

TECHNICAL MEMORANDUM

To: A. Marie Smith, Town Manager
Town of Melbourne Beach
507 Ocean Avenue
Melbourne Beach, FL 32951
TownManager@melbournebeachfl.org

From: David C. Baggett, P.E. – Haley Ward, Inc.

Re: Basin 10 Drainage Review – Resident Comments and Additional Information

Date: September 15, 2026

Thank you for allowing our firm to meet with you to review our previously submitted drainage report, associated documentation, and resident comments from the June 17, 2026 Commission Meeting. At no additional cost to the Town, our firm gathered additional survey data to confirm and/or update the previously submitted drainage model and report where appropriate during the months of July and August 2026. The updated deliverables were submitted to the Town Managers office on August 28, 2026. The updated drainage model produced results that are consistent with the original findings and do not alter the previous recommendations from our firm. Please see the revised documents submitted on August 28, 2026 as well as the correspondence attached for more specific details.

Engineering Methodology & Technical Review Summary

- **Drainage Modeling & Report Updates:** Addressed feedback regarding unrecorded structures and storm sewer data (such as the Riverview additional manhole and historical Oak Street plans), confirming they have been incorporated into field survey. The additional/updated information does not significantly alter model results.
- **Tailwater Condition:** Validated the application of the $-0.71'$ NAVD mean high water tailwater elevation in the drainage model, adhering to accepted engineering standards and aligning with current NOAA National Tidal Datum Epoch guidelines (prior to the unreleased 2029 update).
- **Elevated Tidal Stage Influence:** Demonstrated through sensitivity testing that even during elevated periods like fall "King Tides" (2.00 NAVD), flood elevation changes remain negligible because the storm system maintains positive head and flow.



- **Field Verification:** Corroborated model water levels, storm sewer elevations, and pipe submergence using advanced 3D underground scanning technology and recent local municipal project data (such as the City of Melbourne boat ramp). Survey elevation of the river was obtained and added to the survey with date and time, found to be generally consistent with mean high water line data assumed in the drainage model.
- **Outfall Pipe:** Confirmed the model condition of the outfall pipe to the Harbor East canal which is almost entirely submerged at the mean high water line. Partial submergence of pipes and structures continues up to the structures lying in the Oak Street right of way, albeit less than at the outfall to the Harbor East canal.

We appreciate the opportunity to assist the Town in this matter. Should you have any questions or comments about the information provided in this letter or the updated survey & drainage report please do not hesitate to contact us directly.

Sincerely,
Haley Ward, Inc.

David C Baggett, P.E.
Melbourne Engineering Manager | Vice President



Digitally signed by David C Baggett
DN: CN=David C Baggett,
dnQualifier=A01410C0000019B2D4C533E00083EAB,
O=HALEY WARD INC., C=US
Date: 2026.09.15 01:08:07-04'00'

DB/ss

This item has been digitally signed and sealed by David C. Baggett, P.E. on the date adjacent to the seal.

Signature must be verified on any electronic copies.



David Baggett

From: David Baggett
Sent: Thursday, July 23, 2026 6:37 PM
To: Melbourne Beach Town Manager; PW Supervisor
Cc: Sara Sullivan; Tony Canton
Subject: RE: Basin 10 - Commission Meeting Resident Comment Items

Again, based on our elevations used for the model the pipe would have about 12.5" unsubmerged on the outfall. See below from the recent field work. Everything seems to be coming back consistent at this stage.



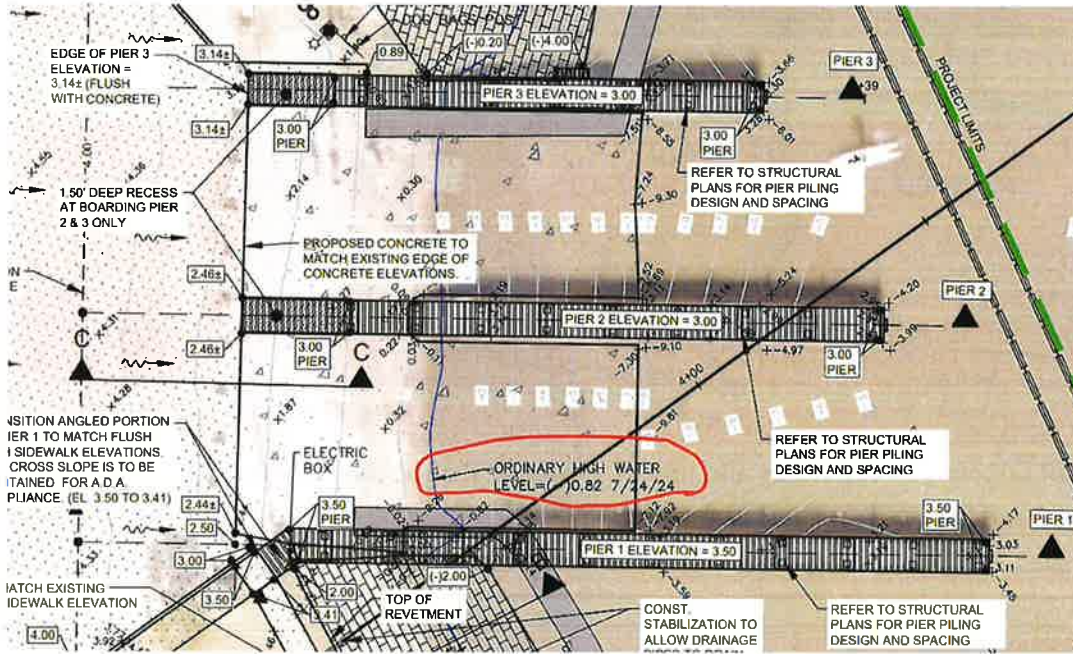
David Baggett, PE
Melbourne Engineering Manager | Vice President
t: 321.280.9969 d: 772.255.7393 m: 321.848.2851

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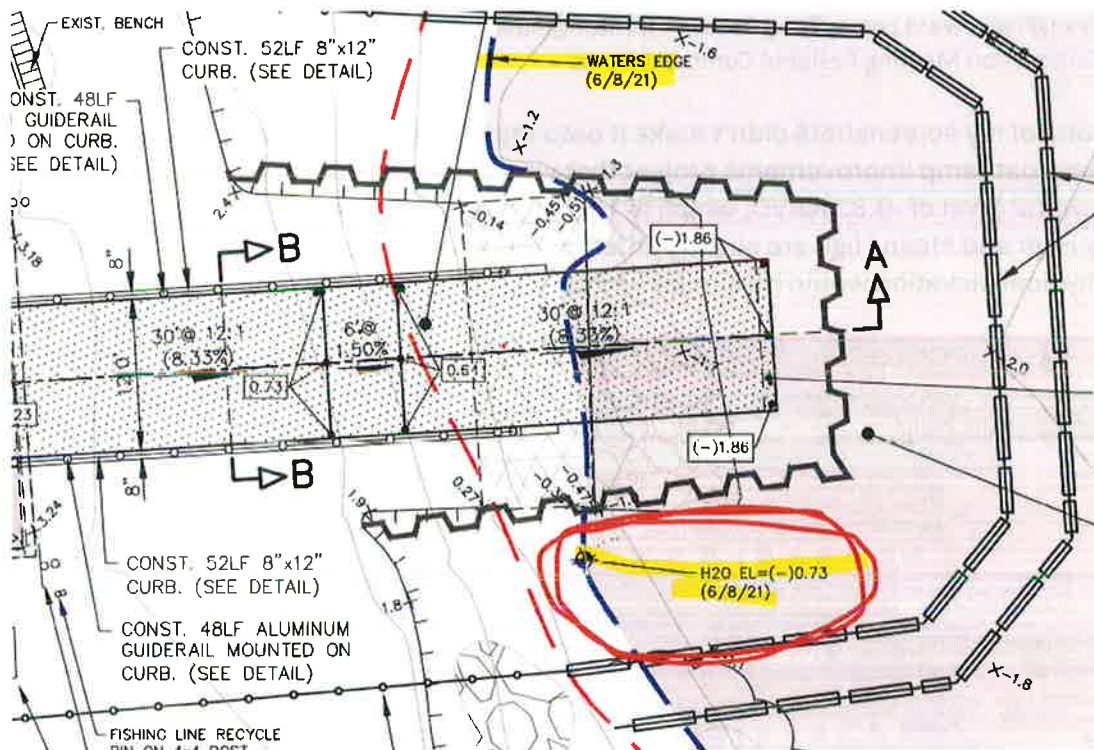
From: David Baggett
Sent: Monday, July 20, 2026 9:36 AM
To: 'Melbourne Beach Town Manager' <townmanager@melbournebeachfl.org>; 'PW Supervisor' <pwsupervisor@melbournebeachfl.org>

Cc: Sara Sullivan <sesullivan@haleyward.com>; Tony Canton <tcanton@haleyward.com>
Subject: RE: Basin 10 - Commission Meeting Resident Comment Items

Good Morning, sorry one of my screenshots didn't make it onto my last email. Here is the City of Melbourne Front Street boat ramp improvements project that was permitted in September 2025. They note an ordinary high water level of -0.82 NAVD, which is 1.32 inches lower than our modeled tailwater of -0.71 NAVD. Ordinary High and Mean High are slightly different terms when it comes to legal/ownership but in this case the physical elevation would be similar and comparable for design purposes.



Additionally, below are from the Riverview Park Boat Ramp permit plans from October 2021. Again, their surveyed water line is similar (slightly lower) to our assumed tidal datum (-0.73 NAVD vs -0.71 NAVD).



We should have a shot of our own on the water and hope to see that its consistent as well./

Thank you

David Baggett, PE
Melbourne Engineering Manager | Vice President
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From: David Baggett
Sent: Friday, July 17, 2026 7:58 PM
To: Melbourne Beach Town Manager <townmanager@melbournebeachfl.org>; PW Supervisor <pwsupervisor@melbournebeachfl.org>
Cc: Sara Sullivan <sesullivan@haleyward.com>; Tony Canton <tcanton@haleyward.com>
Subject: Basin 10 - Commission Meeting Resident Comment Items

Marie and Tom, thank you for passing along the points made on the June 17th and our meeting on July 1. I have summarized some response to the points we discussed in hopes that this sheds some light on them. Copying in a couple members of my team as well.

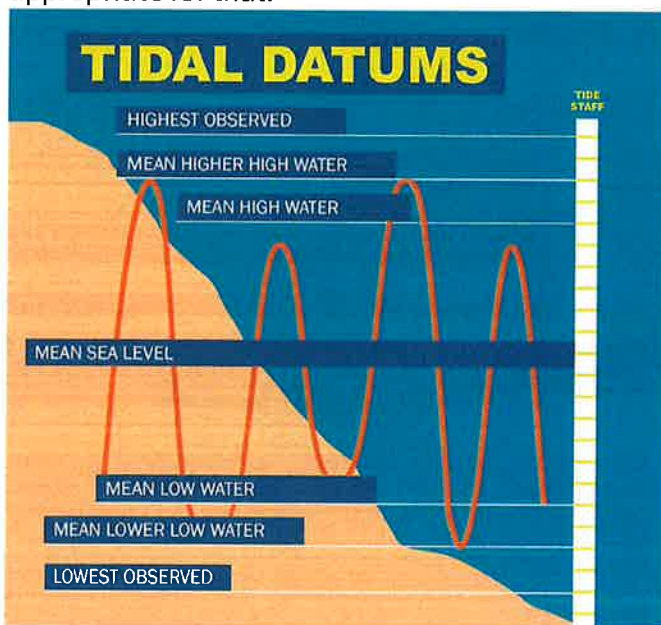
Riverview Additional Drainage Manhole

This was a great piece of information that Mr. Kenny was able to bring up. This structure was not shown in any Town records that we were able to obtain or were given. So our surveyors were not keen to be on the lookout for it in the field. As such, we are in the process of getting this structure added to the survey so we can incorporate into the drainage model we have built. I believe there was also mention of our utilization of the early 2000's Oak Street plans. We did indeed consider this information where ground level survey could not entirely, in a selective manner. With further confirmation from our recent field

work I feel this information was considered appropriately in our model and has not been applied in a way that would significantly affect the results. I don't see that the additional manhole on the outfall pipe run having a significant impact on the model. This is mostly because its close to the river and appears directly in-line with the upstream and downstream runs of pipe. But we are certainly going to review it and incorporate it as necessary, we can let you know if we find anything odd.

Tidal Datum / Tailwater

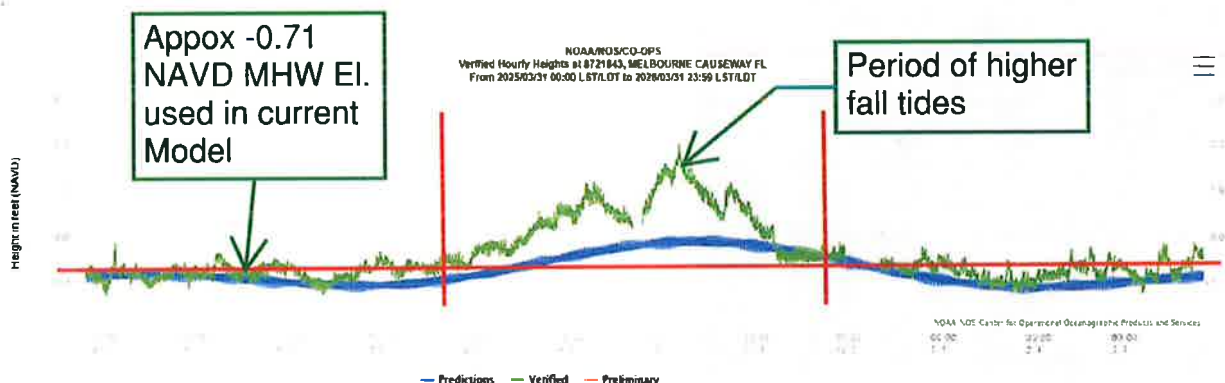
In our model we have to assume an elevation of the river to input into the model so we can try to accurately reflect what the storm sewer is draining into. Another way of saying that is – What is the storm sewer pushing against to get out? We state in our report that the model utilizes a tailwater elevation in the river of -0.71 NAVD. This elevation represents a mean high water elevation of the river based on looking at the various NOAA Tidal Datum stations in the Indian River Lagoon in this area. The mean high water line is define by NOAA as “*The average of all the high water heights observed over the National Tidal Datum Epoch.*” They all vary slightly but are generally within 0.1' of each other. As such we felt comfortable using 0.71' NAVD. Why did we use mean high water elevation for the tailwater? Its an accepted convention by FDOT and the state water management district, representing what the tailwater elevation will be the majority of the time. Can the tailwater fluccuate under unique circumstances like King tides or hurricanes? Yes. But our scopes focus was understanding the capacity of the system to identify issues or potential improvements related to that. As such the mean high water line is most appropriate for that.



Outdated Data

Mr Kenny made the comment that the data was outdated. This must be clarified. As defined above the mean high water elevation is what is observed over a National Tidal Datum Epoch (or NTDE). The NTDE is the specific 19-year period adopted by the National Ocean Service as the official time segment over which tide observations are taken and reduced to obtain mean values for tidal datums. It is necessary for standardization because of periodic and apparent secular trends in sea level. The present accepted NTDE is for years 1983 through 2000, NTDEs are actively considered for revision every 20-25 years. The current NTDE is now undergoing revision and will be replaced by the fifth iteration of the NTDE. Measurements for the update will be based on water level data spanning the years 2002-2020. Once all data has been collected, NOAA will review, analyze, and generate revised datums. **The current**

proposed release date for new NTDE products is in 2029. As such, we do not have any new, accepted tidal datum elevations from NOAA that we can use until 2029. And I understand the point was made to suggest perhaps higher elevations in the river persist now, or perhaps that sea level rise has substantially raised the tide in the river and may need to be considered. Fair question to ask. While not stated in our report we did look at other data sources such as a recent project by the City of Melbourne for a boat ramp facility across the river. Screen shot below showing a water level generally consistent with the mean high water elevation used in our model – this provided some more level of assurance. Additionally, in reviewing the attachment that Mr. Kenny provided, he included NOAA Tide Prediction data for the Melbourne Causeway. The data provided shows water levels generally between 0 to -1.00 NAVD, and fairly consistent with the -0.71 NAVD mean high water elevation. In Central Florida, king tides peak about 1 to 2 feet higher than normal high tides. These astronomical highs occur primarily during the fall (typically September through November) and sporadically in the spring). We can see this in the data that Mr. Kenny provided with a peak elevation close to 2.00 NAVD, see below. As previously mentioned we noted that cases like this are specific scenarios that were not analyzed for the reason mentioned above. To provide some assurance here, I did take some time to look at our model and plug in a tailwater elevation of 2.00 NAVD just to see how it could be affected. The changed in flood elevations were negligible, 1-2 Inches higher cases. This is because even at that elevation the storm system is still flowing positively. There can of course be even more extreme cases such as hurricane storm surge – and those elevations can be so high that the pipe sizes, # of inlets, etc have no impacts because the flooding is entirely dictated by the storm surge. That's not what is routinely observed and as such I support the application of our mean high water elevation in the current model to more accurately understand the regular level of service of the system.

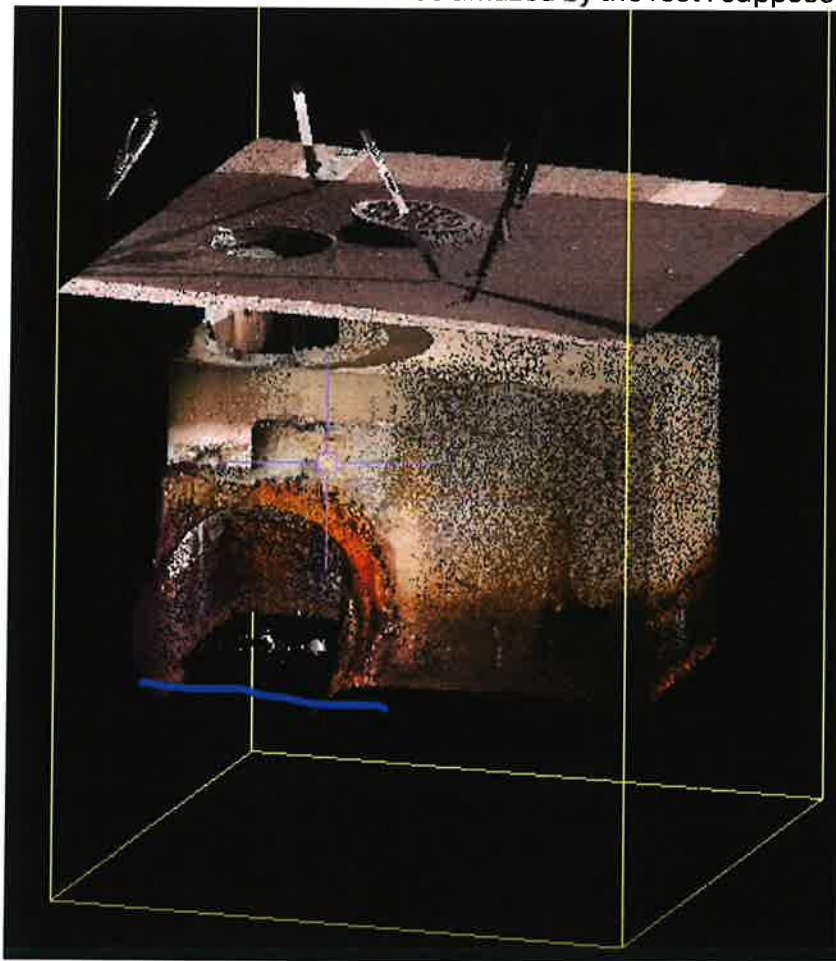


City of Melbourne Boat Ramp

How did Melby swim that far?

I believe tied to the tidal datum/tailwater discussion was the question of – How did Melby the manatee make it up into the storm sewer if the water levels are as low as the NOAA tidal datum suggests? While I cannot attest to seeing what Melby did myself, I have some data that shows consistency with what we have provided in our model in terms of water levels. We have recently acquired some new technology that allows us to create 3D scans of underground structures. We did not have this in March when we did the baseline survey. Regarding the water level in the storm sewer - the scanner shows where water is if it's filled up inside the drainage box. Below is the structure where Melby was found, the round pipe is the one heading towards the river (Harbor East outfall). The blue line I marked is the water line inside the box. When we look at the pipe invert elevation we obtained and the difference to the NOAA mean high water line we utilized (-0.71) you would expect water standing at the bottom of that pipe. So when we actually

scanned the structure we have a 42" pipe and there is less than 7.5" of standing water at the bottom of the pipe. Consistent with what we modeled. Bottom of the box is -1.55 so that would be about 10" of standing water in the box. This appears close to what looks like the depth of water in the box during Melby's discovery (see below, water depth appears slightly less than thickness of Melby's tail, water level slightly over the pipe inverts). It appears there are comparable water levels between the photos during Melby's rescue as the day we scanned the box – two separate dates/observations. Additionally, the invert of the pipe at the Harbor East seawall is much lower than this box. See below input from our model – the invert is -3.17 NAVD per the data we obtained. Holding the -0.71 NAVD mean high water elevation, and the 42" pipe diameter, that would have the outfall pipe submerged 2.46' or 29.5". Leaving about 12.5" unsubmerged. Depending on the tide elevation it could be slightly higher or slightly lower. I believe this would align with what Mr Kenny has seen from the water side where the pipe is mostly submerged. And again, consistent with our model. As for Melby – I still cant answer that entirely, but can confirm there would be a mostly submerged pipe for the manatee to enter at the river and it would get shallowed as pipe runs east away from the river, with some shallow water in the boxes closer to Oak Street. We can make of that what we can and be amazed by the rest I suppose.





Link Pipe Data : Temporary Filter

Menu ▾ |

Link List		Name	Scenario	From Node	To Node	Invert	Manning's N	Upstream
- Scenario: EXISTING CONDITION		LINE 1	EXISTING CONDITIONS 25...	D9	HARBOR EAST CANAL	-1.15	0.012	

All this to say – I am also having our surveyor grab water elevations in the storm sewer and at the river for further comparison. We expect those to be generally consistent with our modeling data but will certainly let you know if there is some discrepancy worth considering.

We appreciate the opportunity to field these questions and comments. I hope I have provided some reasonable assurance here, let me know if I can help with anything else.

Thank you and have a great weekend



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Chat With Me On Teams



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ORDINANCE NO. 2026-02

AN ORDINANCE OF THE TOWN OF MELBOURNE BEACH, FLORIDA, CREATING NEW SECTIONS 30-49 – PAID PARKING PROGRAM, AND 30-50 – PAID PARKING FUNDS, TO CODIFY PAID PARKING PROGRAM IN CERTAIN TOWN PARKS AND CODIFY PAID PARKING FUNDS; PROVIDING FOR LEGISLATIVE FINDINGS; PROVIDING FOR CONFLICTS; PROVIDING FOR SEVERABILITY; PROVIDING FOR CODIFICATION; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the Town of Melbourne Beach has the authority to adopt this Ordinance pursuant to Article VIII of the Constitution of the State of Florida and Chapter 166, Florida Statutes; and

WHEREAS, the Town Commission directed staff to prepare and submit an Ordinance that codifies the Town’s existing paid parking program and paid parking funds; and

WHEREAS, the Town Commission deems it beneficial and in the Town’s best interests to continue the paid parking program as it generates public revenue that benefits the Town’s residents, communities, businesses, and funds some Town operations; and

WHEREAS, the Town Commission hereby finds that this Ordinance serves legitimate government purposes, it is a permissible exercise of the Town’s powers and authority, and benefits the public health, safety, and welfare of the citizens of the Town of Melbourne Beach.

NOW THEREFORE, BE IT ENACTED BY THE TOWN OF MELBOURNE BEACH, FLORIDA:

Section 1. The findings set forth in the recitals above are adopted and fully incorporated herein as legislative findings of the Town Commission pertaining to this Ordinance.

Section 2. Chapter 30, Section 49 – Paid Parking Program, and Chapter 30, Section 50 – Paid Parking Funds, of the Town of Melbourne Beach Code of Ordinances, shall be created as follows (Note: additions indicated by underscore; deletions indicated by ~~strikethrough~~; and text that shall remain unaltered that is not reproduced here is indicated by ellipses (**)):

§ 30-49. PAID PARKING PROGRAM.

- (a) For purposes of this section, the following definitions shall apply unless the context clearly indicates or requires a different meaning.

PAID PARKING LOCATIONS. The words “paid parking locations” shall mean and include the Ryckman Park parking lot, Ocean Park parking lot, Avenues A and B parking lots, and Avenues First through Sixth parking lots.

PARKING KIOSK. The words “parking kiosk” mean and include any Town approved electronic payment device, website, or application accepting monetary payment for the regulation of parking by authority of this section.

PARKING METER SPACE. The words “parking meter space” mean any space within a parking meter zone servicing the paid parking locations and in which a parking meter regulates the parking thereof.

- (b) All fees charged for the use of a parking meter space shall be made through the parking kiosk located at the paid parking locations and shall be collected via electronic payment at the parking kiosk. Evidence of the proper parking fee payment shall be made through a confirmation check using the vehicle license plate.
- (c) The fees and rates to be charged for a parking meter space located in the paid parking program shall be established by resolution approved by the Town Commission. The Town Manager shall be authorized to temporarily waive or modify such fees and rates in the event of a severe weather or emergency event as determined by the Town Manager or said manager’s designee.
- (d) Violations. It shall be unlawful and a violation of the provisions of this section for any person:
 - (1) To cause, allow, or permit any vehicle registered in said person’s name to be parked in a parking meter space overtime;
 - (2) To cause, allow, or permit any vehicle registered in said person’s name to remain or be placed in any parking meter space controlled by any parking kiosk while said parking kiosk provides that the vehicle occupying such parking space has already been parked beyond the period prescribed for such parking space;
 - (3) To cause, allow, or permit any vehicle registered in said person’s name to be parked across any line or making of a parking meter space or in such position that the vehicle shall not be entirely within the area designated by such lines or markings.
- (e) Enforcement and Penalties. Subsections (d)(1), (2), and (3) of this section shall be enforced by Town police officers or parking enforcement specialists in accordance with Sections 30-43.1 and 30-44 of the Town Code. Any person violating sections (d)(1), (2), and (3) of this section shall be subject to a noncriminal infraction and shall be assessed a civil penalty of \$75 in accordance with Sections 30-43.1 and 30-44 of the Town Code. For purposes of this section, the Town incorporates and adopts the procedures set forth in Sections 30-43.1 and 30-44, Town Code, governing the issuance of citations and the civil traffic infraction hearing officer program.
- (f) Resident Annual Pass. All Town residents shall be eligible to obtain an annual pass, which will allow parking at the paid parking locations, excluding Ocean Park, without

being required to pay the daily parking rates as may be adopted by the Town Commission from time to time.

- (g) *Non-Resident Annual Pass.* Non-residents shall be eligible to obtain an annual pass, which will allow parking at the paid parking locations, excluding Ocean Park, at the annual rate that may be adopted by the Town Commission from time to time. The non-resident annual pass shall be limited and issued to the first 100 non-resident applications per year unless otherwise approved by the Town Commission.

§ 30-50. PAID PARKING FUNDS.

- (a) Special Revenue Funds for Ryckman Park and Ocean Park are hereby codified for the deposit of all fees collected pursuant to Section 30-49. All revenues derived from the daily parking rates originating from Ryckman Park and Ocean Park shall be placed in each respective special revenue fund.
- (b) The expenditures of all revenues placed in the Ryckman Park and Ocean Park special revenue funds shall be limited to the following:
- (1) Capital projects relating to the improvement, maintenance, and repair of Town parks and associated facilities;
 - (2) Operational costs for the daily maintenance and management of Town parks and associated facilities;
 - (3) Operational costs for the management of the paid parking program; and
 - (4) Reserve funds as the Town Commission deems necessary and appropriate.

Section 3. Conflicts. All ordinances or parts thereof, in conflict herewith are, to the extent of such conflict, repealed.

Section 4. Severability. Should any word, phrase, sentence, subsection, or section be held by a court of competent jurisdiction to be illegal, void, unenforceable, or unconstitutional, then that word, phrase, sentence, subsection, or section so held shall be severed from this Ordinance and all other words, phrases, sentences, subsections, or sections shall remain in full force and effect.

Section 5. Codification. The provisions of this Ordinance shall be included and incorporated into the Code of Ordinances of the Town of Melbourne Beach, as additions or amendments thereto.

Section 5. Effective Date. This Ordinance shall become effective immediately upon its passage and adoption.

PASSED AND ADOPTED this ____ day of _____, 2026, by the Town Commission of the Town of Melbourne Beach, Florida.

TOWN OF MELBOURNE BEACH, FLORIDA

By: _____
ALISON DENNINGTON, Mayor

ATTEST:

(TOWN SEAL)

Cyd Jones, Town Clerk