic Archaeological: no previously recorded sites within or adjacent

SMF/ FPC	ZAP*	Comments (i.e., soils, vegetation, drainage, previously recorded sites, etc.)
	Low	Historical: no previously recorded resources within; Abandoned segment of the Tampa & Thonotosassa Railroad (8HI13600) is adjacent
SMF 6C	Moderate	Prehistoric Archaeological: no previously recorded sites within or adjacent; on well-drained soil upland from freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within; Abandoned segment of the Tampa & Thonotosassa Railroad (8HI13600) is adjacent
FPC 2	Low - Moderate	Prehistoric Archaeological: no previously recorded sites within; 8HI13597 adjacent; on well-drained soil upland from freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent; one newly identified resource on property but not within FPC site.
FPC 3	Low - Moderate	Prehistoric Archaeological: no previously recorded sites within or adjacent; on well-drained soil upland from freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent; one newly identified resource within
FPC 4	High	Prehistoric site 8HI13597 within
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent
SMF 7A	Low - Moderate	Prehistoric Archaeological: no previously recorded sites within; 8HI06307 adjacent; on elevated land upland from freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent; one newly identified resource on property but not within SMF site.
SMF 7B	Low - Moderate	Prehistoric Archaeological: no previously recorded sites within or adjacent to APE; on elevated land upland from freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent; one newly identified resource adjacent
SMF 7C	Low	Prehistoric Archaeological: no previously recorded sites within or adjacent; all soils poorly drained
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent; one newly identified resource within
FPC 5	Low - Moderate	Prehistoric Archaeological: no previously recorded sites within or adjacent to APE; on elevated land adjacent to freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent; one newly identified resource within & one newly identified resource adjacent
SMF 8A	Low - Moderate	Prehistoric Archaeological: no previously recorded sites within or adjacent; on a slope upland from freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent
SMF 8B	Low - Moderate	Prehistoric Archaeological: no previously recorded sites within; 8HI13601 adjacent; on a slope upland from freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent

SMF/ FPC	ZAP*	Comments (i.e., soils, vegetation, drainage, previously recorded sites, etc.)
SMF 8C	Low - Moderate	Prehistoric Archaeological: no previously recorded sites within or adjacent; on a slope upland from freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent
SMF 9A	Low	Prehistoric Archaeological: no previously recorded sites within or adjacent; most of site inundated
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent
SMF 9B	Low - Moderate	Prehistoric Archaeological: no previously recorded sites within or adjacent to APE; on a slope upland from freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent
SMF 9C	Low - Moderate	Prehistoric Archaeological: no previously recorded sites within or adjacent; on a slope upland from freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent
SMF 10A	Low	Prehistoric Archaeological: no previously recorded sites within or adjacent; inundated
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent
SMF 10B	Low	Prehistoric Archaeological: no previously recorded sites within or adjacent; poorly drained soils and partially wet
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent
SMF 12A	Low	Prehistoric Archaeological: no previously recorded sites within or adjacent; poorly drained soils and mostly wet
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent
SMF 12B	Low	Prehistoric Archaeological: no previously recorded sites within or adjacent; poorly drained soils
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent
SMF 12C	Low	Prehistoric Archaeological: no previously recorded sites within or adjacent; poorly drained soils
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent
FPC 6	Low	Prehistoric Archaeological: no previously recorded sites within or adjacent; poorly drained soils
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent
FPC 7	Low	Prehistoric Archaeological: no previously recorded sites within or adjacent; poorly drained soils
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent
SMF 13A	Low-Moderate	Prehistoric Archaeological: no previously recorded sites within or adjacent; limited well-drained soils upland from freshwater
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent
SMF 13B	Low	Prehistoric Archaeological: no previously recorded sites within or adjacent and area mostly wet

SMF/ FPC	ZAP*	Comments (i.e., soils, vegetation, drainage, previously recorded sites, etc.)
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within or adjacent
FPC 8	Low-Moderate	Prehistoric Archaeological: no previously recorded sites within or adjacent; adjacent to freshwater, on a slope
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within; A recorded segment of US 301 (8PA02675) in Pasco County is located adjacent
Atkins SMF 1A	Low-Moderate	Prehistoric Archaeological: no previously recorded sites within or adjacent; adjacent to freshwater, on a slope
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within; A recorded segment of US 301 (8PA02675) in Pasco County is located adjacent
Atkins FPC 1A	Low-Moderate	Prehistoric Archaeological: no previously recorded sites within or adjacent; adjacent to freshwater, on a slope
	Low	Historic Archaeological: no previously recorded sites within or adjacent
	Low	Historical: no previously recorded resources within; A recorded segment of US 301 (8PA02675) in Pasco County is located adjacent

* Zone of Archaeological Potential; green shading represents archaeological sites within APE; blue shading represents archaeological sites adjacent to the APE

4.0 CONCLUSIONS AND RECOMMENDATIONS

In conclusion, no proposed SMF/FPC site should be avoided due to cultural resource issues. Following the selection of preferred SMF/FPC sites, systematic archaeological field survey is recommended in accordance with the guidelines and standards as per the Florida Department of Transportation (FDOT) and Florida Division of Historical Resources (FDHR). The selected SMF/FPC sites considered to have a low potential also should be surveyed and judgmentally tested. In addition, based on this data, a historical/architectural field survey is also recommended.

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APPENDIX H

Natural Resources Evaluation Report

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Pond ID	Surface Water Impact (acres)	Wetland Impacts (acres)	Estimated Wetland Mitigation Cost	Threatened or Endangered Species Impacts	Environmental Impact Risk
Stormwater Management Facilities					
SMF 1A	0.00	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Burrowing Owl	Low
SMF 1B	0.00	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Burrowing Owl	Low
SMF 1C	0.00	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Burrowing Owl	Low
SMF 2A1	0.03	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Burrowing Owl, Florida Sandhill Crane, Wood Stork, Little Blue Heron, Tricolored Heron	Low
SMF 2A2	0.07	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Burrowing Owl, Florida Sandhill Crane, Wood Stork, Little Blue Heron, Tricolored Heron	Low
SMF 3A*	0.00	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Burrowing Owl	Low
SMF 3B	0.00	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Burrowing Owl	Low
SMF 3C1	0.00	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Burrowing Owl	Low
SMF 3C2	0.00	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Burrowing Owl	Low
SMF 3C3	0.00	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Burrowing Owl	Low
SMF 4A	0.00	0.00	\$0.00	Gopher Tortoise (Observed 2021) , Eastern Indigo Snake, Florida Burrowing Owl, Florida Pine Snake, Southern Fox Squirrel, Florida Black Bear	High
SMF 4B	0.00	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Burrowing Owl	Low
SMF 4C*	13.91	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Sandhill Crane, Wood Stork, Little Blue Heron, Tricolored Heron, Roseate Spoonbill, Florida Pine Snake, American Alligator, Bald Eagle, Southeastern American Kestrel	High
SMF 5A*	0.05	2.06	\$227,372.50	Gopher Tortoise, Eastern Indigo Snake, Florida Sandhill Crane, Wood Stork, Little Blue Heron, Tricolored Heron, Southeastern American Kestrel, Southern Fox Squirrel, Florida Black Bear	High
SMF 5B*	0.01	0.67	\$73,951.25	Gopher Tortoise, Eastern Indigo Snake, Florida Sandhill Crane, Wood Stork, Little Blue Heron, Tricolored Heron, Southeastern American Kestrel, Southern Fox Squirrel, Florida Black Bear	Medium
SMF 5C	0.59	0.99	\$109,271.25	Gopher Tortoise, Eastern Indigo Snake, Wood Stork, Little Blue Heron, Tricolored Heron, Florida Pine Snake, Florida Black Bear	Medium
SMF 6A	0.00	4.22	\$465,782.50	Wood Stork, Little Blue Heron, Tricolored Heron, American Alligator, Florida Black Bear	High
SMF 6B	0.04	4.19	\$462,471.25	Wood Stork, Little Blue Heron, Tricolored Heron, American Alligator, Florida Black Bear	High
SMF 6C*	0.01	2.20	\$242,825.00	Gopher Tortoise, Eastern Indigo Snake, Wood Stork, Little Blue Heron, Tricolored Heron, Florida Pine Snake, Southern Fox Squirrel, Florida Black Bear	High
SMF 7A	0.00	0.04	\$4,415.00	Gopher Tortoise, Eastern Indigo Snake, Florida Sandhill Crane, Southeastern American Kestrel	Low
SMF 7B	0.00	1.96	\$216,335.00	Gopher Tortoise, Eastern Indigo Snake, Florida Burrowing Owl, Wood Stork, Little Blue Heron, Tricolored Heron, Florida Black Bear	High
SMF 7C	0.00	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Burrowing Owl	Low
SMF 8A	0.00	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Burrowing Owl, Florida Pine Snake, Short-tailed Snake, Southern Fox Squirrel, Florida Black Bear	Medium
SMF 8B	0.01	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Burrowing Owl, Florida Pine Snake, Short-tailed Snake, Southern Fox Squirrel, Florida Black Bear	Medium
SMF 8C	0.00	0.14	\$15,452.50	Gopher Tortoise, Eastern Indigo Snake, Florida Burrowing Owl, Florida Pine Snake, Short-tailed Snake, Southern Fox Squirrel, Florida Black Bear	Medium
SMF 9A*	0.00	2.42	\$267,107.50	Gopher Tortoise, Eastern Indigo Snake, Wood Stork, Little Blue Heron, Tricolored Heron, Florida Pine Snake, Short-tailed Snake, Southern Fox Squirrel, Florida Black Bear	High
SMF 9B	0.00	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Burrowing Owl	Low
SMF 9C	0.00	0.18	\$19,867.50	Gopher Tortoise, Eastern Indigo Snake, Florida Sandhill Crane, Wood Stork, Little Blue Heron, Tricolored Heron, Southeastern American Kestrel, Southern Fox Squirrel, Florida Black Bear	Medium
SMF 10A	0.00	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Burrowing Owl	Low
SMF 10B	0.06	0.57	\$62,913.75	Gopher Tortoise, Eastern Indigo Snake, Florida Sandhill Crane, Wood Stork, Little Blue Heron, Tricolored Heron, Southeastern American Kestrel, Southern Fox Squirrel	Medium
SMF 12A	0.00	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Sandhill Crane, Florida Pine Snake, Southeastern American Kestrel, Southern Fox Squirrel	Medium

low density residential

low density residential

low density residential, commercial

roadway with ditches

roadway with ditches

residential, open lands, roads

low density residential

med density residential

med density residential

med density residential

hardwood conifer mixed

med density residential, commercial

open land, pastures, reservoirs

forest wetland, open land

forest wetland, open land

forest wetland and upland, ditches

forest wetland

forest wetland

forest wetland and upland

open land

forest wetland, residential

residential

pine plantations

forest upland

pine plantations, forest wet

forest upland and wetland

residential

forest wetland, open land

residential

open land, forest and herb wetland

shrubland, open land

SMF 12B	0.23	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Sandhill Crane, Wood Stork, Little Blue Heron, Tricolored Heron, Florida Pine Snake, Southeastern American Kestrel, Southern Fox Squirrel	Medium	open land, small forest upland
SMF 12C	0.00	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Sandhill Crane, Florida Pine Snake, Southeastern American Kestrel, Southern Fox Squirrel (Observed 2016), Florida Black Bear	High	forest upland, open land
SMF 13A	0.00	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Sandhill Crane, Southeastern American Kestrel, Southern Fox Squirrel	Medium	open land
SMF 13B	0.00	0.48	\$52,980.00	Gopher Tortoise, Eastern Indigo Snake, Florida Sandhill Crane, Florida Pine Snake, Southeastern American Kestrel, Southern Fox Squirrel, Florida Black Bear	Medium	open land, forest up and wet
Total	15.01	20.12	\$2,220,745.00		N/A	
Floodplain Compensation Sites						
FPC 1*	0.00	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Burrowing Owl, Southern Fox Squirrel, Florida Black Bear	Low	low density residential, adjacent to upland and wetland forest
FPC 2*	0.00	2.00	\$220,750.00	Gopher Tortoise, Eastern Indigo Snake, Florida Burrowing Owl, Florida Sandhill Crane, Wood Stork, Little Blue Heron, Tricolored Heron, Florida Pine Snake, American Alligator, Southeastern American Kestrel, Florida Black Bear	High	forest upland and wetland, open land
FPC 3	0.00	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Pine Snake, Short-tailed Snake, Florida Black Bear	Medium	forest upland
FPC 4	0.00	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Pine Snake, Short-tailed Snake, Florida Black Bear	Low	forest upland, residential
FPC 5	0.67	0.95	\$104,856.25	Gopher Tortoise, Eastern Indigo Snake, Florida Burrowing Owl, Florida Sandhill Crane, Wood Stork, Little Blue Heron, Tricolored Heron, Roseate Spoonbill, Florida Pine Snake, Short-tailed Snake, American Alligator, Florida Black Bear	High	forest upland, herb wetland, reservoir, residential
FPC 6	0.00	0.04	\$4,415.00	Gopher Tortoise, Eastern Indigo Snake, Florida Sandhill Crane, Wood Stork, Little Blue Heron, Tricolored Heron, Roseate Spoonbill, Florida Pine Snake, Southeastern American Kestrel, Southern Fox Squirrel	Medium	open/rangeland, herb wetland
FPC 7	0.00	0.00	\$0.00	Gopher Tortoise, Eastern Indigo Snake, Florida Sandhill Crane, Florida Pine Snake, Southeastern American Kestrel, Southern Fox Squirrel	Medium	open land
FPC 8*	0.00	0.49	\$54,083.75	Gopher Tortoise, Eastern Indigo Snake, Florida Sandhill Crane, Wood Stork, Little Blue Heron, Tricolored Heron, Roseate Spoonbill, Southeastern American Kestrel, Southern Fox Squirrel	Medium	open land, forest and herb wetland
Total	0.67	3.48	\$384,105.00		N/A	N/A

*Includes easement footprint

**Note: \$110,375 per acre of wetland impact was used to calculate estimated wetland mitigation cost for each pond site alternative

none = no wetland involvement and/or no habitat for potentially occurring protected species

low = minimal wetland involvement (<0.5 ac) and/or minimal suboptimal habitat for potentially occurring protected species

medium = some wetland involvement (0.5 - 1.0 ac) and/or conditions favorable for protected species

high = substantial wetland involvement (>1.0 ac) and/or protected species confirmed or highly likely

APPENDIX I

Contamination Screening Evaluation Report

DRAFT

Pond ID	Hazardous Materials & Contamination Potential	Site	Direction & Site Distance	Name	Facility ID	Regulatory Database	Risk Rating
SMF 1A	MEDIUM	21	NE 304 feet	NOAHS ARK DAY CARE AND KINDERGARTEN	110025652470	FRS	NO
		26	E 1,513 feet	ARKLA TERRA PROPERTY	FLSFN0406909/ 123938/	NPL/ VOLCLNUP	MEDIUM
SMF 1B	MEDIUM	26	NE 1,395 feet	ARKLA TERRA PROPERTY	FLSFN0406909/ 123938/	NPL/ VOLCLNUP	MEDIUM
SMF 1C	MEDIUM	21	N 132 feet	NOAHS ARK DAY CARE AND KINDERGARTEN	110025652470	FRS	NO
		22	E 393 feet	DOLLAR GENERAL MARKET #13990	110055041556	FRS, NPDES	LOW
		26	NE 1,395 feet	ARKLA TERRA PROPERTY	FLSFN0406909/ 123938/	NPL/ VOLCLNUP	MEDIUM
SMF 2A1	MEDIUM	26	NW 1,312 feet	ARKLA TERRA PROPERTY	FLSFN0406909/ 123938/	NPL/ VOLCLNUP	MEDIUM
		31	NW 373 feet	TAMPA MACHINERY AUCTION INC	8626313	TANKS	LOW
		33	N 220 feet	TEN TEN INC/ TRUCKLINE EQUIPMENT CO INC	FLD981860737	STRCRA	LOW
		34	S 380 feet	MILLER & SONS TRUCKING	FLD984187716/ 9102916	STRCRA/ TANKS	LOW
SMF 2A2	MEDIUM	26	NW 2,088 feet	ARKLA TERRA PROPERTY	FLSFN0406909/ 123938/	NPL/ VOLCLNUP	MEDIUM
		33	W 265 feet	TEN TEN INC/ TRUCKLINE EQUIPMENT CO INC	FLD981860737	STRCRA	LOW
SMF 3A*	MEDIUM	26	SW 1,996 feet	ARKLA TERRA PROPERTY	FLSFN0406909/ 123938/	NPL/ VOLCLNUP	MEDIUM
		36	NE 154 feet	INCIDENT ID NUMBER 1172331	1172331	ERNS	LOW
SMF 3B	MEDIUM	26	SW 2,606 feet	ARKLA TERRA PROPERTY	FLSFN0406909/ 123938/	NPL/ VOLCLNUP	MEDIUM
		36	0 feet	INCIDENT ID NUMBER 1172331	1172331	ERNS	LOW
SMF 3C1	NO	42	SE 443 feet	SPANISH MAIN TRAVEL RESORT	110035450614	FRS	NO
SMF 3C2	NO						
SMF 3C3	NO						
SMF 4A	NO						
SMF 4B	LOW	49	E 111 feet	COIN CURRENCY DOCUMENT SYSTEMS	110043172278	FRS, NPDES	NO
		51	E 486 feet	EARTHSCAPES COMPLETE LANDSCAPE	9813586	TANKS	LOW
SMF 4C*	LOW	49	W 468 feet	COIN CURRENCY DOCUMENT SYSTEMS	110043172278	FRS, NPDES	NO
		51	NW 241 feet	EARTHSCAPES COMPLETE LANDSCAPE	9813586	TANKS	LOW
		53	S 311 feet	NEON SHOP/ West Central Granite and Marble Works Inc	FLD984168658/ FLA764264	STRCRA/ INDWST	NO
		54	N 186 feet	BMR SUSPENSION	110070275013	FRS	NO
SMF 5A*	MEDIUM	RR	0 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
SMF 5B*	MEDIUM	RR	0 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
SMF 5C	MEDIUM	60	S 382 feet	HILLSBOROUGH COUNTY PUBLIC WORKS	9400620/ 41195/ FLT040074775	LUST/ SLDWST/ STRCRA	LOW
		RR	0 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
SMF 6A	MEDIUM	RR	S 45 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
SMF 6B	MEDIUM	RR	0 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
SMF 6C*	MEDIUM	RR	0 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
SMF 7A	MEDIUM	RR	0 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
SMF 7B	MEDIUM	63	W 198 feet	SR-41 - US-30 [FDOT 1403760]	110035639654	FRS	NO
		RR	W 25 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
SMF 7C	MEDIUM	64	0 feet	UNKNOWN	19534/ 88-536	ERNS	LOW
		RR	E 177 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
SMF 8A	MEDIUM	RR	W 66 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
SMF 8B	MEDIUM	RR	E 170 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
SMF 8C	MEDIUM	RR	W 69 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
SMF 9A*	MEDIUM	RR	E 378 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
SMF 9B	MEDIUM	RR	E 229 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
SMF 9C	MEDIUM	RR	0 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
SMF 10A	MEDIUM	RR	E 227 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM

SMF 10B	MEDIUM	RR	0 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
SMF 12A	MEDIUM	RR	E 303 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
SMF 12B	MEDIUM	RR	0 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
SMF 12C	MEDIUM	RR	E 245 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
SMF 13A	NO						
SMF 13B	NO						
Total							
Floodplain Compensation Sites							
FPC 1*	MEDIUM	22	W 150 feet	DOLLAR GENERAL MARKET #13990	110055041556	FRS, NPDES	LOW
		23	E 76 feet	FLORIDA SAFETY CONTRACTORS, INC.	110035594149/ 110069335473	FRS, NPDES	NO
		24	E 317 feet	SOUTHEAST OIL & DEVELOPMENT	110031128330/ 110035866140/ 110038641048	FRS	LOW
		25	E 294 feet	JAMSON ENVIRONMENTAL INC	110005661088/ FLR000064303	FRS/ STRCRA	LOW
		26	E 478 feet	ARKLA TERRA PROPERTY	FLSFN0406909/ 123938/	NPL/ VOLCLNUP	MEDIUM
		30	SE 417 feet	O'NEIL'S USED CARS, INC.	97485	SLDWST	LOW
FPC 2*	MEDIUM	RR	0 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
FPC 3	MEDIUM	RR	S 330 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
FPC 4	MEDIUM	RR	S 306 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
FPC 5	MEDIUM	RR	E 170 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
FPC 6	MEDIUM	RR	E 288 feet	Former Atlantic Coast Railroad	N/A	N/A	MEDIUM
FPC 7	NO						
FPC 8*	NO						
Total							

*Includes easement footprint

The following buffer distances are recommended on FDOT projects:

500 feet from the ROW line for petroleum, drycleaners, and non-petroleum sites.

1,000 feet from the ROW line for non-landfill solid waste sites.

½ mile (2640 feet) from the ROW line for CERCLA, known also as Superfund, NPL, or landfill sites.

DRAFT

APPENDIX J

Correspondence

DRAFT

Zach Evans

From: Keller, Paul <Paul.Keller@dot.state.fl.us>
Sent: Thursday, January 06, 2022 2:58 PM
To: Zach Evans
Cc: Renato Chuw
Subject: RE: FPID 255796-1-22-01 US 301 PD&E Maintenance/Drainage Concerns

Zach,

The team has reported that there are no specific concerns for maintenance or drainage within the project limits. Our records from the past 6 months include only 7 work needs in the area, and they were routine sign maintenance, tree trimming, litter pick-up, and one ditch cleaning. A long-time Supervisor recalls a pipe replacement a while back, but no issues since. Seems we really have nothing to add to your priority list beyond what's already implied in the scope. Thanks for the opportunity to provide our input.

Sincerely,

Paul Keller
Maintenance Manager/Field Operations – Tampa Opns
(o) 813-612-3255
(c) 813-323-1161
paul.keller@dot.state.fl.us

"Train hard. Work safe. Retire healthy."

From: Zach Evans <zevans@inwoodinc.com>
Sent: Wednesday, January 5, 2022 3:06 PM
To: Keller, Paul <Paul.Keller@dot.state.fl.us>
Cc: Renato Chuw <rchuw@inwoodinc.com>
Subject: FPID 255796-1-22-01 US 301 PD&E Maintenance/Drainage Concerns

EXTERNAL SENDER: Use caution with links and attachments.

Good afternoon, Paul,

We spoke earlier today regarding existing maintenance and drainage concerns along the US 301 corridor from E Fowler Avenue to the Pasco County line. You mentioned you would discuss the area with some of your experts and get back to us. I have attached a project location map to assist in clarifying the limits of the study.

Thanks again and Happy New Year,
Zach

Zach Evans, PE
PROJECT ENGINEER

INWOOD CONSULTING ENGINEERS

Sean Carrigan

From: Guthrie, JoEllyn <JoEllyn.Guthrie@dot.state.fl.us>
Sent: Monday, October 12, 2015 9:22 PM
To: Sean Carrigan
Cc: Renato Chuw; Zach Evans; Hunt, Harvey; Leipski, Andrew J; Montjoy, Anita W; Greif, Charles
Subject: RE: US 301 PD&E Study | WPI Segment No. 255796-1 | From Fowler Avenue to Proposed SR 56

Sean:

As this area in Pasco County is at the headwater of Hillsborough River Watershed, the area is predominantly wet and can remain that way for extended periods of time. The pavement design should take this into consideration and be built accordingly. US 301 is the only state roadway in this area of Pasco County and our maintenance office has not had a significant number of complaints, drainage concerns or pavement issues in this area. If you have specific questions, please do not hesitate to contact me.

Jo Ellyn M. Guthrie, P.E.
Operations Engineer



FDOT - Brooksville Operations
16411 Spring Hill Drive
Brooksville, FL 34604
JoEllyn.Guthrie@dot.state.fl.us

NOTE NEW TELEPHONE/FAX NUMBERS

voice: 352 848-2600
fax: 352 544-5400

From: Sean Carrigan [mailto:scarrigan@inwoodinc.com]
Sent: Monday, October 12, 2015 11:00 AM
To: Guthrie, JoEllyn
Cc: Renato Chuw; Zach Evans; Hunt, Harvey; Leipski, Andrew J; Montjoy, Anita W; Greif, Charles
Subject: RE: US 301 PD&E Study | WPI Segment No. 255796-1 | From Fowler Avenue to Proposed SR 56

Please find attached the project location map.

Thank you,

Sean Carrigan, P.E.

INWOOD CONSULTING ENGINEERS

P: 407-971-8850 ext. 6584

From: Guthrie, JoEllyn [<mailto:JoEllyn.Guthrie@dot.state.fl.us>]
Sent: Monday, October 12, 2015 10:57 AM
To: Sean Carrigan
Cc: Renato Chuw; Zach Evans; Hunt, Harvey; Leipski, Andrew J; Montjoy, Anita W; Greif, Charles
Subject: RE: US 301 PD&E Study | WPI Segment No. 255796-1 | From Fowler Avenue to Proposed SR 56

Please provide a map to review. Without additional information, it will be difficult to tell you our maintenance concerns.

Jo Ellyn M. Guthrie, P.E.
Operations Engineer



FDOT - Brooksville Operations
16411 Spring Hill Drive
Brooksville, FL 34604

JoEllyn.Guthrie@dot.state.fl.us

NOTE NEW TELEPHONE/FAX NUMBERS

voice: 352 848-2600

fax: 352 544-5400

From: Sean Carrigan [<mailto:scarrigan@inwoodinc.com>]
Sent: Monday, October 12, 2015 10:23 AM
To: Hunt, Harvey; Leipski, Andrew J; Montjoy, Anita W; Guthrie, JoEllyn; Greif, Charles
Cc: Renato Chuw; Zach Evans
Subject: US 301 PD&E Study | WPI Segment No. 255796-1 | From Fowler Avenue to Proposed SR 56

Good Morning,

I am working on the US 301 PD&E Study from Fowler Avenue in Hillsborough County to the proposed SR 56 in Pasco County, and wanted to discuss any history of flooding or any other available information regarding maintenance concerns in these areas.

Please let me know when it would be a good time to contact you to discuss. I appreciate your help with this matter.

Thank you,

Sean Carrigan, P.E.

Project Engineer

INWOOD CONSULTING ENGINEERS

3000 Dovera Dr., Suite 200, Oviedo, FL 32765

P: 407-971-8850 ext. 6584

F: 407-971-8955

inwoodinc.com

From: Su, Junshan [mailto:Suj@HillsboroughCounty.ORG]
Sent: Tuesday, January 27, 2015 1:24 PM
To: Renato Chuw
Subject: RE: Hillsborough River watershed model/GIS/Report

Renato,

Attached please find a map showing the proposed stormwater projects in this area.

Please let me know if you have any questions.

Thanks

Junshan Su

Ph.D., PE.

Engineering and Construction Service Section

Public Works Department

Hillsborough County BOCC

p: 813.307.1776 | f: 813.272.5320

e: suj@hillsboroughcounty.org

w: <http://www.hillsboroughcounty.org>

Please note: all correspondence to or from this office is subject to Florida's Public Records laws.



From: Renato Chuw [<mailto:rchuw@inwoodinc.com>]
Sent: Monday, January 26, 2015 1:07 PM
To: Su, Junshan
Subject: Re: Hillsborough River watershed model/GIS/Report

Thanks,

Renato

Sent from my iPhone

On Jan 26, 2015, at 1:01 PM, Su, Junshan <Suj@HillsboroughCounty.ORG> wrote:

We are working on this map. Please wait. Thanks. Junshan

From: Renato Chuw [<mailto:rchuw@inwoodinc.com>]
Sent: Monday, January 26, 2015 12:56 PM
To: Su, Junshan
Subject: Re: Hillsborough River watershed model/GIS/Report

Dr. Su,

Thank you for meeting with me this morning about the US 301 study and the ftp link.

As discussed this morning, you had mentioned that the county had identified future stormwater projects. I was interested in a map/list of projects near the U.S. 301 corridor that I can identify as potential regional stormwater use/joint use with FDOT for my presentation.

Thanks,

Renato

Sent from my iPhone

On Jan 26, 2015, at 10:32 AM, Su, Junshan <Suj@HillsboroughCounty.ORG> wrote:

Renato,

Hillsborough River watershed model/GIS/Report are available at

<ftp://ftp.hillsboroughcounty.org/pwe/pub/masterplan%20update/Hillsborough/>

Please let me know if you have any questions.

Thanks.

Junshan Su

Ph.D., PE.

Engineering and Construction Service Section

Public Works Department

Hillsborough County BOCC

p: 813.307.1776 | f: 813.272.5320

e: suj@hillsboroughcounty.org

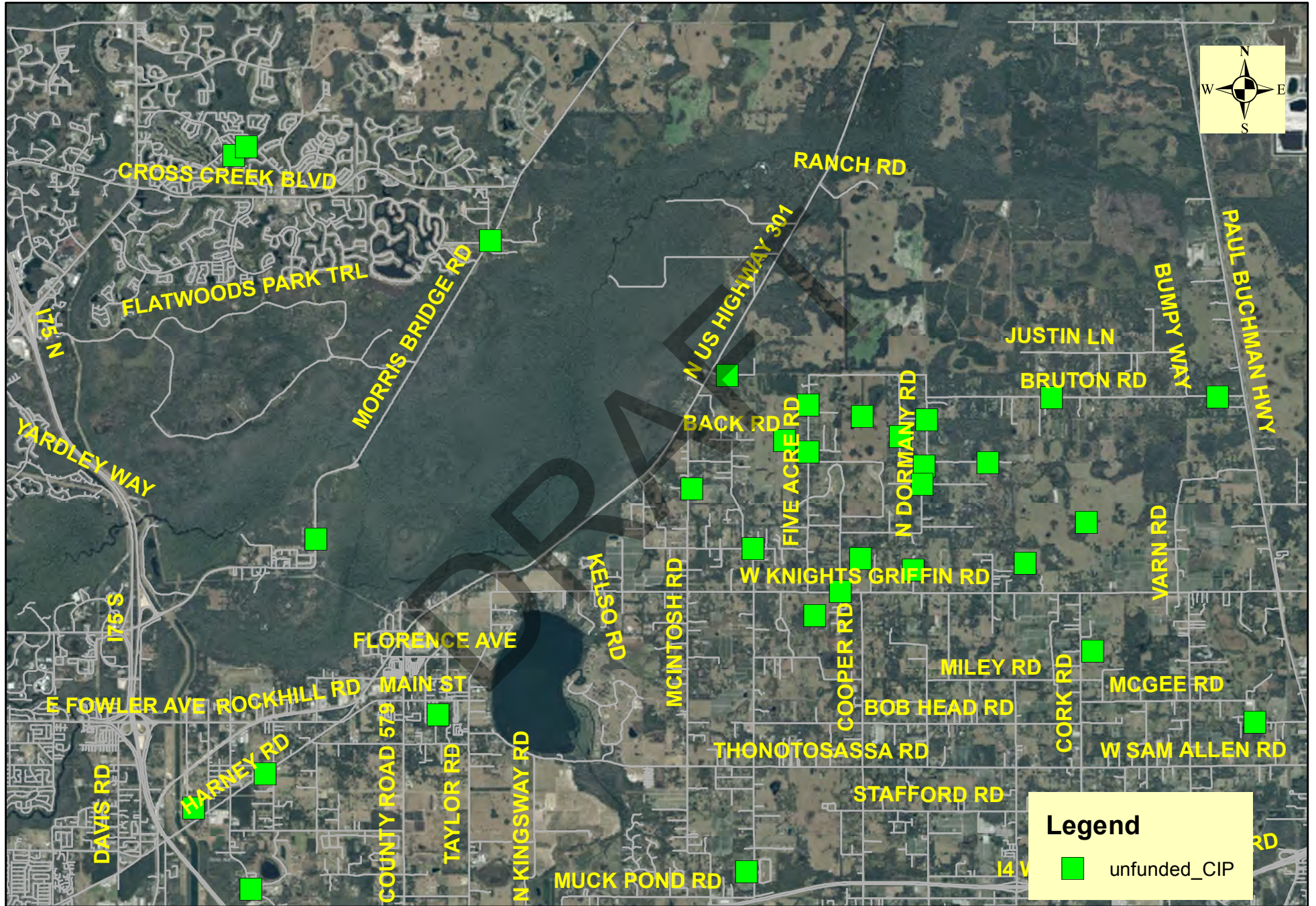
w: <http://www.hillsboroughcounty.org>

Please note: all correspondence to or from this office is subject to Florida's Public Records laws.

<image001.gif>

DRAFT

US 301 from Fowler to County Line Area Proposed Stormwater Projects



12,000 6,000 0 12,000 Feet





Memorandum

3000 Dovera Drive, Suite 200, Oviedo, FL 32765 | P: 407-971-8850 | F: 407-971-8955 | www.inwoodinc.com

DATE: 3/26/2021; updated 4/1/2021

TO: Ashley Henzel, PE

FROM: Renato Chuw, PE

RE: US 301 PD&E from Fowler Avenue to SR 56; FPID 255796-1-22-01; Revised SMF and FPC sites per Longlist meeting comments

CC: Bob Finck

The following updates to the SMF and FPC sites for the US 301 PD&E Study in Hillsborough/Pasco Counties were done in response to the comments from the Longlist Pond Site Meeting with FDOT, discussion with the FDOT Project Manager and subsequent refinements to the sizes of the ponds. Below is a list of these updates:

- Easement for FPC 1 changed to be within Jackson Road and Ohio Avenue
- SMF 1A site relocated to the west side of US 301
- SMF 1B site reshaped to impact fewer parcels and have total takes of these parcels
- SMF 3B relocated to the west side of US 301 to avoid previous mobile home park to the east
- SMF 3C1 reshaped to avoid the FGT easement
- SMF 3C2 size was reduced, thus impacting one less parcel
- SMF 4B relocated to the west side of US 301
- SMF 4C was eliminated and instead, the 3rd alternative will be to use the permitted expansion of the existing borrow pit for Copart of Connecticut. The permitted information indicates runoff from portions of US 301 is already accounted in the expansion of the borrow pit
- FPC 2 site relocated to the other side of the floodplain (north side) and in the same parcel as SMF 7A
- SMF 7A slightly reshaped but same site and parcel
- SMF 7B reshaped to impact fewer parcels and have total takes on these parcels
- SMF 7C relocated to the west side of US 301. Previous site to the east was not feasible due to topography and hydraulic considerations
- SMF 9A easement relocated to the north side of the parcel
- SMF 10A reduced in size and is only on one parcel
- SMFs 11A and 11B eliminated. Compensating treatment will be provided in adjacent Basins 10 and 12
- SMF 12C increased in size due to refinement of analysis and topography
- Preferred SMF and FPC by adjacent design segment shown for Basin 14
- FPC 9 was eliminated. With coordination with adjacent design segment, their preferred FPC 1A will be included for evaluation for our study

DATE: 3/12/2021, revised 3/25/21

TO: Ashley Henzel, PE

FROM: Renato Chuw, PE

RE: US 301 PD&E from Fowler Avenue to SR 56; FPID 255796-1-22-01; Longlist Pond Siting Meeting

CC: IN ATTENDANCE: Kirk Bogen, Anthony Celani, Allison Conner, Timothy Drawhorn, Ashley Henzel, Art Mariano, Bill McTeer, Melissa Mulvaney, Zabrina Penton, Abdul Waris, Ana Zea, Bob Finck (AIM), Jeffrey Jacquin (AIM), Renato Chuw (Inwood), Zach Evans (Inwood), Forrest McClellan (Inwood)

The longlist pond siting meeting was held via a Teams meeting on Wednesday, March 10th, 2021 at 1:30 pm with FDOT, AIM Engineering and Inwood Consulting Engineers' staff for the US 301 PD&E Study in Hillsborough County from Fowler Avenue to SR 56 in Pasco County. The purpose of the meeting was to present to FDOT staff, the initial SMF (Stormwater Management Facilities) alternative sites for the study and obtain input. A brief introduction of the study was provided by Bob Finck (AIM Engineering) as the prime consultant for this study. Inwood Consulting Engineers are the sub-consultant to AIM for the drainage evaluation of the study and followed with the description of each SMF site per basin. Exhibits were displayed on the monitor and provided to all attendees to follow the discussions.

Basin 1 SMF alternatives

- FDOT asked if the FGT gas line was within the R/W and wanted to confirm if any of the SMF alternatives would impact the gas line. The gas line was confirmed to run along the east side of US 301 and just inside the existing R/W.
- Two SMF alternatives (1A and 1B) are located on the east side of US 301. FDOT indicated that on another project, FGT did not want FDOT to cross their gas line with a drainage pipe. However, after verifying with Dan Hunter (FDOT Utilities), it was indicated that for the US 301 PD&E Study, it would be possible to cross the FGT line and the gas line is about 4 to 6 ft in depth. Crossing the FGT gas line was mentioned to be avoided if possible.
- The easement to FPC 1 was discussed. The easement is necessary to allow FDOT to access the FPC in case of emergency or maintenance. Alternative routes for the easement to the FPC were discussed. FDOT mentioned that if the easement is on a private road, all residents on the private road would have to be notified and agreed on the FDOT access. Options to relocate the easement on public roads were explored. An easement from Jackson Rd and Ohio Avenue was discussed (both are public roads) and will be investigated.

Follow up telephone call with Ashley Henzel (3/12/21):

- Inwood will look at moving one of the SMF alternatives on the east (either SMF 1A or 1B) to the west side, to limit only one SMF option on the east for crossing the FGT line.

Basin 2 SMF alternatives

- FDOT asked if an ICE (Intersection Control Evaluation) study was performed at the intersection with Harney Rd. If a roundabout is implemented, it will impact the proposed SMF within the R/W. Only one SMF alternative was presented since it is within the FDOT R/W.
- Inwood stated that there is room to expand the SMF and it will be revised to allow for the potential of a roundabout at this intersection.

Basin 3 SMF alternatives

- The shape of SMF 3C will be revised to avoid impacting the FGT easement on the west side of US 301 where it makes a 90 degree turn to the east and crosses the road.
- FDOT may request moving the FGT easement south of Langshaw Dr., although it could be very expensive.
- The location of SMF 3B currently impacts a trailer park. This SMF will be moved to the west to impact 5 or 6 private residential parcels rather than the trailer park.

Basin 4 SMF alternatives

- FDOT asked if there was a possibility to expand the existing pond/lake south of SMF 4C. Inwood indicated that existing permits were researched but not permit was found for this pond.
- Inwood mentioned that further investigation will be made as to the nature of this existing pond and look for an opportunity to expand for joint-use/expand the pond.

Follow up telephone call with Ashley Henzel (3/12/21):

- Inwood indicated that SMF 4B and 4C are on the east side and the FGT line runs along the inside of the existing R/W. Similar to the SMFs in Basin 1, Inwood will investigate moving one of the SMFs options on the east side to the west, to limit only one SMF alternative that requires crossing of the FGT line.

Basin 5 SMF alternatives

- Inwood indicated that one SMF alternative was located within the R/W, however, because of the length of the basin, it was doubtful this alternative would be able to serve the requirements for the whole basin. Therefore, three offsite SMFs were located.
- SMF 5C and 5D are located within county parcels. FDOT asked if there was a possibility to combine Basins 5 and 6 and expand one of the sites within the county parcel. Inwood mentioned that combining basins was difficult for 5 and 6 due to hydraulics and crossing the bridge culvert at Flint Creek.
- Parcels to the west of US 301 are public owned lands. FDOT mentioned that for state funded projects, ponds can be placed in state owned lands that are not 4(f) resources.
- Coordination with the State Park occurred in 2017 and traditional stormwater ponds were not preferred by the park. The park would prefer using low lying areas or natural areas. The park was open to innovative ideas.
- Inwood will investigate if SMF 5D would block offsite flow to Flint Creek.
- Coordination with the county will occur regarding sites SMF 5C and 5D in their property.

Basin 6 SMF alternatives

- All three SMF alternatives are located on the east side of US 301 to avoid public lands and state park on the west side. All three SMFs are in county parcels.
- Coordination with the county will occur regarding the nature of these parcels (i.e., conservation lands or other).
- It was asked if SMF 6A would be within the floodway boundaries of Flint Creek. Inwood stated that the SMF is outside of the floodway limits.
- FDOT indicated that it would be more advantageous for FPC 2 to be located adjacent to the R/W and show cup for cup compensation rather than its current location which may require a floodplain model. Inwood will relocate FPC 2.

Basin 7 SMF alternatives

- FDOT mentioned that SMFs near ponds may cause seepage issues. Considerations for a barrier between the SMF and the home or full parcel takes should be consider.
- SMF 7B will be reshaped to impact fewer parcels (full takes rather than partial takes).

Basin 8 SMF alternatives

- No comments from the Department regarding the SMFs or the FPC

Basin 9 SMF alternatives

- The easement for SMF 9A will be relocated to the north side of the parcel and avoid potential conflicts with utilities.
- FDOT commented that SMF 9A would require a long conveyance pipe to the pond. Inwood stated that the pond was situated on the back of the parcel for best use of the remaining parcel for the property owner. The outfall for this SMF could be a spreader swale to the adjacent wetlands to Two Hole Branch rather than to run another separate outfall back to the US 301 R/W.

Basin 10 SMF alternatives

- Only two SMF alternatives were presented for this basin. SMF 10B would have slight impacts to the floodplain but these will be compensated for.

Basin 11 SMF alternatives

- FDOT indicated that a long conveyance pipe would be require for SMF 11B.
- FDOT asked if there was a possibility to eliminate Basin 11 and combine into Basins 10 and 12. Inwood will investigate but indicated that it could be feasible.

Basin 12 SMF alternative

- The FPC sites (6 and 7) were shaped to avoid floodplain boundaries, however, the exhibit provided did not show the remaining floodplain areas at this location. These will be shown in the updated exhibit.

Basin 13 SMF alternative

- No comments from the Department regarding the SMFs or the FPC

Basin 14

- Basin 14 is currently included in the design phase of the adjacent segment by Atkins. Their designation is Basin 1 and the preferred site they are moving forward with is SMF 1A.
- The exhibit will be updated to show the adjacent design segment's preferred SMF and FPC.
- Coordination occurred after the longlist pond meeting for CADD files and calculations from the adjacent design segment.
- Further coordination will continue as the SMF and FPC are being refined at the time of the meeting.

Revisions to the pond sites based on the longlist pond siting meeting will occur. A revised pond exhibit will be provided to FDOT staff. FDOT agreed that a 2nd meeting is not necessary and the coordination for updated pond sites can be done via email, meeting minutes and revised exhibit attachments.

After the updated pond sites are approved by FDOT, desktop analysis and screening can begin. R/W cost estimate request will be submitted to Bill McTeer.

Impacts to State or Conservation Lands will be identified (if applicable) for the SMF / FPC sites. The SMF evaluation matrix in the PSR will include a column to identify this in lieu of 4(f).

After preferred SMFs are identified (once desktop screening and R/W costs are provided), a meeting with FDOT staff will occur to review the final preferred pond sites.

These are the author's understanding of the discussions and decisions reached at this meeting. If there are comments or questions, please contact Renato Chuw at rchuw@inwoodinc.com or 407-971-8850.

DRAFT

Zach Evans

From: Henzel, Ashley <Ashley.Henzel@dot.state.fl.us>
Sent: Wednesday, July 21, 2021 3:02 PM
To: Renato Chuw; Bob Finck
Cc: Zach Evans; Conner, Allison; Geiger, Crystal; Bogen, Kirk
Subject: RE: 255796-1/US 301 from Fowler Ave to SR 56 - Preferred Pond Site Selection - desktop screening evaluations

I forgot to mention that for the preferred site Basin 6 (SMF 6C), you'll need to confirm if this is in the State Park or if this is Hillsborough County ELAPP property.

Thanks,

Ashley Henzel, PE
FDOT District 7, GEC
Office: 813-975-6433

From: Henzel, Ashley
Sent: Wednesday, July 21, 2021 2:59 PM
To: Renato Chuw <rchuw@inwoodinc.com>; Bob Finck <bfinck@aimengr.com>
Cc: Zach Evans <zevans@inwoodinc.com>; Conner, Allison <Allison.Conner@dot.state.fl.us>; Geiger, Crystal <Crystal.Geiger@dot.state.fl.us>; Bogen, Kirk <Kirk.Bogen@dot.state.fl.us>
Subject: RE: 255796-1/US 301 from Fowler Ave to SR 56 - Preferred Pond Site Selection - desktop screening evaluations

Hi Renato,

Per our pond siting meeting last week the Department was going to review the desktop analysis double check the preferred pond site in Basin 5.

After reviewing the materials and in coordination with Crystal and Allison, we suggest revising the preferred site in Basin 5 from SMF 5C to SMF 5B.

Please let me know if you have any questions or concerns regarding this change.

Thanks,

Ashley Henzel, PE
FDOT District 7, GEC
Office: 813-975-6433

From: Renato Chuw <rchuw@inwoodinc.com>
Sent: Wednesday, July 14, 2021 12:01 PM
To: Henzel, Ashley <Ashley.Henzel@dot.state.fl.us>; Bob Finck <bfinck@aimengr.com>
Cc: Zach Evans <zevans@inwoodinc.com>
Subject: 255796-1/US 301 from Fowler Ave to SR 56 - Preferred Pond Site Selection - desktop screening evaluations

EXTERNAL SENDER: Use caution with links and attachments.

Ashley,

Please find attached the desktop screening evaluation for contamination, CRAS and environmental provided to us and used for the preliminary rankings of the pond sites

Regards,

Renato

Renato E. Chuw

Associate Principal – Senior Drainage Engineer

INWOOD CONSULTING ENGINEERS

3000 Dovera Dr., Suite 200, Oviedo, FL 32765

P: 407-971-8850

inwoodinc.com

DRAFT

THIS FORM IS INTENDED TO FACILITATE AND GUIDE THE DIALOGUE DURING A PRE-APPLICATION MEETING BY PROVIDING A PARTIAL "PROMPT LIST" OF DISCUSSION SUBJECTS. IT IS NOT A LIST OF REQUIREMENTS FOR SUBMITTAL BY THE APPLICANT.



**SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
RESOURCE REGULATION DIVISION
PRE-APPLICATION MEETING NOTES**

FILE NUMBER:

PA 401835

Date:	1/14/2015
Time:	9:00
Project Name:	FDOT US301 PD&E Study (Hillsborough & Pasco)
Attendees:	Richard Alt, Lee Hughes; Renato Chuw - Inwood Consulting Engineers, rchuw@inwoodinc.com , Mark Easley - KCA

County:	Hillsborough	Sec/Twp/Rge:	various
Total Land Acreage:	400	Project Acreage:	100 acres

Prior On-Site/Off-Site Permit Activity:

- Existing 2 lane road
- ETDM under review - 14194

Project Overview:

- Design divided 4 lane

Environmental Discussion: (Wetlands On-Site, Wetlands on Adjacent Properties, Delineation, T&E species, Easements, Drawdown Issues, Setbacks, Justification, Elimination/Reduction, Permanent/Temporary Impacts, Secondary and Cumulative Impacts, Mitigation Options, SHWL, Upland Habitats, Site Visit, etc.)

- Provide the limits of jurisdictional wetlands.
- Provide appropriate mitigation using UMAM for impacts, if applicable.
- Demonstrate elimination and reduction of wetland impacts.
- Maintain minimum 15 foot, average 25 foot wetland conservation area setback or address secondary impacts.
- Mitigation Banks (North Tampa, Boarshead, Hillsborough River) with future forested and herbaceous mitigation credits proposed for release. Will need to have them officially released before they can be utilized for mitigation.
- If the project is located in a county which is listed as a coastal county under the Coastal Zone Management Act (CZM) and the project has wetland impacts, it will require a noticing period once the permit application is deemed complete. Wetland and/or surface waters impacts less than 1 acre in size will require a 10 day noticing period, prior to the issuance of the permit. Wetland and/or surface water impacts greater than 1 acre in size will require a 30 day noticing period, prior to the issuance of the permit. Permits could be issued as early as the 11th or 31st day, but staffs' schedule and workload will determine the actual issuance date.

Site Information Discussion: (SHW Levels, Floodplain, Tailwater Conditions, Adjacent Off-Site Contributing Sources, Receiving Waterbody, etc.)

- Existing roadway/intersections –
- WBIDs need to be independently verified by the consultant - WBID – 1443B, 1522A, 1520, 1443C, 1505, 1489, 1443D, 1453, 1443A, and 1446
- Discharging to impaired waters.

Water Quantity Discussions: (Basin Description, Storm Event, Pre/Post Volume, Pre/Post Discharge, etc.)

- Demonstrate that discharges from proposed project area will not cause an adverse impact for a 25-year, 24-hour storm event.
- Demonstrate that site will not impede the conveyance of contributing off-site flows.
- Demonstrate that the project will not increase flood stages up- or down-stream of the project area(s).
- Provide equivalent compensating storage for all 100-year, 24-hour riverine floodplain impacts if applicable.

Water Quality Discussions: (Type of Treatment, Technical Characteristics, Non-presumptive Alternatives, etc.)

- Provide water quality treatment for required project area.
- May need to meet OFW criteria in portions of project
- In addition, if the project discharges to an impaired water body, must provide a net environmental improvement.
- Applicant must demonstrate a net improvement for the parameters of concern by performing a pre/post pollutant loading analysis based on existing land use and the proposed land use.
- Also replace treatment function of existing ditches to be filled.
- Will acknowledge compensatory treatment to offset pollutant loads associated with portions of the project area that cannot be physically treated.

Sovereign Lands Discussion: (Determining Location, Correct Form of Authorization, Content of Application, Assessment of Fees, Coordination with FDEP)

- SSL in Hillsborough County will be processed through Tampa Port Authority; any within Pasco County will be processed through SWFWMD.

Operation and Maintenance/Legal Information: (Ownership or Perpetual Control, O&M Entity, O&M Instructions, Homeowner Association Documents, Coastal Zone requirements, etc.)

- The permit must be issued to the FDOT.
- Provide proof of ownership in the form of a deed or contract for sale.
- Provide appropriate O&M instructions.
- Provide detailed construction surface water management plan.

Application Type and Fee Required:

- SWERP – Sections A, C, and E of the ERP Application.
- < 640 acres of project area and < 50 acres of wetland or surface water impacts - \$4,141
- Fees will depend on project size determined during phasing

Other: (Future Pre-Application Meetings, Fast Track, Submittal Date, Construction Start Date, Required District Permits – WUP, WOD, Well Construction, etc.)

- In accordance with Rule 40D-1.603(2), F.A.C., no later than 30 days after submittal of an initial application of an Individual surface water management permit the applicant shall publish at the applicant's expense a notice of the District's receipt of the application in a newspaper having general circulation as defined in Chapter 50, F.S., in the county or counties in which the activity is proposed. Please provide documentation that such noticing has been accomplished. Note that the published notices of receipt for an ERP must be in accordance with the language provided in Rule 40D-1.603(11), F.A.C., and receipt of an affidavit establishing proof of this publication will be considered a completeness item of this ERP Application. Per Rule 40D-1.603(13), F.A.C., this must be received before the application will be considered complete and the 60-day timeframe for taking agency action on the application will commence.

40D-1.603(13) – “Applicants required to publish a notice of receipt of application must provide to the District a publisher’s affidavit establishing proof of publication pursuant to Sections 50.041 and 50.051, F.S., before the application will be considered complete and the applicable timeframe for taking agency action on the application will commence.”

Disclaimer: The District ERP pre-application meeting process is a service made available to the public to assist interested parties in preparing for submittal of a permit application. Information shared at pre-application meetings is superseded by the actual permit application submittal. District permit decisions are based upon information submitted during the application process and Rules in effect at the time the application is complete.

MEETING MINUTES



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Date/Time: May 1, 2023, at 9:00 AM at FDOT D7 Pelican Conference Room and MS Teams

Subject: SMF and FPC Site Meeting
WPI Segment No. 255796-1
US 301 PD&E Study from Fowler Avenue to SR 56
Hillsborough and Pasco Counties

In-Person Attendees: Amber Russo, Kirk Bogen, Robin Rhinesmith, Bill McTeer, Zabrina Penton, Timothy Drawhorn – FDOT
Chris Salicco, JJ Jacquin – AIM

Virtual Attendees: Abdul Waris, Anthony Celani, Amanda Serra – FDOT; Renato Chuw – Inwood

Prepared by: Chris Salicco – AIM

The purpose of this meeting was to discuss and receive guidance from the Department on updated SMF and FPC site based in recent changes in typical sections for US 301.

The meeting was kicked off by Amber Russo with a brief discussion about the changes in typical sections which has led to changes in the roadway conceptual layout. The meeting was turned over to Renato Chuw to run the team in attendance through the proposed SMF and FPC sites and discuss the changes basin by basin moving from south to north. The SMF sites were primarily discussed first, followed by a brief discussion on the FPC sites, and ended with an open discussion. A summary of the findings of the meeting is outlined below:

- Basin 1
 - Three SMF alternatives were shown for Basin 1.
 - SMF 1A and SMF 1C were reduced in size from that shown at the public hearing based on drainage criteria for the curb and gutter as opposed to the rural typical section. The reduction in SMF 1A will avoid a structure currently located on the parcel and may avoid a relocation at this site.
 - SMF 1A will remain as the preferred alternative for this basin.
- Basin 2
 - SMF 2A1 and 2A2 were previously shown as the preferred alternatives for this basin and were located within the right of way for the realignment of US 301 at Harney Road. The realignment is no longer needed with the changed typical section.
 - No ponds are proposed in Basin 2. Combining basins was investigated and the southern portion of the basin will drain to Basin 1 SMF and the remainder of the basin to the north will drain to Basin 3 SMF.
- Basin 3

- Three SMF alternatives were shown for Basin 3.
- SMF 3A is slightly larger due to combining Basins 2 and 3 together. SMF 3A will remain as the preferred alternative for this basin.
- SMF 3C sites had to be expanded to acquire additional parcels, but these will remain as an alternative site
- Basin 4
 - Three SMF alternatives were shown for Basin 4.
 - SMF 4A will remain as the preferred alternative for this basin.
- Basin 5
 - Three SMF alternatives were shown for Basin 5.
 - SMF 5B will remain as the preferred alternative for this basin. Detailed maps will need to be provided to Bill McTeer to coordinate with Hillsborough County regarding land swap associated with a separate project (Sun City Center).
- Basin 6
 - Three SMF alternatives were shown for Basin 6.
 - SMF 6C will remain as the preferred alternative for this basin. Information for this site will also need to be provided to Bill McTeer to coordinate with Hillsborough County.
- Basin 7
 - Three SMF alternatives were shown for Basin 7.
 - SMF 7A will remain as the preferred alternative for this basin. The previously approved footprint from the public hearing will be used for this site.
- Basin 8
 - Three SMF alternatives were shown for Basin 8.
 - The preferred alternative for the previously held public hearing was SMF 8A; however, SMF 8B will be the preferred alternative for this basin since FPC 5 footprint was reduced, which allows for SMF 8B and FPC 5 to be on the same parcel. This reduces the number of property owners for right of way acquisition.
- Basin 9
 - Three SMF alternatives were shown for Basin 9.
 - SMF 9C will remain as the preferred alternative for this basin.
- Basin 10
 - Two SMF alternatives were shown for Basin 10.
 - SMF 10B will remain as the preferred alternative for this basin.
- Basin 11
 - Basin 11 has no SMF or FPC sites. This is a small basin near the Hillsborough River State Park. Stormwater for this basin will be collected in Basins 10 and 12.
- Basin 12

- Two SMF alternatives were shown for Basin 12.
- The previously alternative SMF 12C on the west side of US 301 from the first public hearing, was shown to be eliminated for the pond site meeting, however, after further discussions, it will be shown back as an alternative site.
- SMF 12A will remain as the preferred alternative for this basin.
- Basin 13
 - Two SMF alternatives were shown for Basin 13.
 - The previously shown preferred SMF alternative, located west of US 301, will remain as the preferred alternative in Hillsborough County.
 - An additional SMF site in Pasco County will need to be evaluated for this basin. This will allow for the Pasco County segment of the project to be constructed if funding is available separate from the Hillsborough County segment. After the pond site meeting, further investigation occurred on the feasibility of a third SMF site in the Pasco County side and coordination with FDOT is ongoing on this topic.
 - Overall, the direction from the Department was to show the previous SMFs and FPCs on the west side of US 301, for Basins 12 and 13.

General Notes/Open Discussion

- FPC sites will generally remain as previously shown at the public hearing unless specifically stated that changes are being made, such as FPC 5.
- SMF sites are all designed for 6 lanes.
 - South of Stacey Road, the lanes were reduced from 12' lanes to 11' lanes which allowed for reduction in SMF sites in some locations, along with other factors such as the configuration of the ultimate 6-lane typical, change in design criteria for urban curb and gutter drainage systems and change in rainfall intensities to NOAA rainfall data.
- Possible land swap with Hillsborough County for SMFs 5B and 6C. This is associated with a Hillsborough County project in Sun City Center.
- SMF 8B will become the preferred alternative for that basin based on the discussion provided above for Basin 8.
- North of the Hillsborough River, the SMF and FPC sites that were shown to the west of US 301 as part of the previous public hearing will remain as the preferred alternatives for those basins.
 - In this area, also consider shifting/extending the mainline right of way to the west.
- FPC 5 should be evaluated to avoid the residential relocation previously shown at the public hearing.
- Leave all SMF and FPC sites the same sizes as previously shown at the public hearing unless otherwise directed or to avoid impacts and show the appropriate reduction. All ponds that increased in size will need to be shown and right of way costs updated for those sites.

Action Items

- AIM/Inwood to provide the SMF 5B and 6C site location and files to Bill McTeer to use for coordination with Hillsborough County.
- Evaluate FPC 5 to avoid residential relocation.
- Evaluate SMF in Basin 13 within Pasco County. This will be done in case funding for the Pasco section becomes available prior to the Hillsborough section. Additional coordination with the Department will follow

The meeting minutes contained herein represent the author's understanding of the discussions which occurred during the referenced meeting. Any attendee who does not entirely agree with the summary or can offer additional information that should be noted within these minutes, please call or e-mail Chris Salicco within seven days for edit coordination.

DRAFT

MEETING MINUTES



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Date/Time: May 9, 2023, at 9:00 AM on Microsoft Teams

Subject: Basin 13 SMF Alternative Site Meeting
WPI Segment No. 255796-1
US 301 PD&E Study from Fowler Avenue to SR 56
Hillsborough and Pasco Counties

Attendees: Amber Russo, Kirk Bogen, Robin Rhinesmith, Bill McTeer, Anthony Celani, Amanda Serra, Carolyn Cation Smith – FDOT; Renato Chuw, Zach Evans – Inwood; Chris Salicco – AIM

Prepared by: Chris Salicco – AIM

The purpose of this meeting was to discuss the need to evaluate an additional stormwater management facility (SMF) within Basin 13 in Pasco County. This meeting was a follow-up from discussions that started at the SMF and FPC alternatives meeting that was held on March 1, 2023.

A summary of the findings of the meeting is outlined below:

- Renato explained that a pond site in Pasco County is difficult hydraulically since the topography in Basin 13 runs from north to south to a low point in Hillsborough County near the cross drain (located approximately 1,400 feet south of the county line).
- Water from the southern portion of Basin 13 would be difficult to route to a SMF location in Pasco County. This would require revising the basin limit in Basin 12 and expansion of the Basin 12 SMF alternative(s) to handle the runoff that would run south from the county line.
- It was noted that an alternative in Pasco County would still be working with the same property owner as that in Hillsborough County (Two Rivers property).
- It was discussed whether or not work can be done in Hillsborough County for the Pasco County project (255796-3). One of the two projects will need to extend beyond the county line to tie in (taper to existing 2-lane condition or connect to 4-lane condition depending on which project moves forward into construction if not funded together).
- The 255796-3 design is currently underway in-house. It will be discussed to carry the widening to 4 lanes to the county line and taper to 2 lanes in Hillsborough County.
- It was recommended by Kirk and Bill to leave the Basin 13 SMF alternatives as-is. There is no need to evaluate a SMF site in Pasco County.
- Renato asked if updated cost estimates need to be completed for the alternative SMF sites that increased in size. Bill mentioned that there was a 25% contingency in the estimates to account for increase in sizes of SMFs. The cost estimates will not be updated for the alternative SMFs based on this discussion.

- For project cost estimates, the preferred SMF in Basin 13 will be included in the Pasco County project (255796-3)

Action Items

- Inwood (Renato) will provide a .kmz file of the SMF and FPC sites to Department staff per Anthony's request. Following the meeting, Renato submitted the .kmz file to Amber on March 9, 2023, via email.

The meeting minutes contained herein represent the author's understanding of the discussions which occurred during the referenced meeting. Any attendee who does not entirely agree with the summary or can offer additional information that should be noted within these minutes, please call or e-mail Chris Salicco within seven days for edit coordination.

DRAFT