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HOWARD SCD ENGINEERING NEWSLETTER

PONDS

20' 'NO WOODY VEGETATION' BUFFER:

The Howard County Department of Public Works states within its Volume 1, Section 5.2.4.G that "no trees are permitted within 20 feet of the toe of fill of a pond embankment". This is a design requirement wisely established in accordance with state guidance, to keep mature tree roots from reaching and weakening the embankment. **Embankments are structures.** However, because they are constructed of earth (for least expense), they are often overlooked and prone to accelerated deterioration by invasive woody vegetation which seeks to root itself. Eventually the constructed earth, which was optimally compacted to impound water, is pervaded, weakened and rendered dangerous to downstream owners. Therefore the HOWARD SCD supports and adopts this policy to promote ease of maintenance and to ensure that future owners and generations are left with embankments which are safe from the nearby woody vegetation that typically is left and encouraged to mature in the adjacent buffer/open-space/floodplain areas. **Note that this no-woody-vegetation buffer is entirely outside the wetland and stream buffers, floodplain and forest conservation areas which county regulations encourage to mature into natural, no-maintenance state, for optimum long-term protection of environmentally sensitive areas.**

REDLINES NEED HOWARD SCD APPROVAL:

A recent occurrence has reminded those involved that all redline revisions to ponds require **HOWARD SCD approval**. If you've received DED approval without HOWARD SCD comments, be advised that this is not implicit approval from our office. While we strive for coordination due to mutual interests, the county is not responsible for securing HOWARD SCD approval, as is the owner/developer required by state law. Please contact our office should you have any questions or concerns.

ULTIMATE DEVELOPMENT T_c :

Note that, as required by MD-378, a pond design must account for potential of future full development of the watershed. Not only does this include Ultimate RCN (per zoning) computations, but **reasonable estimates of T_c (time of concentration) must be made as well.** Typically in residential- zoned areas the runoff originates on rooftops and lawns, only to be intercepted by swales between houses and conveyed into street gutters and stormdrains. Forested or long overland and swale flows are not considered typical for Residential or other Urban Zonings. Please provide T_c computations which reflect the shortest flow durations expected within the life of the pond, even when it originates off-site.

DISCHARGE EASEMENTS:

Md Standards and Specs reminds consultants that where discharge occurs at the property line, drainage easements will be obtained in accordance with local ordinances.

Section 16.133 of Howard County Code states that where deemed necessary...the developer shall provide off-site drainage easements.

Volume 1 - Storm Drainage Design Manual of Howard County, Chapter 1 states that easements will not be required unless the point of discharge has been concentrated or altered in location or size of the drainage basin has been significantly increased in area. Section 5.2.4.F further states that "where a stormwater plan involves concentration or increase of runoff off the site, it shall be the responsibility of the developer to obtain from the adjacent property owners any easements or other necessary property interest concerning the flowage of water".

Because such easements are often necessary for proper and unerosive conveyance to an existing stable watercourse the HOWARD SCD will not approve plans which do not include secured easements. Also a breach routing may reflect need for a wider easement to contain the breach flood.

TRASH RACK PROJECTION & CLEARANCE:

As stated in MD-378 "inlet structures that have flow over the top shall have a non-clogging trash rack such as hood-type inlet which allows passage of water from underneath the trash rack into the riser". Similar to standard metal, concentric trash rack designs, the goal is to design a hood-type, feed-from-underneath trash rack which keeps floating debris from clogging the principal weirs. Concrete weir openings follow the same methodology. The bottom-of-trashrack area (A_{TB}) should exceed the weir flow area (A_{WF}) for all weir stages, i.e. $A_{TB} > A_{WF}$, up through the design high water (DHW).

Also, while not explicit in the specification, ample clearance is needed between the embankment and entire trashrack. Therefore please ensure that there is 1' **minimum** clearance between embankment and entire trashrack and that flow between bottom-of-trashrack and

embankment is unerosive, e.g. < 5 fps.

PRINCIPAL SPILLWAY, CREST:

Please note that the principal spillway crest as referenced on pp. 378-4 under "Principal Spillway" is interpreted as the highest weir-elevation of riser structure. It is this weir from which the 1' minimum to emergency spillway is measured.

EROSION & SEDIMENT CONTROL

TEMPORARY SWM:

After discussions with the engineering community and inspectors the HOWARD SCD has agreed to allow routing of TSWM computations to begin at top-of-wet rather than top-of-dry volume, except in situations where there is high water table or a baseflow present, in which case the routing may not occur until the first "free" (e.g. no dewatering device) and open orifice. Please note the following answers to frequently asked questions.

- 1). TSWM is required for traps/basins receiving > 2 acres of runoff .
- 2). Minimum E/S Control (MDE) wet and dry volumes must be provided (1800 cf/Ac., each) for the entire drainage area.
- 3). Dry volume must be filtered through a dewatering device.
- 4). Any TSWM volume beyond the dry sediment control volume may be routed through an amply protected orifice set at or above the dry volume.
- 5). One foot (1') freeboard on the 10-yr. storm is required for basins with an emergency spillway, 2' for no emergency spillway.
- 6). The uppermost weir opening may not enter orifice flow before barrel controls.
- 7). TSWM is to maintain runoff from the **largest** post-disturbance drainage area for any one trap or basin equal to the pre-disturbance rate at the outfall.

- 8). Except in cases of high water table or baseflow to a trap/basin, TSWM routing may begin at the wet elevation.

- 14). Cleanout elev.
- 15). Bottom elev.
- 16). Bottom dimensions
- 17). $Q_{2\text{exist}} / Q_{2\text{prop}}$ (if D.A. > 2 ac.)

SEDIMENT BASINS:

All basin designs need to meet Design Criteria (pp. C-10-2) and Construction Specifications (pp. C-10-6) of MDE Standards and Specifications. All submissions need to address "Information To Be Submitted" (pp. C-10-8), and include completed Temporary Sediment Design Data Sheet (pp. C-10-10). Also please note that if trap design limits must be exceeded due to physical constraints then they must be designed as basins. Finally all basins require baffles unless computations prove otherwise.

TYPICAL BASIN/TRAP ITEMS:

- i). Note that basins and traps typically need Removable Pumping Stations (RPS) and Inflow Protection (RRP, GM, PSD).
- ii). Traps should meet minimum dimensions listed within tables 9 and 10 of Maryland Standards and Specifications for Soil Erosion and Sediment Control. Otherwise please provide baffle design.
- iii). Trap schedules should typically include the following:
 - 1). Trap number
 - 2). Trap Type (detail)
 - 3). Existing (pre-disturbance) Drainage Area
 - 4). Proposed (post-disturbance) Drainage Area
 - 5). Storage required (wet & dry)
 - 6). Storage provided (wet & dry)
 - 7). Weir length or riser/barrel size.
 - 8). Depth below outlet elev.
 - 9). Channel depth (if Type III)
 - 10). Outfall length (if Type IV)
 - 11). Embankment elev.
 - 12). Weir crest elev.
 - 13). Outlet elev. (= wet elev., = bottom of perforated POST)

FOREBAY WEIRS & CHANNELS:

Site visits and conversations with maintenance personnel have revealed commonly overlooked erosion problems in forebay designs. While not considered an actual "embankment" the forebays and their weirs do retain shallow depths of water, enough to build pressure inside the stone/baskets and "blow-out" earth material around the abutments and toes of the forebay. The following list of design criteria were assembled to address the typical problems of failure:

- 1). Gabion baskets need geotextile at all interfaces with stone.
- 2). Gabion needs to be embedded by 3' minimum into earth, to increase seepage length.
- 3). Aprons should be a minimum of 5' in length and of Class I riprap to prevent movement by weir impact and/or people.
- 4). Forebay embankments need a 1' minimum depth weir of sufficient capacity (width) to keep the flow contained at one well-armoured spot. This applies even to those forebays with low flow pipes which typically clog from grass, leaves, twigs & trash.
- 5). Riprap and gabion on steep slopes should receive intermittent impervious cutoffs to prevent undermining and slope failure from frequent flows.

There are several sources for design of seepage controls (e.g. "Groundwater & Seepage", M. Harr; "Seepage, drainage and Flow Nets", H.R. Cedergreen) however the commonly used 3' depth should suffice for most cutoffs and embedment of shallow impoundments and mild sloping channels. Note that an experienced geotechnical engineer may be employed to analyze the adjacent soil material and provide design recommendations to control seepage.

ECM MINIMUM PROTECTION:

Any visit to a recently completed construction site, even after the most mild rain event, will reveal signs of any weaknesses in soil stability due to lack of sufficient cover. Sufficient cover, however, is not available in vegetated areas until grass is mature enough to withstand erosion. Erosion control matting is therefore the typical "instant" protection one can provide to hold seed mix in place until the grass is established well enough to "hold it's own". Therefore on steep slopes or concentrated flow conditions (e.g. swales between homes, ditches, outfalls, etc.) the HOWARD SCD is accepting an ECM symbol or hatch in these areas to temporarily address erosion until the vegetation has taken hold.

TRACTIVE FORCE METHOD (HEC-15):

There are two approaches most commonly used to assess the stability of channel flows: 1). Permissible velocity method, and 2). Permissible tractive force (shear stress) method. Because of the variability of velocities within a section of channel, the velocity method is considered limited in accuracy as compared to shear stress which measures the actual force that flowing water exerts on the ground surface. (Ref: "Geosynthetic Erosion Control Products: A Brief Overview", Warren Cohn, Synthetic Industries). The Federal Highway Administration publication entitled "Design of Roadside Channels with Flexible Linings", Hydraulic Engineering Circular No. 15 is an excellent source of analysis through use of the tractive force method and is available in software form from McTrans of the University of Florida (352-392-0378), with the supporting manual. In questionable cases the HOWARD SCD may call for documentation of stability using the tractive force method and analysis of the materials used to prevent erosion failure.

INCREMENTAL STABILIZATION:

Embedded with Section 20.0 of the MDE Standards is the Incremental Stabilization specifications for cut and fill areas, divided into a 15' vertical increments.

Please incorporate the specifications and figures into plans when applicable and include PSD on plan views where needed.

The following items should be included on all plans, which are submitted to the Department of Planning & Zoning on July 1, 1999 and after:

STOCKPILES:

All stockpile areas no matter how labeled are to be shown as temporary and are to have their removal included in the sequence of construction.

BOLD SEDIMENT CONTROLS:

On the sheets, which show sediment controls, please "darken" or "bold" them in order for them to be more easily seen.

GRADING PLAN PROCESS:

The following is to be followed when applying for a single residential lot grading plan approval from the Howard SCD;

- 1). Submit one print to the Howard SCD for review. The Howard SCD will assign a due date that will be five working days from the date of submission of the plan. The Howard SCD will also assign the plan a "GP" number. The Howard SCD will respond to the engineer who submitted the plan originally. We will not respond to the builder or developer. The engineer will address the Howard SCD comments and provide a corrected print and the original mylars for signature, or one additional print for further review depending on the severity of the comments provided.

ADDRESS OF SITE:

Please provide the address of the site on the plans.

WETLANDS

WETLAND JURISDICTION ≠ DEFINITION

There has been some confusion of late regarding Howard County regulation of wetland buffers. Please note the following:

1. Howard County (Reg. County Code See 16.116) states that "Grading or removal of vegetative cover shall not be permitted within 25 feet of a wetland in any zoning district".

Note that the above has no limit to county jurisdiction other than the actual wetland as defined by the currently accepted Federal (1987 ACOE) Manual and amendments thereto.

2. Maryland (Reg. State Code, Title 5, Subtitle 9) lists those activities which are considered regulated (5-901(i)) and those which are exempt (5-906 (a)).

Note that while the county may use similar discretion as the state during waiver considerations, there are no explicit exemptions by county regulation as those listed by the state.

3. Federal (Ref. 33 CFR Part. 328) regulations describe wetlands as a subset to "waters of the United States" and lists their limits of federal jurisdiction (CFR 328.4) and those activities covered by nationwide permits (CFR 330).

What has surprised some consultants is that their receipt of Federal release of jurisdiction from the ACOE has caused them to assume that delineations were correct and that all (county and state) other local regulations were satisfied.

Please note that release of Federal jurisdiction does not mean release of County (local) jurisdiction. Our experience has been that the ACOE is scrutinizing jurisdictional determinations more closely with respect to isolated wetlands and hydrologic connectivity as they relate to interstate commerce and continuity ("adjacent") with the contiguous waters of the United States.

The state jurisdiction also exempts isolated nontidal wetlands (MDE 5-906) by their definition of

hydrologically connected (26.23.01.01) also "reaches further" than federal jurisdiction. Generally a wetland which is part of a drainage ditch, 100-yr. floodplain, part of a spring-flow, or artificially (manmade) separated by berms, roads, etc. are included by state regulation.

Our office references the same delineation (87 ACOE) manual as the Federal and State regulators, and on occasion may disagree on boundaries based on differences in technical interpretations, as professionals often do. However our greater challenge is to make developers and consultants aware of the subtle differences between jurisdiction and definition. Because the county does not explicitly define and exclude isolated wetlands we would advise consultants to show all wetlands and apply for county waivers on a case-by-case basis, as presently required.

Conceptually the Federal waters (including wetlands) cover large adjacent systems, State wetlands extend hydrologically connected wetlands, and the county wetlands scrutinize the fringes that make up the upper and most numerous areas that protect runoff quality and wildlife habitat within Howard County.

When solicited by the county our office uses its technical expertise in engineering, wetland delineation and resource protection planning to advise on issues regarding "necessary" disturbances, mitigation and other environmental issues. "Necessary" items may include access/utility crossings and often activities such as those listed under COMAR 26.23.03 for which we may recommend some pertinent means of mitigation.

GENERAL

WAIVER ≠ APPROVAL:

If you have received DPZ approval to waive the SDP for mass grading, you have not received HOWARD SCD approval for the sediment control. Because conditions and requirements may accompany its approval, waivers to SDPs are considered only for the merit of the waiver, not the design of the plan. Only after the waiver is approved, and any conditions therein incorporated, will the plan be accepted for review by the HOWARD SCD.

HOWARD COUNTY SOIL SURVEY UPDATE:

The modernization effort of the 1968 Howard County Soil Survey is well under way.

The soil survey is a planning tool, containing soils information which will benefit anyone who uses the land for growing crops, building houses, roads, or ponds, recreational purposes, for land use planning, or who is planning on purchasing one building lot or hundreds of acres. In the earlier version of the soil survey, the major focus was on agricultural interpretation, as a result the soil was only examined down to a depth of approximately four feet in most cases. Today, soil scientists are examining the soils deeper enabling them to provide accurate interpretations related to urban issues such as basements, and septic field functions to name a few. The soil survey also provides timely information related to such issues as water quality, wetlands, seasonal high water tables and updated crop yields.

The photobase will be updated at a larger scale than the original soil survey, enabling the soil scientist to make soil delineations with much more precision. This precision is accomplished by using the contrasting tones, and identifying soils which were omitted in the original survey due to the smaller scale. The new photobase will be in a digital format, with the soil delineated on the photobase. With this electronic capability, the survey will be much easier to use and at the same time requirements for conservation and land use planning activities will be greatly reduced. Soils information along with roads, streams, floodplain boundaries, tax parcels and conservation practices if available can be superimposed on one another to provide valuable information to landuse planners, conservationists and the homeowner.

This is a very exciting time for the soil survey program in Howard County with many new changes in store for the new soil survey.