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TOWN OF WALKERSVILLE – BMP PROJECT UPDATE

TO:	Town of Walkersville
FROM:	Andrew Tuleya, GIS Manager - ARRO Consulting
RE:	Town of Walkersville (MD) – BMP Projects Update
DATE:	3/30/23

The following memo summarizes the current state of the four (4) BMP projects that ARRO is designing on behalf of the Town of Walkersville in order to meet the Town's Chesapeake Bay Restoration Requirement by 2025. Each upgraded and/or new stormwater Best Management Practices (BMPs) design is to meet performance criteria standards established in the Maryland Stormwater Design Manual.

Colony Village

- ARRO is proposing to retrofit the existing basin into a multiple pond system.
- Current facility drains through a 48" CMP outlet pipe in a westward direction tributary to Glade Creek.
- After construction of the proposed BMP, the site will continue to flow in the same pattern as the existing conditions, however at an even lesser rate due to a larger storage volume and modified outlet structure in the proposed BMP. Project will reduce the current peak flow rates by increasing the basin volume and modifying the outlet structure.
- Six major BMPs are within the drainage area. Each was analyzed and included in the model to accurately portray runoff conditions.
- Structural Improvements Include:
    - Lowering basin bottom
    - Increasing berm height
    - Modifying basin grading
    - Installing a slow-release outlet structure
    - Installation of sediment forebay
    - Increasing spillway invert
    - 2 pond cells to be installed for water quality treatment
        - cell 1 – 2.75' permanent water depth
        - cell 2 – 1.25' permanent water depth

Anticipated Potential Objections From HOA: Standing Water (Safety/Insects).

Possible Alterations/Alternative Approaches: The maximum pond depth based on the existing design is 2.75'. This depth should minimize the risk of injury in the event someone enters the basin. Fencing may also be installed around the basin perimeter to prevent individuals from entering the facility. Reducing the overall area of each pond may be an option, however this would require making each pond deeper to maintain water quality treatment. If pond diameter is reduced without increasing depth, impervious restoration credit will likely be reduced.

To minimize the presence of insects specific to the ponds, the vegetation that will be installed within the aquatic zones as well as throughout the basin bottom will promote a habitat for birds and other wildlife that feed on insects. Additionally, the size of the drainage area is large enough so that continual water flow into the facility will prevent the ponds from becoming stagnant. Outside of irregular dry periods, most of the water will be replenished on a regular basis.

Proposing an infiltration facility with no standing water was considered, however due to the size of the drainage area, the presence of standing water is required by MDE.

Other Site Consideration: ARRO will include lining within the basin footprint to adhere to the Town's Sinkhole Ordinance (Chapter 62 of the Town code).

ARRO recommends that the Town implement changes to the downstream stormwater infrastructure as per the previously conducted study.

Deerfield Swale

- ARRO is proposing to retrofit the existing channel into a dry swale.
- The site is currently channel that drains through 2 X 33" RCP culverts in an eastward direction into Israel Creek.
- After construction of the proposed BMP, the site will continue to flow in the same pattern as the existing conditions.
- Retrofitted facility will improve the current site conditions, prevent erosion, and decrease nutrient and sediment loads into local surface waters.
- Structural Improvements Include:
    - Regrading swale
    - Installation of sediment forebay
    - Installing new rip-rap
    - Installing permeable soils
    - Installing a 4" PVC underdrain
- Currently a number of fences installed by private residents encroach the existing 10' swale buffer.

- New fencing is not a requirement but can be implemented if desired by the Town.

Anticipated Potential Objections From HOA: Some existing fences are within the 10' swale easement and may need to be removed as part of the project retrofit.

Possible Alterations/Alternative Approaches: While many of the existing fences encroach the current 10' buffer, ARRO will attempt to minimize impacts to property owners adjacent or within the easement. Some fences may need to be pushed back if the project moves forward.

Other Site Consideration: Specific to the Town's Sinkhole Ordinance (Chapter 62 of the Town code), ARRO recommends that a liner is not installed at this location. A liner would conflict with the installation of amended soils related to WQV. The amount of time this facility would contain standing water is minimal.

Deerfield Open Space

- ARRO is proposing to construct a multiple pond system.
- The site is currently a field that drains in a southward direction into Israel Creek.
- After construction of the proposed BMP, the site will continue to flow in the same pattern as the existing conditions, however at an even lesser rate due to a large storage volume and installed outlet structure in the proposed BMP.
- Improvements will create lower peak runoff rates discharging from the BMP, as well as detain water for a longer period of time which will help treat the stormwater and improve downstream impacts.
- Structural Improvements Include:
    - Forming basin bottom
    - Installing a berm
    - Modifying site grading
    - Installing an outlet structure
    - Installation of sediment forebay
    - Installing an emergency spillway
    - 3 pond cells to be installed for water quality treatment
        - cell 1 – 1' permanent water depth
        - cell 2 – 1' permanent water depth
        - cell 3 - 1' – permanent water depth

Possible Objections: Standing Water (Safety/Insects), Size, Reducing Open Space.

Possible Alterations/Alternative Approaches: The maximum pond depth based on the existing design is 1'. This depth should minimize the risk of injury in the event someone enters the basin. Fencing may also be installed around the basin perimeter to prevent individuals from

entering the facility. Reducing the overall area of each pond may be an option, however this would require making each pond deeper to maintain water quality treatment. If pond diameter is reduced without increasing depth, impervious restoration credit will likely be reduced.

To minimize the presence of insects specific to the ponds, the vegetation that will be installed within the aquatic zones as well as throughout the basin bottom will promote a habitat for birds and other wildlife that feed on insects. Additionally, the size of the drainage area is large enough so that continual water flow into the facility will prevent the ponds from becoming stagnant. Outside of irregular dry periods, most of the water will be replenished on a regular basis.

The current design footprint maximizes available space within the property to account for the drainage area volume, as well as to maximize water quality treatment specifically with the installed ponds. We may have the ability to reduce the size of the basin footprint. We have reached out to the County and MDE to discuss options available to reduce the basin footprints. We have analyzed our options with the information provided by the reviewing jurisdictions to determine that there is the possibility to reduce each basins' footprint up to approximately 50% smaller than what was shown in the preliminary design plan. Concurrent with the size decrease, the permanent pools will shrink in area but increase in depth. At this decreased footprint, this basin will provide similar water quality treatment, however there will be a significant bypass system to allow the large storms to pass through, untreated and non-detained. There will be less measurable stormwater benefits in the form of rate and volume reduction than originally designed, however, the state water quality benefits will be maintained.

Proposing an infiltration facility with no standing water was considered, however due to the size of the drainage area, the presence of standing water is required by MDE.

Other Site Consideration: The site currently sits within a 100-year floodplain. The Town Code specifically states that water impoundments are not prohibited from the HUD/FIA floodplains. In speaking with the Town Planner, the term water impoundment is not exclusively defined within the Town code. ARRO will prepare all necessary state permits associated with work within the floodplain as part of the project submissions. To further satisfy the Town Code, Article 7 (specifically Section 28-35 and Section 28-36) of the Floodplain Management Ordinance is being met through these projects. These stormwater BMPs significantly control and reduce the rate of stormwater entering into Israel Creek. They will store a significant amount of runoff which will keep it out of the waterway. The placement of the embankments provide additional storage within the floodplain given that the existing area was a flat (ie. the storage is dependent on the peak water elevation of the stream). The introduction of the embankment creates a storage for floodwater greater than what is currently located in the floodplain, theoretically reducing flood heights of Israel Creek. We can certainly have a discussion to make sure we are all on the same page regarding this point. Additionally, ARRO

will include lining within the basin footprint to adhere to the Town's Sinkhole Ordinance (Chapter 62 of the Town code).

Glade Town

- ARRO is proposing to construct a multiple pond system.
- The site currently drains through a concrete swale in a southern direction into Israel Creek.
- After construction of the proposed BMP, the site will continue to flow in the same pattern as the existing conditions, however at an even lesser rate due to a larger storage volume and addition of 2 outlet structures in the proposed BMP.
- Improvements will create lower peak runoff rates discharging from the BMP, as well as detain water for a longer period of time which will help treat the stormwater and improve downstream impacts.
- Structural Improvements Include:
    - Forming basin bottom
    - Installing a berm
    - Modifying site grading
    - Installing outlet structures
    - Installation of sediment forebays
    - Installing an emergency spillway
    - 3 pond cells to be installed for water quality treatment.
        - cell 1 – 2.25' permanent water depth
        - cell 2 – 1' permanent water depth
        - cell 3 - 1.25' – permanent water depth

Possible Objections: Standing Water (Safety/Insects), Size, Reducing Open Space.

Possible Alterations/Alternative Approaches: The maximum pond depth based on the existing design is 2.25'. This depth should minimize the risk of injury in the event someone enters the basin. Fencing may also be installed around the basin perimeter to prevent individuals from entering the facility. Reducing the overall area of each pond may be an option, however this would require making each pond deeper to maintain water quality treatment. If pond diameter is reduced without increasing depth, impervious restoration credit will likely be reduced.

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stagnant. Outside of irregular dry periods, most of the water will be replenished on a regular basis.

The current design footprint within the property is required to account for the drainage area volume, as well as to maximize water quality treatment specifically with the installed ponds. While unlikely, we may have the ability to reduce the size of the basin footprint. We have reached out to the County and MDE to discuss options available to reduce the basin footprints. We have analyzed our options with the information provided by the reviewing jurisdictions to determine that there is the possibility to reduce each basins' footprint up to approximately 50% smaller than what was shown in the preliminary design plan. Concurrent with the size decrease, the permanent pools will shrink in area but increase in depth. At this decreased footprint, this basin will provide similar water quality treatment, however there will be a significant bypass system to allow the large storms to pass through, untreated and non-detained. There will be less measurable stormwater benefits in the form of rate and volume reduction than originally designed, however, the state water quality benefits will be maintained.

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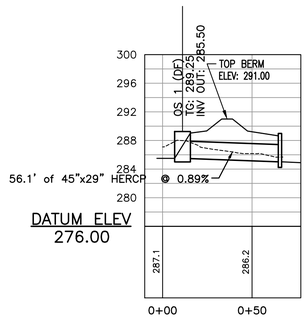
Other Misc. Notes:

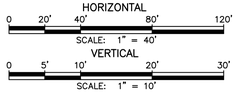
Questions ARRO has provided to MDE:

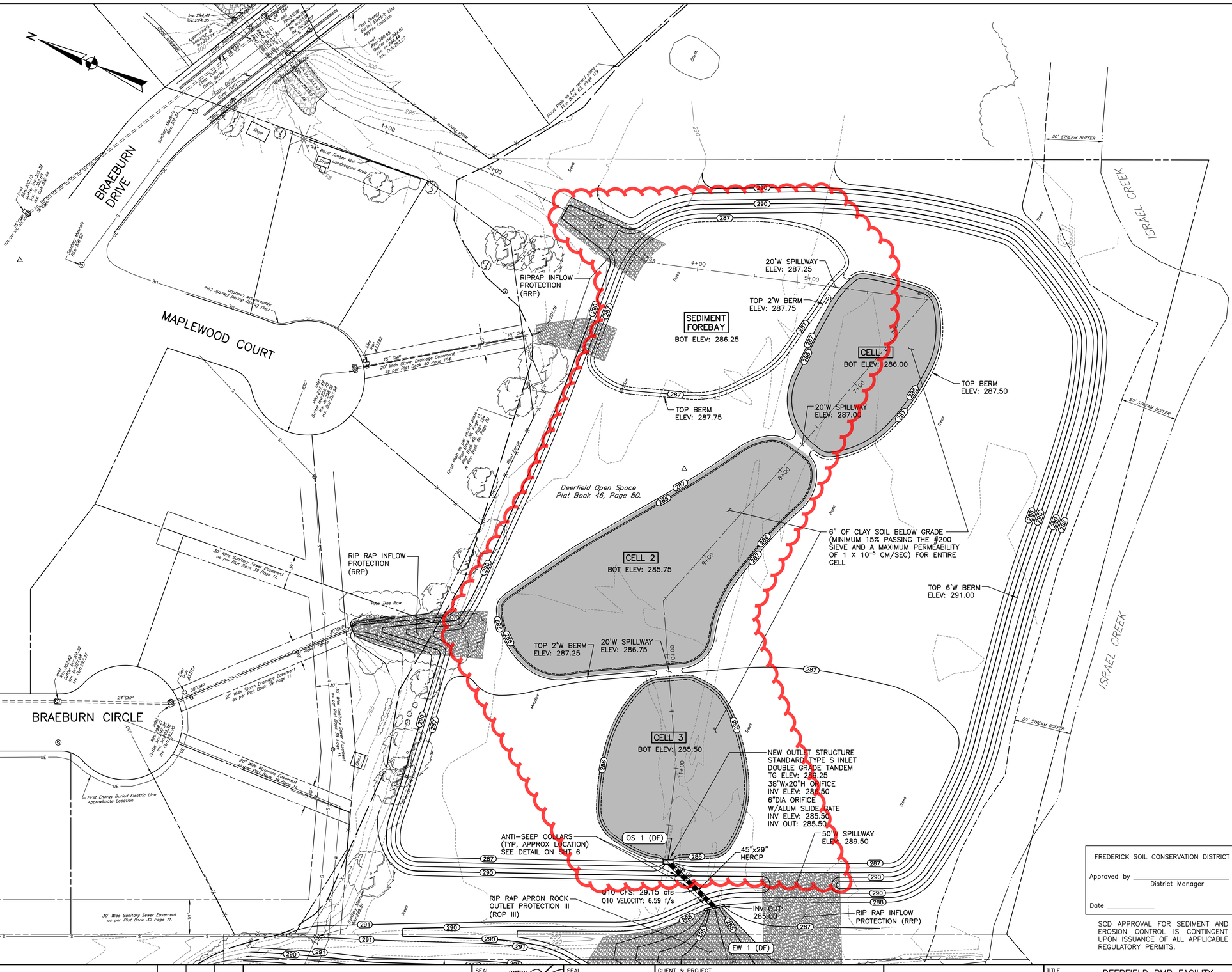
If we wish to reduce basin size via a bypass for large storms:

- If we can design the facility to function to treat as an example a 2 year storm event, are we still able to claim full WQV credit for that facility? What storm size does the facility need to treat not including water that would be directed to an overflow bypass.
    - MDE/Frederick County provided feedback during the weeks of 3/20 and 3/27. This information has been added to the Deerfield and Glade Town possible alterations/alternative approaches sections.

If you have any questions related to this summary, please contact Andrew Tuleya (GIS Manager, ARRO) at andrew.tuleya@arroconsulting.com, or by calling 717-793-1121.







FREDERICK SOIL CONSERVATION DISTRICT

Approved by _____
District Manager

Date _____

SCD APPROVAL FOR SEDIMENT AND EROSION CONTROL IS CONTINGENT UPON ISSUANCE OF ALL APPLICABLE REGULATORY PERMITS.

NO	REVISION	DATE	BY	APP.

NO	REVISION	DATE	BY	APP.

MICHAEL J. BINGHAM, PE
RELEASED BY

DESIGN: BCU	CHECKED
DRAWN: CADD	CHECKED
DATE: OCTOBER 2022	SURVEY DATE: SEPT 2022
	FIELD BOOK: WEBER SURVEYORS

SEAL

STATE OF MARYLAND · MICHAEL BINGHAM · No. 49804 · PROFESSIONAL ENGINEER

SEAL

PROFESSIONAL CERTIFICATION
I, MICHAEL J. BINGHAM, P.E. hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 49804 Expiration Date: 2024-08-23

CLIENT & PROJECT

TOWN OF WALKERSVILLE
21 WEST FREDERICK STREET
WALKERSVILLE, MARYLAND 21793

BMP DESIGNS
WALKERSVILLE, FREDERICK COUNTY, MARYLAND

ARRO
201 Thomas Johnson Drive Suite 207
Frederick, MD 21702
Tel 301.791.1100

TITLE
DEERFIELD BMP FACILITY
PROPOSED CONDITIONS

SCALE 0 20' 40' 80' 120'
SCALE: 1" = 40'

DWG. NO.

PROJECT NO. 10827.37

SHEET NO. 3 OF 9

REV.

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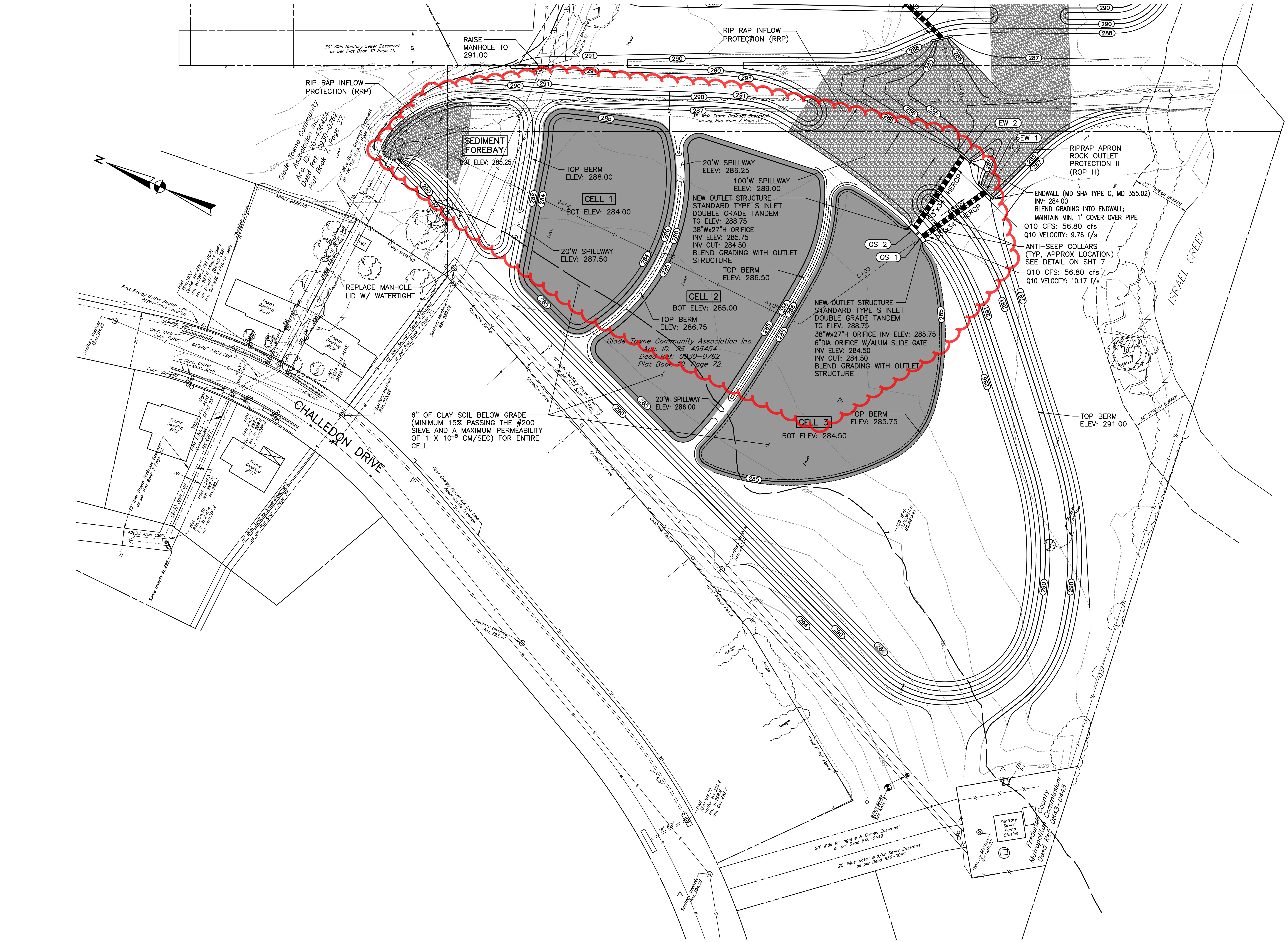

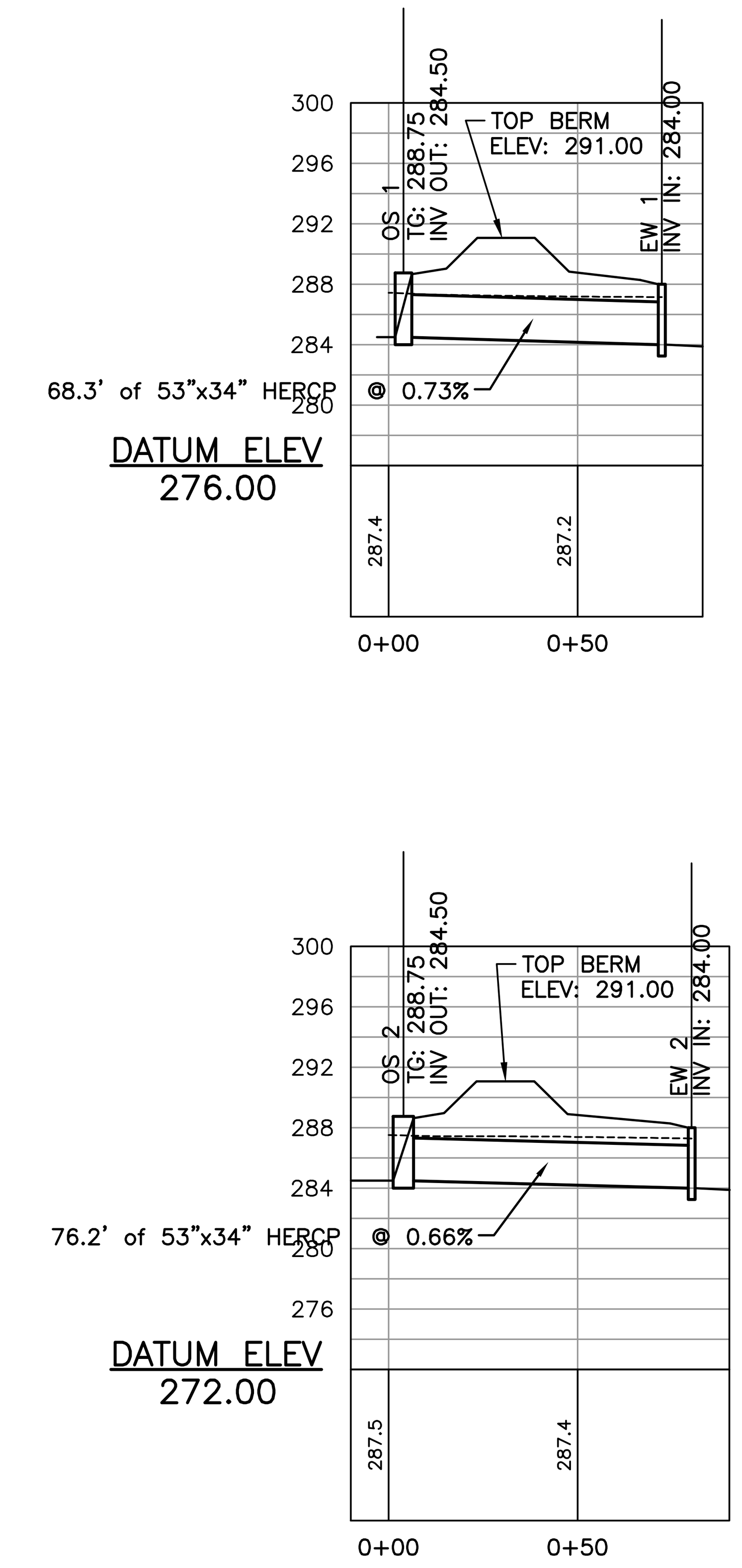

HORIZONTAL
0 20' 40' 80' 120'
SCALE: 1" = 40'

VERTICAL
0 5' 10' 20' 30'
SCALE: 1" = 10'

FREDERICK SOIL CONSERVATION DISTRICT

Approved by ______________
District Manager

Date ___________

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NO	REVISION	DATE	BY	APP.	NO	REVISION	DATE	BY	APP.

MICHAEL J. BINGHAM, PE
RELEASED BY
DESIGN: BCU — CHECKED
DRAWN: CADD — CHECKED
DATE: OCTOBER 2022 — SURVEY DATE: SEPT 2022 — FIELD BOOK: WEBER SURVEYORS

SEAL: STATE OF MARYLAND MICHAEL J. BINGHAM No. 49804 PROFESSIONAL ENGINEER

SEAL
PROFESSIONAL CERTIFICATION
I, MICHAEL J. BINGHAM, P.E. hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 49804 Expiration Date: 2024-08-23

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WALKERSVILLE, MARYLAND 21793

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WALKERSVILLE, FREDERICK COUNTY, MARYLAND

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TITLE
GLADE TOWNE BMP FACILITY
PROPOSED CONDITIONS

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DWG. NO.
PROJECT NO. 10827.37
SHEET NO. 3 OF 9
REV.

Dwg. Name: 1082737-S01.DWG Plotted: 1/5/2023 8:52 AM