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September 30, 2020

Mr. Elius F. Nortelus, P.E., Engineer 3
Department of Regulatory and Economic Resources
Division of Environmental Resources Management
Water Management Division
701 NW 1st Court, 5th Floor
Miami, FL 33136-3912

Subject: C-1 Watershed XP-SWMM Model

Dear Mr. Nortelus:

CDM Smith has completed the final review of the C-1 Canal Watershed XP-SWMM Calibration Model (Hurricane Irma, September 2017) and design storm models. All comments from earlier preliminary reviews of both calibration and design storm models have been addressed for this watershed. The results of the calibration simulation provide reasonably close matches to observed stages and SFWMD estimated flows at multiple gages throughout the watershed.

Let me know if you have any questions.

Sincerely,

Tom Nye, P.E., Ph.D.
Water Resource Engineer
CDM Smith Inc.

TN/ la

cc: Daniel R. Maher





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cdmsmith.com

October 22, 2019

Mr. Elius F. Nortelus, P.E., Engineer 3
Department of Regulatory and Economic Resources
Division of Environmental Resources Management
Water Management Division
701 NW 1st Court, 5th Floor
Miami, FL 33136-3912

Subject: C-2 Canal Watershed XP-SWMM Model

Dear Mr. Nortelus:

CDM Smith has completed the final review of the C-2 Canal Watershed XP-SWMM Calibration Model (Hurricane Irma, September 2017). All comments from earlier preliminary reviews of the Calibration model (from May 2018 to present) have been addressed. The results of the calibration simulations provide close matches to observed stages and SFWMD estimated flows at multiple gages throughout the watershed.

The C-2 Canal intersects the C-4 Canal near the intersection of Tamiami Trail and the Homestead Extension of the Florida Turnpike (117th Ave). For calibration storms, stages near this intersection are set by a boundary condition equal to the observed stage at the SFWMD Gate T5W. For design storms, the intersecting canals may flow at significant amplitudes in either direction based on multiple factors, including precipitation, structure operations, and back-pumping operations. Therefore, the models should be combined to allow the model to determine direction and amplitude of flow at this location. If not combined, the models should be run iteratively for each design storm/sea level rise scenario to equalize heads across both models at this location.

The review spreadsheet SWMM_ReviewChecklist - C-2-10222019.xlsx, is attached.

Let me know if you have any questions.

Sincerely,

Tom Nye, P.E., Ph.D.
Water Resource Engineer
CDM Smith Inc.

Attachment
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January 7, 2020

Mr. Elius F. Nortelus, P.E., Engineer 3
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Subject: C-4 Canal Watershed XP-SWMM Model

Dear Mr. Nortelus:

CDM Smith has completed the final review of the C-4 Canal Watershed XP-SWMM Calibration Model (Hurricane Irma, September 2017). All comments from earlier preliminary reviews of the Calibration model have been addressed. The results of the calibration simulations provide close matches to observed stages and South Florida Water Management District (SFWMD) estimated flows at multiple gages throughout the watershed.

The C-4 Canal intersects the C-2 Canal near the intersection of Tamiami Trail and the Homestead Extension of the Florida Turnpike (117th Ave). For calibration storms, stages near this intersection are set by a boundary condition equal to the observed stage at the SFWMD Gate T5W. For design storms, the intersecting canals may flow at significant amplitudes in either direction based on multiple factors, including precipitation, structure operations, and back-pumping operations. Therefore, the models should be combined to allow the model to determine direction and amplitude of flow at this location. If not combined, the models should be run iteratively for each design storm/sea level rise scenario to equalize heads across both models at this location.

The review spreadsheet SWMM_ReviewChecklist - C-4-01072020.xlsx, is attached. Let me know if you have any questions.

Sincerely,

Tom Nye, P.E., Ph.D.
Water Resource Engineer
CDM Smith Inc.

TN/bm
Attachment





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May 22, 2019

Mr. Elius F. Nortelus, P.E., Engineer 3
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Miami, FL 33136-3912

Subject: C-6 Canal Watershed XP-SWMM Model

Dear Mr. Nortelus:

CDM Smith has completed the final review of the C-6 Canal Watershed XP-SWMM Calibration Model (Hurricane Irma, September 2017), and the preliminary review of the C-6 Canal Watershed XP-SWMM Design Storm Models. All comments from earlier preliminary reviews of the Calibration model (from May 2018 to present) have been addressed. The results of the calibration simulations provide close matches to observed stages and South Florida Water Management District (SFWMD) estimated flows at multiple gages throughout the watershed.

The C-6 watershed accepts flows from the C-4 and C_5 watersheds through SFWMD Structures S-25B and S-25, respectively. For calibration storms, these flows are estimated by the SFWMD using observed headwater and tailwater stages and the structures' rating curves. For design storms, the boundary conditions should be developed using calibrated models of the C-4 and C-5 watersheds, which MDC has not yet completed. Therefore, the design storm models use relatively crude estimates of flows for the boundaries with the C-4 and C-5 watersheds. The C-6 design storm model also uses zero-flow boundary with the C-7 watershed. It is recommended that these three models be finished before flood maps from the C-6 watershed are finalized. All flood mapping from the model in the current condition should be marked preliminary and all interested parties should be made aware that updates will be forthcoming once all the boundary models have been finalized.

Let me know if you have any questions.

Sincerely,

Tom Nye, P.E., Ph.D.
Water Resource Engineer
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February 3, 2021

Mr. Elius F. Nortelus, P.E., Engineer 3
Department of Regulatory and Economic Resources
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701 NW 1st Court, 5th Floor
Miami, FL 33136-3912

Subject: C-8 and C-9 Watershed XP-SWMM Models

Dear Mr. Nortelus:

CDM Smith has completed a review of the C-8 Canal Watershed XP-SWMM Design Storm Model, and the C-9 Canal Watershed XP-SWMM Design Storm Model, with additional modeled areas east of the SFWMD Salinity Control Structures. All comments from earlier preliminary reviews of both models have been addressed for this watershed. CDM Smith has recommended that further investigation into overland flow link inverts be conducted where the flood mapping rasters have depth discrepancies to confirm hydraulic ridges between sub-watersheds; however, we do not need to review the models again. This is a suggestion for further due diligence by the County prior to map publication.

Let me know if you have any questions.

Sincerely,

Tom Nye, P.E., Ph.D.
Water Resource Engineer
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TN/ la

cc: Daniel R. Maher





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September 30, 2020

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Subject: C-7 Watershed XP-SWMM Model

Dear Mr. Nortelus:

CDM Smith has completed the final review of the C-7 Canal Watershed XP-SWMM Calibration Model (Hurricane Irma, September 2017) and design storm models. All comments from earlier preliminary reviews of both calibration and design storm models have been addressed for this watershed. The results of the calibration simulation provide an adequate match to observed stages and SFWMD estimated flows at the S-27 SFWMD Structure, considering the inflows during the peak of Hurricane Irma and the limitations of the SFWMD flow estimates when tailwater is higher than headwater.

Let me know if you have any questions.

Sincerely,

Tom Nye, P.E., Ph.D.
Water Resource Engineer
CDM Smith Inc.

TN/la

cc: Daniel R. Maher



4/15/2019

Mr. Elius F. Nortelus, P.E., Engineer 3
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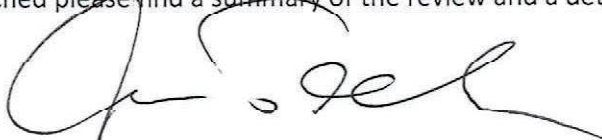
QA/QC REVIEW OF THE C-100 CALIBRATION MODEL FOR THE STORMWATER MASTER PLAN UPDATE FROM 2019

Dear Mr. Nortelus:

GIT CONSULTING has conducted a QA/QC review of the C-100 Calibration Model. The review established that the C100 Calibration Model has implemented numerous updates to the original C-100 model from 2007 in terms of basin delineation and recent stormwater infrastructure and it has been recalibrated to storm Irma from September 2017.

The calibration model showed adequate response to storm event and it is recommended for development of design events and flood maps of C-100 Basin.

Attached please find a summary of the review and a detailed spreadsheet of the reviewed items.



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11/18/2019

Mr. Elius F. Nortelus, P.E., Engineer 3
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QA/QC REVIEW OF THE C-102 CALIBRATION MODEL FOR THE STORMWATER MASTER PLAN UPDATE FROM 2019

Dear Mr. Nortelus:

GIT CONSULTING has conducted a QA/QC review of the C-102 Calibration Model. The review established that the C-102 Calibration Model has implemented numerous updates to the original C-102 model from 2003 in terms of basin delineation, hydrology and recent stormwater infrastructure and it has been recalibrated to storm Irma from September 2017.

The C102 is subdivided into 334 sub-basins which range between 0.5 and 880 acres. The sub-basins boundaries adequately follow the topography. All model components which have elevation parameters have been updated and accurately transitioned from NGVD29 to NAVD88 datum. The hydrology has been entirely revised and all available infrastructure has been implemented.

The calibration model showed adequate response to the storm event Irma from September 2017. All initial QA/QC comments have been addressed and the final calibration model has excellent performance. The calibrated model was used to develop the design events for 24-hour storms (5, 10, 25 years of recurrence) and for 72-hour storms (10, 25, 50, 100, 500 and 1000 years of recurrence).

Based on the QA/QC review the C-102 model recommended for development of design events and flood maps of Basin C-102.



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September 20, 2020

Mr. Elius F. Nortelus, P.E., Engineer 3
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Subject: C-103 Watershed XP-SWMM Model

Dear Mr. Nortelus:

CDM Smith has completed the final review of the C-103 Canal Watershed XP-SWMM Calibration Model (Hurricane Irma, September 2017) and design storm models. All comments from earlier preliminary reviews of both calibration and design storm models have been addressed for this watershed. The results of the calibration simulation provide reasonably close matches to observed stages and SFWMD estimated flows at multiple gages throughout the watershed.

Let me know if you have any questions.

Sincerely,

Tom Nye, P.E., Ph.D.
Water Resource Engineer
CDM Smith Inc.

TN/ la

cc: Daniel R. Maher



3/25/2020

Mr. Elius F. Nortelus, P.E., Engineer 3
Department of Regulatory and Economic Resources
Division of Environmental Resources Management
Water Management Division
701 NW 1st Court, 5th Floor
Miami, FL 33136-3912

QA/QC REVIEW OF THE C-111 CALIBRATION MODEL FOR THE STORMWATER MASTER PLAN UPDATE - 2020

Dear Mr. Nortelus:

GIT CONSULTING has conducted a QA/QC review of the C-111 Calibration Model. The review established that the C-111 Calibration Model was entirely updated and redeveloped. The updated model covers more than 170 sq. mi. and implements numerous updates to the original C-111 model from 2007 in terms of basin delineation, updates related to the latest topographic data (LIDAR based DEM from 2015), recent land use and implementation of recently surveyed stormwater infrastructure. The model takes into account the potential seepage from the Detention Areas West of Canal C-111 and includes the critical infrastructure along canal C-111, and internal to the model primary canals and structures which are maintained and operated by South Florida Water Management District. The model has been recalibrated to storm Irma from September 2017. Design events have been developed and validated for 0.2%, 1%, 2%, 4% and 10% chance of occurrence.

The calibration model showed adequate response to storm event and it is recommended for development of design events and flood maps of C-111 Basin.



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April 22, 2021

Mr. Elius F. Nortelus, P.E., Engineer 3
Department of Regulatory and Economic Resources
Division of Environmental Resources Management
Water Management Division
701 NW 1st Court, 5th Floor
Miami, FL 33136-3912

Subject: Stormwater Management Program Master Plan Update (FY2021) Review

CDM Smith has completed a review of the Stormwater Management Program (SWMP) Master Plan Update (FY2021) Review. The review consisted of edits in "track changes" and suggestions in comments to improve the report's readability and cohesion, and to clarify some technical aspects of the modeling section. For the individual watershed reports, CDM Smith found some discrepancies between reported input values and the XPSWMM numerical models which need further investigation; however, it will not be necessary to re-review these sections once the County has performed the changes.

Overall, the SWMP report is comprehensive and includes abundant information and guidance for stakeholders to consider and utilize. However, as discussed by personal communications (telephone and email), CDM Smith recommends that the alternative control measures outlined in the report be performed prior to publication.

Let me know if you have any questions.

Sincerely,

Tom Nye, P.E., Ph.D.
Water Resource Engineer
CDM Smith Inc.

TN/ la

cc: Daniel R. Maher



From: SFWMD Hydraulics & Hydrology (H&H) Bureau Staff

Cc: Akin Owosina, H&H Bureau Chief

Date: April 25, 2021

RE: Backcheck of the responses to the comments on South Miami Dade County Water Control Map and the Flood Criteria Map

Thank you for the responses to the District's review comments dated March 25, 2021. As discussed, the Hydraulics & Hydrology (H&H) Bureau Staff from the District completed the backcheck of the responses to the review comments on South Miami Dade County Water Control Map and the Flood Criteria Map. Please see below for the detailed comments backcheck information.

GENERAL COMMENT

9. Does this mean the tidal boundary for the H&H run (25 YR/72 HR) was the constant NOAA mean sea level plus 2 ft. and not an oscillating tidal boundary? Were any coastal storm analyses performed in the development of these maps?

Response:

- The tidal boundary for the 25-year/72-hour run was based on using the tidal boundary which used the M2 Harmonic Constituent (amplitude of 0.98 ft), and the average sea level for 2020 based on observed data, plus +2.0 feet SLR using NOAA Intermediate High from the Climate Compact update 2019

Backcheck: Thank you for the response to this question (printed below). This question was in reference to General Requirements #4 on the Water Control Map (MDC_WC_20210105.pdf) below. This response seems to be saying something different than GR#4. Please check the answer against the #4 General Requirement (epoch 1983-2001 NOAA mean sea level vs. M2 Harmonic Constituent and the average sea level 2020) to reconcile to Miami Dade satisfaction.

Response Backcheck 1: The Water Control Map does not have GR# 4 regarding NOAA MSL, it is regarding Sea Walls.

I. Comments on MDC_CFC_20210105.pdf: Miami-Dade County Flood Criteria Map

- The map looks like an offset to a contoured topography map. The text on the lower right portion of the map (GENERAL REQUIREMENTS) says that the purpose of the map is "to determine the minimum ground surface elevation of properties and the crown/grade of roads,...". What is that offset? How was that determined. Why is 6 ft NAVD delineated in blue? What is the significance of 6 ft NAVD?

Response:

- The map is derived from several conditions, if the flood elevation is below the topography, the topography is assumed as the CFC.
- The previous CFC had 5.

Backcheck: partially addressed; request documentation on the source of 6 ft NAVD criteria.

Response Backcheck 1: 6-ft NAVD Criteria was developed to account for +2.5 feet increase of the original CFC requirement which referred 5 ft NGVD29 (3.5 NAVD88) in 1980, +0.5 feet was added for the period of 1980-2000 and +2 feet for the projected increase between 2020-2060 to arrive at $3.5+0.5+2.0 = 6.0$ ft NAVD 88.

2. Suggest including more detailed descriptions in the legend box. Do the contour lines represent the minimum required surface elevation for road crown or first floor elevation of properties?

Response:

- To be revised. The CFC map is approved by the Board of County Commissioners as a Plat. It is used for minimum elevations of developed properties, crown of roads, minimum top of seawalls, and secondary canal banks. The map is based on a 10 year/24 hr storm event. Use of the map is regulated in the Code of Miami-Dade County and the County's Public Works Manual. The CFC is NOT used for determination of lowest floor elevations in buildings. Buildings are built using the 100 year storm event baseline with the appropriate freeboard as per the current Florida Building Code.

Backcheck: The response provided is very helpful. Look forward to seeing this information in the legend box.

Response Backcheck 2: Please see revised map. [MDC_FC_20210528.pdf](#)

3. Why are the gradients in some areas are so high? For example, for the area between SW 88 st and SW 104 st, the contours change from 9 to 16 sharply.

Response:

- For location which are not flooded, the CFC follows the topography

Backcheck: Closed.

4. Does this imply that both public and private properties (new, old or proposed) should be in compliance OR is this map just another indicator of flooding risk? What does it mean, and what are the corresponding courses of action when a property is below a minimum ground

elevation? For example, most of Miami Beach and Homestead Air Reserve Base are under the 6 ft NAVD minimum. The coastline just south of the C-6 outflow to Biscayne Bay are mostly in double digits. Minimum ground surface elevation of the properties in that area is probably closer to sea level.

Response:

- All public and private property should be in compliance

Backcheck: partially addressed; How will this CFC be applied to the old properties? Will the old properties be retrofitted in order to be in compliance?

Response Backcheck 4: New or substantial improvements (more than 50%) retrofitted will be required to comply

- Item 4 says a seawall elevation of 6.0 ft NAVD88 applies to all coastal areas. Suggest delineating these areas on the map clearly.

Response:

- A revision is in consideration

Backcheck: OK, will wait for the next edition of the map

Response Backcheck 5: Please see revised map. MDC_FC_20210528.pdf

- Item 5 says a minimum elevation of 5.0 ft NAVD88 applies to all areas except where indicated. Does this requirement also apply to the Frog Pond Basin?

Response:

- All areas within the urban boundary

Backcheck: Closed. Suggest the urban boundary be delineated on the map.

Response Backcheck 6: Please see revised map. MDC_FC_20210528.pdf

- It is hard to tell the difference between a nine (9) versus a six (6);

Response:

- A revision will be provided

Backcheck: OK, will wait for the next edition of the map

Response Backcheck 7: Please see revised map. MDC_FC_20210528.pdf

8. Not sure why contour lines are limited to the 2 shades of blue: bright blue for 6 ft and dark blue for all other greater values. One unique color per elevation should be used.

Response:

- A revision is in consideration

Backcheck: OK, will wait for the next edition of the map

Response Backcheck 8: A unique color for each elevation is not clearly legible.

9. Based on the scale used the font size of the labels should be made smaller to improve readability.

Response:

- A revision is in consideration

Backcheck: OK, will wait for the next edition of the map

Response Backcheck 9: Please see revised map. MDC_FC_20210528.pdf

10. The contour lines are probably based on bare earth. Otherwise, one would be able to decipher roads just by looking at the collections of lines. “The purpose of the map is to determine the minimum ground surface elevation of properties and the crown/grade of roads,...” It seems like a lot of the existing roads near the water’s edge are already “NOT” in compliance!? Does the county deal with non-compliance or the does the flood criteria only apply to new construction?

Response:

- Roads not in compliance have been identified

Backcheck: OK.

11. There is a 9-ft contour line inside WCA-3B. Please verify if this is correct.

Response:

- The map provides revision only for the areas updated in the new SWMP. For areas outside of the SWMP domain, the previous CFC map is used (converted to NAVD 88)

Backcheck: Recommendation: remove contour lines outside SWMP domain as they are outside jurisdiction of Miami-Dade, e.g. WCA-3B.

Response Backcheck 11: The contours will be preserved in order to maintain the same contour footprint until a new analysis is provided for these areas.

12. There are contour lines cross waterbodies/waterways/canals/golf courses/parks. Please verify if these are correct.

Response:

- A revision is in progress

Backcheck: OK, will wait for the next edition of the map

Response Backcheck 12: All contours were developed using the same methodology and will be maintained on the open areas

13. Does the map take into account coastal storm surge? If not would there be additional restrictions due to being in the velocity zone based on coastal flooding? This may be out of the scope for development of the stormwater master plan but a suggestion is to somehow delineate areas on the map in such a way to notify users to look for additional restrictions due to coastal flooding.

Response:

- Coastal storm surge is not in consideration

Backcheck: Closed.

II. Comments on MDC_WC_20210105.pdf: Water Control Map

This map shows the water control systems under the jurisdiction of Miami-Dade County and the C&SF Flood Control District (USACE+SFWMD). The text on the lower right portion of the map (GENERAL REQUIREMENTS) says that the purpose of the map is “to establish guidelines and requirements for designing water control facilities for land development, and to show the general locations of proposed canals, levees, ...”. In addition to the planned secondary canals and ditches, the map also shows existing primary and secondary canals in Miami-Dade.

14. Elevation requirements of secondary canal banks are described under items 5 and 9 (a). The descriptions are inconsistent. Item 9(a) includes the 5.0 ft NAVD88 minimum or the current Miami data county flood criteria as items to consider, but there are not included in item #5.

Response:

- To be revised

Backcheck: Closed.

15. For items 5 and 9 (a), are the surface water levels of the 25YR/72 HR 2060 with SLR referred to the peak stages of the event?

Response:

- Peak stages of the 25YR/24HR 2060 were used

Backcheck: the response says 25YR 24HR 2060 were used. But the items 4, 5, and 8 of the General Requirement have 25Yr/72 Hr 2060 scenario listed. Please confirm which one is the correct one.

Response Backcheck 15: 25-yr/72-hrs 2060 scenarios is the correct response

16. Item number 8. How are the minimum peak stages of the 25YR/72 HR 2060 with SLR defined? For each cross section, only one peak stage from the 25YR/72 HR 2060 scenario can be extracted.

Response:

- Model uses initial surface and groundwater elevations, which are based on average October values, after simulation start, only the peak stages are reported for each cross section (hydraulic node).

Backcheck: Closed.

17. Suggest label S20A differently since this structure is not in service anymore.

Response:

- To be revised

Backcheck: OK.

Response Backcheck 17: This structure will be marked that it is not in operation

18. This map should be in color.

Response:

- Color version also are available

Backcheck: OK.

Response Backcheck 18: Please see revised map. MDC_WCM_20210528.pdf for the color version. However, the black and white version will be the version published in the Plat Book once approved.

19. What is the date stamp on the map? This is needed because the map makes reference to planned secondary canals and ditches.

Response:

- To be provided

Backcheck: OK, will wait for the next edition of the map.

Response Backcheck 19: Please see revised map. MDC_WCM_20210528.pdf