



TOWN OF MELBOURNE BEACH

TOWN COMMISSION WORKSHOP

May 6, 2026

6:00 PM

AGENDA PACKET

Town of Melbourne Beach
TOWN COMMISSION WORKSHOP
Wednesday, May 6, 2026 @ 6:00 pm
COMMUNITY CENTER – 509 OCEAN AVENUE

PUBLIC NOTICE
AGENDA

Commission Members:

Mayor Alison Dennington
Vice Mayor Terry Cronin
Commissioner Anna Butler
Commissioner Tim Reed
Commissioner Sherri Quarrie

Staff Members:

Town Manager A. Marie Smith
Town Clerk Amber Brown

1. Call to Order

2. Roll Call

3. Pledge of Allegiance, Moment of Silence, and Civility Pledge

The Commission and Staff of The Town of Melbourne Beach pledge to conduct all public discourse in a civil manner. The Mayor and all members of the Commission will treat one another with courtesy and respect and ask the public to do the same toward the Commission, each other, and toward Staff. We will be respectful of one another even when we disagree. We will direct all comments toward the issues. We will avoid personal attacks.

4. Public Comment

After being acknowledged by the Mayor, members of the public should state their name and address for the record. The Commission encourages citizens to prepare their comments in advance. Each individual will have three (3) minutes to address the Commission on any topic(s) related to Town business, not on the Agenda. Please remember to sign the sign-in sheet provided if you will be speaking at the meeting.

5. New Business

A. Presentation and discussion on Basin 10 by Haley Ward

6. Adjournment

PURSUANT TO SECTION 286.0105, FLORIDA STATUTES, THE TOWN HEREBY ADVISES THE PUBLIC THAT: In order to appeal any decision made at this meeting, you will need a verbatim transcript of the proceedings. It will be your responsibility to ensure such a record is made. Such person must provide a method for recording the proceedings verbatim as the Town does not do so. In accordance with the Americans with Disability Act and Section 286.26, Florida Statutes, persons needing special accommodations for this meeting shall, at least 5 days prior to the meeting, contact the Office of the Town Clerk at (321) 724-5860 or Florida Relay System at 711.



HALEY WARD®

Town of Melbourne Beach Basin 10 Drainage Analysis

Presented by: David C. Baggett, P.E.
May 6, 2026

1



An Unexpected Rescue...



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Professional Background

- David C Baggett, P.E. – Vice President, Melbourne Engineering Manager
- 16 years experience in civil engineering, specializing in stormwater design/permitting
- Past Work Experience as a stormwater engineer for the State of Florida (FDEP)
- Bachelors and Masters in Environmental Engineering from University of Central Florida
- Life long Brevard County resident and Melbourne Beach native



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HALEY WARD

Purpose

- Basin 10 consists of the contributing drainage area located between Oak Street to west, 6th Avenue to the north, the Jimmy Buffett Memorial Highway (A1A) to the east, and the Brevard County Flutie Athletic Complex to the south
- Discharges to Indian River Lagoon via a single outfall pipe through the Harbor East subdivision
- Haley Ward retained to comprehensively analyze Basin 10 drainage system to help identify potential causes of observed flooding and make recommendation for possible improvements to the system



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Basin 10 Description

- Majority of land use coverage is ¼ acre residential lots, public roadways. Multi-family fronting Highway A1A
- Not located within a FEMA mapped floodplain
- Drainage patterns are generally east from A1A down the east-west oriented streets to a series of inlets along Rosewood Dr, Cherry Dr, and Cedar Lane.
- A series of inlets and manholes run along Oak Street that collect localized runoff as well as off-site flows from the Flutie Athletic Complex and the St. Sebastian Church.
- Storm sewer confluences at Oak Street and Cherry Drive to a single 42" elliptical outfall pipe.

National Flood Hazard Layer FIRMette



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Methodology – Historical Review and Data Collection

**TOWN OF MELBOURNE BEACH
STORMWATER MASTER PLAN
2007 UPDATE**

Jones Edmunds Project No. 13190509-01

Client:
THE TOWN OF MELBOURNE BEACH
Melbourne Beach Town Hall
907 Ocean Avenue
Melbourne Beach, FL 32951

Engineer:
JONES EDMUNDS & ASSOCIATES, INC.
3190 S. Washington Ave.
Suite 210
Pompano Beach, FL 33069
Certificate of Authorization #1841

October 2007

DAM STREET DRAINAGE IMPROVEMENTS
PROJECT No. 080715
STORMWATER REPORT

November 29, 2005

Revised
MS - 5 2006
2/2/07
MS - 5 2006

By: Gordon England, P.E.
Chief Engineer, Inc.
4406 W. Eau Claire Blvd., Suite 202
Melbourne, FL 32914
321.285.9244

Gordon England
3-1-07

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Methodology – Updated Survey

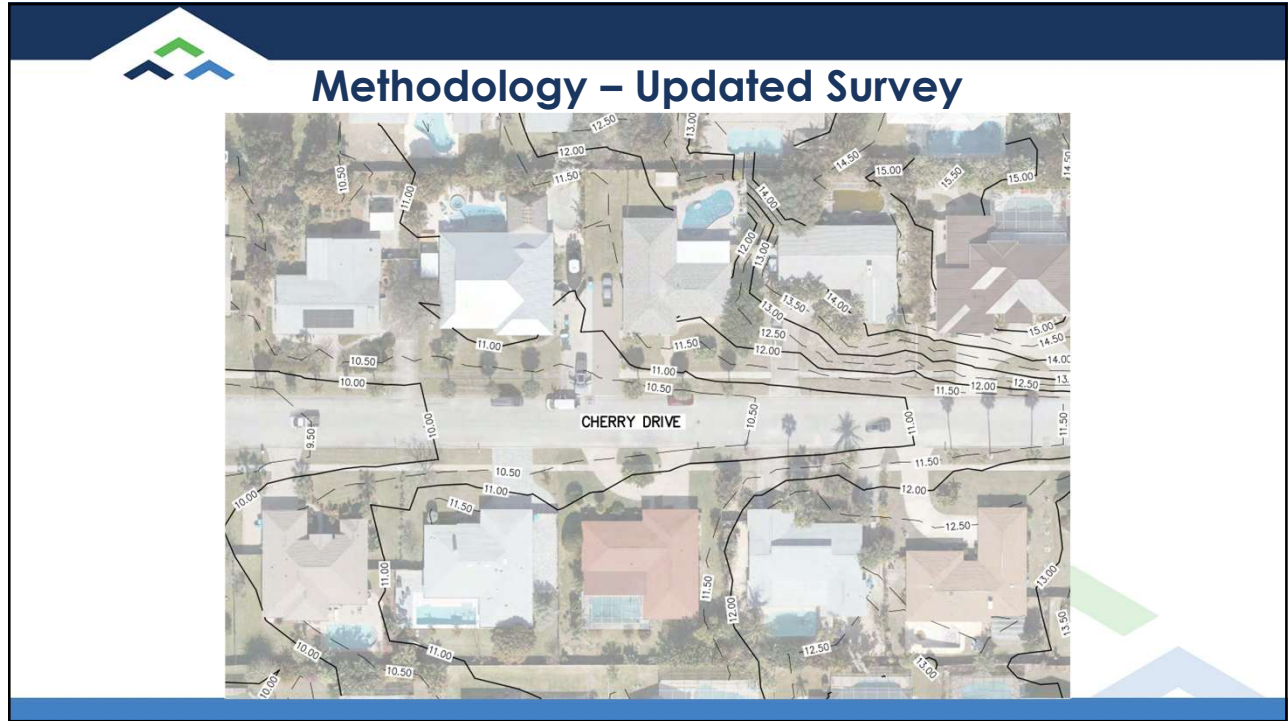
MATCHLINE SHEET 2

MATCHLINE SHEET 6

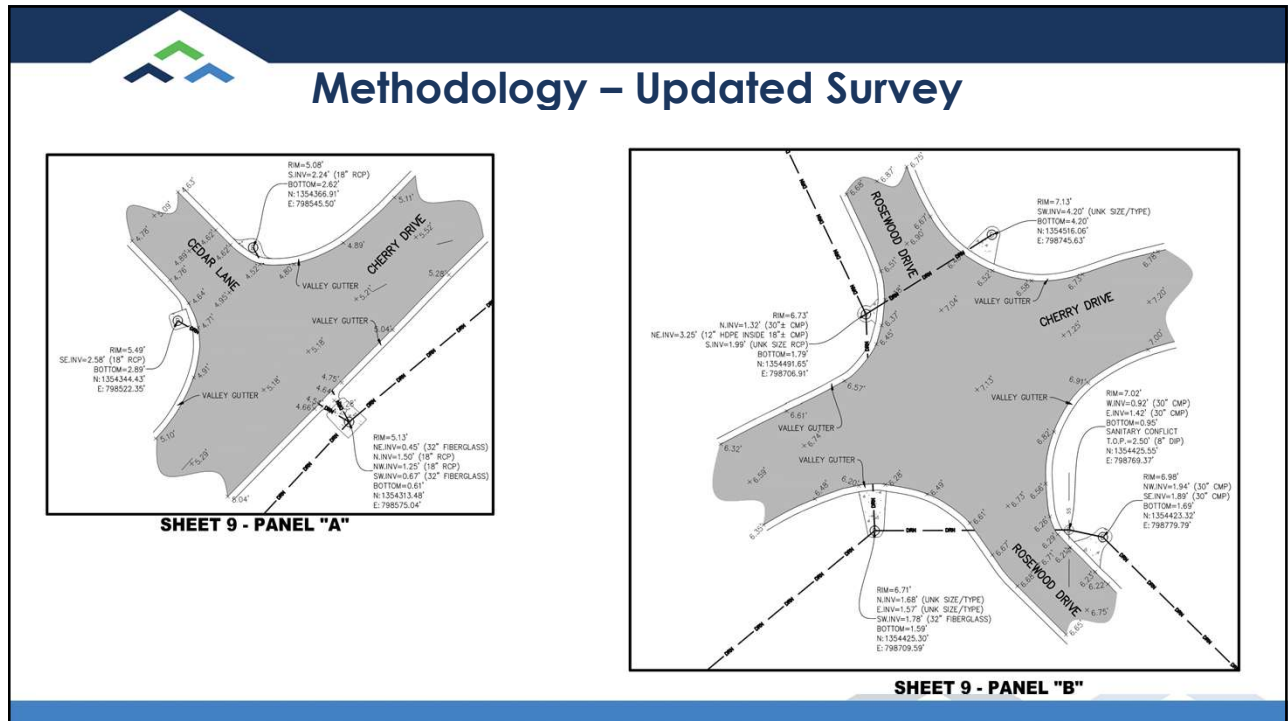
MATCHLINE SHEET 5

MATCHLINE SHEET 4

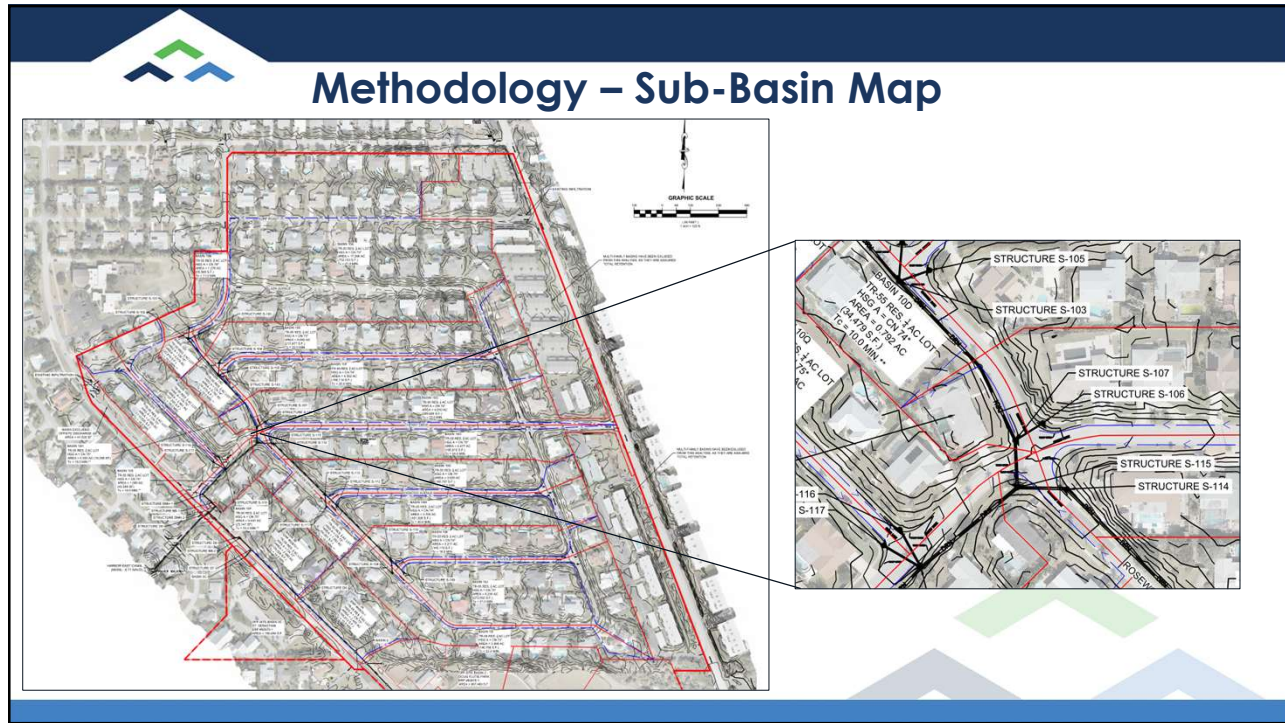
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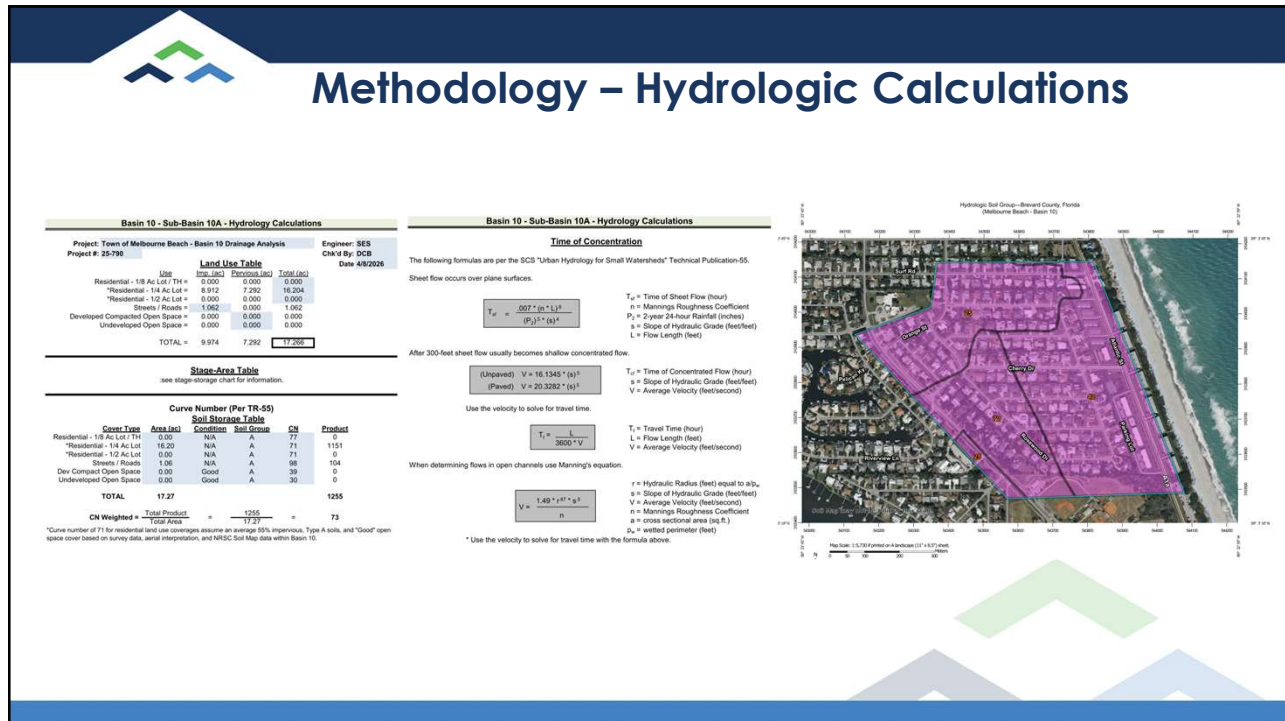
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12

Methodology – StormWise Model

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Methodology – Hydrologic Calculations

- Range of intensities, rainfall totals, and return periods
- Mean Annual (50% occurrence)
- 5 Year (20% occurrence)
- 10 Year (10% occurrence)
- 25 Year (4% occurrence)
- 100 Year (1% occurrence)
- Both 24hr and 1 Hr Durations

NOAA Atlas 14, Volume 8, Version 2
Location name: Baltimore, Maryland, USA
Latitude: 39.2892, Longitude: -76.5858
Elevation: 40'

POINT PRECIPITATION FREQUENCY ESTIMATES
Data Source: National Weather Service, Storm Survey, Maryland
NOAA National Weather Service, Storm Survey, Maryland
PF tabular | PF graphical | PF graphical


Duration	1	2	5	10	25	50	100	200	500	1000
5-min	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
15-min	0.008	0.005	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001
30-min	0.014	0.009	0.005	0.004	0.002	0.002	0.002	0.002	0.002	0.002
1-hr	0.23	0.15	0.09	0.07	0.04	0.03	0.02	0.02	0.02	0.02
2-hr	0.38	0.25	0.15	0.11	0.07	0.05	0.04	0.03	0.03	0.03
3-hr	0.45	0.30	0.18	0.13	0.08	0.06	0.04	0.04	0.03	0.03
4-hr	0.49	0.33	0.20	0.14	0.09	0.07	0.05	0.04	0.03	0.03
6-hr	0.54	0.36	0.22	0.16	0.10	0.08	0.06	0.04	0.04	0.03
8-hr	0.58	0.39	0.24	0.17	0.11	0.09	0.07	0.05	0.04	0.03
12-hr	0.64	0.43	0.26	0.19	0.12	0.10	0.08	0.06	0.04	0.03
18-hr	0.70	0.47	0.28	0.20	0.13	0.11	0.09	0.07	0.05	0.04
24-hr	0.74	0.50	0.30	0.21	0.14	0.12	0.10	0.08	0.06	0.04
3-hr	0.80	0.53	0.32	0.22	0.15	0.13	0.11	0.09	0.07	0.05
4-hr	0.83	0.55	0.33	0.23	0.16	0.14	0.12	0.10	0.08	0.06
6-hr	0.87	0.57	0.34	0.24	0.17	0.15	0.13	0.11	0.09	0.07
8-hr	0.90	0.59	0.35	0.25	0.18	0.16	0.14	0.12	0.10	0.08
12-hr	0.95	0.62	0.37	0.26	0.19	0.17	0.15	0.13	0.11	0.09
18-hr	1.00	0.65	0.39	0.27	0.20	0.18	0.16	0.14	0.12	0.10
24-hr	1.04	0.67	0.40	0.28	0.21	0.19	0.17	0.15	0.13	0.11
3-hr	1.09	0.70	0.42	0.29	0.22	0.20	0.18	0.16	0.14	0.12
4-hr	1.12	0.72	0.43	0.30	0.23	0.21	0.19	0.17	0.15	0.13
6-hr	1.16	0.74	0.44	0.31	0.24	0.22	0.20	0.18	0.16	0.14
8-hr	1.19	0.76	0.45	0.32	0.25	0.23	0.21	0.19	0.17	0.15
12-hr	1.24	0.79	0.47	0.33	0.26	0.24	0.22	0.20	0.18	0.16
18-hr	1.29	0.82	0.49	0.34	0.27	0.25	0.23	0.21	0.19	0.17
24-hr	1.33	0.84	0.50	0.35	0.28	0.26	0.24	0.22	0.20	0.18
3-hr	1.38	0.87	0.52	0.36	0.29	0.27	0.25	0.23	0.21	0.19
4-hr	1.41	0.89	0.53	0.37	0.30	0.28	0.26	0.24	0.22	0.20
6-hr	1.45	0.91	0.54	0.38	0.31	0.29	0.27	0.25	0.23	0.21
8-hr	1.48	0.93	0.55	0.39	0.32	0.30	0.28	0.26	0.24	0.22
12-hr	1.54	0.96	0.57	0.40	0.33	0.31	0.29	0.27	0.25	0.23
18-hr	1.59	0.99	0.59	0.41	0.34	0.32	0.30	0.28	0.26	0.24
24-hr	1.63	1.01	0.60	0.42	0.35	0.33	0.31	0.29	0.27	0.25
3-hr	1.68	1.04	0.62	0.43	0.36	0.34	0.32	0.30	0.28	0.26
4-hr	1.71	1.06	0.63	0.44	0.37	0.35	0.33	0.31	0.29	0.27
6-hr	1.75	1.08	0.64	0.45	0.38	0.36	0.34	0.32	0.30	0.28
8-hr	1.78	1.10	0.65	0.46	0.39	0.37	0.35	0.33	0.31	0.29
12-hr	1.84	1.13	0.67	0.47	0.40	0.38	0.36	0.34	0.32	0.30
18-hr	1.89	1.16	0.69	0.48	0.41	0.39	0.37	0.35	0.33	0.31
24-hr	1.93	1.18	0.70	0.49	0.42	0.40	0.38	0.36	0.34	0.32
3-hr	1.98	1.21	0.72	0.50	0.43	0.41	0.39	0.37	0.35	0.33
4-hr	2.01	1.23	0.73	0.51	0.44	0.42	0.40	0.38	0.36	0.34
6-hr	2.05	1.25	0.74	0.52	0.45	0.43	0.41	0.39	0.37	0.35
8-hr	2.08	1.27	0.75	0.53	0.46	0.44	0.42	0.40	0.38	0.36
12-hr	2.14	1.30	0.77	0.54	0.47	0.45	0.43	0.41	0.39	0.37
18-hr	2.19	1.33	0.79	0.55	0.48	0.46	0.44	0.42	0.40	0.38
24-hr	2.23	1.35	0.80	0.56	0.49	0.47	0.45	0.43	0.41	0.39
3-hr	2.28	1.38	0.82	0.57	0.50	0.48	0.46	0.44	0.42	0.40
4-hr	2.31	1.40	0.83	0.58	0.51	0.49	0.47	0.45	0.43	0.41
6-hr	2.35	1.42	0.84	0.59	0.52	0.50	0.48	0.46	0.44	0.42
8-hr	2.38	1.44	0.85	0.60	0.53	0.51	0.49	0.47	0.45	0.43
12-hr	2.44	1.47	0.87	0.61	0.54	0.52	0.50	0.48	0.46	0.44
18-hr	2.49	1.50	0.89	0.62	0.55	0.53	0.51	0.49	0.47	0.45
24-hr	2.53	1.52	0.90	0.63	0.56	0.54	0.52	0.50	0.48	0.46
3-hr	2.58	1.55	0.92	0.64	0.57	0.55	0.53	0.51	0.49	0.47
4-hr	2.61	1.57	0.93	0.65	0.58	0.56	0.54	0.52	0.50	0.48
6-hr	2.65	1.59	0.94	0.66	0.59	0.57	0.55	0.53	0.51	0.49
8-hr	2.68	1.61	0.95	0.67	0.60	0.58	0.56	0.54	0.52	0.50
12-hr	2.74	1.64	0.97	0.68	0.61	0.59	0.57	0.55	0.53	0.51
18-hr	2.79	1.67	0.99	0.69	0.62	0.60	0.58	0.56	0.54	0.52
24-hr	2.83	1.69	1.00	0.70	0.63	0.61	0.59	0.57	0.55	0.53
3-hr	2.88	1.72	1.02	0.71	0.64	0.62	0.60	0.58	0.56	0.54
4-hr	2.91	1.74	1.03	0.72	0.65	0.63	0.61	0.59	0.57	0.55
6-hr	2.95	1.76	1.04	0.73	0.66	0.64	0.62	0.60	0.58	0.56
8-hr	2.98	1.78	1.05	0.74	0.67	0.65	0.63	0.61	0.59	0.57
12-hr	3.04	1.81	1.07	0.75	0.68	0.66	0.64	0.62	0.60	0.58
18-hr	3.09	1.84	1.09	0.76	0.69	0.67	0.65	0.63	0.61	0.59
24-hr	3.13	1.86	1.10	0.77	0.70	0.68	0.66	0.64	0.62	0.60
3-hr	3.18	1.89	1.12	0.78	0.71	0.69	0.67	0.65	0.63	0.61
4-hr	3.21	1.91	1.13	0.79	0.72	0.70	0.68	0.66	0.64	0.62
6-hr	3.25	1.93	1.14	0.80	0.73	0.71	0.69	0.67	0.65	0.63
8-hr	3.28	1.95	1.15	0.81	0.74	0.72	0.70	0.68	0.66	0.64
12-hr	3.34	1.98	1.17	0.82	0.75	0.73	0.71	0.69	0.67	0.65
18-hr	3.39	2.01	1.19	0.83	0.76	0.74	0.72	0.70	0.68	0.66
24-hr	3.43	2.03	1.20	0.84	0.77	0.75	0.73	0.71	0.69	0.67
3-hr	3.48	2.06	1.22	0.85	0.78	0.76	0.74	0.72	0.70	0.68
4-hr	3.51	2.08	1.23	0.86	0.79	0.77	0.75	0.73	0.71	0.69
6-hr	3.55	2.10	1.24	0.87	0.80	0.78	0.76	0.74	0.72	0.70
8-hr	3.58	2.12	1.25	0.88	0.81	0.79	0.77	0.75	0.73	0.71
12-hr	3.64	2.15	1.27	0.89	0.82	0.80	0.78	0.76	0.74	0.72
18-hr	3.69	2.18	1.29	0.90	0.83	0.81	0.79	0.77	0.75	0.73
24-hr	3.73	2.20	1.30	0.91	0.84	0.82	0.80	0.78	0.76	0.74
3-hr	3.78	2.23	1.32	0.92	0.85	0.83	0.81	0.79	0.77	0.75
4-hr	3.81	2.25	1.33	0.93	0.86	0.84	0.82	0.80	0.78	0.76
6-hr	3.85	2.27	1.34	0.94	0.87	0.85	0.83	0.81	0.79	0.77
8-hr	3.88	2.29	1.35	0.95	0.88	0.86	0.84	0.82	0.80	0.78
12-hr	3.94	2.32	1.37	0.96	0.89	0.87	0.85	0.83	0.81	0.79
18-hr	3.99	2.35	1.39	0.97	0.90	0.88	0.86	0.84	0.82	0.80
24-hr	4.03	2.37	1.40	0.98	0.91	0.89	0.87	0.85	0.83	0.81
3-hr	4.08	2.40	1.42	0.99	0.92	0.90	0.88	0.86	0.84	0.82
4-hr	4.11	2.42	1.43	1.00	0.93	0.91	0.89	0.87	0.85	0.83
6-hr	4.15	2.44	1.44	1.01	0.94	0.92	0.90	0.88	0.86	0.84
8-hr	4.18	2.46	1.45	1.02	0.95	0.93	0.91	0.89	0.87	0.85
12-hr	4.24	2.49	1.47	1.03	0.96	0.94	0.92	0.90	0.88	0.86
18-hr	4.29	2.52	1.49	1.04	0.97	0.95	0.93	0.91	0.89	0.87
24-hr	4.33	2.54	1.50	1.05	0.98	0.96	0.94	0.92	0.90	0.88
3-hr	4.38	2.57	1.52	1.06	0.99	0.97	0.95	0.93	0.91	0.89
4-hr	4.41	2.59	1.53	1.07	1.00	0.98	0.96	0.94	0.92	0.90
6-hr	4.45	2.61	1.54	1.08	1.01	0.99	0.97	0.95	0.93	0.91
8-hr	4.48	2.63	1.55	1.09	1.02	1.00	0.98	0.96	0.94	




Methodology - Rainfall

Table 1-Scenario and Rainfall Data

Scenario	Rainfall Amount	Storm Duration	Storm Peak	Storm Recovery
Mean Annual; 24-Hour	4.72 Inches	24 Hours	12 Hours	72 Hours
5-Year; 24-Hour	6.14 Inches	24 Hours	12 Hours	72 Hours
10-Year; 24-Hour	7.45 Inches	24 Hours	12 Hours	72 Hours
25-Year; 24-Hour	9.45 Inches	24 Hours	12 Hours	72 Hours
100-Year; 24-Hour	13.0 Inches	24 Hours	12 Hours	72 Hours
Mean Annual; 1-Hour	2.21 Inches	1 Hour	30 Mins	12 Hours
5-Year; 1-Hour	2.68 Inches	1 Hour	30 Mins	12 Hours
10-Year; 1-Hour	3.06 Inches	1 Hour	30 Mins	12 Hours
25-Year; 1-Hour	3.58 Inches	1 Hour	30 Mins	12 Hours
100-Year; 1-Hour	4.38 Inches	1 Hour	30 Mins	12 Hours



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Results

- We compared low pavement elevations (“Alert Stage”) and low finished floor elevations (“Warning Stage”) against the peak stage of the various storm events.
- We also compared the duration that flooding occurs

Table 7-Existing 5 Year – 24 Hour Peak Staging Results

5 YEAR – 24 HOUR STORM EVENT							
Inlet Structure	Peak Stage Time (hr)	Peak Stage (ft)	Alert Stage (Road) (ft)	Warning Stage (FFE) (ft)	Flooding Occurring (Y/N)	Recovery Stage Time (hr)	Time of Flood (hr)
S-100	14.0	7.61	6.70	8.50	Y	19.0	5.0
S-101	14.0	6.95	6.57	8.00	Y	15.0	1.0
S-102	14.0	6.94	6.71	7.75	Y	15.0	1.0
S-103	13.0	6.88	6.95	8.00	N	N/A	0.0
S-104	13.0	7.13	6.95	8.50	Y	15.0	2.0
S-105	13.0	7.10	6.82	8.50	Y	15.0	2.0
S-106	13.0	7.38	7.13	9.50	Y	15.0	2.0



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Results

Table 7-Existing 5 Year – 24 Hour Peak Staging Results

5 YEAR – 24 HOUR STORM EVENT							
Inlet Structure	Peak Stage Time (hr)	Peak Stage (ft)	Alert Stage (Road) (ft)	Warning Stage (FFE) (ft)	Flooding Occurring (Y/N)	Recovery Stage Time (hr)	Time of Flood (hr)
S-100	14.0	7.61	6.70	8.50	Y	19.0	5.0
S-101	14.0	6.95	6.57	8.00	Y	15.0	1.0
S-102	14.0	6.94	6.71	7.75	Y	15.0	1.0
S-103	13.0	6.88	6.95	8.00	N	N/A	0.0
S-104	13.0	7.13	6.95	8.50	Y	15.0	2.0
S-105	13.0	7.10	6.82	8.50	Y	15.0	2.0
S-106	13.0	7.38	7.13	9.50	Y	15.0	2.0

Table 12-Existing 5 Year – 1 Hour Peak Staging Results

5 YEAR – 1 HOUR STORM EVENT							
Inlet Structure	Peak Stage Time (hr)	Peak Stage (ft)	Alert Stage (Road) (ft)	Warning Stage (FFE) (ft)	Flooding Occurring (Y/N)	Recovery Stage Time (hr)	Time of Flood (hr)
S-100	2.0	6.59	6.70	8.50	N	N/A	0.0
S-101	1.0	6.16	6.57	8.00	N	N/A	0.0
S-102	1.0	6.16	6.71	7.75	N	N/A	0.0
S-103	1.0	6.13	6.95	8.00	N	N/A	0.0
S-104	1.0	6.30	6.95	8.50	N	N/A	0.0
S-105	1.0	6.29	6.82	8.50	N	N/A	0.0
S-106	1.0	6.53	7.13	9.50	N	N/A	0.0


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Results

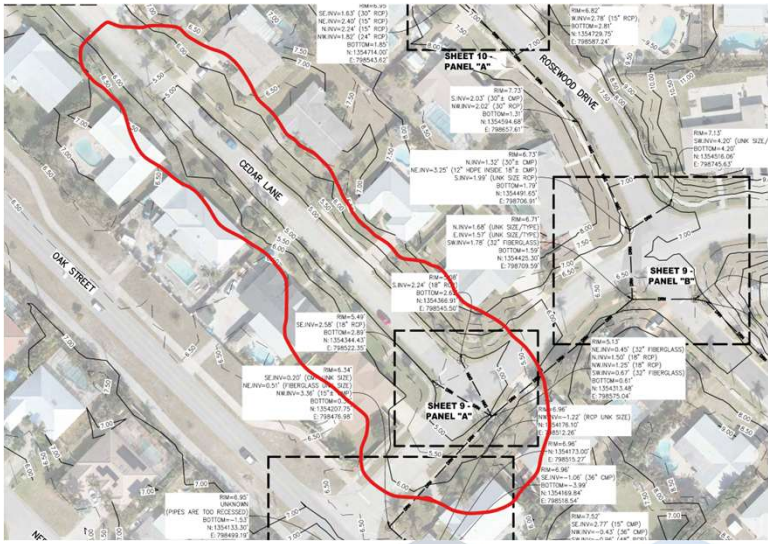
- Contributing Area vs # of Inlets ratio is large in some areas, may cause elevated stages
- Generally, during 1-hr storm events roads do not flood until the 100-year storm. This is likely due to the short duration of the rainfall and the lag of time it takes to produce runoff
- In half of the model sub-basins the lowest Finished Floors elevation are exceeded during the 100YR-24HR storm only, though many are close to FFE during the 25YR-24HR storm.
- Model shows that streets and front of lots at low spots within the various sub-basins may have flooding for greater than a 5-year storm event (6.14" in 24 hrs).
- Mostly short duration flooding (1-5hrs depending on severity of storms), longer duration flooding (8-10hrs) for the 100-year storm
- Pipes sunk/cast below structure bottom in some areas.
- Shallow drainage structures

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Results

- Cherry and Cedar – Finished floor elevations have relatively little vertical separation from the low pavement elevations.
- Cedar Lane has a relatively low profile grade, thus flooding on the road spreads to a greater extent





Results

- Some flooding results in the model along Oak Street for larger events. This is likely due to the modeled off-site flows from previously designed/permitted projects at Flutie Athletic Complex and Oak Street Drainage Improvements
- Significant amount of area (over 17 acres) appears to drain to a single inlet at Orange and Rosewood. Structure has a small pipe for such service (12")
- Baffle Box at Oak Street does not appear to be a significant hindrance to Basin 10 outfall flow.
- Dissimilar pipe sizes and inverts not on downstream grade
- Certain structures were not fully accessible, utilized historical data
- Field Observations – inlet screens/baffles may be subject to clogging, yard debris placed at inlets

Cherry Dr and Cedar Lane



Recommendations

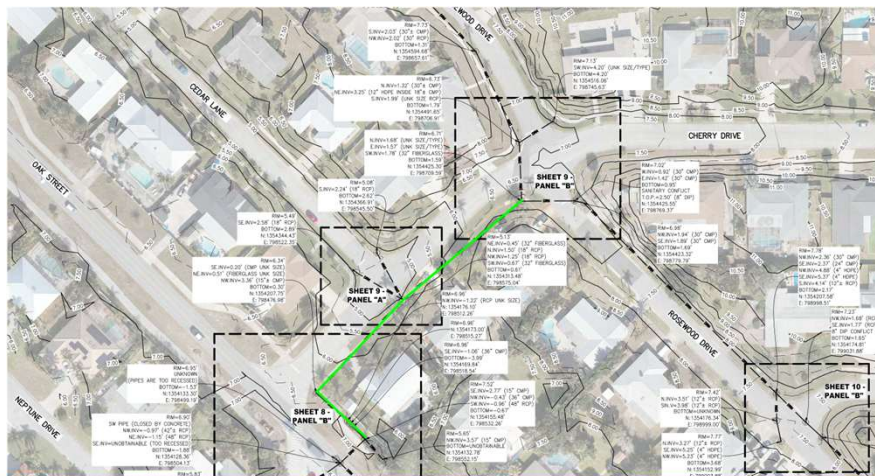
- TV Sewer Inspection storm sewer system along Cherry and Rosewood before any design or new improvements are proposed. Other runs may be less of a priority, but a comprehensive TV inspection of the rest of the system would provide more assurance



21

Recommendations


- Increase pipe size downstream of Cherry Drive intersections to outfall pipe at Oak Street (alternative, install parallel pipe)



22

Reccomendations

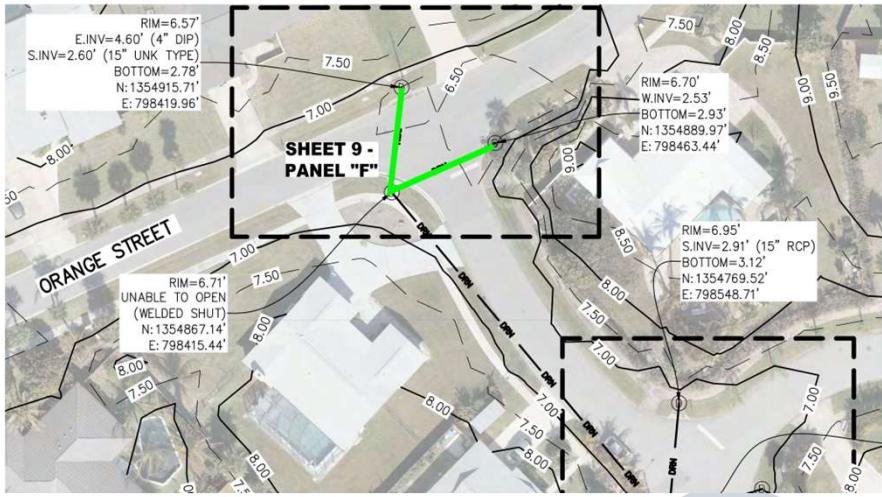
- If flooding along Rosewood is a frequent concern, adding inlets along the contributing E-W streets will break sub-basins in to smaller drainage catchment areas. Rosewood inlets will not be as overwhelmed (according to model)
- Upsizing pipes along Rosewood would improve capacity but may only be necessary if regular concerns persist after the Cherry Dr trunk line pipe is upsized



23

Reccomendations

- Upsize pipes at Orange St and Rosewood



SHEET 9 - PANEL "F"

ORANGE STREET

RIM=6.57'
E.INV=4.60' (4" DIP)
S.INV=2.60' (15" UNK TYPE)
BOTTOM=2.78'
N: 1354915.71'
E: 798419.96'

RIM=6.70'
W.INV=2.53'
BOTTOM=2.93'
N: 1354889.97'
E: 798463.44'

RIM=6.95'
S.INV=2.91' (15" RCP)
BOTTOM=3.12'
N: 1354769.52'
E: 798548.71'

RIM=6.71'
UNABLE TO OPEN (WELDED SHUT)
N: 1354867.14'
E: 798415.44'

24

Recommendations – Manatee Protection

OAK STREET DRAINAGE IMPROVEMENTS		11/02/01	LSJ	MODIFIED FOR COUNTY COMMENTS
SITE PLAN NEPTUNE DRIVE		12/21/01	LSJ	MODIFIED PIPE & ADDED ANJUNCTION BOX
BREVARD FLORIDA		4/17/02	LSJ	ADDED MANATEE PROTECTOR DETAIL
DATE	BY	REVISIONS		

ENGINEER
CREECH ENGINEERING
301 N. W. 15th Street, Ft. Lauderdale, FL 33311
4080 WEST EAU GALLE BLVD., BELLSBORNE
707 EAST PARK AVENUE, TALLAHASSEE, FL 32304
STATE OF FLORIDA, REGISTERED PROFESSIONAL ENGINEER
NO. 12489

25

THANK YOU

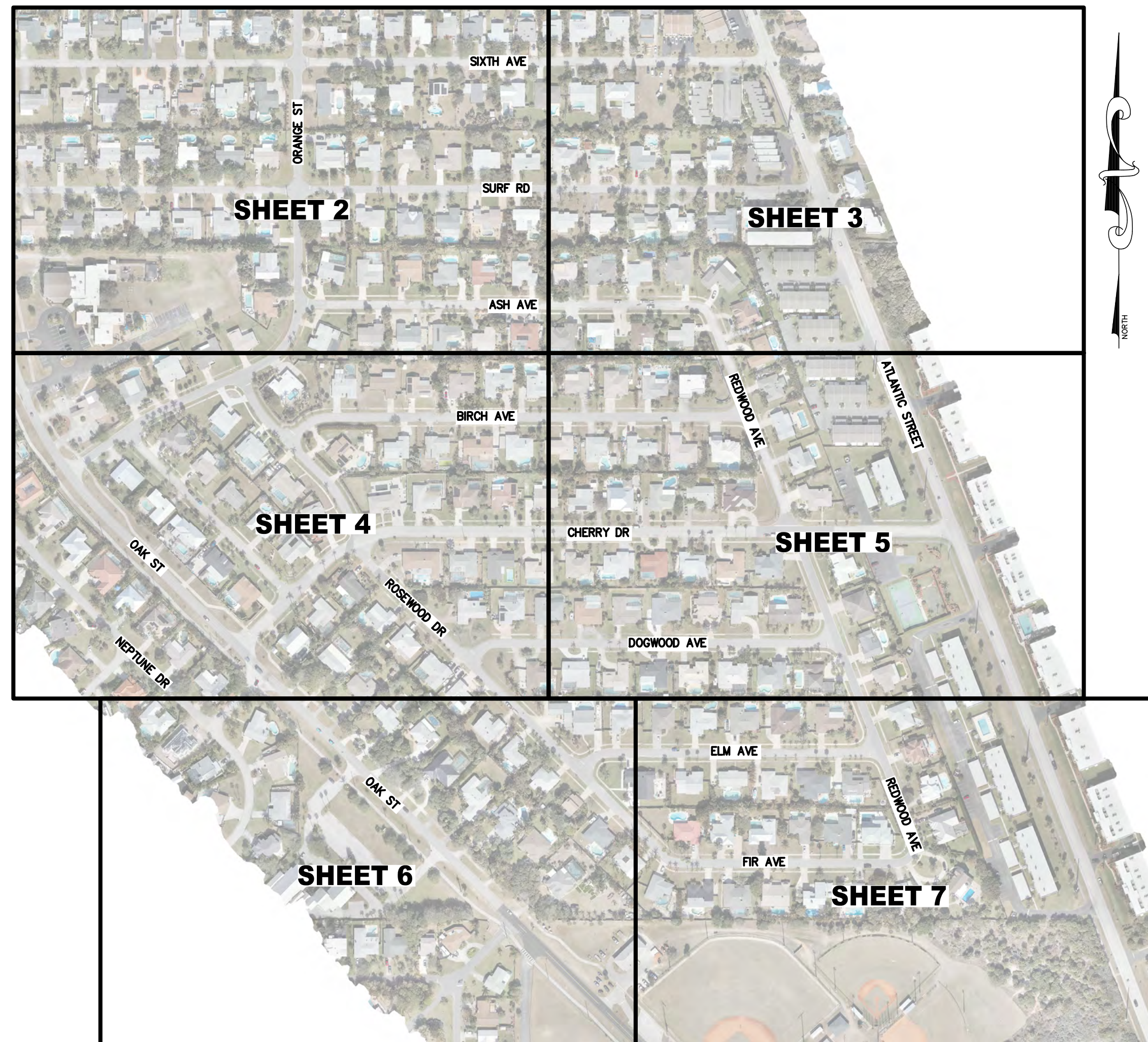
QUESTIONS?
COMMENTS?

26

SPECIFIC PURPOSE SURVEY

MELBOURNE BEACH BASIN 10 BREVARD COUNTY, FLORIDA

SITE MAP



LIDAR FLIGHT NOTES & ACCURACY REPORT:

- THIS SITE WAS FLOWN DURING FEBRUARY 9, 2026 UTILIZING A DJI MATRICE 300 UAV.
- FLIGHT PLANNING WAS PERFORMED WITH PHOENIX FLIGHT PLANNER AND POST-PROCESSED USING PHOENIX LIDARMILL AND TRIMBLE BUSINESS CENTER.
- THE FLIGHT WAS OBSERVED BY CERTIFIED REMOTE PILOT NUMBER 4545445.
- GROUND ELEVATIONS WERE SPOT CHECKED WITH GLOBAL POSITIONING SYSTEM (GPS) REAL TIME KINEMATIC (RTK) OBSERVATION.
- FEATURES ARE LIMITED TO THOSE VISIBLE AT TIME OF THE FLIGHT AND ARE SUBJECT TO FIELD VERIFICATION BY THE END USER. AREAS DESIGNATED AS "OBSCURED" INDICATE THE GROUND IS OBSCURED BY VEGETATION AND/OR SHADOWS. MAPPING WITHIN THESE AREAS MAY NOT MEET STANDARD ACCURACY.
- RELATIVE ACCURACY:
 - VERTICAL ACCURACY IS ± 0.25' FOR OPEN AREAS
 - VERTICAL ACCURACY IS ± 0.50' AREAS OF DENSE VEGETATION.

PHOTGRAMMETRIC FLIGHT NOTES & ACCURACY REPORT:

- THIS SITE WAS FLOWN ON FEBRUARY 9, 2026 UTILIZING A DJI MATRICE 300 UAS.
- DATA POST PROCESSING WAS PERFORMED UTILIZING PIX4D MATIC, VERSION 2.0.1, ON FEBRUARY 12, 2026.
- SENSOR(S) USED: ZENMUSE P1 45MP
- THE FLIGHT WAS CONDUCTED BY CERTIFIED REMOTE PILOT NUMBER 4545445
- HORIZONTAL CONTROL STATEMENT: MAP BASED UPON NORTH AMERICAN DATUM OF 1983 (NAD83), FLORIDA STATE PLANE PROJECTION, EAST ZONE, US SURVEY FEET, FL83-EP UTILIZING EUROPEAN PETROLEUM SURVEY GROUP (EPSG) CODE 6438. USE OF FOUND PLAT CONTROL, STATE RIGHT OF WAY POINTS, NATIONAL GEODETIC SURVEY (NOS) MONUMENTATION AND/OR SECTIONAL BREAKDOWN WERE USED AS PART OF THE MAPPING PROCESS. DISTANCES SHOWN ARE IN U.S. SURVEY FEET AND DECIMAL PARTS THEREOF.
- MEASUREMENTS OF DISTANCE, AREA AND VOLUME WITHIN THE MAP ARE ACCURATE TO WITHIN 3 TIMES THE GROUND SAMPLING DISTANCE. MAP MEASUREMENTS ARE WITHIN 2%± OF GROUND-BASED MEASUREMENTS.
- FEATURES ARE LIMITED TO THOSE VISIBLE AT TIME OF THE PHOTOGRAPHY AND ARE SUBJECT TO FIELD VERIFICATION BY THE END USER. AREAS DESIGNATED AS "OBSCURED" INDICATE THE GROUND IS OBSCURED BY VEGETATION AND/OR SHADOWS. MAPPING WITHIN THESE AREAS MAY NOT MEET STANDARD ACCURACY.
- RELATIVE ACCURACY:
 - GROUND SAMPLING DISTANCE (GSD) RANGE= 0024 FT/PIXEL
 - TOTAL ROOT MEAN SQUARE DEVIATION (RMSE): X:0.020 FT - Y:0.030 FT - Z:0.012 FT
 - TOTAL GROUND CONTROL POINTS (GCP) UTILIZED: 8 WITH A MEAN ROOT MEAN SQUARE ERROR: 0.021 FT
 - CAMERA CALIBRATION/OPTIMIZATION:0.35% VARIATION FROM REFERENCE DATA.
- DENSIFICATION:
 - TOTAL POINTS COLLECTED:1.02 BILLION
 - EXTRACTED TOPOGRAPHY SHOWN BASED ON A POINT CLOUD DENSITY OF:148.63 POINTS/FT³
- THIS MAP MEETS OR EXCEEDS THE AMERICAN SOCIETY FOR PHOTGRAMMETRY AND REMOTE SENSING (ASPRS) ACCURACY STANDARDS FOR DIGITAL GEOSPATIAL DATA.

SURVEYORS NOTES AND REPORT:

- THIS SPECIFIC PURPOSE SURVEY WAS PERFORMED FOR THE PURPOSE OF SUPPORTING A DRAINAGE ANALYSIS WITHIN THE AREA'S ROAD INTERSECTIONS AND ASSOCIATED DRAINAGE STRUCTURES. THE SURVEY MAPS EXISTING FEATURES AND CONDITIONS AS SHOWN AND DEPICTED HEREON. I HEREBY CERTIFY TO THE BEST OF MY KNOWLEDGE AND BELIEF THAT THIS IS A TRUE AND ACCURATE DEPICTION OF A FIELD SURVEY PERFORMED UNDER MY DIRECTION AND COMPLETED ON MARCH 26, 2026. I FURTHER CERTIFY THAT SAID DRAWING IS IN COMPLIANCE WITH THE STANDARDS OF PRACTICE AS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS, IN CHAPTER 5J-17, FLORIDA ADMINISTRATIVE CODE PURSUANT TO SECTION 472.027, FLORIDA STATUTES.
- THIS SURVEY MAP, AND REPRODUCTIONS THEREOF, ARE NOT VALID WITHOUT THE ORIGINAL SIGNATURE AND SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER OR ORIGINAL ELECTRONIC SIGNATURE. THIS SURVEY CANNOT BE TRANSFERRED OR ASSIGNED WITHOUT THE SPECIFIC WRITTEN PERMISSION OF HALEY WARD, INC. IT IS A VIOLATION OF CHAPTER 5J-17 OF THE FLORIDA ADMINISTRATIVE CODE TO ALTER THIS SURVEY WITHOUT THE EXPRESS PRIOR WRITTEN CONSENT OF THE SURVEYOR. ADDITIONS AND/OR DELETIONS MADE TO THE FACE OF THIS SURVEY WILL MAKE THIS SURVEY INVALID.
- THE LAST DATE OF FIELD WORK (AND DATA ACQUISITION) WAS MARCH 5, 2026.
- THIS SPECIFIC PURPOSE SURVEY HAS BEEN REFERENCED TO THE FLORIDA STATE PLANE COORDINATE SYSTEM-EAST ZONE, NAD 83 (2011 ADJUSTMENT).
- REVISIONS SHOWN HEREON DO NOT REPRESENT A "FIELD SURVEY UPDATE" UNLESS OTHERWISE NOTED.
- ELEVATIONS SHOWN HEREON ARE RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND ARE BASED ON THE FOLLOWING BREVARD COUNTY BENCHMARK:
 - BC PID: K8A06 ELEVATION: 9.83'
- THIS SITE WAS SURVEYED UTILIZING TRIMBLE/SPECTRA HARDWARE TOGETHER WITH TRIMBLE ACCESS AND WAS BASED ON TRIMBLE'S "VRS NOW" NETWORK AND/OR THE FLORIDA PERMANENT REFERENCE NETWORK (FPRN). THE PROCEDURES AND NETWORK DESIGN MEETS THE GEODETIC ACCURACY STANDARDS AND SPECIFICATIONS FOR USING GPS RELATED POSITIONING AS SET FORTH BY THE FEDERAL GEODETIC CONTROL COMMITTEE IN THE MOST CURRENT PUBLICATION FOR 3RD ORDER CLASS ONE FOR HORIZONTAL CONTROL SURVEYS, WITH A PRECISION OF ±0.05 FEET.
- THE SURVEY MAP SHOWN HEREON DOES NOT NECESSARILY CONTAIN ALL OF THE INFORMATION OBTAINED OR DEVELOPED BY THE UNDERSIGNED SURVEYOR IN HIS FIELD WORK, OFFICE WORK, OR RESEARCH.
- ELEVATIONS AND CONTOURS SHOWN HEREON ARE BASED ON LIDAR AND PHOTOGRAMMETRY DATA. PLEASE REFER TO THE FLIGHT NOTES AND ACCURACY REPORTS ON THIS PAGE FOR ADDITIONAL INFORMATION REGARDING DATA SOURCES AND ACCURACY.
- ROADWAY INTERSECTION DETAILS SHOWN HEREON IS LIMITED TO THE EDGE OF PAVEMENT, APPLICABLE ROADWAY CURBING, AND ASSOCIATED DRAINAGE STRUCTURES ONLY, AND DOES NOT DEPICT SIDEWALKS OR OTHER SITE FEATURES.
- DRAINAGE STRUCTURE DATA SHOWN HEREON IS BASED ON VISIBLE FIELD OBSERVATIONS AT THE TIME OF SURVEY. IN SOME INSTANCES, STANDING WATER, SEDIMENT, DEBRIS, AND RECESSED PIPE CONNECTIONS LIMITED THE ABILITY TO ACCURATELY DETERMINE PIPE SIZES, MATERIALS, AND INVERT ELEVATIONS. ACCORDINGLY, PIPE INFORMATION SHOWN IS APPROXIMATE AND SOME DATA DEPICTED MAY BE INACCURATE. CLEANING OF STRUCTURES AND ADDITIONAL INVESTIGATION MAY BE REQUIRED TO VERIFY PIPE CHARACTERISTICS AND INVERTS.
- THE INTRACOASTAL MEAN HIGH WATER (MHW) ELEVATION AT THIS LOCATION IS APPROXIMATELY 0.70 FEET (NAVD 88). THIS VALUE IS DERIVED FROM TIDE INTERPOLATION POINTS 2746 LOCATED 14± MILES SOUTH OF THE OUTFALL IN BREVARD COUNTY WITH A PUBLISHED MHW ELEVATION OF 0.71 FEET AND TIDE INTERPOLATION POINTS 4048 LOCATED 96± MILES NORTH IN VOLUSIA COUNTY WITH A PUBLISHED MHW ELEVATION OF 0.60 FEET.

SYMBOL & ABBREVIATION LEGEND:

- ELEV ELEVATION
- INV INVERT
- UNK UNKNOWN
- RCP REINFORCED CONCRETE PIPE
- HDPE HIGH DENSITY POLYETHYLENE
- CMP CORRUGATED METAL PIPE
- DRAINAGE PIPE
- ⊙ DRAINAGE MANHOLE
- ▣ CATCH BASIN
- ⊕ BENCHMARK

SCALE: 1"=250'

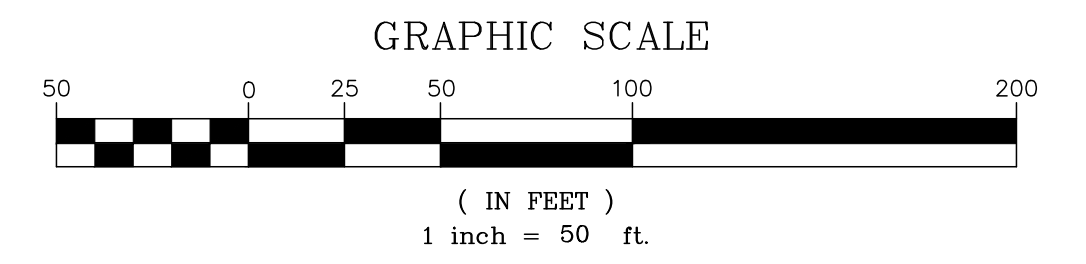
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<p>LAND PLANNING INTERIOR DESIGN F.B.E. AUTHORIZATION NO. 32664 L.B. AUTHORIZATION NO. 8267 930 S. Harbor City Blvd, Suite 506 Melbourne, FL 32901 321.280.9969</p>				
PROJECT BASIN 10 MELBOURNE BEACH, FLORIDA				
TITLE SPECIFIC PURPOSE SURVEY				
DATE		SCALE		
02.27.2026		AS SHOWN		
DRAWN BY	FIELD CREW	CHECKED BY		
ABB	JR	MTO		
PROJECT No. 25-790				
SHEET No. 1 OF 11				

MICHAEL T. OWEN PROFESSIONAL SURVEYOR AND MAPPER
FLORIDA REGISTRATION #5556

SIGNATURE DATE:


SPECIFIC PURPOSE SURVEY

MELBOURNE BEACH BASIN 10 BREVARD COUNTY, FLORIDA



MATCHLINE SHEET 3

MATCHLINE SHEET 4

REV.	DATE	DESCRIPTION	BY	CHK.
 HALEY WARD ENGINEERING ENVIRONMENTAL SURVEYING LAND PLANNING INTERIOR DESIGN F.B.E. AUTHORIZATION NO. 32664 L.B. AUTHORIZATION NO. 8267 930 S. Harbor City Blvd, Suite 506 Melbourne, FL 32901 321.280.9969 WWW.HALEYWARD.COM				

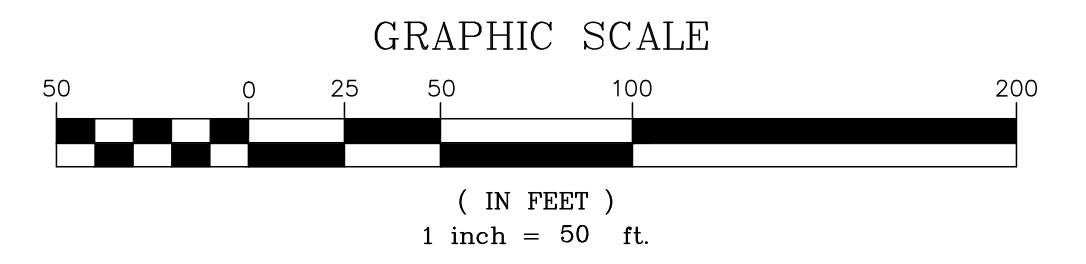
PROJECT
BASIN 10
MELBOURNE BEACH, FLORIDA

TITLE
SPECIFIC PURPOSE SURVEY


DATE	02.27.2026	SCALE	AS SHOWN
DRAWN BY	ABB	FIELD CREW	JR
CHECKED BY			MTO
PROJECT No.	25-790		
SHEET No.	2 OF 11		

SPECIFIC PURPOSE SURVEY

MELBOURNE BEACH BASIN 10 BREVARD COUNTY, FLORIDA

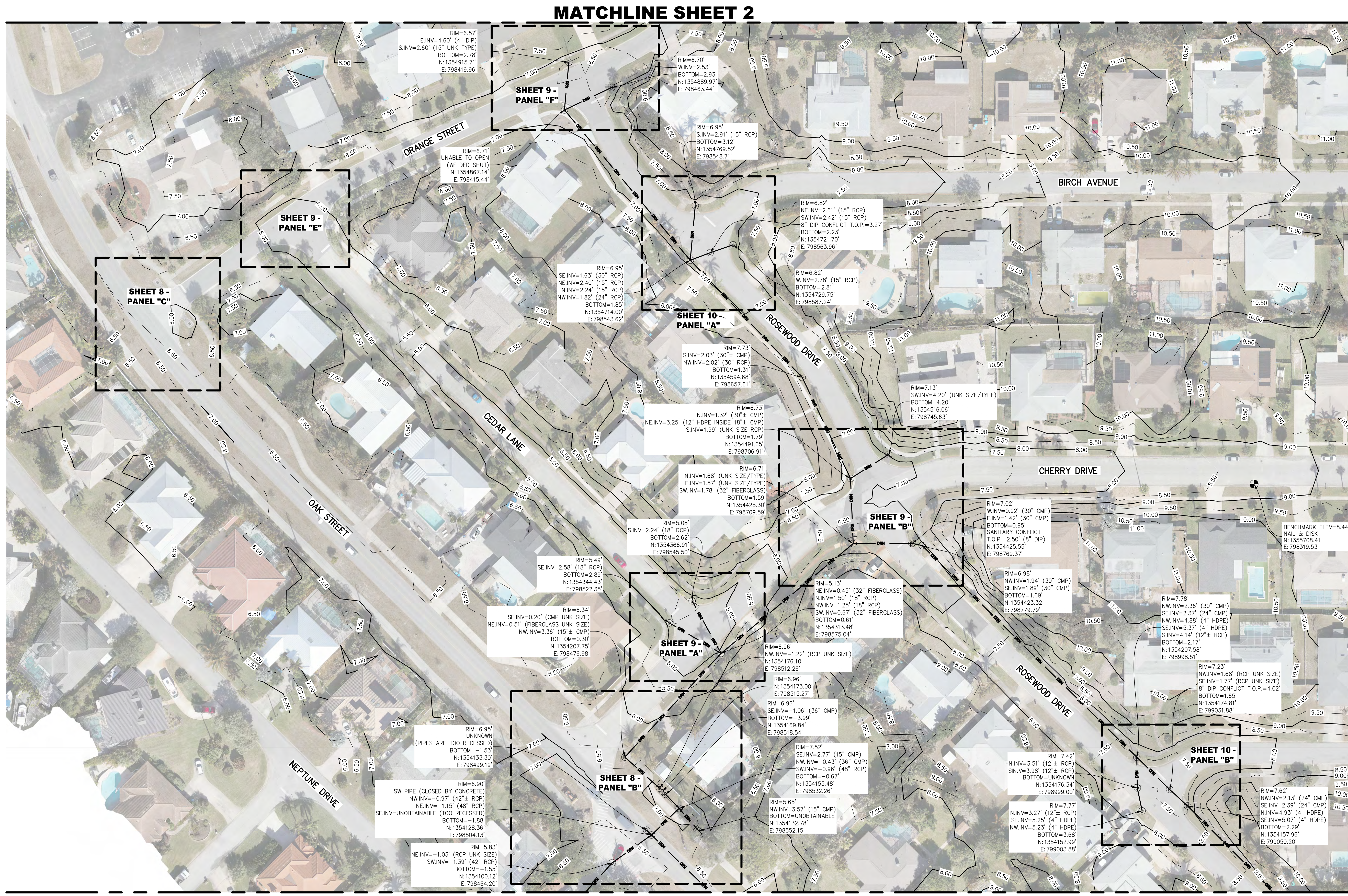
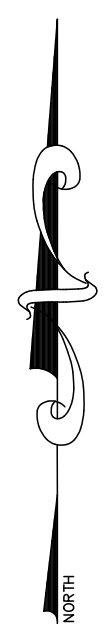
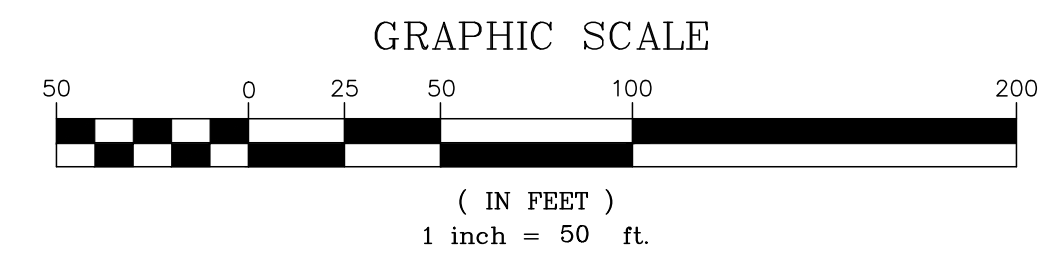


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REV.	DATE	DESCRIPTION	BY	CHK.
 HALEY WARD ENGINEERING ENVIRONMENTAL SURVEYING LAND PLANNING INTERIOR DESIGN F.B.P.E. AUTHORIZATION NO. 32664 L.B. AUTHORIZATION NO. 8267 930 S. Harbor City Blvd, Suite 506 Melbourne, FL 32901 321.280.9969 WWW.HALEYWARD.COM				
PROJECT BASIN 10 MELBOURNE BEACH, FLORIDA				
TITLE SPECIFIC PURPOSE SURVEY				
DATE		SCALE		
02.27.2026		AS SHOWN		
DRAWN BY	FIELD CREW	CHECKED BY		
ABB	JR	MTO		
PROJECT No. 25-790				
SHEET No. 3 OF 11				

SPECIFIC PURPOSE SURVEY

MELBOURNE BEACH BASIN 10 BREVARD COUNTY, FLORIDA



MATCHLINE SHEET 5

MATCHLINE SHEET 2

MATCHLINE SHEET 6

REV.	DATE	DESCRIPTION	BY	CHK.

HALEY WARD
ENGINEERING | ENVIRONMENTAL | SURVEYING
LAND PLANNING | INTERIOR DESIGN
F.B.E. AUTHORIZATION NO. 32664
L.B. AUTHORIZATION NO. 8267
930 S. Harbor City Blvd, Suite 506
Melbourne, FL 32901
321.280.9969

PROJECT
BASIN 10
MELBOURNE BEACH, FLORIDA

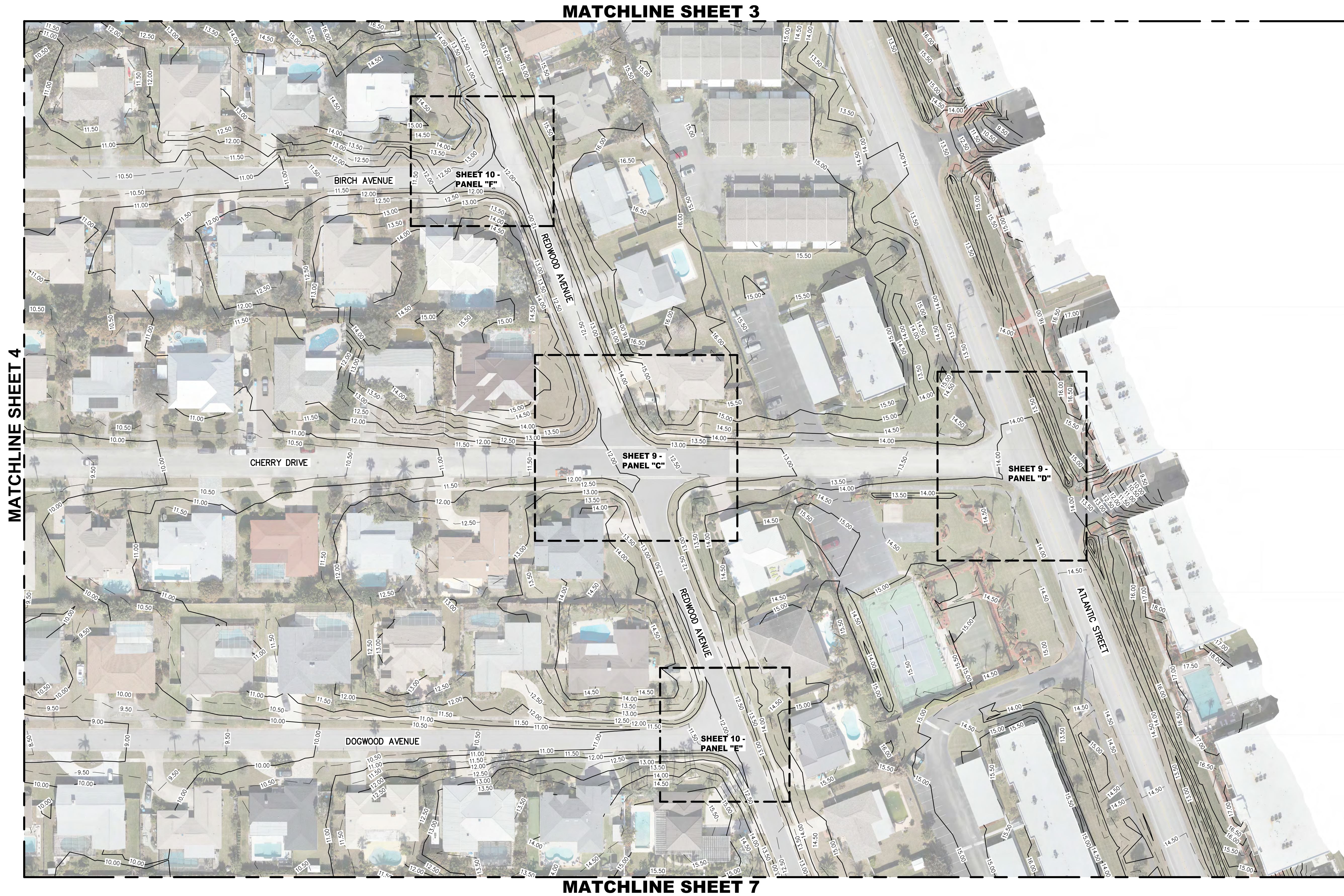
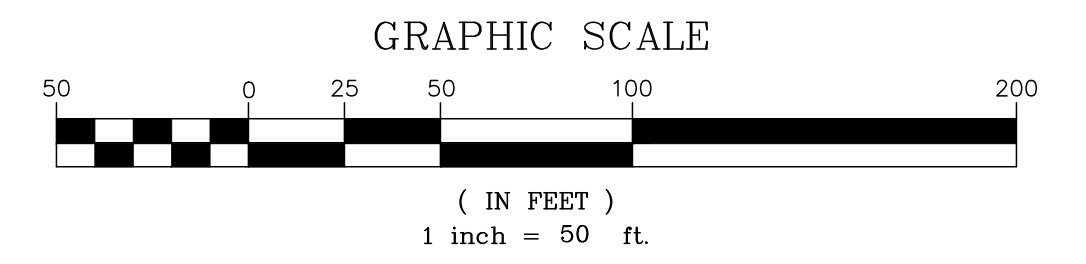
TITLE
SPECIFIC PURPOSE SURVEY

DATE	02.27.2026	SCALE	AS SHOWN
DRAWN BY	ABB	FIELD CREW	JR
CHECKED BY			MTO
PROJECT No.	25-790		
SHEET No.	4 OF 11		


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SPECIFIC PURPOSE SURVEY

MELBOURNE BEACH
 BASIN 10
 BREVARD COUNTY, FLORIDA

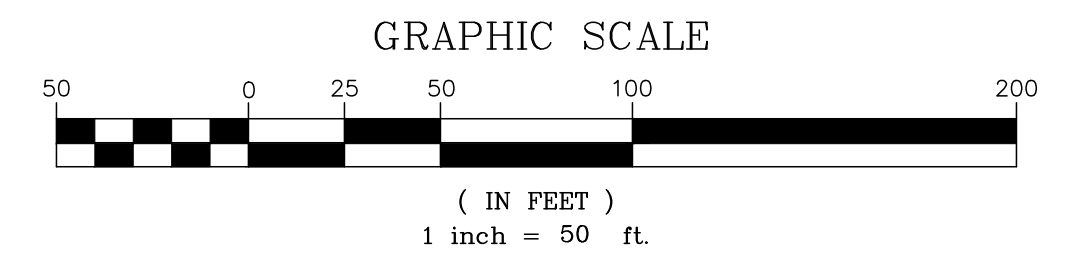


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PROJECT BASIN 10 MELBOURNE BEACH, FLORIDA				
TITLE SPECIFIC PURPOSE SURVEY				
DATE		02.27.2026	SCALE	
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FIELD CREW		JR	CHECKED BY	
PROJECT No.		25-790		
SHEET No.		5 OF 11		

SPECIFIC PURPOSE SURVEY

MELBOURNE BEACH
BASIN 10
BREVARD COUNTY, FLORIDA



MATCHLINE SHEET 5



MATCHLINE SHEET 6

FILE LOCATION: Z:\EDC\2025\25-790 - MELBOURNE BEACH - BASIN 10 DRAINAGE ANALYSIS\SURVEY\DWG - 25-790-01.DWG, 2025.03.28, 4:58 PM

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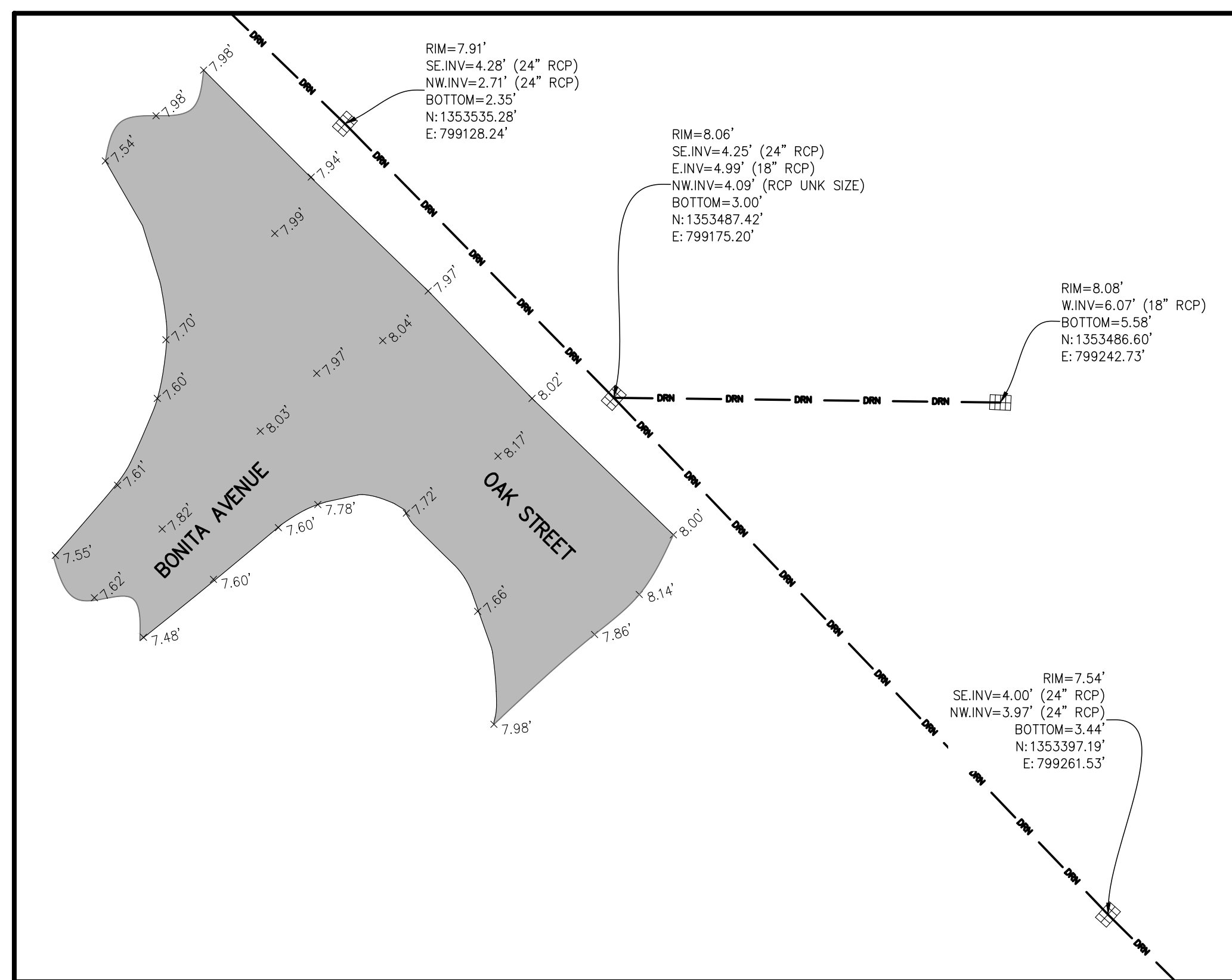
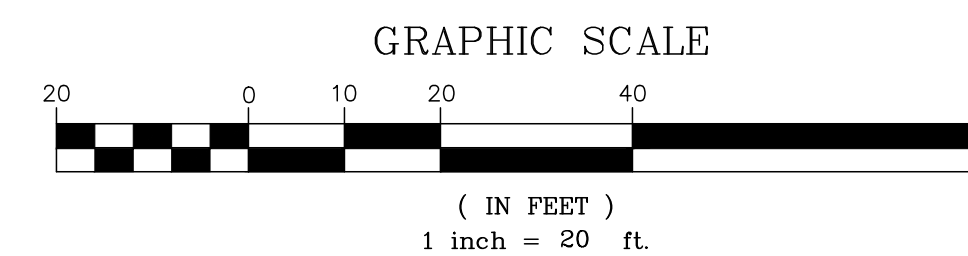
PROJECT
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MELBOURNE BEACH, FLORIDA

TITLE
SPECIFIC PURPOSE SURVEY

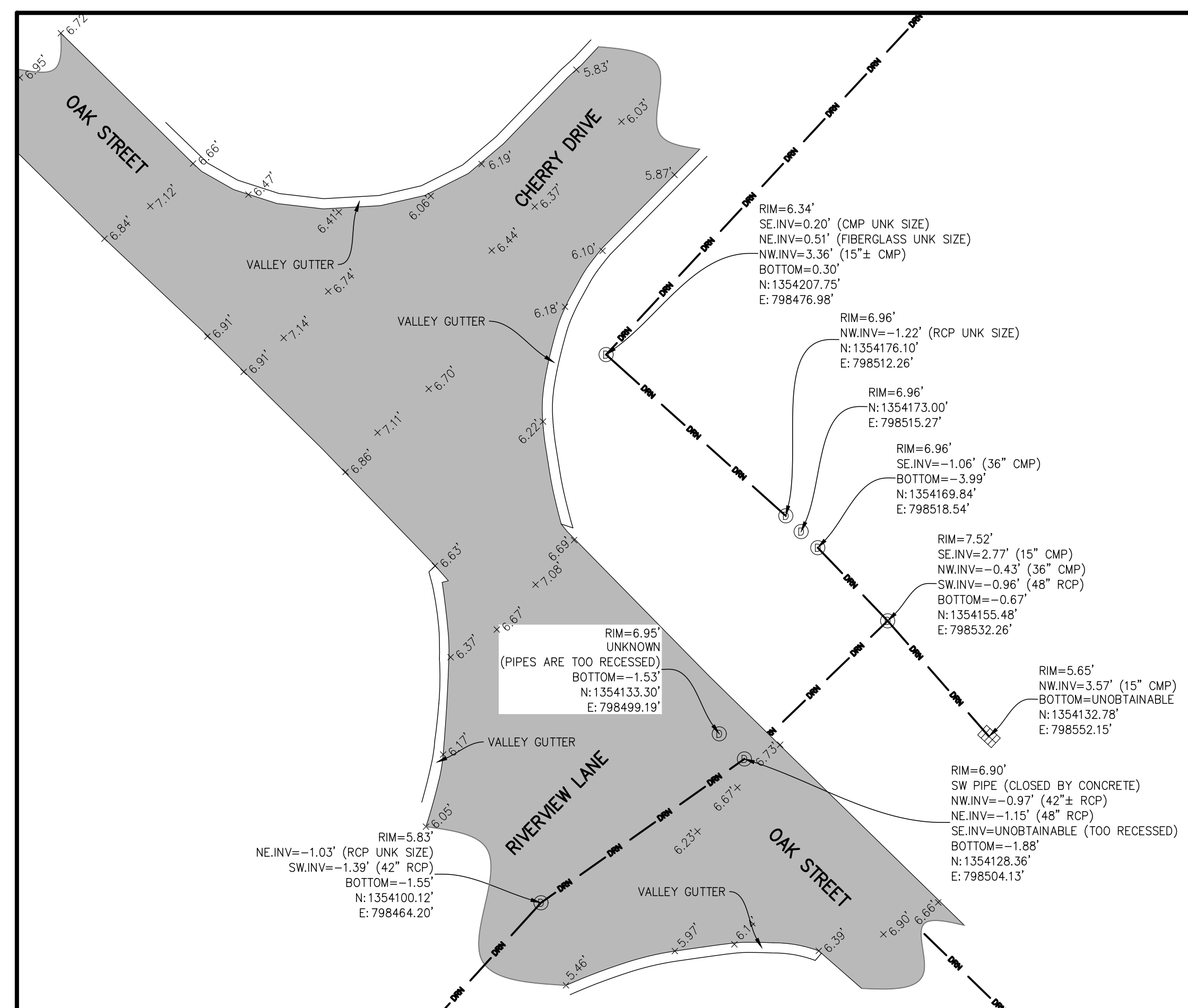
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SHEET No.	7 OF 11		

SPECIFIC PURPOSE SURVEY

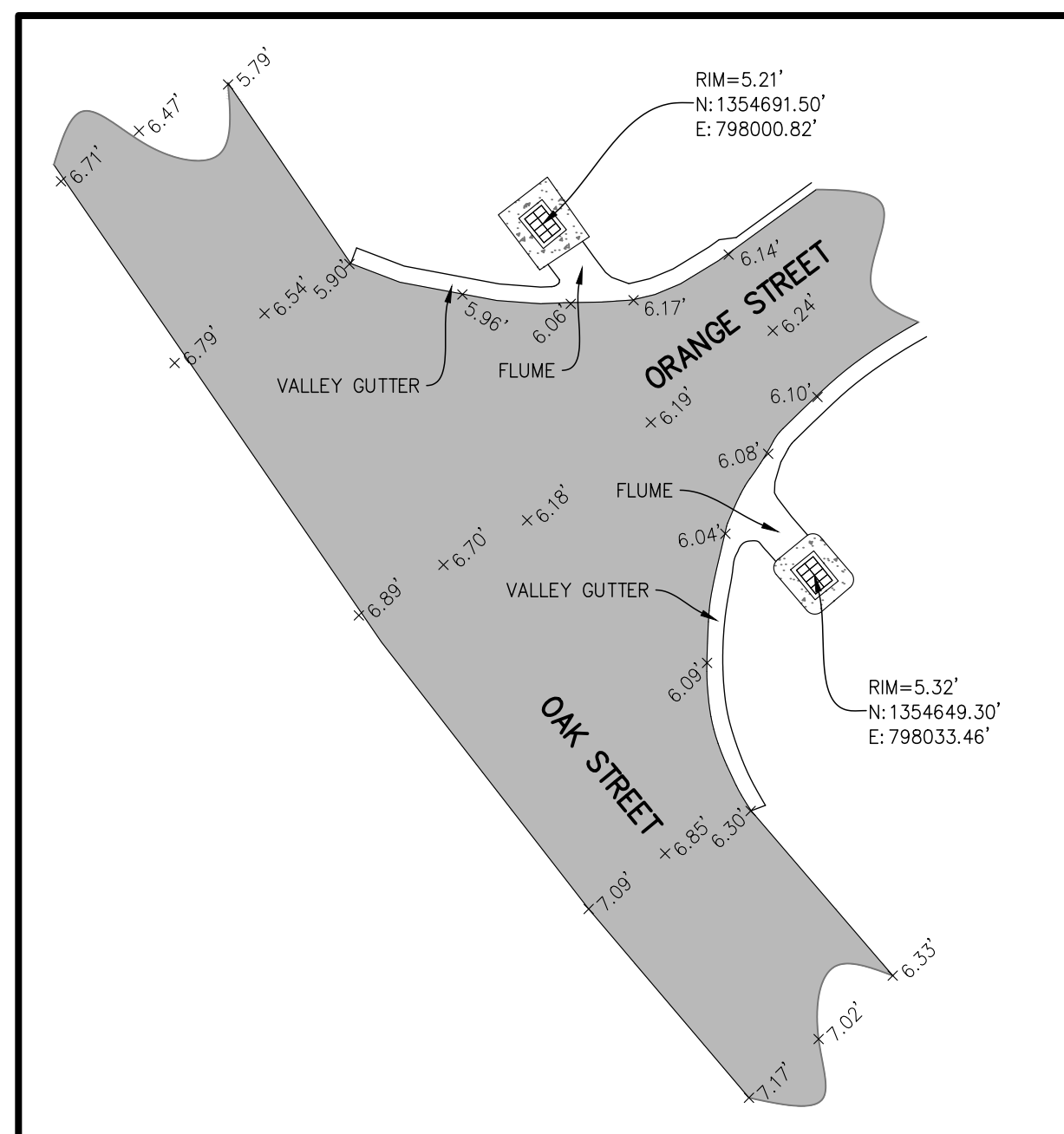
MELBOURNE BEACH BASIN 10 BREVARD COUNTY, FLORIDA



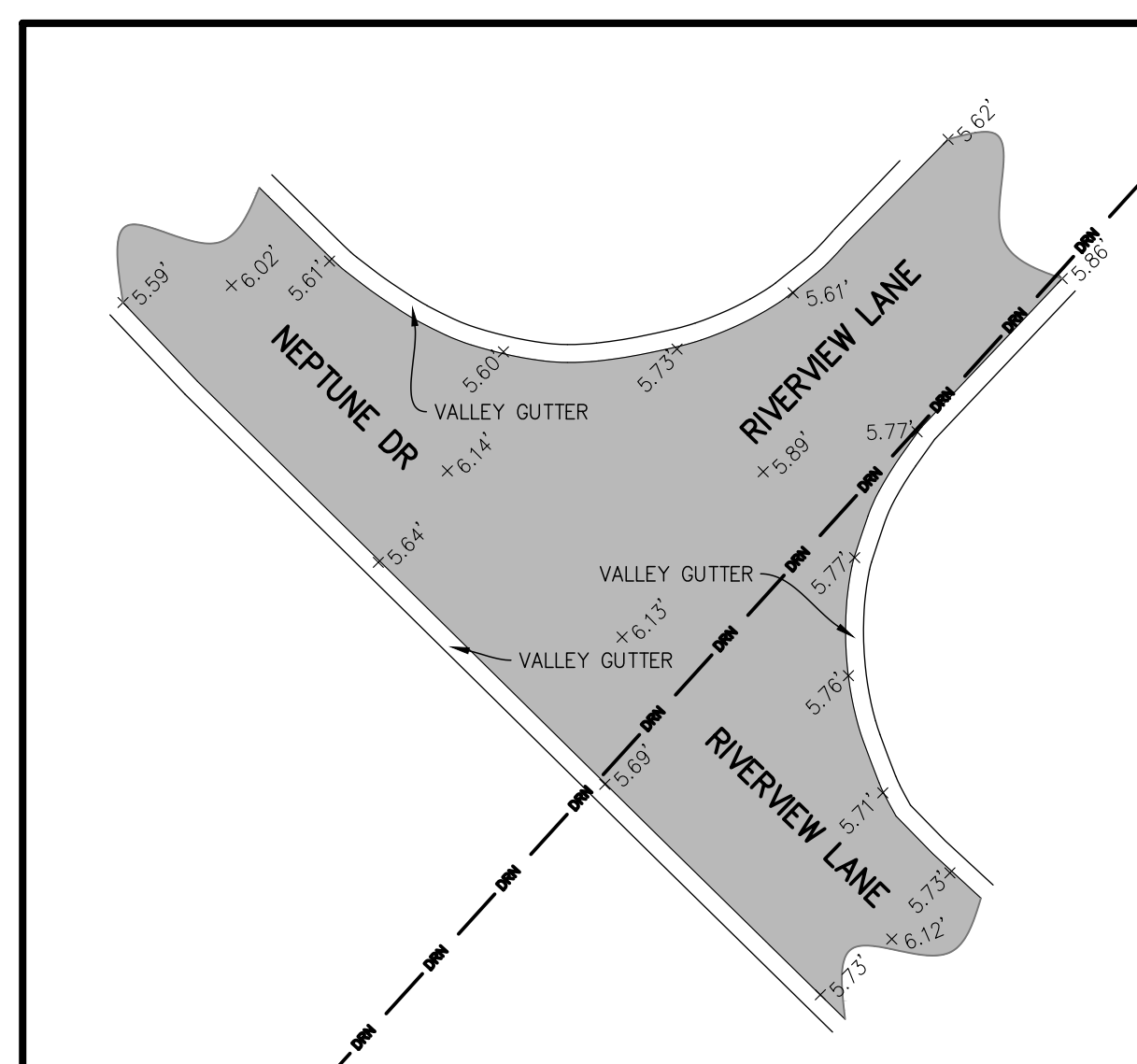
SHEET 8 - PANEL "A"



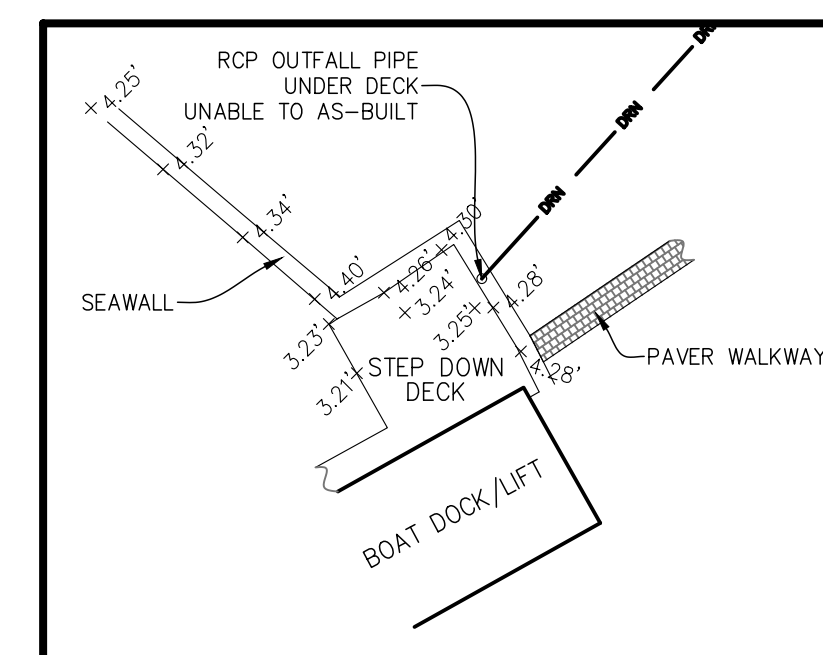
SHEET 8 - PANEL "B"



SHEET 8 - PANEL "C"



SHEET 8 - PANEL "D"



SHEET 8 - PANEL "E"

REV.	DATE	DESCRIPTION	BY	CHK.
<p>HALEY WARD ENGINEERING ENVIRONMENTAL SURVEYING LAND PLANNING INTERIOR DESIGN F.B.E. AUTHORIZATION NO. 32664 L.B. AUTHORIZATION NO. 8267 930 S. Harbor City Blvd, Suite 506 Melbourne, FL 32901 321.280.9969</p>				

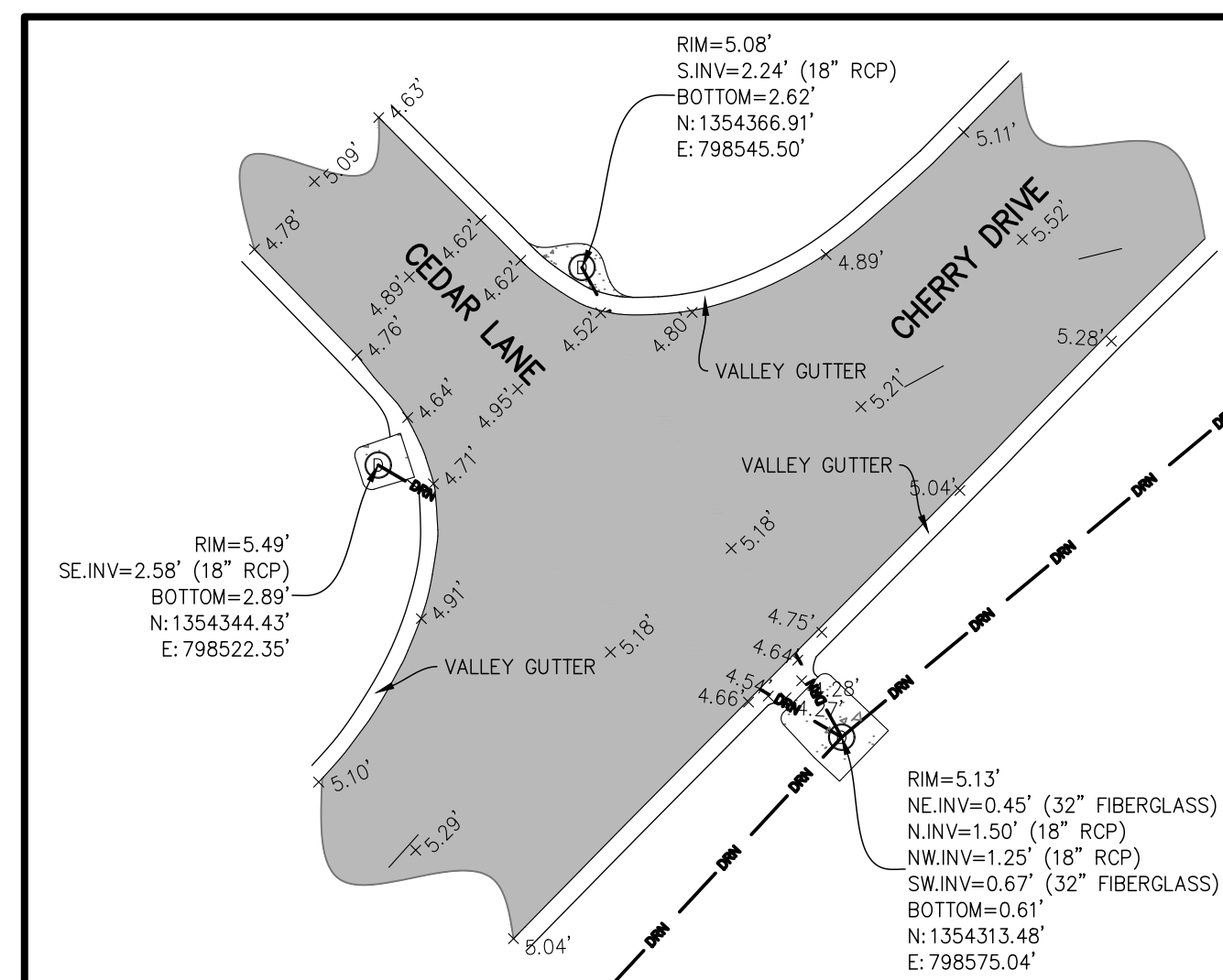
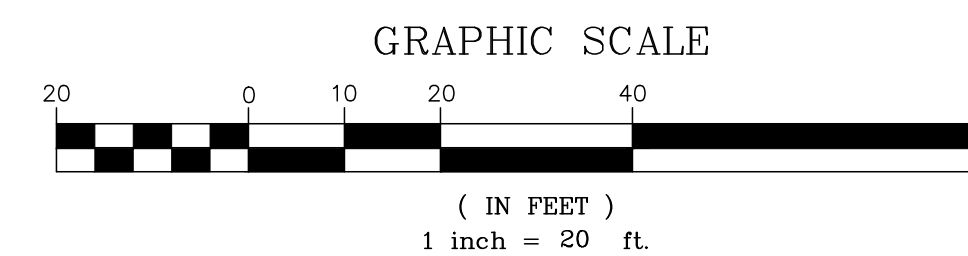
PROJECT
BASIN 10
MELBOURNE BEACH, FLORIDA

TITLE
SPECIFIC PURPOSE SURVEY

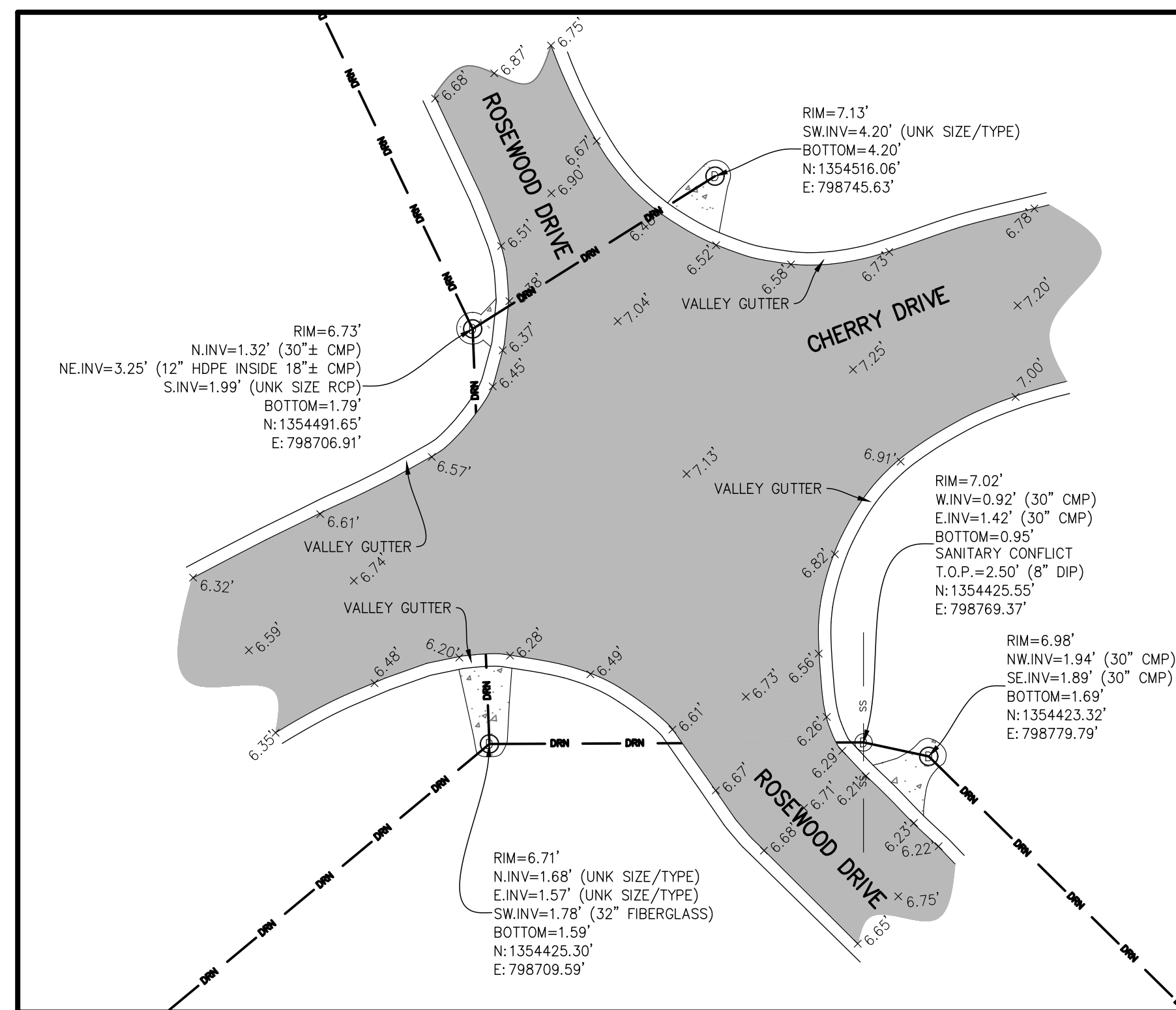
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02.27.2026	AS SHOWN	
DRAWN BY ABB	FIELD CREW JR	CHECKED BY MTO
PROJECT No. 25-790		
8 OF 11		

SPECIFIC PURPOSE SURVEY

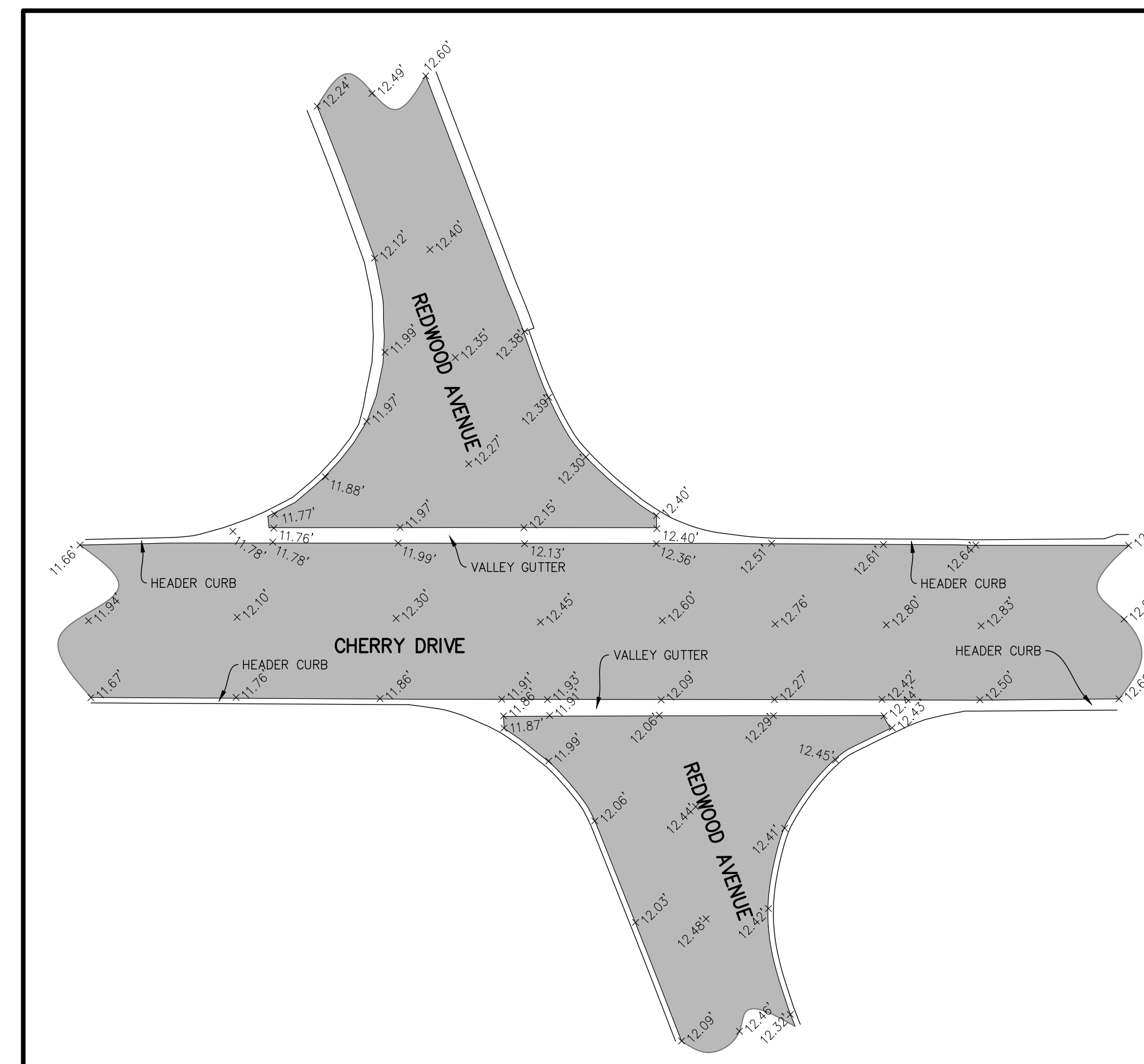
MELBOURNE BEACH BASIN 10 BREVARD COUNTY, FLORIDA



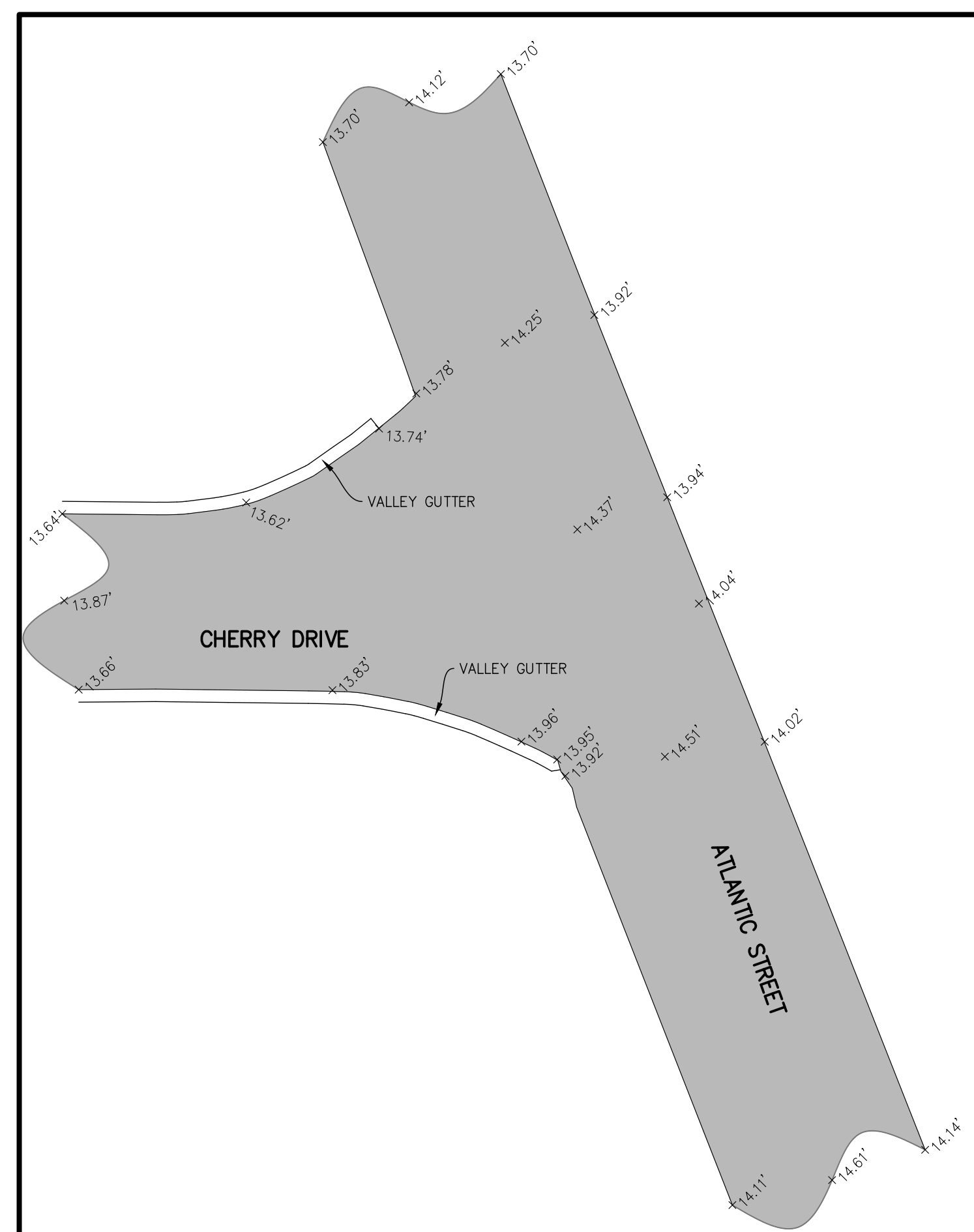
SHEET 9 - PANEL "A"



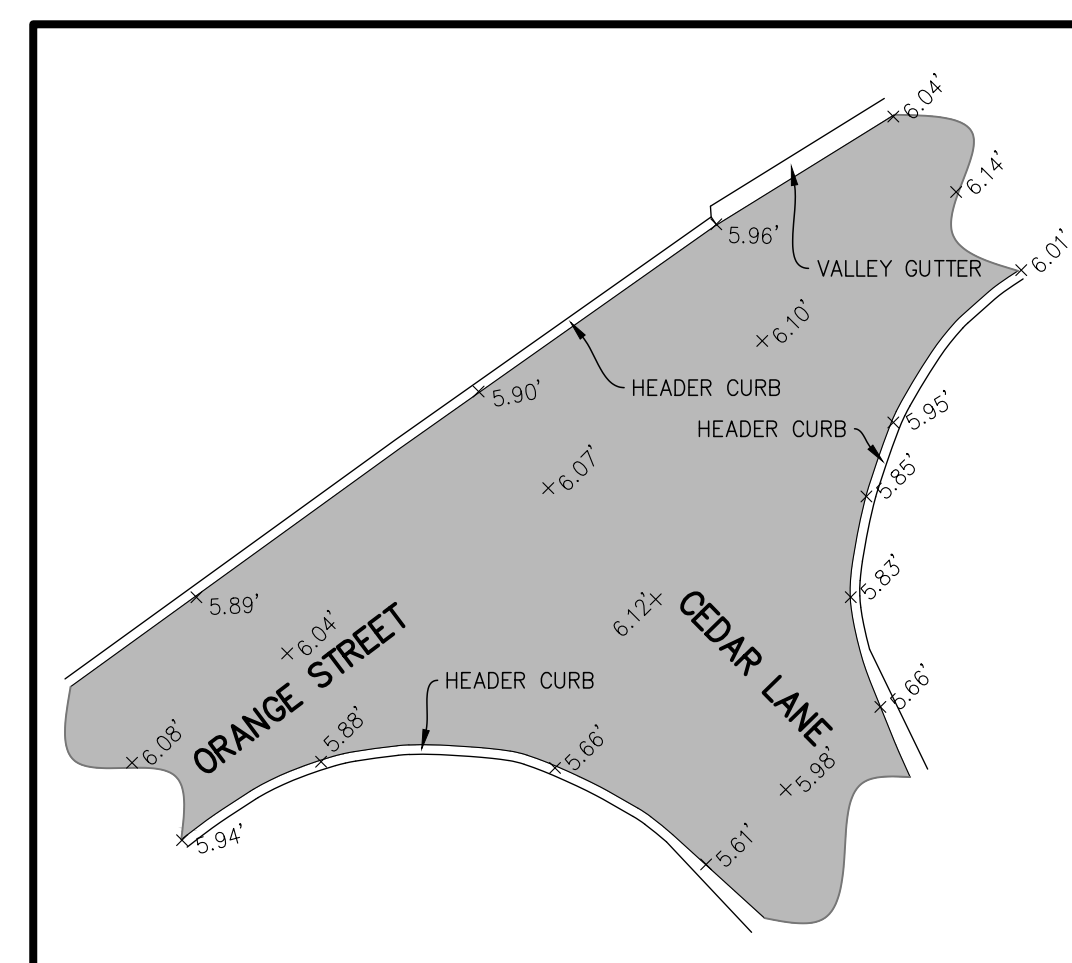
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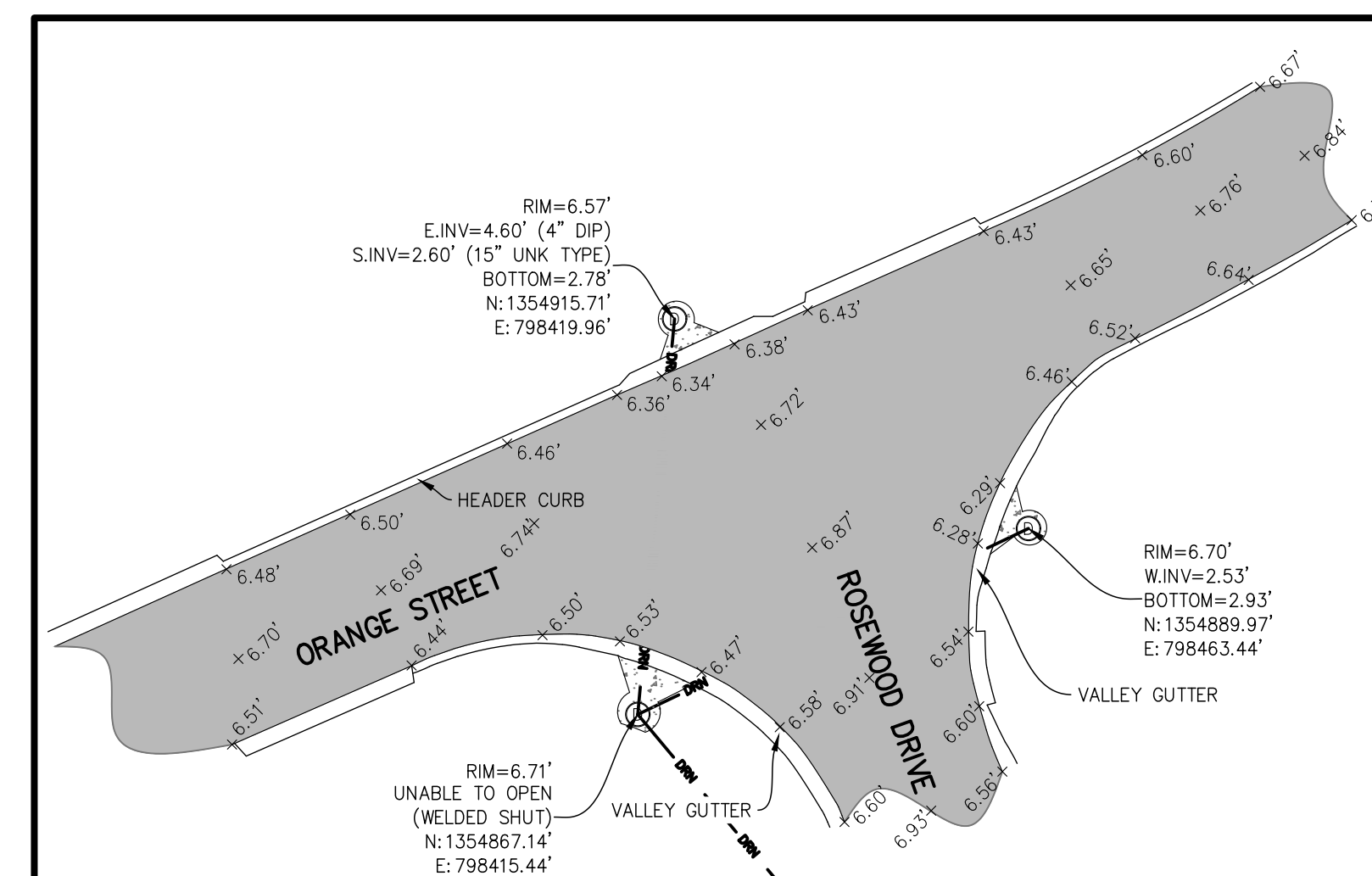
SHEET 9 - PANEL "C"



SHEET 9 - PANEL "D"



SHEET 9 - PANEL "E"



SHEET 9 - PANEL "F"

REV	DATE	DESCRIPTION	BY	CHK.
 HALEY WARD ENGINEERING ENVIRONMENTAL SURVEYING LAND PLANNING INTERIOR DESIGN F.B.P.E. AUTHORIZATION NO. 32664 L.B. AUTHORIZATION NO. 8267 930 S. Harbor City Blvd, Suite 506 Melbourne, FL 32901 321.280.9969 WWW.HALEYWARD.COM				

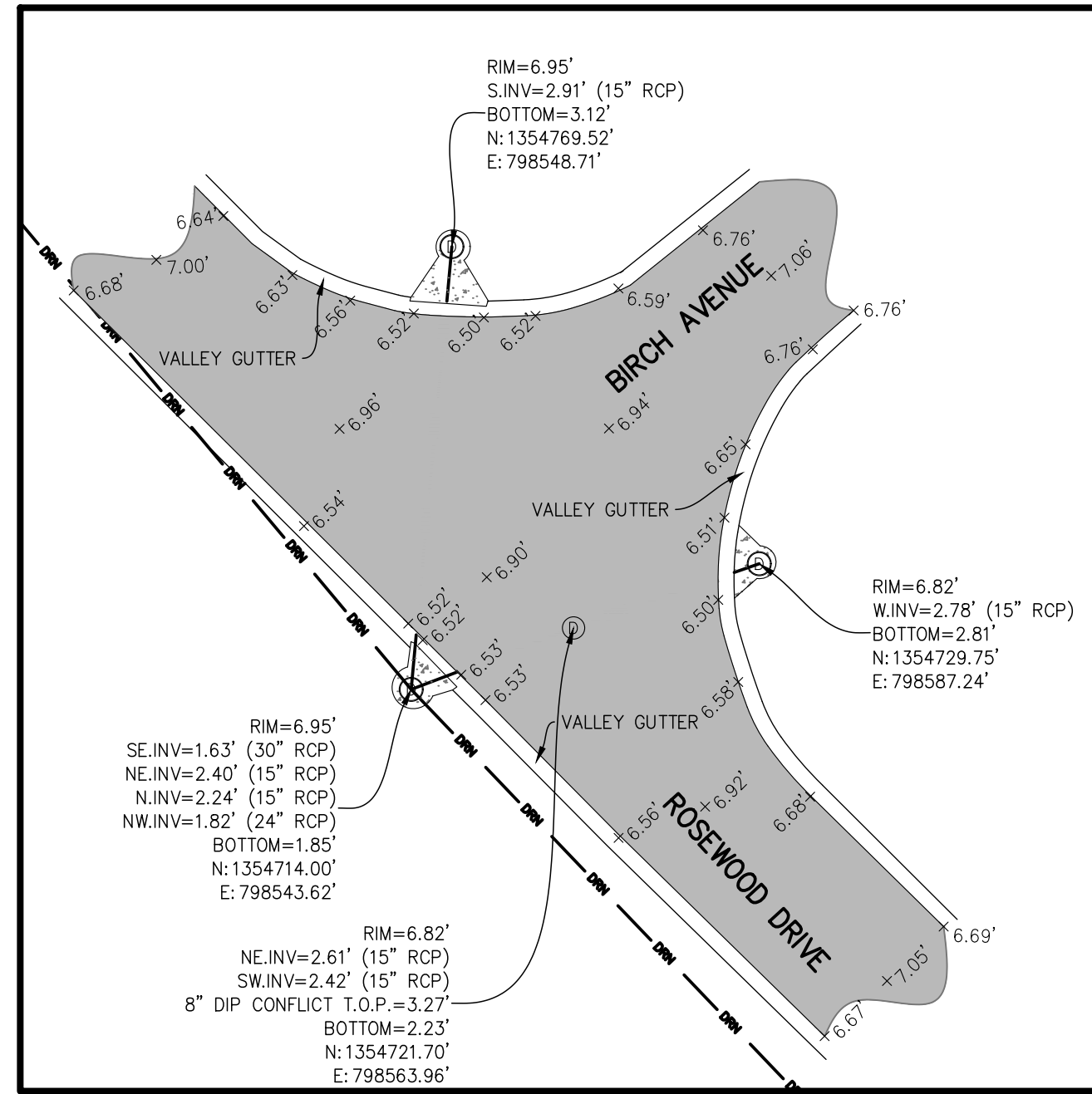
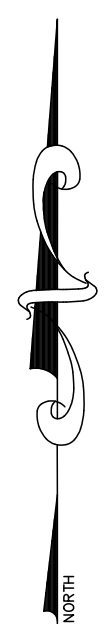
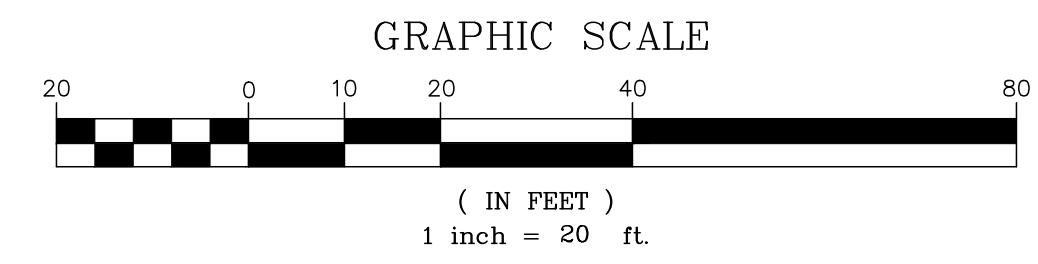
PROJECT
BASIN 10
MELBOURNE BEACH, FLORIDA

TITLE
SPECIFIC PURPOSE SURVEY

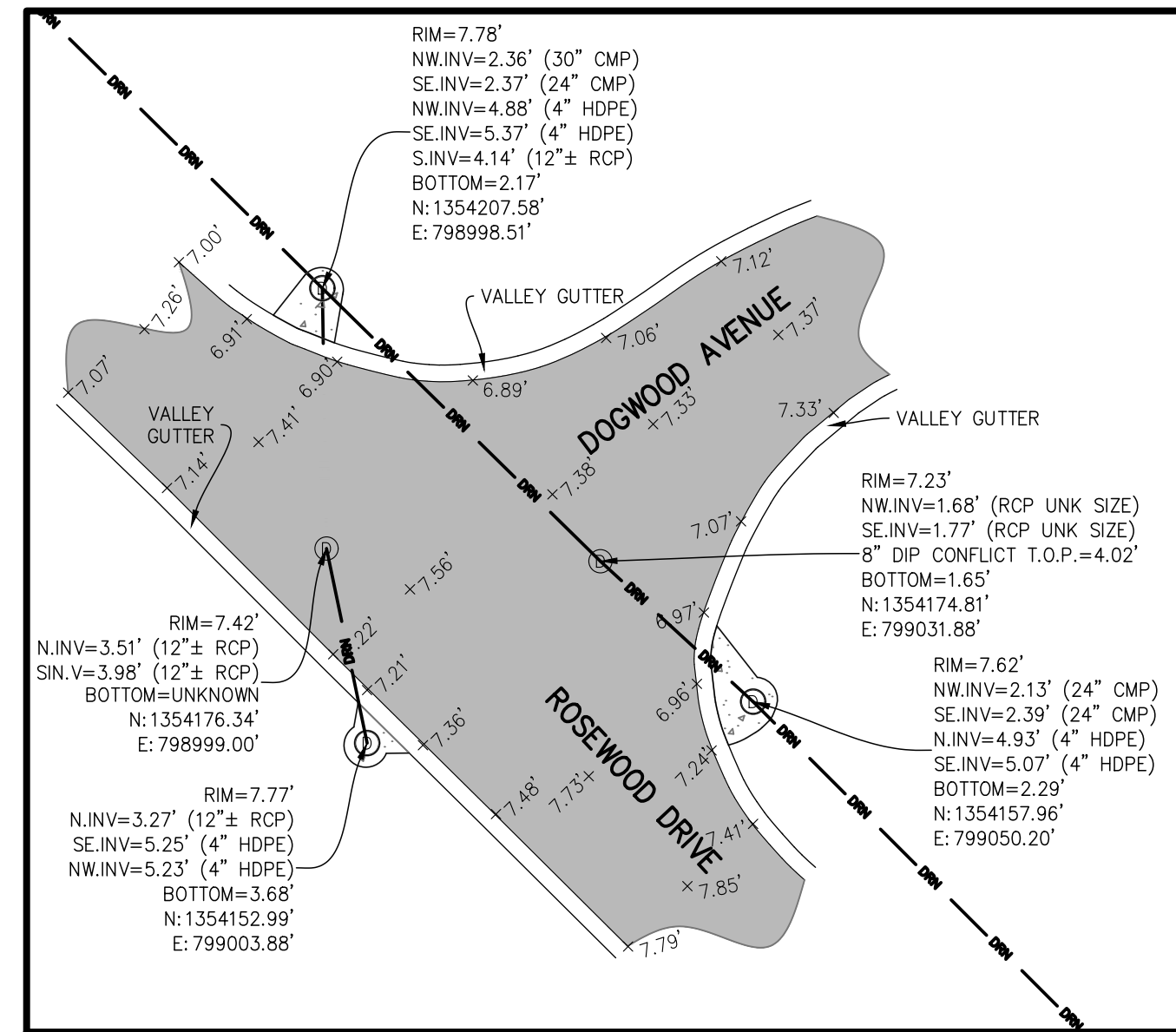
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CHECKED BY	MTO		
PROJECT No.	25-790		
SHEET No.	9 OF 11		

SPECIFIC PURPOSE SURVEY

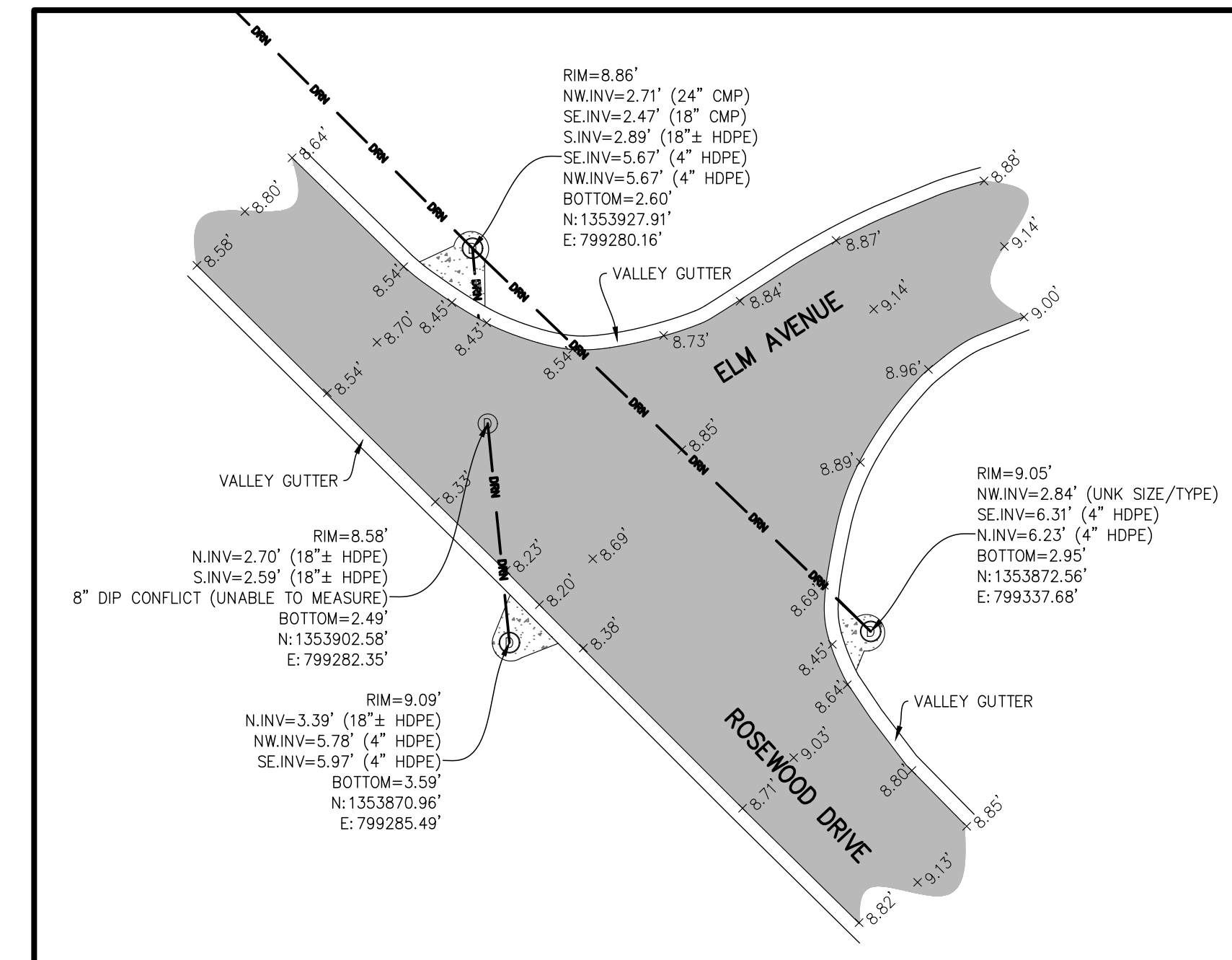
MELBOURNE BEACH BASIN 10 BREVARD COUNTY, FLORIDA



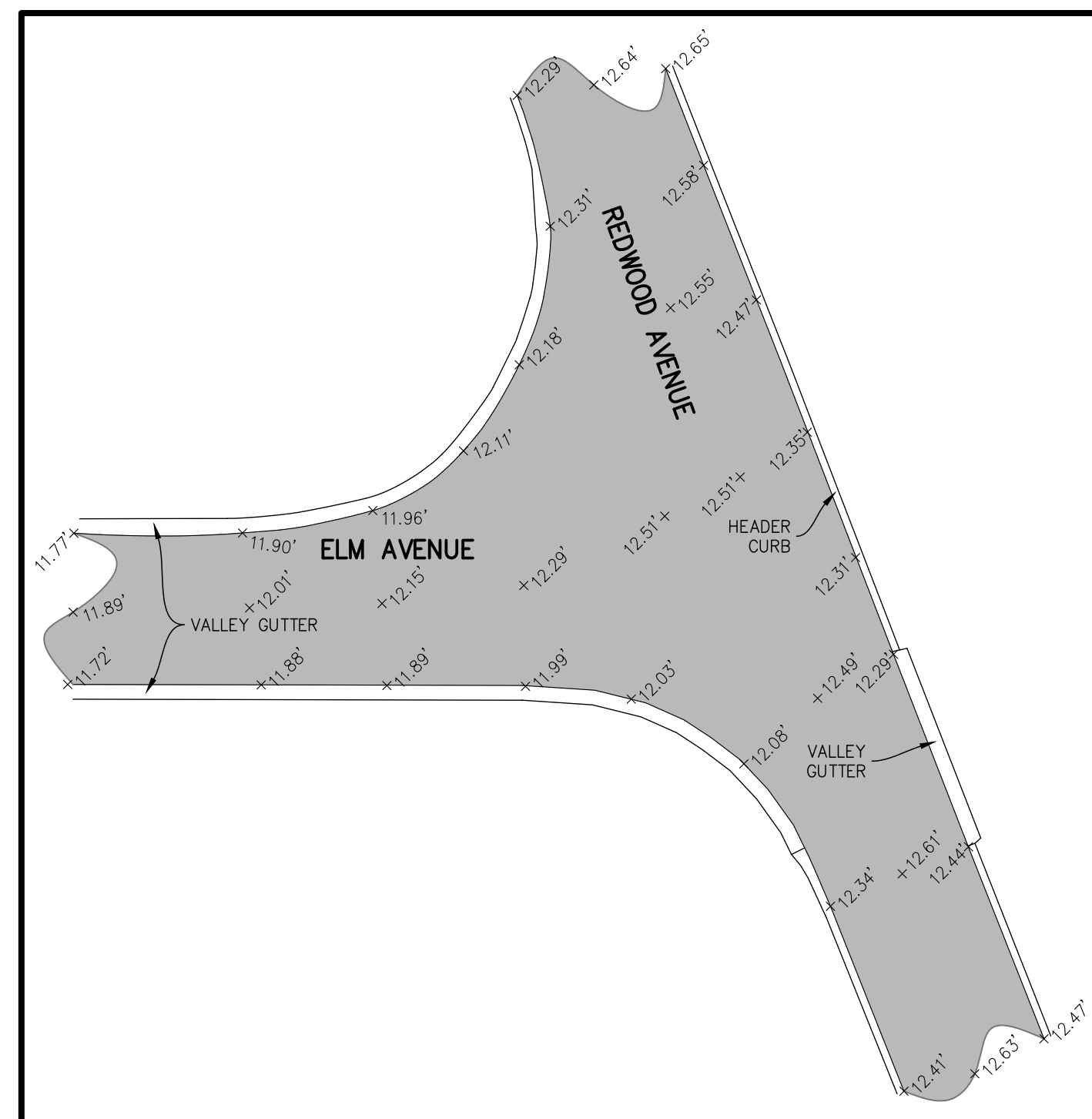
SHEET 10 - PANEL "A"



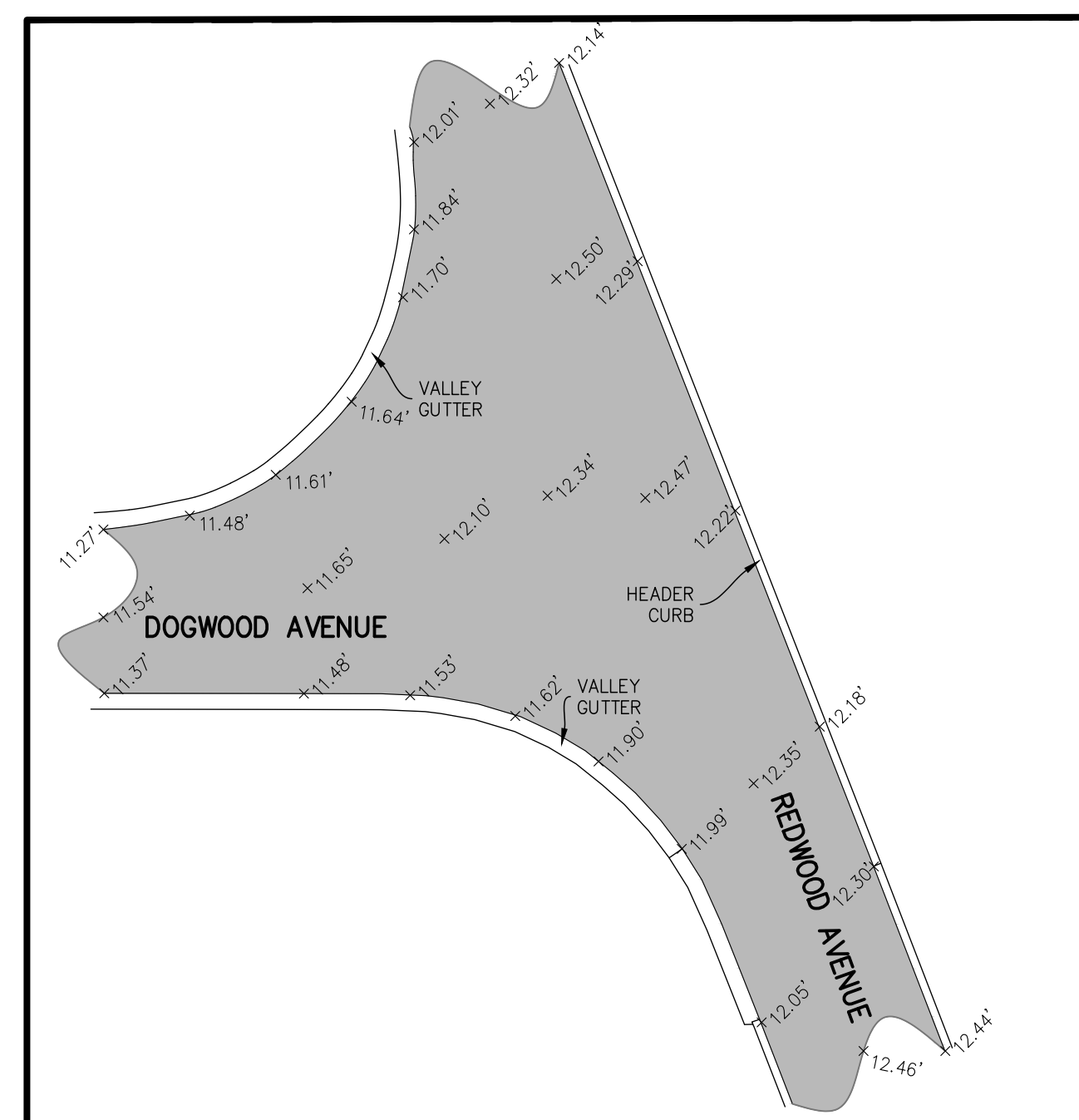
SHEET 10 - PANEL "B"



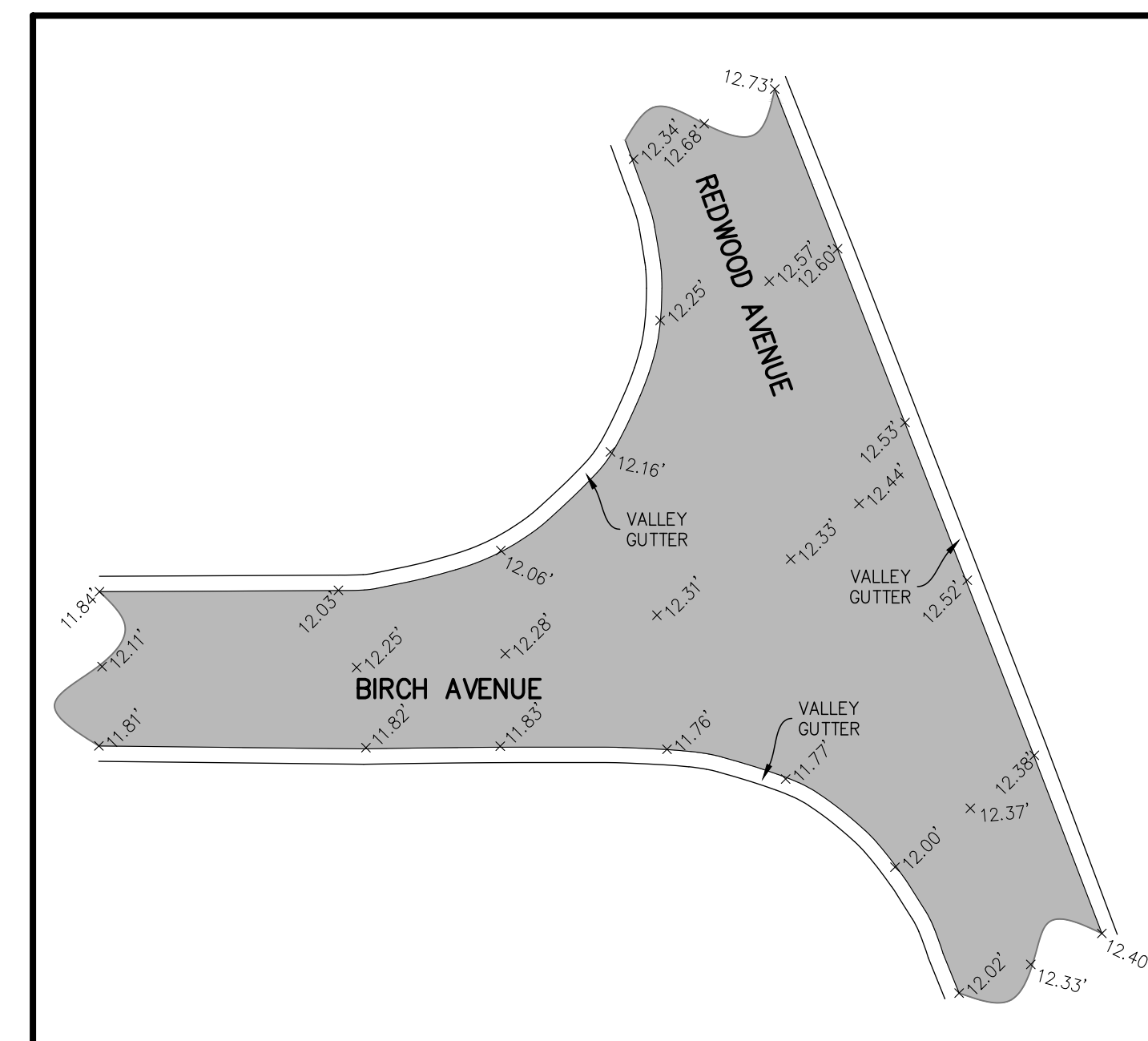
SHEET 10 - PANEL "C"



SHEET 10 - PANEL "D"



SHEET 10 - PANEL "E"



SHEET 10 - PANEL "F"

REV.	DATE	DESCRIPTION	BY	CHK.
 HALEY WARD ENGINEERING ENVIRONMENTAL SURVEYING LAND PLANNING INTERIOR DESIGN F.B.E. AUTHORIZATION NO. 32664 L.B. AUTHORIZATION NO. 8267 930 S. Harbor City Blvd, Suite 506 Melbourne, FL 32901 321.280.9969 WWW.HALEYWARD.COM				

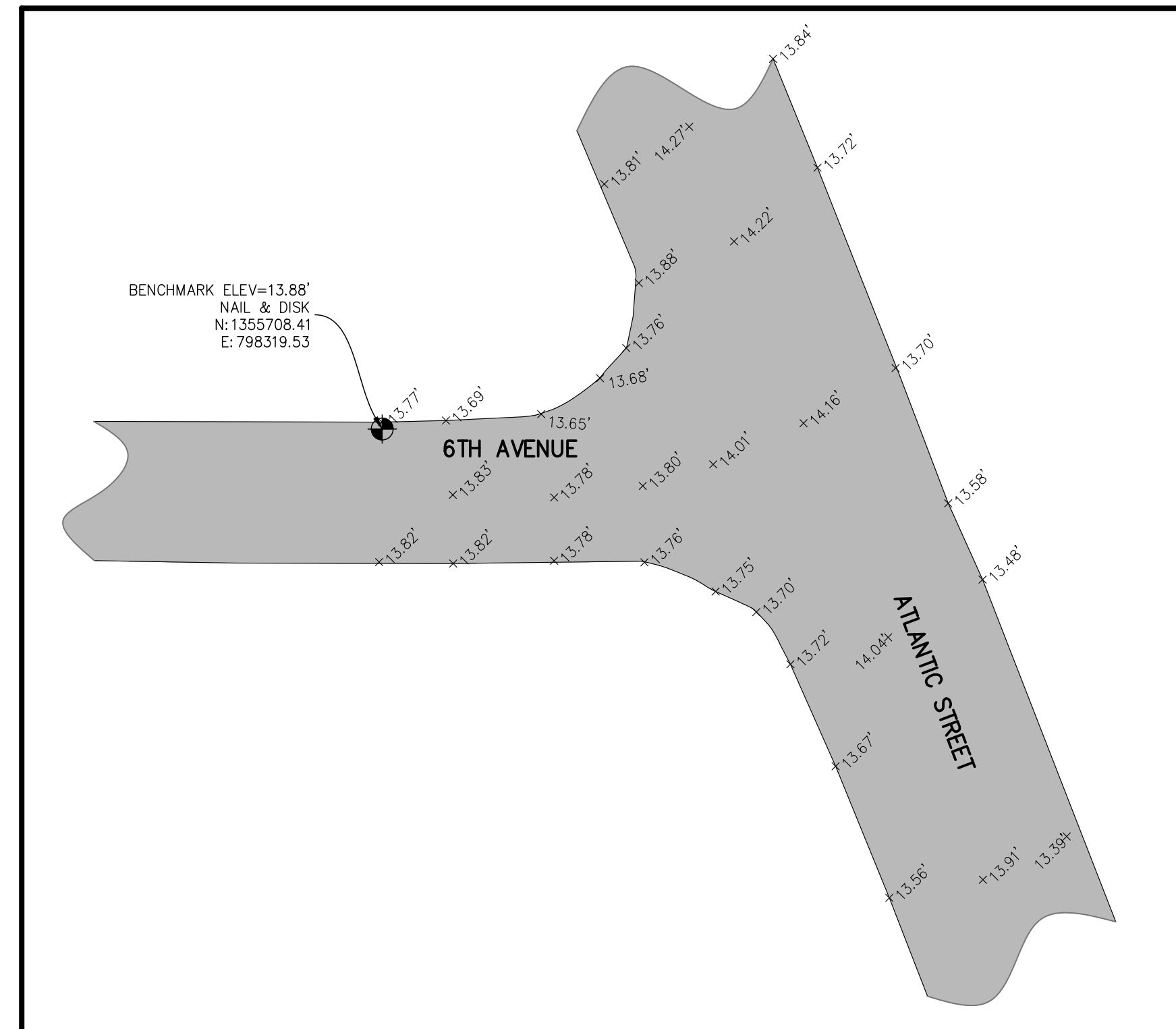
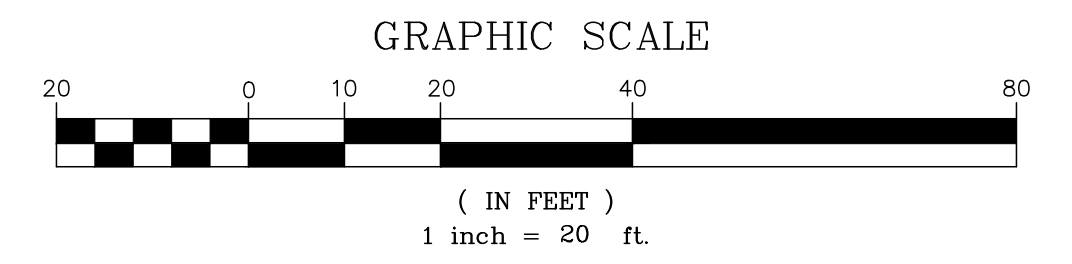
PROJECT
BASIN 10
MELBOURNE BEACH, FLORIDA

TITLE
SPECIFIC PURPOSE SURVEY

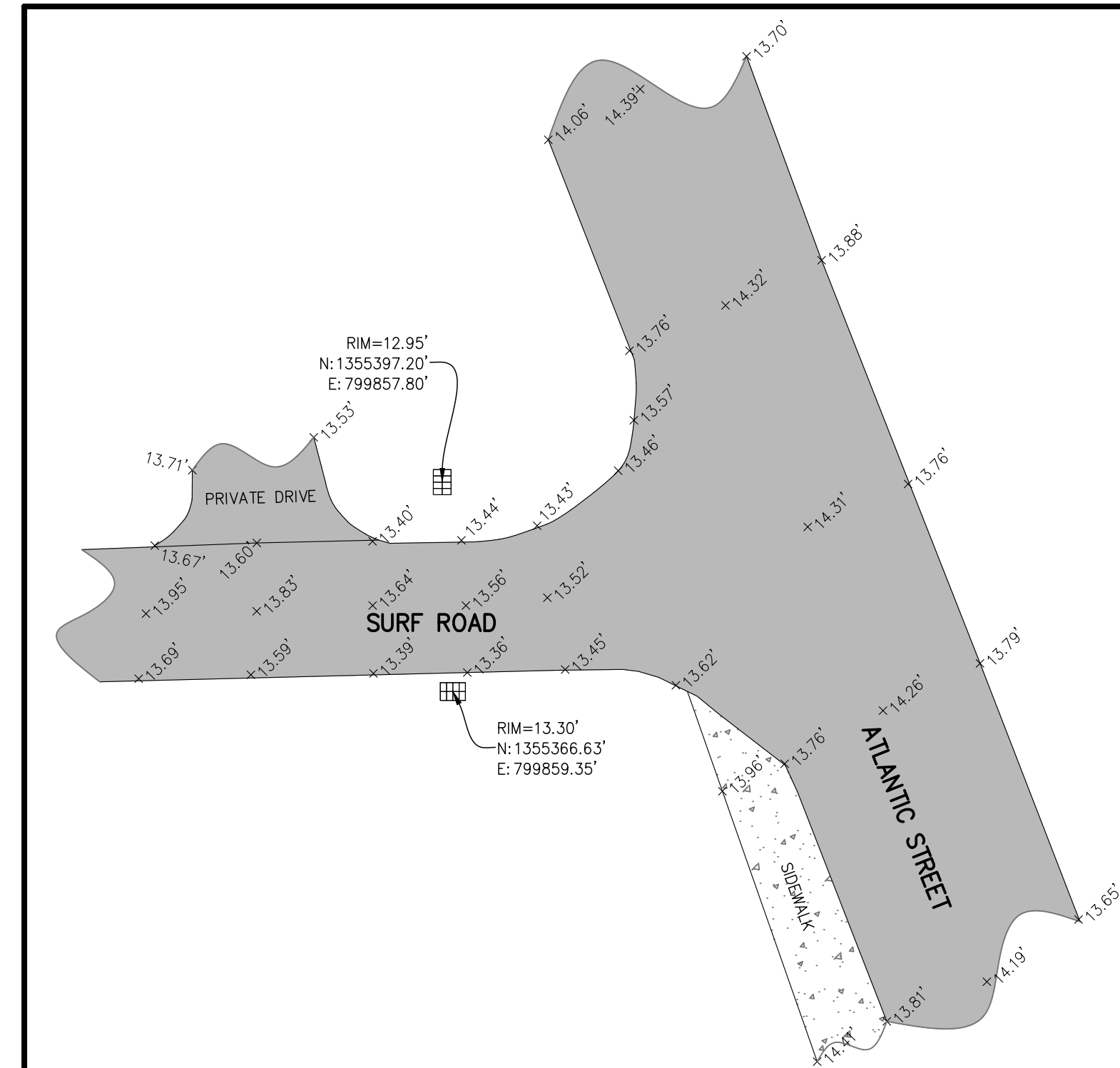
DATE	02.27.2026	SCALE	AS SHOWN
DRAWN BY	ABB	FIELD CREW	JR
CHECKED BY	MTO		
PROJECT No.	25-790		
SHEET No.	10 OF 11		

SPECIFIC PURPOSE SURVEY

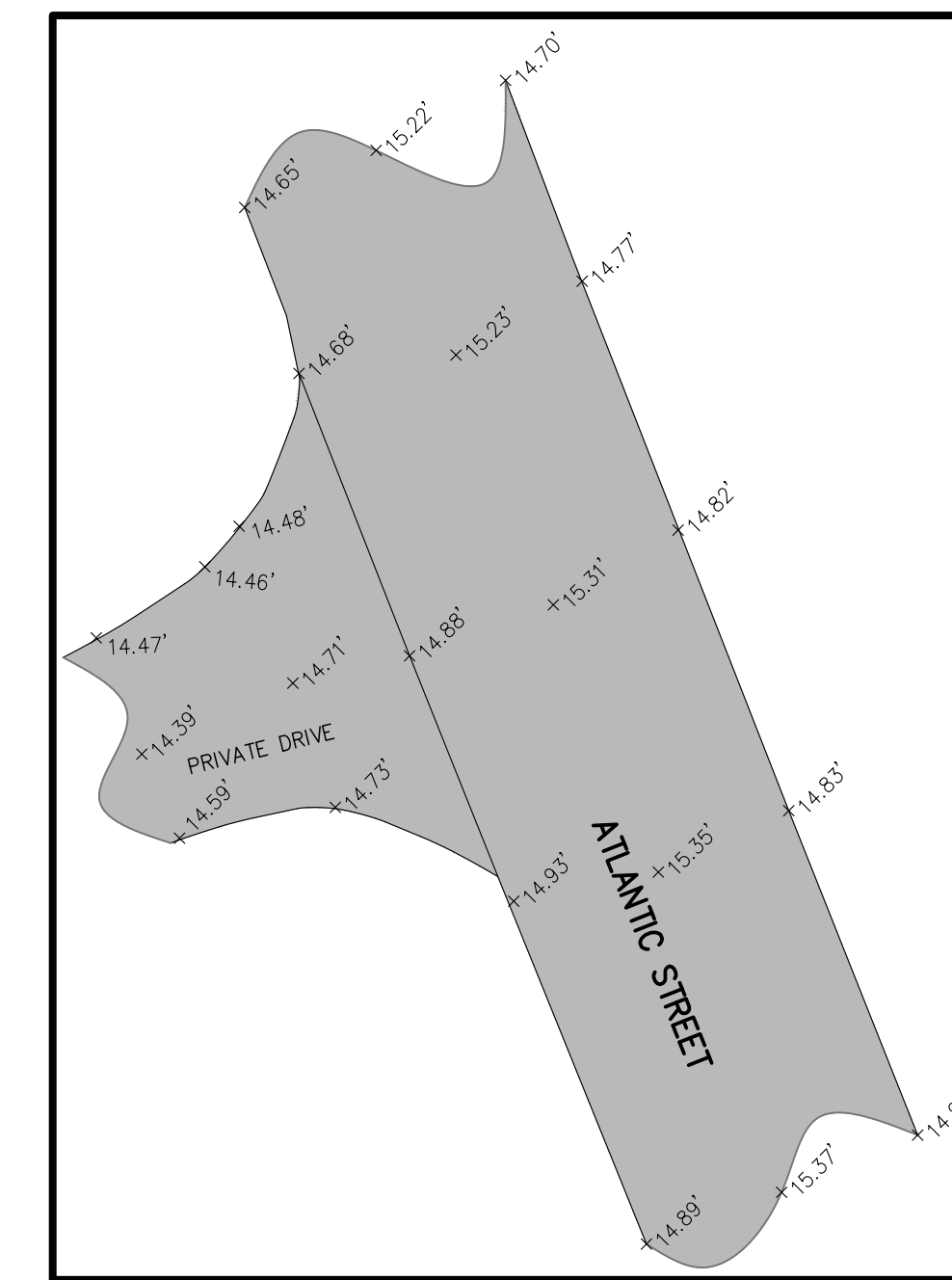
MELBOURNE BEACH BASIN 10 BREVARD COUNTY, FLORIDA



SHEET 11 - PANEL "A"




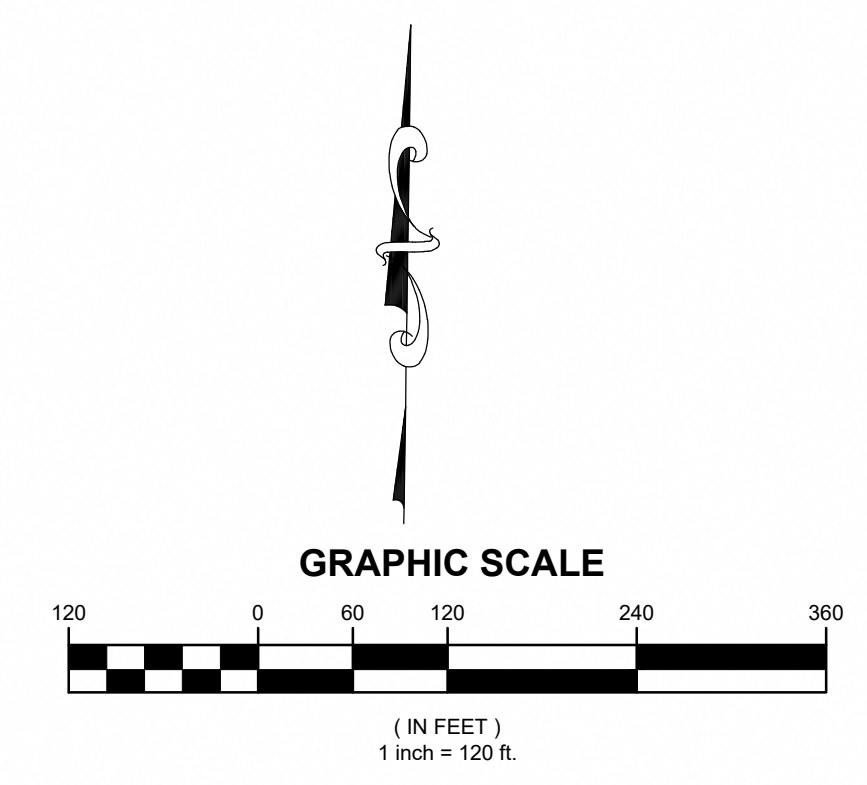
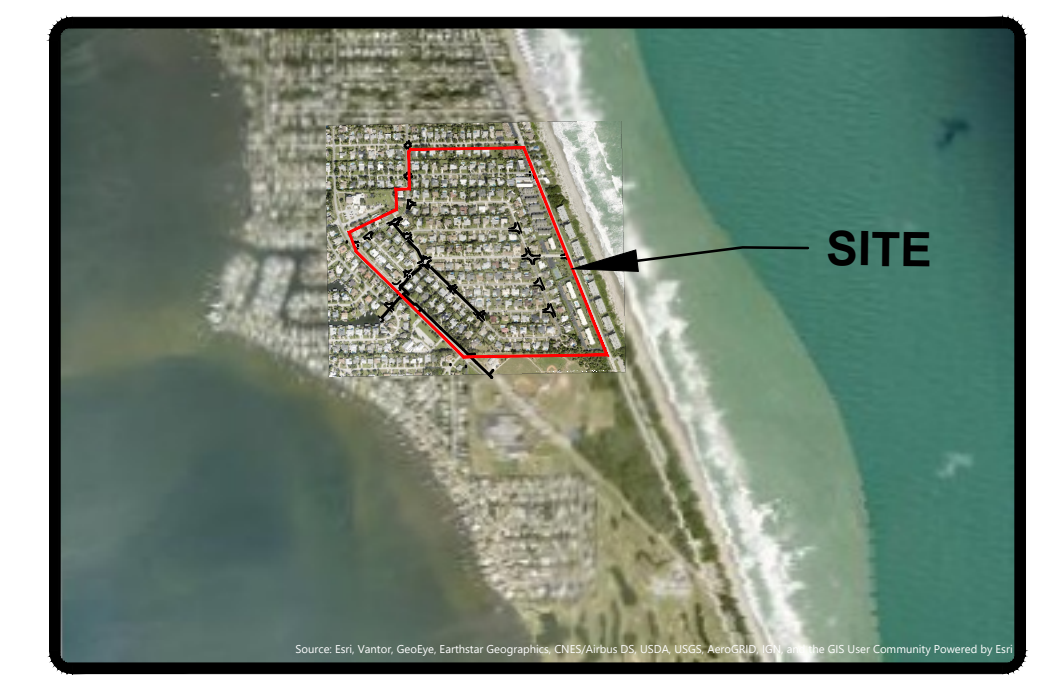
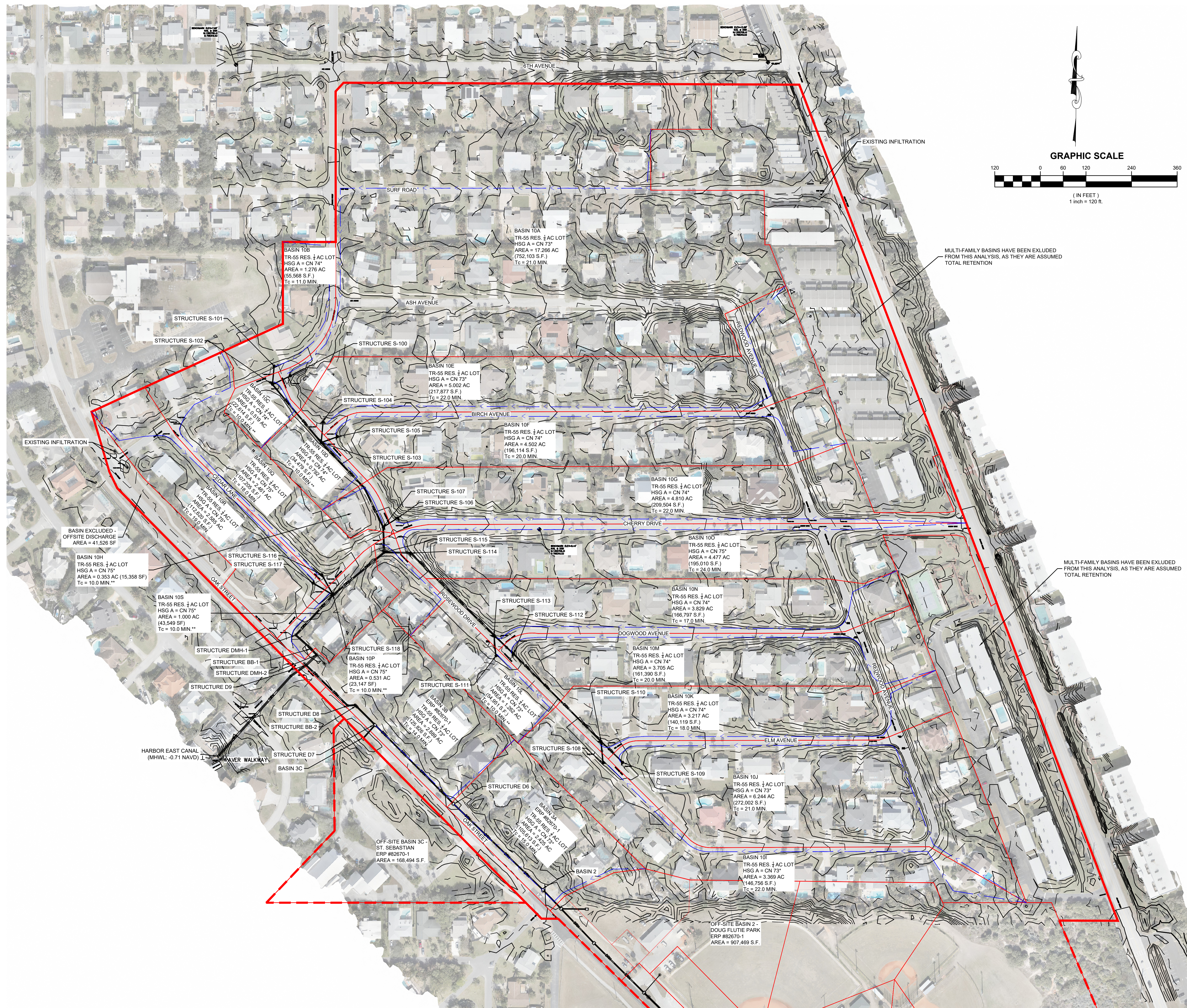
SHEET 11 - PANEL "B"



SHEET 11 - PANEL "C"

FILE LOCATION: Z:\EDC\2025\790 - MELBOURNE BEACH - BASIN 10 DRAINAGE ANALYSIS\SURVEY\DWG - PDF\DWG25-790 MELBOURNE BEACH BASIN 10 SPB-UPDATED.DWG, 2025.03.26, 11:53 AM

REV.	DATE	DESCRIPTION	BY	CHK.
 HALEY WARD ENGINEERING ENVIRONMENTAL SURVEYING LAND PLANNING INTERIOR DESIGN F.B.P.E. AUTHORIZATION No. 32664 L.B. AUTHORIZATION NO. 8267 930 S. Harbor City Blvd, Suite 506 Melbourne, FL 32901 321.280.9969 WWW.HALEYWARD.COM				
PROJECT BASIN 10 MELBOURNE BEACH, FLORIDA				
TITLE SPECIFIC PURPOSE SURVEY				
DATE		02.27.2026	SCALE	
DRAWN BY		ABB	AS SHOWN	
PROJECT No.		25-790	CHECKED BY	
SHEET No.		11 OF 11	MTO	



LEGEND	
—	BASIN 10 LIMITS (OVERALL)
—	BASIN 10 LIMITS (SUB-BASINS)
- - -	OFFSITE BASIN LIMITS
—	TIME OF CONCENTRATION FLOW PATH
—	MAJOR CONTOURS (1-FOOT)
—	MINOR CONTOURS (0.5-FOOT)

TOTAL BASIN SUMMARY						
NODE NAME	STRUCTURE NAME	AREA (AC)	MIN. FFE (WARNING STAGE)	MIN. PVMT (ALERT STAGE)	**Tc (MIN)	*CN (HSG A)
BASIN 10A	S-100	17.266	8.50	6.70	21.0	73
BASIN 10B	S-101	1.276	8.00	6.57	11.0	74
BASIN 10C	S-102	0.519	7.75	6.71	10.0	74
BASIN 10D	S-103	0.792	8.00	6.95	10.0	74
BASIN 10E	S-104	5.002	8.50	6.95	22.0	73
BASIN 10F	S-105	4.502	8.50	6.82	20.0	74
BASIN 10G	S-106	4.810	9.50	7.13	22.0	74
BASIN 10H	S-107	0.353	8.50	6.73	10.0	75
BASIN 10I	S-108	3.369	10.00	9.09	22.0	73
BASIN 10J	S-109	6.244	10.25	8.05	21.0	73
BASIN 10K	S-110	3.217	9.75	8.98	18.0	74
BASIN 10L	S-111	1.262	8.50	7.77	10.0	73
BASIN 10M	S-112	3.705	10.25	7.62	20.0	74
BASIN 10N	S-113	3.829	9.75	7.78	17.0	74
BASIN 10O	S-114	4.477	10.50	6.98	24.0	75
BASIN 10P	S-115	0.531	8.25	6.71	10.0	75
BASIN 10Q	S-116	2.461	6.75	5.08	18.0	75
BASIN 10R	S-117	2.585	6.00	5.49	19.0	75
BASIN 10S	S-118	1.000	6.25	5.13	10.0	75
BASIN 3A	D6	2.425	9.25	63.74	15.0	73
BASIN 3B	D7	2.889	8.25	5.77	14.0	73
TOTAL AREA:		72.512				

*Curve number of 71 for residential land use covers assume an average 55% impervious, Type A soils, and "Good" open space cover based on survey data, aerial interpretation, and NRCS Soil Map data within Basin 10.
 **A minimum Time of Concentration of 10 minutes was used for this analysis.

REV.	DATE	DESCRIPTION	BY	CHK.
DRAWING ISSUE STATUS				

NOT FOR CONSTRUCTION



PROJECT
**MELBOURNE BEACH
 BASIN 10 DRAINAGE ANALYSIS**
 TOWN OF MELBOURNE, FL

TITLE
**EXISTING CONDITIONS
 BASIN MAP 2026**

DATE	SCALE	
4/6/2026	AS SHOWN	
DRAWN BY SES	DESIGNED BY SES	CHECKED BY TS / BC
PROJECT No. 25-790-BASIN MAPS.DWG	CERTIFICATE OF AUTHORIZATION No. 32664	
DRAWING No. DAVID C. BAGGETT, P.E. (DATE) #81375	REV.	
830 S. HARBOR CITY BLVD., SUITE 506 MELBOURNE, FL 32901 TEL: 321.280.9999		
EX. BM 2026		



FILE LOCATION: Z:\EGC\2025\790 - MELBOURNE BEACH - BASIN 10 DRAINAGE ANALYSIS\DRAWINGS\790-BASIN MAPS.DWG, 2026.04.06, 2:08 PM
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