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MassDOT
Massachusetts Department of Transportation
Highway Division

November 20, 2020

Lisa Rhodes
Wetlands Program Chief
Massachusetts Department of Environmental Protection
1 Winter Street
Boston, MA 02050

Subject: Proposed Changes for Massachusetts Stormwater Handbook and Massachusetts Stormwater Regulations

Dear Ms. Rhodes,

Over the course of this past year, the Massachusetts Department of Environmental Protection (MassDEP) presented proposed changes related to stormwater management design. MassDEP plans to incorporate these changes into revised Massachusetts Wetlands Protection Act (WPA) stormwater regulations and the updated Massachusetts Stormwater Handbook.

We appreciate the time and effort MassDEP has put into this topic and agree that these changes are important. MassDEP states that these changes are being made to meet the following goals while protecting the wetlands and water resources of the Commonwealth:

- Align the WPA Stormwater Management Standards with the post-construction rules of the 2016 General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) in Massachusetts, and
- Address climate resilience implications through updates to precipitation projections for stormwater management.

Concurrently, as part of the upcoming transportation-specific MS4 permit (known as the TS4 Permit) and Massachusetts Department of Transportation's (MassDOT's) efforts to update its own Stormwater Design Guide (SDG), MassDEP has had multiple meetings with EPA and MassDOT. As a result, our agencies have identified considerations to address highway system constraints that will be incorporated into the revised Massachusetts Stormwater Handbook.

MassDOT agrees with the goals above and is grateful to be part of the Stormwater Advisory meetings. As a member of the Stormwater Advisory Committee (and sister state agency), MassDOT herein provides our input on the proposed changes to meet the goals of the Committee. This letter provides MassDOT's comments on the proposed changes related to stormwater management design. The letter is organized to provide comments as they relate to each of the recent meetings.

Meeting #2: Highway-Specific Considerations (8/25/20)

MassDOT agrees with the concepts proposed for the highway-specific considerations. We understand that the details and specific language of the considerations are to be discussed with MassDOT during future meetings and would like to make sure the following specific comment is addressed.

1. MassDOT noted that the applicability of certain considerations shown on the presentation's last slide (with the blue, orange, and green dots) changed from the matrix that was shared with MassDOT in July 2020. Based on the presentation, three considerations previously determined to be allowed for MassDOT-executed municipal projects were identified with a question mark. The considerations include:

    a. Macro approach

    b. Linear practices

    c. Bioretention and peak rates

    Additionally, two more considerations previously determined to be allowed for MassDOT-executed municipal projects were removed. These considerations include:

    d. Inlet grates for catch basins

    e. Hoods for deep sump catch basins

    During meetings in January and July 2020, MassDEP and MassDOT thoroughly discussed the topic of the considerations' applicability to MassDOT-executed municipal projects. We ask that these considerations be added back into the MassDEP changes. See attached for the Special Considerations Matrix that MassDEP shared with MassDOT in July 2020.

Recommendations: Maintain the applicable entities to use the highway-specific considerations consistent with the list identified in July 2020.

Meeting #3: Updating Precipitation Projections (9/22/20)

2. MassDOT agrees that the Massachusetts Stormwater Handbook should adopt use of the *National Oceanic Atmospheric Association Atlas 14-Precipitation-Frequency Atlas of the U.S. Volume 10, Version 3.0: Northeastern States* (NOAA Atlas 14) for hydrologic and hydraulic analyses. The NOAA Atlas 14 precipitation estimates are based on frequency analysis of partial duration series using data up to 2015 that covers the New England and New York region. This dataset is more robust than the current dataset used for Technical Paper No. 40 (TP-40). TP-40 was published in 1961 and is based on historical data from approximately 50 years of observations and does not reflect recent rainfall estimates. Along with using the NOAA Atlas 14, MassDOT suggests MassDEP incorporate the flexibility to adopt any data that supersedes NOAA Atlas 14 in the future, in order to accommodate future atlases published by NOAA/USGS.

3. The precipitation data used for MassDEP stormwater regulations should not conflict with the future guidelines proposed by the Resilient Massachusetts Action Team (RMAT), the team responsible for preparing the Climate Resilience Design Standards and Guidelines for the State. The RMAT guidelines have not been finalized at this time. See https://www.mass.gov/info-details/resilient-ma-action-team-rmat for further details about RMAT.

4. There is high uncertainty in the estimates of future rainfall, and data varies depending on the source and modeling approach. Instead of accepting that uncertainty and incorporating it into state regulations, it may be better to take a flexible and iterative approach to precipitation data for stormwater management design. This iterative approach can be updated as regulations are updated over the years (e.g., every 5 or 10 years) and will allow regulations to adapt as the science evolves.

5. MassDEP noted during the presentation that updates will be forthcoming on the delineation of the jurisdictional areas Bordering Land Subject to Flooding (BLSF) and Isolated Land Subject to Flooding (ILSF). Although these updates were briefly discussed, it is currently unclear what the extent of these

updates and potential impacts to MassDOT projects might be. Potential updates and impacts include the following.

a. BLSF typically relies on Federal Emergency Management Agency (FEMA) Flood Insurance Studies (FISs) and Flood Insurance Rate Maps (FIRMs) to determine its extent. These flood studies and mapping are based on historical rainfall data and stream flows and do not account for potential climate change impacts. In areas that do not have a detailed study from FEMA, hydrologic and hydraulic modeling is typically used to determine a design flood elevation. In either case, MassDEP could update the methodology for delineating BLSF in order to include climate change data. This could include using NOAA 14+ rainfall or requiring hydrologic and hydraulic modeling rather than relying on historical FEMA mapping or studies. If these changes were to occur, additional engineering costs and/or greater compensatory storage would likely be required for MassDOT projects.

b. ILSF boundaries are determined using the 100-year storm event. If MassDEP updates the calculation requirements to require the use of NOAA 14+ data, then ILSF footprints would become larger, thus reducing developable area.

6. MassDOT has a vested interest in using the appropriate precipitation data for designing its infrastructure. Appropriate design will protect our public investments, reduce damage due to flooding or scour, and maintain a safe transportation network. MassDOT regularly utilizes rainfall data for design and analysis of its infrastructure including bridges, culverts, and drainage conveyance systems. Although these analyses are outside jurisdiction of the Wetland Protection Act (WPA) or Stormwater Management Standards, the adoption of NOAA 14+ in state regulations could make this the default engineering standard for practitioners. MassDOT could be requested to use NOAA 14+ for these analyses during regulatory reviews even if it is outside the jurisdiction of the Stormwater Standards. This has the potential to add significant, and potentially unwarranted, construction costs to bridges, culverts, and drainage conveyance systems. MassDEP should review how use of NOAA 14+ may affect the design approaches for hydraulically dependent structures (e.g., bridges, culverts).

7. The **NOAA 14+ approach should be fully vetted through a peer review** so as to be supported by the climate change community and used for the purposes of stormwater design. The peer review should be performed by entities well-versed in climate change science (e.g., academia, USGS, NOAA). A subcomponent of the peer review should include an impact analysis on use of increased precipitation depths to understand how it affects stormwater management design and other hydraulic structures (e.g., bridges, culverts, stormwater conveyance systems). The impact analysis should be completed by qualified engineers.

Recommendations: MassDEP should adopt NOAA Atlas 14, and any new data that supersedes NOAA Atlas 14, as the basis to meet Standard 2 for stormwater management design, while making sure this approach will not conflict with RMAT guidelines. As the next step toward addressing climate change concerns (before respective regulatory changes), MassDEP should have a peer review performed on the NOAA 14+ approach. MassDEP should also review the extent of impact that NOAA 14+ may have on other resource areas like BLSF and ILSF and design approaches for hydraulically dependent structures.

Meeting #4: Alignment with MS4 Permit (10/15/20)

Overall:

8. Although MassDEP had indicated that the proposed changes were meant to align with post-construction treatment requirements in the MS4 permit, the proposed changes to Stormwater Standards 4 and 7 are more stringent than the MS4 permit requirements. By making the MassDEP rules more difficult to meet

than EPA's, permittees (including MassDOT) will most likely maintain two sets of design requirements based on the jurisdiction they fall under so that stormwater design projects have flexibility to meeting requirements. With two sets of rules, the process for stormwater management design will likely cause confusion for the public and take longer to sort through different options to identify the best method. It would be more efficient and straightforward if there is one set of standards that are applicable across the State.

9. MassDEP should provide guidance on projects that are considered purely maintenance or improvement of existing roadways (i.e., widening less than a single lane, adding shoulders, correcting substandard intersections, improving existing drainage systems, and repaving projects). Based on the existing Massachusetts Stormwater Handbook, these projects are considered redevelopment and required to meet the structural requirements of Standard 4 to the maximum extent practical. Based on the MS4 Permit, these projects need to improve existing conditions unless infeasible and are exempt from part 2.3.6.a.ii.4. which is focused on pollutant removal (and is similar in purpose to Standard 4). MassDOT recommends that MassDEP confirm that these types of projects will be regulated in a consistent fashion with the MS4 Permit and that the following applies for these types of projects:
    - These projects are considered redevelopment.
    - These projects need to improve existing conditions to the maximum extent practicable.
    - These projects need to meet Stormwater Standards 1, 2, and 3 and the pretreatment and structural BMP requirements of Standards 4, 5, 6, and 7 to the maximum extent practicable.

    It is unknown at this time how Standard 11 will apply to these projects since the details of Standard 11 are still being determined.
10. MassDEP should confirm that new sidewalks, footpaths, bike travel lanes and paths, and similar access ways for pedestrian and/or nonmotorized vehicles should follow the Stormwater Standards to the "maximum extent practicable."
11. Although this does not affect MassDOT, the schedule for release of the Massachusetts Stormwater Handbook and revised regulations may impact the deadline of July 1, 2021 for permittees to revise their stormwater by-laws and regulations in order to be consistent with the MS4 Permit. This delay in schedule may create unnecessary extra work for the towns and require them to update their by-laws and regulations multiple times over the next couple years in order to be compliant with the MS4 Permit and MassDEP regulations. Multiple revisions to the bylaws and regulations in a short amount of time may create confusion to the public about requirements and design approaches. The delay in the release of the Massachusetts Stormwater Handbook and revised regulations may also impact the release of the TS4 Permit for MassDOT.

Recommendations: MassDEP should follow the same treatment requirements as the MS4 permit so there is one set of standards that are applicable across the State. MassDEP should confirm that projects consisting purely of maintenance or improvement of existing roadways will be regulated in a fashion consistent with the MS4 Permit. MassDEP should confirm that new sidewalks, footpaths, bike paths, and similar access ways, etc. should follow the Stormwater Standards to the maximum extent practicable.

<u>Standard 2 – Peak Flow</u>

12. MassDOT agrees that there should be no changes to this Standard, although we recognize that stormwater management design may be affected by a change in the data source used for precipitation estimates.

Recommendations: None.

Standard 3 - Recharge

13. MassDEP is proposing to require 1-inch of recharge and explained that this change is based on alignment with the MS4 Permit. However, the MS4 permit requires treatment through an optional retainment of the 1 inch of runoff volume, not 1 inch of recharge. The MS4 permit provides the 1-inch of retainment as an option for how to meet the post-construction treatment requirements. Under the MS4 permit, the designer may choose to use the EPA curves for meeting the treatment requirements in lieu of demonstrating retainment. By providing options, designers are allowed more flexibility to provide the right type of treatment for the site and to maximize the areas which can provide treatment. As presented, the proposed revisions to this standard are not in alignment with the MS4 permit.
14. It should be noted that there is a difference between recharge, which is a requirement under the Stormwater Standards, and retainment, which is an option for treatment under the MS4 Permit. Recharge replenishes groundwater and improves baseflow while retention holds back stormwater from discharging offsite. Recharge is a form of retention, but retention can also be met through evaporation, transpiration, and water reuse.
15. **The research and assumptions made to support the proposed revisions to Standard 3 should be peer reviewed**. MassDEP stated that the recharge needed to approximate pre-development equals 70% of the annual precipitation. Without a detailed review of supporting data and analysis, it is unclear how this statement was determined. For example:
    a. No research has been done on identifying trends in streamflow or increase in wetland areas.
    b. No evidence has been provided that shows an increase in precipitation equates to an increased ability for soils to increase its absorption rate or hydraulic conductivity.

    The supporting analysis that was presented appears to be based on climate change and increased precipitation rates, not on attempting to achieve alignment with the MS4.
16. A requirement of 1-inch of recharge appears excessive given the distribution of small storms over the course of a year. If the goal of Standard 3 is to promote recharge to groundwater on an annual basis, the BMPs should be designed to provide a desired recharge volume on an annual basis and requirement should be based on achieving those goals.
17. The proposed revisions to Standard 3 will be very difficult to meet for certain site conditions, such as HSG C soils. This requirement may require structural BMPs with very large footprints to provide enough surface area for stormwater to infiltrate within 72 hours. The example that MassDEP provided titled "1-inch Recharge Can Be Achieved in All Soils" was based on a BMP that has the same footprint as its contributing watershed, which would essentially apply to porous pavement only. The 1-inch of runoff is multiplied by the contributing impervious area to the BMP to obtain a recharge volume. When the recharge volume is concentrated in a BMP such as a basin, it will pond to a depth much greater than 1-inch and the available surface area for infiltration will be a fraction of the contributing drainage area. Therefore, the infiltration rates needed to achieve full drawdown in 72 hours will depend on the BMP infiltration surface area in addition to infiltration rate at the location of the BMP.
18. It is unreasonable to require 1-inch of recharge across all soil types (excluding HSG D soils). It will require large and costly structural BMPs, the opposite of what low impact development promotes. As discussed in the previous two comments, the soil infiltration rates greatly impact the quantity of annual recharge at a site (the goal) and the ability of the BMP to provide recharge (the mitigation measure), and therefore requirements should be aligned with the soil types of the site and not be universal.

Recommendations: MassDEP should have a peer review performed on the research and assumptions made to support the proposed revisions to Standard 3. MassDEP should maintain the approach of requiring recharge depth based on different soil types, instead of requiring 1-inch of recharge across the board.

Standard 4 – Water Quality Treatment

19. For new development projects, the proposed changes to Standard 3 essentially negate the requirement for Standard 4 and use of the curves. By meeting the proposed Standard 3 and providing 1-inch of recharge for the site, you have also met Standard 4. This change causes Standard 4 to have little to no purpose. The only situation where Standard 4 would become important to address directly is when a site has HSG D soils, there is bedrock at or near the surface, or it's a hazardous and solid waste site because the Standard 3 recharge requirement is to the MEP. For projects with HSG D soils or bedrock that can't recharge 1-inch, you are not allowed to use the curves to show compliance with Standard 4 and so you must treat 1 inch of runoff using MassDEP-approved BMPs. For projects at hazardous and solid waste sites that cannot recharge 1-inch, you could either use the curves or treat 1 inch of runoff using MassDEP-approved BMPs. However, this would provide only one situation for potential use of the curves. Therefore, as presented, Standard 4 largely negates the opportunity to use the EPA curves and ignores importance of using field-driven data to optimize BMP sizing and calculate pollutant reduction.
20. For redevelopment projects, Standard 3 allows recharge to the MEP (as defined in Standard 7). The MS4 permit presents two options for meeting treatment requirements:

    1) provide 1 inch of retention, or

    2) use the EPA curves to demonstrate treatment.

    MassDEP presents a similar option 1 but as recharge instead of retention, includes option 2, and presents an additional option of:

    3) treat 1-inch using MassDEP-approved BMPs.

    Additional options using a different accounting system (water quality volume vs. pollutant removal performance) may create confusion and incongruence with the MS4 permit if designers choose not to use the EPA curves for BMPs that need to meet both the requirements of the Stormwater Standards and the MS4 Permit.

Recommendations: MassDEP should provide one option to meet Standard 4 and that option should be to allow use of the EPA curves to align with the MS4 permit.

Standard 7 - Redevelopment

21. MassDEP is not proposing any changes to the definitions of new development and redevelopment from the existing definitions, whereas EPA has new definitions, therefore propagating two sets of definitions of when a project is considered redevelopment or new development between MassDEP and EPA. Two sets of rules will create confusion for where BMPs need to meet both the requirements of the Stormwater Standards and the MS4 Permit. MassDOT recommends rectifying the definitions to align with the MS4 permit.
22. MassDEP's proposed revisions to Standard 7 do not allow off-site mitigation to meet Standards 3 and 4 for discharges to Critical Areas or to receiving waters with TMDLs. This approach does not align with the MS4 permit as the permit allows offsite mitigation to meet post-construction treatment requirements and requires that TMDLs be met on a watershed scale (not project scale). The MS4 permit promotes

treatment at the watershed scale and allowing offsite mitigation within the same HUC 12 watershed is the exact reason for this requirement. Discharges to receiving waters with TMDLs should be allowed to implement offsite mitigation. It should be noted that most of Massachusetts is covered by a TMDL (including out-of-state TMDLs) and the requirement to not allow offsite mitigation to receiving waters with a TMDL would impact many projects.

23. MassDEP is proposing to update the definition of impervious area to align with the MS4 permit which is ideal. However, the revised definition is not exactly the same as EPA's definition. EPA's definition includes "compacted gravel and soil" while MassDEP's definition includes "gravel roads" which is not necessarily the same thing. MassDOT recommends using the same words between definitions to avoid confusion.

Recommendations: MassDEP should reconcile the definitions of new development and redevelopment to align with the MS4 Permit. MassDEP should allow offsite mitigation to provide treatment for projects that discharge to receiving waters with TMDLs. MassDEP should use the language provided in the MS4 Permit for definition of impervious area.

Standard 11 – Supporting TMDLs

MassDEP presented the concept of the new Standard 11 which would address TMDLs but did not provide specifics, therefore MassDOT does not have detailed comments yet.

24. MassDOT recommends MassDEP follow the same TMDL and impaired water requirements as the MS4 permit (Appendices F and H of the MS4 Permit). The MS4 permit's approach to TMDL compliance is based on a watershed scale, not a project scale. Therefore, to be consistent with the MS4 permit, MassDOT recommends that project-specific TMDL requirements do not apply and instead that project proponents show how the TMDL is being met on a whole by the associated MS4 and its BMPs and how the project factors into TMDL compliance for the permittee.

Recommendations: MassDEP should use the same TMDL and impaired water requirements as Appendices F and H of the MS4 Permit to be consistent during development of the details of Standard 11.

Based on MassDEP's proposed changes to the Stormwater Standards, MassDOT may have more highway-specific considerations to propose, depending on the final changes. We are looking forward to finalizing the details of the highway-specific considerations with MassDEP once updates to the Standards are finalized.

MassDOT appreciates the opportunity to comment on the proposed changes and for being part of the Advisory Committee. We look forward to continuing to work together with the Committee as we share our cumulative expertise, and provide critical support as MassDEP works on the updates to the regulations and the Massachusetts Stormwater Handbook. We welcome additional meetings with the Advisory Committee, as necessary. Please feel free to contact me at (617) 838-2888 with any questions.

Sincerely,

Henry h Barbaro

Henry Barbaro
Wetland Unit
Environmental Services Section

Special Consideration Matrix VERSION 1

PROJECT TYPES

- All Project Types
- MassDOT roadways only
- Municipal roadway projects funded by MassDOT that meet MassDOT Design Specifications
- Municipal funded roads

Special Consideration # (NOT MassDEP Standard #)	**TOPIC**	**CURRENT**	**PROPOSED**	**APPLIES TO**	**COMMENTS**
1	Use of EPA Curves to calculate TSS and TP removal credits for Stormwater Control Measures (SCMs).	MassDEP has Credits defined in Stormwater (SW) Handbook	Proponents may use EPA Curves when available (using WQV for new development & % removal for redevelopment). If no EPA curve, use MassDEP credits in SW Handbook.	All project types	Provides alignment with MS4 permit, less confusion for proponents.
2	Treatment Credit for MassDOT Linear Practices (i.e. Bioretention, Wet Pond, Infiltration)	MassDEP SW handbook has Design specifications for these Best Management Practices	Allow credit per this special condition, provided MassDOT develops a design specification incorporating MassDEP conditions.	MassDOT roadway projects, Municipal roadway projects funded by MassDOT that meet MassDOT design specifications, and Municipal funded roadway projects.	Provides additional options for roadway projects to comply with SW standards. Note this special condition is extended to municipal roadway projects provided MassDOT prepares a specification that can be included in the Stormwater Handbook.

3	Use of Bioretention SCMs to meet Peak Rate Attenuation (Standard 2)	No peak rate credit for bioretention	Peak rate credit for bioretention, provided MassDEP conditions met.	MassDOT roadway projects, Municipal roadway projects funded by MassDOT that meet MassDOT design specifications, and Municipal funded roadway projects.	Provides additional options for roadway projects to comply with SW standards. Unlikely to be utilized on municipal roads due to size constraints. Note this special condition is extended to municipal roadway projects provided MassDOT prepares a specification that can be included in the Stormwater Handbook.
4	Interpretation of New Stormwater Discharges as Existing	New = new outfall or new discharge point	Allows for a new reconfiguration to be considered "existing discharge" provided it results in an improvement to WQ/reduces impact to resource area	All project types	Encourages improvements.

5	Allows for Alternative MassDOT Inlet Grate Specifications for Catch Basins	The current SW Handbook requires 1-inch orifices; No greater than 3 cfs; and no curb inlet, to receive MassDEP credit	The proposed standard would allow 4.4- x 2.7-inch orifices; 2- x 2-inch orifices; 1.2- x 21-inch orifices; no curb inlets to receive credit	MassDOT roadway projects, Municipal roadway projects funded by MassDOT that meet MassDOT design specifications	MassDOT provided computations demonstrating that these alternative standards will meet the 3 cfs flow rate criteria and minimize resuspension of sediment trapped in catch basins.
6	Porous Pavement Filter Course Depth for Porous Asphalt	SW Handbook requires minimum 12-inch filter course for porous asphalt	Proposal to require minimum 8- to 12-inch filter course for porous asphalt	All project types	Provides incentive of less cost to promote porous pavement. Supported by UNH specification.
7	Maintenance Access to SCMs	SW Handbook requires minimum at least 15-feet wide	Proposal to require minimum 12-feet wide	MassDOT only	MassDOT uses small bobcat vehicles to conduct maintenance
8	Hoods for Deep Sump Catch Basins	SW Handbook requires that all deep sump catch basins must contain hoods to receive MassDEP credit	Proposal that Hoods be required at: • Commercial areas • Rest areas • Maintenance yards • Where there is combination inlet (open curb inlet plus grate inlet) • Discharges to or near Critical Areas	MassDOT roadway projects, Municipal roadway projects funded by MassDOT that meet MassDOT design specifications	Same as approved MassDOT criteria in 2004, except for combination inlets.

9	O/M Approach	SW Handbook has a minimum cleaning frequency by BMP type	Proposed Plan to include: • Interim Plan to be submitted to MassDEP for approval • Permanent Plan to be submitted to MassDEP for approval	MassDOT only	MassDOT is unable to meet current maintenance requirements given the size of the roadway drainage system they maintain, and the cost. Cleaning frequency also to be dictated by TS4 permit.
10	Macro Approach	SW Handbook requires that stormwater mitigation must be provided onsite at the resource area/buffer zone altered	Offsite mitigation allowed provided MassDEP conditions met.	MassDOT roadway projects, Municipal roadway projects funded by MassDOT that meet MassDOT design specifications	Expect smaller roads to be able to comply without macro approach, but longer projects benefit. Is there a minimum distance that should be applied? Need to be considerate of watershed restrictions. Ask AC.