ALLEGAN COUNTY DRAIN COMMISSIONER’S
DEVELOPMENT STANDARDS
FOR
STORMWATER MANAGEMENT SYSTEMS

Allegan County Drain Commissioner          - Becky Riningter
Chief Deputy                                - Beverly Green
Deputy                                      - Denise Medemar
Engineer                                    - Glenn Pomp
Maintenance Supervisor                      - Brent Scholten
Maintenance Worker                          - Ron King
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SPECIAL NOTE

Every effort possible has been made to eliminate conflicting information within this document; however, in the case conflicting information still exists the reader shall assume the most stringent standard applies and is encouraged to inform the Drain Commissioner’s office of said conflicts. The reader is also encouraged to share any other concerns and/or comments with the Drain Commissioner about any part of the standards.
SECTION 1

PURPOSE AND INTRODUCTION
PURPOSE AND INTRODUCTION

A. All plats to be recorded with the Register of Deeds must be in conformity with the Michigan Land Division Public Act 591 of 1996. Under this Act, the Drain Commissioner is responsible for reviewing the drainage or storm water management system of a development. The following standards and specifications are designed for these purposes.

B. The Drain Commissioner of Allegan County, through Public Act 40 of the Public Acts of 1956, as amended, MSA 11.1001 et seq.; MCLA 280.1 et seq., known as the Drain Code of 1956, has acquired jurisdiction over established county drains and under the terms of Michigan Land Division Act acquires jurisdiction of drainage systems within subdivided lands and drains external to the proposed subdivision after January 1, 1968. In accordance with the provisions of the Michigan Land Division Public Act 591 of 1996, the Drain Commissioner has the authority to ensure that established drains and natural water courses, both inside and outside of the plat, be improved or protected to the standards established by the Drain Commissioner. Primary drainage systems within subdivided lands are considered public systems under the jurisdiction of the Drain Commissioner. In the case of this section subdivided lands shall mean public plats or site condominiums that are required by the municipality to be reviewed by the Drain Commissioner.

C. The general standards set forth herein will also be applied by the Allegan County Drain Commissioner in the review of the following:


3. Plans for parcel splits requiring the construction of a new public or private roadway.

4. Drain Use Permit will be required for activity within a county drain including but not limited to crossings, connections, cleanouts, enclosures and relocations.

5. Review of storm water system plans in other classes of development or redevelopment, when requested by local governments.

D. These rules provide minimum standards to be complied with by proprietors, and in no way limit the authority of the local municipality in which the development is situated to adopt and enforce higher standards as a condition of approval of the final plat or site plan. If the local municipality has adopted more stringent standards, the Drain Commissioner’s Office will review plans in accordance with those standards.

E. All plats, site condominiums, and regular condominiums, as well as parcel splits involving new roadways, will be reviewed using “Procedures for Plat & Site Condominium Submission and Review” found in Section 2. Primary drainage systems within these types of developments, which are reviewed and approved by the Drain Commissioner, will be established as public systems under the jurisdiction of the Drain Commissioner. All other developments will be reviewed using Section 3 of these standards.
F. It should be noted that compliance to these standards does not relieve developers from obtaining permits and/or permission from any and all other governmental agencies having jurisdiction, such as from MDEQ and from obtaining a SE&SC Permit when applicable.
SECTION 2

PROCEDURES FOR PLAT & SITE CONDOMINIUM SUBMISSION AND REVIEW
PROCEDURES FOR PLAT & SITE CONDOMINIUM

SUBMISSION AND REVIEW

I. PRELIMINARY PLAN

A. Submission of preliminary plan

1. In order for plats/site condos to be prepared in conformity with the Michigan Land Division Act, the proprietor shall have prepared a preliminary plan showing the layout of the area intended to be developed. This plan shall be prepared under the direction of a professional engineer or a professional land surveyor, and shall be drawn to a scale not smaller than 1”=100’. Existing contour information should be shown on the plan at 2’ intervals, unless otherwise permitted.

2. The preliminary plan must give the location of the proposed plat/site condo with reference to the section and part of section in which the parcel is situated and the name of the local municipality (township, city or village). The plan shall show the proposed street and alley layout, lot and development dimensions, sizes and locations of upstream and downstream culverts serving the major drainage routes flowing into and out of the development and all pertinent factors such as adjoining roads and subdivisions, railroads, high tension power lines or underground transmission lines, cemeteries, parks, sanitary sewers, floodplain areas, wetlands, natural water courses, established drains, easements, or any other feature, the existence, location, or description of which might be of value in determining overall drainage requirements for the plat/site condo.

3. In the case where the proprietor wishes to subdivide a given area but wishes to begin with only a portion of the total area, included with the preliminary plan shall be a proposed general plan for the entire area. The part which is proposed to be subdivided first shall be clearly superimposed upon the storm water management plan in order to illustrate the method of development that the proprietor intends to follow. Each subsequent plan shall follow the same procedure until the entire area controlled by the proprietor is subdivided. The final acceptance of a plat/site condo, which is a partial development of a larger general layout, does not automatically ensure the final acceptance of the overall layout. A Storm Water Master Plan of the overall development is strongly encouraged by this office.

4. Two prints of the preliminary plan prepared in accordance with the above standards and preliminary plan review fee (page 19) shall be submitted together with a letter of transmittal requesting that the plan be reviewed and, if found satisfactory, approved. Plans will not be reviewed until fees are received. A copy of the site report furnished by the Allegan County Environmental Health Department may be required. The names of the proprietor and engineering or surveying firm, with mailing addresses and telephone numbers for each, shall be included with the transmittal. Where available, e-mail addresses should be provided for all parties associated with the development.
5. The Drain Commissioner, within 30 days of receipt of the preliminary plan, shall, in writing, approve or reject it. If the proposed plan is not approved as originally submitted, the Drain Commissioner or the engineer shall notify the proprietor or the proprietor’s engineer or surveyor in writing setting forth reasons for withholding approval and request that the necessary change(s) is made in the preliminary plan before proceeding with the submission of drainage plans.

6. If the proprietor finds it advantageous to make changes in the preliminary plan, they shall be incorporated in the plan and a new preliminary plan resubmitted for approval even though the Drain Commissioner may have already approved the original plan. Changes shall be noted on the cover letter and detailed on the plan.

7. In the case that review and approval of the proposed development by other governing bodies (local, state or federal agencies or governmental units) requires changes to the proposed layout or the proposed drainage facilities, such changes shall be incorporated into the plan and resubmitted for review by the Drain Commissioner. Submission of the revised plan is required even if the original plan was previously approved by the Drain Commissioner.

8. If the proprietor fails to present a final plat or site condominium to the Drain Commissioner for final approval within two years after receiving preliminary approval, then he/she will be required to resubmit a preliminary plan for review and approval subject to the standards in effect at that time.

B. Check List of General Information that needs to be considered and/or included with Preliminary Plat Submittal. See Appendix U.

II. CONSTRUCTION PLANS AND DRAINAGE IMPROVEMENTS

A. Drainage plans

1. All plans submitted to the Drain Commissioner for approval must be prepared by a professional engineer.

2. After the preliminary plan of the proposed plat/site condo has been approved by the Drain Commissioner as outlined heretofore, the proprietor’s engineer may proceed with the preparation of the drainage plans for the construction of the plat/site condo. These plans shall show plan, profile, cross-section, location of drainage facilities and structures, special details, and other such drainage information as may be necessary. All plans shall be referenced to the N.G.V.D. or any other accepted federal bench mark system. Two prints of construction plans showing drainage and calculations shall be submitted to the Drain Commissioner for review along with construction plan review fee. Plans will not be reviewed until fees are received. After the Drain Commissioner’s reviewing engineer has reviewed the plans, approval or rejection shall be provided within 30 days, to the proprietor or the proprietor’s engineer in writing.

3. If the proprietor finds it advantageous to make changes to the construction plan, they shall be incorporated in the plan and a new construction plan resubmitted for approval
even though the Drain Commissioner may have already approved the original plan. Changes shall be noted on the cover letter and detailed on the plan. If the proprietor does not present the final plan to the Drain Commissioner for approval within a period of two years after receiving approval of the preliminary or construction plan, revival of the project will require resubmitting the plan for review by the Commissioner.

4. Drainage plans, which are prepared by the proprietor’s engineer, shall clearly show how the surface drainage will leave the streets in the proposed plat/site condo. Where drainage easements are required, the existing ground elevations shall be shown together with final swale, ditch or storm sewer profiles proposed to be adopted. In order to adequately provide for the surface drainage of the proposed plat/site condo it is often necessary to do work outside the limits of the plat/site condo and/or acquire easements across private property. The plans submitted by the proprietor’s engineer need to show how this will be accomplished. If drainage easements are required by the Drain Commissioner beyond the limits of the plat/site condo, the proprietor shall acquire these easements. In the event the proposed plat/site condo is a partial development of a larger area, it will be necessary for each phase to be self sufficient from the standpoint of drainage, and for each phase to be compatible with the overall plan.

5. The Tulip Intercounty Drain and the Gun River Intercounty Drain have separate policy statements that apply to all developments within their boundaries. (See pages 40 -47).

6. The proprietor’s professional engineer shall submit one set of “As-Built Plans” to the Drain Commissioner upon completion of the work no later than 30 days prior to the expiration of any performance surety. Said As-Built Drawings shall be reviewed by the Drain Commissioner’s Engineer and shall be verified in the field by the Allegan County Drain Commissioner or their engineer, as deemed necessary. Cost for this work will be invoiced and shall be received prior to allowing the performance surety to expire.

B. Public drain capacity

1. Open drains: The capacity of new open drains shall be designed to convey the storm water generated during a 4% annual chance rainfall (25 year recurrence interval). The proprietor’s engineer for each development shall determine the amount of impervious ground cover.

2. Enclosed storm sewers: All storm sewers shall be designed to convey the storm water generated during a 10% annual chance rainfall (10 year recurrence interval). The storm sewer shall be designed in such a manner that during a 10% annual chance storm, water will not surcharge unless the developer’s engineer provides calculations showing surcharging during a 4% annual chance storm will be no higher than 6” below the top of castings of all catch basins within the project. The exception to this standard is if an enclosed system is to replace an existing open drain, in which case the system shall be designed for the 4% annual chance rainfall (25 year recurrence interval). Regardless of what frequency storm is used to design the storm sewer system, sufficient, detailed, design hydraulic calculations shall be provided by the design engineer to the Drain Commissioner to show that there is no surcharging in the system during the design
storm. When determining the hydraulic grade line of the storm sewer, the grade line shall begin at the higher of the water level of the design storm at the outlet, or the 2/3 point of the outlet pipe. See Appendix S, Part I. A. 3. for more detail information on the design calculations for storm sewers.

3. Compliance with the Drain Commissioner’s Storm Water Management Policy is required of plats/site condos.

C. Off-site drainage

1. Drainage originating outside the plat/site condo limits, which has thus far flowed onto or across the plat/site condo, must be accounted for and accommodated.

2. The proprietor’s engineer shall provide evidence that the existing receiving stream has the capacity to carry the storm water runoff from the land within the overall drainage basin, excluding the land to be developed, during a 4% annual chance storm, in addition to the storm water runoff from the developed land during a 4% (if acceptable routing calculations are performed) to a 1% annual chance storm. The above calculations for the capacity of the receiving stream may include the capacity of the existing floodplain area as long as no flood damage to off-site land will occur.

3. Otherwise, the proprietor’s engineer shall provide plans and design calculations to adequately manage the storm water runoff leaving said development. The method to be used to adequately address storm water shall be formulated by the proprietor’s engineer, and must be reviewed and subjected to approval or rejection by the Drain Commissioner and/or the Drain Commissioner’s engineer. The most common method of adequately controlling the storm water runoff leaving a developed site is to store excess runoff generated by the development. Storm water detained before leaving the site shall meet the guidelines of the Drain Commissioner’s Storm Water Management Policy. Additional water quality assurance measures may also be required.

4. The acceptable manner to handle off-site storm water runoff is to divert it around the proposed development in such a way that it does not adversely affect off-site lands. If the developer or the developer’s engineer proves that it is not feasible or reasonable to divert off-site surface water runoff around the development then the proposed development’s conveyance or storm sewer system must be sized to handle the on site surface water runoff (at the acceptable design storm) and the off-site surface water runoff generated during a 4% chance storm with the off-site land in its existing condition, unless the off-site water is directed to the development site via an enclosed storm sewer system or an open drain. If the off-site storm water is discharged onto the proposed development via an enclosed storm sewer system or an open drain the proposed conveying storm sewer system shall be sized to handle the off-site water for the same design storm used to design said off-site storm water conveyance system.

5. If it becomes necessary to convey off-site surface water runoff through a proposed development’s storm water detention system, the proposed storm water detention basin shall be designed with a dual outlet. The lower (primary) outlet system shall be designed to handle the proposed development’s surface water runoff only, using a
release rate of 0.05 cfs/acre, until the water level in the basin reaches the level achieved during a 5 Year, 20% chance storm. The secondary outlet shall be installed at the 5 Year storm elevation for the basin and the secondary outlet shall be designed to pass through off-site water plus the remainder of the allowable on-site water not accounted for with the primary outlet with the water level in the basin at its design high water elevation. If a storm water retention system is utilized for the proposed development, it shall be sized to handle the surface water runoff from off-site land in its existing condition. The frequency of the storm to use in determining the volume of off-site surface water runoff to include in a development’s retention system shall be based on the existing capacity of the conveyance system used to convey surface water to the proposed development from off-site land. If off-site surface water runoff gets to the proposed developed area via sheet flow, the detention system shall be designed to include the off-site surface water runoff generated during a 4%, 25 Year Chance Storm.

D. Where storm sewers are to be constructed, the proprietor’s construction plan and profile drawings shall show the location and size of each storm sewer and drainage structure in the drainage system, together with elevations and proposed grades. The plan sheet shall clearly show the areas that will be contributing storm water runoff to each inlet in the storm sewer system.

E. 12” diameter pipe is the minimum allowable storm sewer size. All storm sewer and culvert pipe shall be designated on the plans by the appropriate type and class. Materials used for storm sewers shall be approved for use by the Michigan Department of Transportation and/or by the Drain Commissioner’s engineer. Where a storm sewer will be continually subjected to internal or external hydraulic pressures the pipe joints for the system shall be design in a manner acceptable to the industry to withstand the pressures.

F. When necessary for drainage purposes, road culverts and driveway approach culverts shall be installed at locations shown on the plans or as designated by the engineer. The pipe used for public road culverts shall be reinforced concrete pipe as required by the Allegan County Road Commission. Driveway culverts may be concrete pipe, or corrugated metal pipe, or HDPE pipe, or SWCP, or other pipe approved for use by the Road Commission, the MDOT and the Drain Commissioner. The pipe furnished shall conform to the current specifications for reinforced concrete A.S.T.M. designation C-76 Class III, to the current specifications for corrugated metal culvert pipe A.A.S.H.T.O. designation M-36, or the specifications approved by the MDOT and the Allegan County Road Commission. The pipe size shall meet the requirements of the Drain Commissioner.

G. The Subdivision Control Act recognizes that the responsibility of the Board of County Road Commissioners is to establish rules for plat submission and for proper drainage for highways, streets and alleys in its jurisdiction.

H. Where street drainage is discharged to established drains or natural watercourses, such outlets shall be designed so as to enter the drain or water course at an angle of 90º or less, as determined by the upstream centerline. Erosion protection such as headwalls, armoring and/or sodding will be required at storm drainage crossings and/or outlets. See Appendix S for more detail information on outlet from storm sewers and culverts.
I. The main trunk line of the storm sewer shall be located 18’ right or left of the centerline of the road right-of-way (ACRC Standard). The exact location of the storm sewer trunk line shall be verified with the Allegan County Road Commission.

J. All storm sewers will be laid in a straight line, manhole to manhole, unless otherwise approved by the Drain Commissioner. Maximum distance between manholes shall be 350 feet. Pipe curvature in the road right-of-way will also require approval of the Allegan County Road Commission.

K. Backyard drainage patterns must have an emergency outlet or sufficient storage capacity to protect the lowest opening of adjacent homes during a 1% annual chance (100 Year) rainfall.

L. Delineate easement boundaries for all drainage swales with silt fence once final grade of swale has been achieved. Silt fence should not be removed until each lot has been final graded for landscaping and has established growth. Said easement areas shall also be top dressed with a minimum of 3” of topsoil or approved compost material. Seed shall be applied over entire easement area using appropriate perennial type seed, annual seed types will not be allowed within easements containing rear yard drainage patterns. Upon completion of seeding, mulch shall be applied in either the form of mulch blanket, hydro mulch or approved alternative.

M. Cleaning out, tiling, enclosing or relocating of a proposed or existing storm drainage system may be required by the Drain Commissioner and shall be in compliance with the Drain Commissioner’s Maintenance & Construction Policy. No open ditch drains shall be constructed along plat/site condo side lot lines without Drain Commissioner’s approval.

N. The Drain Commissioner may consider a storm drainage system reliant on a lift pump station under certain circumstances. As a minimum, approval in writing from the Allegan County Road Commission and from the local municipality within which the system is proposed will be required.

O. The proprietor shall be responsible for cleaning all sewers, manholes, catch basins, or other structures affected by the construction in the plat/site condo before final release of Performance Surety. Sodding, seeding and mulching, where required, shall be done in accordance with the standards of the Drain Commissioner’s Authorized Public Agent Specifications or per the requirements of the Soil Erosion and Sedimentation Control Act (Part 91, of Act 451 of 1994, formerly Act 347).

P. No culvert, storm sewer, or other drainage pipe that is a part of, or will be connected to, the storm sewer system of a plat/site condo shall be designed or constructed to function in a permanently submerged condition. Occasional surcharging as might normally be expected in rain events exceeding the system design frequency, or from a temporary high water level associated with storm water detention area, will be permitted. Sufficient hydraulic design information shall be provided along with the Construction Plans to show that submergence does not exist during normal flow in the drainage system.
Q. A storm water facility maintenance plan, schedule, and budget shall be submitted when the system will not be owned, operated and maintained by the ACDC or other municipal entity. See Appendix I and Appendix J.

R. Completed master deed documents, including by-laws and Exhibit B drawings shall be submitted for the Drain Commissioner’s review and approval prior to recording site condominium documents with the local and state agencies.

S. These policies, standards and specifications are not intended to cover every foreseeable item of work that may be necessary in order to design and complete the drain improvements to the satisfaction of the Drain Commissioner. If it should become necessary, in the opinion of the Drain Commissioner, that certain work not itemized, be performed as part of the drainage improvement, it shall be the proprietor’s obligation to do so upon direction of the Commissioner.

III. PUBLIC DRAINS, EASEMENTS

A. The following minimum easement widths are standard for established county drains and natural water courses that will be utilized and/or lay within the confines of the proposed plat/site condo.

1. Open drains and watercourses shall have a minimum easement width equal to the extreme width of the drain, plus 30 feet. The easement shall be centered on the centerline of the drain or water course or shall have a minimum of 15’ of space between top of bank and edge of easement. The extreme width of drain is defined as the top of bank to top of bank width of the drain or watercourse, as long as its side slopes are at least as flat as 1 vertical on 2 horizontal.

2. Enclosed drains shall have at least a 30’ easement centered over the drain unless acceptable information is provided to the Drain Commissioner to demonstrate that a smaller width easement is sufficient.

B. The above widths shall govern generally. However, if the reviewing engineer determines that additional easement area is required for proper construction, or because of special circumstances, additional easement area may be required.

C. An easement, not land ownership, is the approved method of providing access to and protection of public storm drainage facilities. Transfer of land ownership to Allegan County, the Drain Commissioner or an established Drainage District in the County is not allowed unless permitted in writing by the Drain Commissioner.

D. All natural watercourses, drainage ditches or swales, enclosed storm drains, detention or retention facilities or established drains within the plat/site condo shall be granted easements to the appropriate drainage district and must be shown on the final plan. Example: Private Easement for Drainage Purposes to the Kuipers Drain Drainage District.

All easements for detention and/or ponding of storm water shall be labeled as such.
E. A minimum of 20’ open flat space between a public detention basin and an existing county drain will be granted for drainage easement to achieve equipment access and maintain both facilities. At least 20’ of open space shall be provided above the 1% annual chance design high water level of retention/detention basins. The area of the retention/detention basin plus the open space around it (them) shall be protected by a drainage easement to provide access and to allow maintenance of said basin. Ingress and egress easement shall also be provided to maintain the basin. The flat area shall be no steeper than 10% in slope in the steepest location and preferable no steeper than 4%.

F. Easements will be required downstream of a plat/site condo when the receiving watercourse is not an established drain and lacks sufficient capacity or grade to be of ongoing service to the plat or site condo without regular maintenance. Utilization of storm water management techniques might eliminate this requirement. The Drain Commissioner may require downstream drain construction/maintenance prior to plat or site condo approval.

G. If any utilities are to be located within a drainage easement, the proprietor’s engineer shall present plans detailing such utilities to the Drain Commissioner for approval of location and depth. If utilities are to be located in the drain bottom they must be at least 3 feet below the design bottom and a Drain Use Permit shall be obtained. Such plans shall be presented at the same time as drainage plans so all details of construction and location may be reviewed.

H. The liber and page reference of all recorded easements shall be shown on the final plat. Drainage easements obtained prior to 1956 were not required to be recorded with the Register of Deeds. Therefore, it may be necessary to check the permanent records of the Drain Commissioner’s office. Drainage District Easements, Private Easements for Drainage Purposes, Drainage Easements, and Drainage Easements to the Drain Commissioner or the Allegan County Drain Commissioner within recorded plat/site condos are all considered exclusive easements that may be utilized by the Drain Commissioner for the purpose of accessing, maintaining and constructing open or enclosed drains.

I. An easement form that is acceptable to the Drain Commissioner is shown in Appendix A. Easement documents must be submitted with a check, made out to the Allegan County Register of Deeds, for recording. Check with the Register of Deeds Office for current fees.

IV. DRAINS UNDER THE JURISDICTION OF THE DRAIN COMMISSIONER

A. Drainage district boundaries must not be altered when designing development drainage unless drainage routes are altered but remain on site, except as provided under Sections 425 and 433 of Act 40, Public Act 1956 as amended.

B. Existing county drain easements must be indicated on plans and final plats and must be designates as “___________” (County) Drain. County drain easements prior to 1956 were not required by statute to be recorded immediately; therefore, the files of the Drain Commissioner should be checked to determine if a drain easement is in existence for the subject property.
C. Any and all proposed modifications to designated county drains will require a Drain Use Permit from the office of the Drain Commissioner. State and local permits may also be necessary including, but not limited to, a SE&SC Permit and a MDEQ Permit. A Drain Use Permit must be obtained prior to any work that affects a county drain, including tapping into or crossing over said drain plus any work in the right-of-way or drainage easement area. The following requirements shall be met prior to the issuance of any Drain Use Permit.

1. Detailed construction plans and design hydraulic calculations along with the appropriate review fees shall be submitted for review with the permit application. A professional engineer shall prepare these.

2. All fees due the Drain Commissioner must be paid in full prior to a permit being granted.

3. After receiving the Drain Use Permit, the permittee must contact the Drain Commissioner’s Office 48 hours prior to the start of construction.

4. All work shall be completed in accordance with the plans and specifications approved by the Drain Commissioner.

5. A cash deposit, bond or letter of credit in an amount satisfactory to the Drain Commissioner shall be deposited to insure full completion of the project in accordance with the approved plans. The permittee shall allow the Drain Commissioner, or the Drain Commissioner’s representative, to inspect the permitted activity as needed and in accordance with Part 91 of PA 451 and PA 40.

6. The Drain Commissioner shall be notified in writing within 10 days of completion of a project.

7. A Final Inspection and Letter of Permit Closure must be issued by the Drain Commissioner or representative before a site will be considered finished.

8. Authority granted by a Drain Use Permit from the Drain Commissioner does not convey, provide or otherwise imply approval of any other governing agency nor does it waive the permittee’s obligation to acquire any and all additional federal, state, county or local approvals or authorization necessary to conduct the activity.

V. DRAINS NOT UNDER THE JURISDICTION OF THE DRAIN COMMISSIONER

A. Easements will be required downstream of a plat when the receiving water course is not an established drain and lacks sufficient capacity or grade to be of ongoing service to the plat without regular maintenance. An acceptable release of right-of-way form for drainage is included in Appendix A. Recordable releases of right-of-way shall be submitted to the Drain Commissioner prior to construction. The Drain Commissioner may require downstream drain construction and/or maintenance prior to plat approval.
B. When concentrated storm water is proposed to be discharged over, onto, or across private property (other than that owned by the developer), an agreement between the owners must be executed relieving the drainage district, or municipality if there is no drainage district, of any and all responsibility for damage that might occur. An acceptable “flooding” easement form is included in Appendix D. Such an agreement shall be submitted to the Drain Commissioner prior to construction.

C. “Certification of No Net Increase of Stormwater” is required when storm water is proposed to be discharged over, onto, or across private property, and flooding easements are not obtained. A standard form is included in Appendix E.

VI. DRAINAGE DISTRICT (433 agreement)

In accordance with the Michigan Drain Code of 1956, the drainage of the proposed plat/site condo shall be contained within an established drainage district or districts.

Section 433 of drain code provides for enlargement of existing drains and districts and the creation of new drains and districts where none currently exist. A formal agreement is required between the proprietor and the Drain Commissioner or Drainage Board. Owners of adjoining properties who will be included in the assessment district for maintenance of the drain must be parties to the agreement. The property of any adjoining landowner who refuses to sign cannot be included in the district for assessment purposes. However, surface and subsurface runoff from the adjoining property must be accommodated by the storm water collection system and outlet. An “Agreement to Establish a County Drain” (Appendix F) will be used to establish a drainage district per Sec. 280.433(5) of the Drain Code of 1956. An “Agreement for the Extension of a County Drain and County Drainage District” (Appendix G) will be used to add lands and/or storm drainage system to an existing 433 District Agreement. You must contact the office of the Drain Commissioner to determine which agreement will be necessary. This document shall be prepared by the developer or the developer’s agents and submitted to the Allegan County Drain Commissioner’s Office.

The exhibits that must accompany the agreement are: the engineer’s certificate stating the drain has capacity, the drainage district drawing, drainage district boundary legal description, drain route & course drawing, and drain route & course legal description. The route & course description shall consist of the entire route and course of the drain being established. This includes storm sewer pipes, detention/retention facilities, drainage swales, etc. After the agreement has been signed it shall be submitted to the Drain Commissioner’s Office along with a check (made payable to the Allegan County Register of Deeds) for the appropriate recording fee, for review and approval. Contact the Register of Deeds Office for the current fees. As-Built Plan & Profile Drawings of the entire system shall also be presented to the Drain Commissioner, if they have not already been submitted as part of the Final Plat Documents.

The landowner or developer who transfers a drainage system to the Drain Commissioner shall deposit 5% of the cost to construct the drain but not more than $2,500.00. The money received by the Drain Commissioner shall be deposited in a drain maintenance fund that shall be used for the future maintenance of that specific drain.
VII. FINAL PLAT APPROVAL

A. Final plat mylars of the number and type directed by the Michigan Department of Commerce must be prepared in accordance with the requirement of the Subdivision Control Act which sets forth size, scale, material, and reproduction process. Final plat documents must be delivered to the Drain Commissioner for review 10 days prior to Road Commission submittal. A copy of the plat in digital CAD format shall be submitted to the LIS Department of Allegan County. If the Drain Commissioner rejects the Final Plat, notice of such rejection and reason therefore are given to the proprietor and the clerk of the related local municipality within 10 days.

B. If it is the desire of the proprietor to have the plat recorded before completing the drainage improvements, the proprietor shall enter into an agreement with the Drain Commissioner and post satisfactory cash, certified check or irrevocable bank letter of credit in an amount approved by the Commissioner or the Commissioner's engineer to guarantee the completion of all improvements in accordance with the Commissioner’s requirements. The required amount, which shall include 110% of the total: engineering design and inspection; construction staking; and all associated construction work, shall be posted prior to approval of the final plat by the Drain Commissioner. A copy of the letter of credit shall be provided to the Drain Commissioner.

1. If approved drainage improvements are not completed as agreed the Drain Commissioner may draw on the irrevocable bank letter of credit or use the posted cash or certified check and proceed to fulfill the proprietor’s obligation at such time and in such manner as the Drain Commissioner may determine appropriate.

2. If a proprietor wishes to reduce the amount of a letter of credit they may do so with written permission from the Drain Commissioner. The amount will at no time be reduced to less than the estimated cost of the work still remaining to be completed, plus 10%.

3. In the event the proprietor makes a cash deposit to guarantee performance of the Drain Commissioner’s requisites, the Commissioner shall, upon request, rebate to the proprietor portions of the original deposit as the work progresses. However, the amount of deposit retained by the Drain Commissioner will at no time be reduced to less than the estimated cost of the work still remaining to be completed, plus 10%.

4. Thirty days prior to the release of the last portion of any of the previously mentioned types of credit, the proprietor’s professional engineer or professional surveyor shall submit one set of “As Built Plans” on paper (and in digital CAD format to the LIS Department of Allegan County) to the Drain Commissioner and shall certify that all work required to comply with the Drain Commissioner’s Standards and Specifications has been completed. These plans shall show that the drains and watercourses shown on the plat are improved in accordance with the approved construction plans.

C. Restrictive Covenants shall be provided and include the following:

1. Floor and Opening Elevation Restrictions
a) Low floor elevations shall be provided to restrict the placement of all floors to 1’ or more above the high ground water elevation. The high ground water elevation shall be determined by soil borings or backhoe excavation showing mottling & water elevation. The information in the Soils Manual for the County; or other acceptable records should be used as a preliminary design tool.

b) Low opening elevations shall be provided to restrict the placement of all openings to 1’ or more above the 1% annual chance (100 year) flood plain and 1’ above the design high water elevation for any backyard drainage system. Both elevation restrictions shall be provided by the proprietor’s engineer to reduce the risk of structural damage and the flooding of residential interiors.

c) It is the responsibility of the proprietor to provide for each lot with a restrictive building elevation, a marker or monument that provides an N.G.V.D. elevation to be used as a reference point for establishing a building or its low opening elevation prior to the expiration of the letter of credit and/or the recording of the Final Plat or Site Condominium Documents.

2. Information on any Easement for Surface Drainage

The restrictive covenants shall state: “Easements for Drainage are for the benefit of upland lots within the subdivision and any improper construction, development, or grading that occurs within these easements will interfere with the drainage rights of those upland lots. Easements for Drainage are for the continuous passage of surface drainage and each lot owner will be responsible for maintaining the surface drainage system across their property. No structure is permitted within an Easement for Drainage. This includes, but is not limited to, swimming pools, sheds, garages, patios, decks, fences or other permanent structures or landscaping features that may interfere with surface drainage or maintenance of subsurface systems.”

3. Block Grading Plan

A Block Grading Plan shall be incorporated in the restrictive covenants of the development to ensure proper drainage. The restrictive covenants shall state: “The block grading plan shows the direction of flow for the surface drainage for all lots. It is the lot owner’s responsibility to ensure that the final grading of the lot is in accordance with the block-grading plan. During the final lot grading and landscaping, the owner shall take care to ensure that the installation of fences, plantings, trees, and shrubs do not interfere with nor concentrate the flow of surface drainage. No changes will be made in the grading of any lot areas used as drainage swales which would later affect surface run-off drainage patterns without the prior written consent of the Allegan County Drain Commissioner for all portions of swales.”

4. Easement Boundaries for Rear Yard Drainage Swales
The restrictive covenants shall state: “Silt fence shall remain in place along the easement boundary until the lot has been final graded for landscaping and has established growth. Only the portion of silt fence on a lot that has been developed and that has adequate ground cover may be removed.”

5. Waiver

The restrictive covenants shall state: “A waiver from elevations may be granted by the Allegan County Drain Commissioner following receipt of a certification from a registered professional engineer demonstrating that the proposed elevation does not pose a risk of flooding.”

6. Footing Drains & Sump Pumps

a) Where outlets for footing drain laterals are to be provided for each lot it is the responsibility of the proprietor to provide a marker or monument that indicates the location of the sump pump lateral access point. Laterals are to be constructed of Green, schedule 40 PVC or an approved equivalent. The Commissioner does not warranty long term operation or maintenance of footing drains or their laterals.

b) The restrictive covenants shall state: “Water from such sources as eave troughs and footing drains shall be directed to footing drain laterals provided for the lots. Water from footing drains shall be discharged to the lateral via a sump pump with check valve system and not a gravity system. If no lateral is provided, the lot owner shall discharge said water in such a manner as to not impact neighboring land, lots or public streets.”

c) The restrictive covenants shall state: “Laundry facilities or other similar features shall not be connected to a footing drain or pump system discharging to footing laterals and the storm sewer system. Laundry facilities and interior sanitary waste sump pumps must be drained to the sewage disposal system”.

D. The Drain Commissioner may require the creation of an Association or inclusion in the restrictive covenants language regarding lot owner(s) responsibilities to oversee decisions regarding and be fiscally responsible for the aesthetics, aquatic habitat, recreational, liability and water quality concerns related to open water bodies. When required, association documentation must be provided for the Commissioner’s approval.

E. A 433 Drainage District Agreement (Appendix F & G) shall be signed and submitted for recording. A check made payable to the Allegan County Register of Deeds for the appropriate recording fee shall accompany the agreement.

F. All drainage easements shall be signed and submitted in recordable form to the Drain Commissioner. Off-site drainage improvements located in future phases of a development may be enclosed in reversionary easement. Such easement may be released when platting of that land commences, superseded by the future plat documents. A check made payable to the Allegan County Register of Deeds for the appropriate recording fee shall accompany the easement(s).
G. All preliminary/construction plan review fees shall be paid and any extra fees incurred during the review process.

H. At the time of Final Plat Submittal the proprietor shall be required to post a Repair Bond in the amount of $5000.00 or 10% of the construction cost, whichever is less, with the Drain Commissioner to guarantee repairs of any defects which may show up as a result of poor workmanship or defective materials within one year after completion of the improvements. Should no defects occur within this period of one year and should no adjustments be required, this bond will be returned to the proprietor in its entirety. An acceptable Repair Bond is included in Appendix T.

VIII. FINAL SITE CONDO APPROVAL

A. The proprietor shall enter into an agreement with the Drain Commissioner and post satisfactory cash, certified check or irrevocable bank letter of credit in an amount approved by the Commissioner or the Commissioner's engineer to guarantee the completion of all improvements in accordance with the Commissioner’s requirements. Such amount shall be posted prior to approval of the construction plans by the Drain Commissioner. A copy of the letter of credit shall be provided to the Drain Commissioner.

1. If approved drainage improvements are not completed as agreed the Drain Commissioner may draw on the irrevocable bank letter of credit or use the posted cash or certified check and proceed to fulfill the proprietor’s obligation at such time and in such manner as the Drain Commissioner may determine appropriate.

2. If a proprietor wishes to reduce the amount of a letter of credit they may do so with written permission from the Drain Commissioner. The amount will at no time be reduced to less than the estimated cost of the work still remaining to be completed, plus 10%.

3. In the event the proprietor makes a cash deposit to guarantee performance of the Drain Commissioner’s requisites, the Commissioner shall, upon request, rebate to the proprietor portions of the original deposit as the work progresses. However, the amount of deposit retained by the Drain Commissioner will at no time be reduced to less than the estimated cost of the work still remaining to be completed, plus 10%.

4. Thirty days prior to the release of the last portion of any of the previously mentioned types of credit, the proprietor’s professional engineer or professional surveyor shall submit one set of “As Built Plans” on paper (and in digital CAD format to the LIS Department of Allegan County) to the Drain Commissioner and shall certify that all work required to comply with the Drain Commissioner’s Standards and Specifications has been completed. These plans shall show that the drains and watercourses shown are improved in accordance with the approved construction plans.

B. A copy of the Master Deed shall be provided and state:

_____________________________ DRAIN DRAINAGE DISTRICT
Attached as Exhibit A is an Agreement establishing the ___ Drain Drainage District pursuant to Section 433 of Act No. 40 of the Public Acts of 1956 as amended. A copy of the 433 Agreement (see sample in Appendix H) is recorded in the Allegan County Register of Deeds at Liber __________ Page __________. Attached as exhibit B is a Maintenance Agreement outlining the maintenance responsibilities of the Association for the Drain. A copy of the Maintenance Agreement (see sample in Appendix I) is recorded in the Allegan County Register of Deeds at Liber __________ Page __________.

Easements. There shall be easements over all units and common elements for purposes of construction, maintenance and improvement of storm water drainage and retention or detention as designated on the survey & site plan. The easements are granted in favor of the ____________________ Drain Drainage District. The Drainage District shall have the right to sell, assign transfer or convey this easement to any other governmental unit. The Allegan County Drain Commissioner, and his/her agents, contractors and designated representatives shall have the right of entry on, and to gain access to, the easement property.

No unit owner shall disturb the grade or otherwise modify the areas within the easements in any way inconsistent with the Drain. No unit owner shall install, maintain, repair or replace landscaping materials located within the Drain easement areas lying within such unit owner’s area in any way inconsistent with the use by the Drainage District. All unit owners shall release the Drainage District and its successors, assigns or transerees from any and all claims to damages in any way arising from or incidental to the construction and maintenance of the Drain, or otherwise arising from or incidental to the exercise by the Drainage District of its rights under said easements, and all unit owners covenant not to sue the Drainage District for any such damages.

Maintenance for the ____________________ Drain. Maintenance of the storm drainage shall be performed as provided in the Maintenance Agreement attached as Exhibit B. All costs incurred by the Drain Commissioner relating to the maintenance and improvement of the ____________________ Drain shall be borne by the Drainage District and assessed to the unit owners pursuant to Act No. 40 of the Public Acts of 1956, as amended.

Also including the required language as stated under Final Plat Approval, Part “C” on pages 16 through 18.

C. The Drain Commissioner may require the creation of an Association or inclusion in the Master Deed language regarding lot owner(s) responsibilities to oversee decisions regarding and be fiscally responsible for the aesthetics, aquatic habitat, recreational, liability and water quality concerns related to open water bodies. When required, association documentation must be provided for the Commissioner’s approval.
D. A 433 Drainage District Agreement (Appendix F - H ) shall be signed and submitted for recording. A check made payable to the Allegan County Register of Deeds for the appropriate recording fee shall accompany the agreement.

E. All drainage easements shall be signed and submitted in recordable form to the Drain Commissioner. A check made payable to the Allegan County Register of Deeds for the appropriate recording fee shall accompany the easement(s).

F. All preliminary/construction plan review fees shall be paid and any extra fees incurred during the review process.

G. Prior to Final Condo Approval by the Drain Commissioner, the proprietor shall be required to post a Repair Bond in the amount of $5000.00 or 10% of the construction cost, which ever is less, with the Drain Commissioner to guarantee repairs of any defects which may show up as a result of poor workmanship or defective materials within one year after completion of the improvements. Should no defects occur within this period of one year and should no adjustments be required, this bond will be returned to the proprietor in its entirety. An acceptable Repair Bond is included in Appendix T.

IX. REVIEW FEES (see also fee schedule for misc. development reviews on page 26)

A. Plan review fees:

The fee for reviewing a plan to determine that the provisions of the Subdivision Control Act and the Allegan County Drain Commissioner’s Standards and Specifications have been complied with shall be:

1. County Administrative Fees $200.00

2. Preliminary Plan Review Fees shall be deposited with the Office of the Allegan County Drain Commissioner when the plans are submitted for review:

   For developments with 20 or less lots - $200.00

   For developments with 21 or more lots - $10.00 per lot

3. Construction Plan Review Fees shall be deposited with the Office of the Allegan County Drain Commissioner when the plans and calculations are submitted for review:

   Open drains $0.25 per foot
   Enclosed drains $0.60 per foot
   Rear yard drainage patterns within drainage easement $0.25 per foot
   Detention/Retention ponds (greatest distance across) $0.60 per foot

B. Fees fund the review of plans by the Drain Commissioner’s engineer. If the expense to review the proposed development exceeds the amount of fees collected, the Commissioner shall charge additional fees.
C. Any recording fees incurred due to registering a document are the responsibility of the proprietor.

X. NATIONAL FLOOD INSURANCE PROGRAM

A. Projects located within the 100-Year floodplain of a river or stream come under the jurisdiction of the Flood Hazard Regulatory Authority as found in Part 31, Water Resources Protection of the Natural Resource and Environmental Protection Act, Act 451 of the Public Acts of 1994. A permit needs to be filed with the Department of Environmental Quality (DEQ) for projects that involve construction, filling, and grading within a floodplain area.

The objectives of Part 31 are: a) to ensure that the flood carrying capabilities of the rivers and streams is maintained such that the floodways are not obstructed and that the floodway portions of floodplains are not inhabited.

Many communities in Allegan County also participate in the National Flood Insurance Program (NFIP). The program makes flood insurance available in those communities agreeing to regulate future floodplain construction. Associated with the program are community floodplain mapping, building standards, federal lending restriction, and flood insurance rates supportive of local floodplain regulation. In order for a community to participate in the NFIP local regulations must be in force to:

1. Require that new construction and substantial improvements in flood prone areas be designed and anchored to prevent flotation, collapse, or lateral movement, be constructed with materials and utility equipment resistant to flood damage, and be constructed by methods and practices to minimize flood damages.

2. Require, where flood elevation data are available, that:
   a. All new construction and substantial improvements of residential structures located in flood hazard areas have the lowest floor (including basement) elevated to or above the 100-Year Flood Level.

   b. All new construction and substantial improvements of nonresidential structures in flood hazard areas have the lowest floor (including basement) elevated or dry floodproofed to or above the 100-Year Flood Level. A registered professional engineer or architect must certify Floodproofing.

3. Require anchoring of mobile homes in the flood prone areas.

4. Maintain a record of all lowest floor elevations to which new buildings have been constructed or existing buildings have been floodproofed when the structures are located in a flood hazard area.

Floodplains are mapped for most communities that participate in the NFIP. Floodplain maps are available for inspection in city, village, and township offices, or may be obtained from the Department of Environmental Quality (DEQ). The DEQ may also be able to
provide estimates of flood elevations in many streams, and in communities where maps do not exist.

B. FLOODPLAIN MITIGATION

Natural floodway filling or alteration shall not be allowed without review and approval by the Allegan County Drain Commissioner and in compliance with the Floodplain Regulatory Authority found in Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA) on watercourses with contributing drainage area of 2 square miles or greater. If a floodway has not been mapped, the applicant’s consultant shall provide the floodway delineation to the Allegan County Drain Commissioner for approval.

Natural floodway fringe filling or alteration shall not be allowed without review and approval by the Allegan County Drain Commissioner and in compliance with the Floodplain Regulatory Authority found in Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA) on watercourses with contributing area of 2 square miles or greater. If a floodplain has not been mapped, the applicant’s consultant shall provide the floodplain delineation including the floodway to the Allegan County Drain Commission for approval.

To provide for stream bank stability a buffer zone is to be established and called out on a recorded plat, an approved block grading plan, a site plan, or an improvement plan. This Zone shall consist of existing natural tree and vegetation slope protection within a minimum of 25’ from the ordinary high water mark. This buffer zone shall be maintained as is, that is not earth change or disturbance is to take place.

Replacement of lost floodplain shall meet the following criteria:

1. Replacement of the loss of floodplain storage volume storage volume of at least 1 to 1 ratio unless watershed conditions warrant a higher ratio. This applies to floodplain associated with rainfall events up to a 100-Year Frequency. The grading plan shall provide for an equivalent volume of storage for floodplains associated with more frequent events such as 10 and 25 Year Frequencies.

2. Storm water detention does not apply toward the replacement volume.

3. Floodplain storage volume shall be computed above the seasonal high ground water level only.

4. The inflow and outflow rates to the area shall be consistent with predevelopment rates.

5. Up to 50% of the floodplain mitigation storage volume may be used for snow storage.

6. The proximity of the floodplain mitigation area shall provide for an equivalent hydrologic impact to the receiving stream and adjacent parcels.
SECTION 3

PROCEDURES FOR DEVELOPMENT SUBMISSION & REVIEW
(OTHER THAN PLATS & SITE CONDOMINIUMS)
PROCEDURES FOR DEVELOPMENT SUBMISSION AND REVIEW
(OTHER THAN PLATS & SITE CONDOMINIUMS)

Unless otherwise agreed to new developments and additions to previous developments in Allegan County will be directed to construct a system for the storage and controlled release of storm water runoff. Drainage systems within these developments, (not including plats or site condominiums), are private drainage systems. Drain Commissioner review of private drainage systems focuses on the controlled release of storm water runoff into adequate outlets and the necessary accommodation of surface water that naturally flows from upstream areas into the area drained by the private system. The Tulip Intercounty Drain & the Gun River Intercounty Drain have separate policy statements, which apply to all developments within their boundaries (pages 40 - 47).

I Submission of plan

1. The plan must give the location of the proposed development with reference to the section and part of section in which the parcel is situated and the name of the local municipality. The plan shall show the proposed lot and building dimensions, all pertinent factors such as adjoining roads and subdivisions, railroads, high tension power lines or underground transmission lines, cemeteries, parks, sanitary sewers, floodplain areas, wetlands, natural water courses, established drains, easements, or any other feature, the existence, location, or description of which might be of value in determining overall drainage requirements for the development.

2. Existing and proposed contour information shall be shown on the plan at 2’ intervals unless otherwise permitted.

3. Two prints of the plan prepared in accordance with the above standards and plan review fee (page 23) shall be submitted together with a letter of transmittal requesting that the plan be reviewed and, if found satisfactory, approved. It may also be required that a copy of the plan in digital CAD format be submitted to the LIS Department of Allegan County. Requirements for digital submission are shown in Appendix R Plans will not be reviewed until fees are received. A copy of the site report furnished by the Allegan County Environmental Health Department may be required. The names of the proprietor and engineering or surveying firm, with mailing addresses and telephone numbers for each, shall be included with the transmittal.

II Drainage Plans

1. After the plans have been reviewed by the Drain Commissioner’s reviewing engineer, approval or rejection shall be provided within 30 days, to the proprietor or the
proprietor’s engineer in writing. If the information given to the Drain Commissioner does not represent the conditions as they exist on the ground, and should any revisions be required as a result of this lack of complete information, such revisions shall be noted and detailed on the plan and cover letter and approved by the Allegan County Drain Commissioner prior to construction.

2. If drainage easements are required by the Drain Commissioner, these easements shall be acquired by the proprietor on behalf of the appropriate drainage district.

3. Internal drainage system designs are not subject to Allegan County Drain Commissioner approval in private developments. Site plans will be reviewed based on the following criteria:

   a) Storm water detention design, per these standards;

   b) Storm sewer design and how it will impact neighboring lands;

   c) Upstream pass through runoff shall be accounted for in the design and calculations.

4. If the proprietor finds it advantageous to make changes to the plan, the changes shall be incorporated into the plan and a new plan resubmitted for approval, even though the Drain Commissioner may have already approved the original plan. Changes shall be noted on the cover letter and detailed on the plan. If the proprietor does not present the final plan to the Drain Commissioner for approval within a period of two years after receiving preliminary approval of the original plan, revival of the project will require resubmitting the plan for review by the Commissioner subject to the standards in effect at that time.

III Review Fees for Miscellaneous Developments (see also fee schedule for plat & site condo reviews on pages 21)

   $350 for projects under 1 acre
   $500 for projects 1 to 10 acres
   $750 for projects over 10+ to 19 acres
   $1000 for projects over 19 acres
   County Administrative Fees $50.00

1. The fees outlined above shall be deposited with the office of the Allegan County Drain Commissioner prior to review and approval of the drainage layout in the site plan.
2. Fees fund the review of plans by the Drain Commissioner’s engineer. If the expense to review the proposed development exceeds the amount of fees collected, additional fees will be charged by the Drain Commissioner’s Office.
SECTION 4

STORM WATER MANAGEMENT POLICY
STORM WATER MANAGEMENT POLICY

Pursuant to the Clean Water Act of 1974 and the Federal Water Pollution Control Act, MI Act 451 of 1994, local authorities become responsible for implementing storm water management using storm water detention/retention basins or other suitable storm water management techniques to address land use changes. The Drain Commissioner’s policy recognizes that geographic location, topographic features, local requirements, aesthetics and many other factors render each land use change and its related watershed unique. This policy is intended to provide flexibility in type, location and configuration of storm water management techniques while still providing a safe, low maintenance, long lasting, effective water quantity and quality control useful to individual watersheds.

I. Basin Design Criteria

The design criteria included herein are intended as baseline standards for the calculation of runoff, detention volumes, discharge rate, etc. In the absence of more detailed analysis and calculations, the Allegan County Drain Commissioner shall find these methods acceptable. The design engineer may use computer models or other analytic tools that are available and accepted in the profession. Designs using alternate methods to those shown herein must explain and be prepared to defend their conclusions, if the resulting design is less restrictive than when using these criteria.

A. Retention basins are the preferred standard of the Drain Commissioner. Dry or shallow water detention basins are allowed when native soils cannot discharge storm water runoff by seepage. Permanent ponds are allowed for retention/detention within residential subdivisions, but with more detailed geometric pond design and operation criteria. In areas where wet detention or retention ponds are used, they must be separated from proposed dwellings, such that the design high water line is a least 50’ from the front building setback line.

B. An effort should be made to limit the number of storm water facilities within a development. A large number of small storm water facilities serving a development may be cause for the Drain Commissioner’s refusal to accept the drainage system for operation and maintenance.

C. The maximum release rate of storm water from all developments shall be restricted to 0.13 cfs/ac. In all areas of Allegan County two stage extended detention (one example Appendix P) shall be required unless it has been demonstrated that site specific conditions warrant otherwise. No alternate analysis allowing greater outflows than 0.13 cfs/ac will be considered, unless the development is located in a designated non-mandated detention zone (Appendix O), or sufficient evidence of receiving watercourse adequacy is provided.
D. Some areas in Allegan County are listed as non-mandated detention zones (Appendix O). The Drain Commissioner may allow, and in some cases require, excavating new floodplain in lieu of standard storm water detention. The required excavation volume shall be found by standard basin sizing methods. Only material excavated above the 2 year (50% annual chance) and below the 100-year (1% annual chance) floodplain elevation shall be included to balance required volumes.

E. The Drain Commissioner may require the determination of floodplain or wetland extents. No filling shall be allowed on these lands without the prior approval of the Drain Commissioner’s Office and of the MDEQ. Easement shall be granted to the appropriate drainage district for all existing and new floodplain within a given development.

F. The use of off-site storm water management features to address retention, detention, floodplain excavation, etc. will be evaluated on a site-specific basis.

G. Surface water runoff from offsite land shall be routed around the onsite development’s system unless otherwise approved by the Drain Commissioner. If the developer and/or the developer’s engineer show that it is not feasible or reasonable to divert off-site surface water runoff around a development and the Drain Commissioner agrees, the development’s drainage system shall be designed to convey runoff from off-site land (in its existing condition). Enclosed systems shall be designed with a capacity for the 10% annual chance (10 Year) rainfall for the on-site land and up to a 4% annual chance (25 Year) rainfall for the off-site land. Open drainage systems shall be designed with a capacity for the 4% annual chance (25 Year) rainfall for the on-site land and up to a 4% annual chance (25 Year) for the off-site land. The design rainfall used to determine the size of the on-site system shall depend on the design capacity of the existing off-site system conveying surface water runoff to the site. If the design capacity of the off-site conveyance system can not be determined then the capacity shall be assumed to have been designed using the same criteria as outlined above for on-site surface water runoff.

H. Emergency overflow pathways are strongly encouraged to convey excess storm water from the development and upstream, for rainfalls in excess of the design criteria.

II. Retention Design Criteria

A. If soils are suitable, retention basins may be required by the Drain Commissioner, even if a positive outlet is available. This preferred form of storm water management shall be utilized where the native soils and ground water table allow, or when a positive outlet is unavailable. Evidence shall be provided that the basin, subsurface soils and groundwater aquifer can safely hold and convey storm water runoff from the drainage area during a 1% annual chance rainfall event. Such evidence shall show that the ground water mound created at the basin does not adversely affect adjacent lands or structures, unless all structures are kept a minimum of 100’ from the high water line of a retention basin or the lowest floor elevation of any structure within 100’ of said high water line is at least 1’ above the design high water elevation.

B. Storm water retention volumes shall be calculated from the maximum runoff volume from the 1% annual chance rainfall, minus the volume discharged from the basin by percolation
through the basin bottom and hydraulically engaged side slopes, for any and all rainfall durations, from the developed site. The rainfall shall be determined by using Bulletin 71 (Rainfall Frequency Atlas of the Midwest by Huff & Angel). (Note: Percolation rate shall be determined from perk tests performed at the elevations and locations of the proposed basin’s seepage surfaces.)

C. Retention basins shall use design permeability equal to \( \frac{1}{2} \) the lowest rate as determined by approved testing methods at the site or in the lab with soil samples taken from the elevation of the proposed bottom. Note that the Allegan County Soils Manual is a good source for preliminary design information, but should not be used for final design of a retention basin. The method of choose for determining the percolation rate of the soil and the soil types is to have a machine, such as a backhoe, excavate down to the level of the proposed basin bottom and to perform an on-site percolation test, and then dig at least 4’ below the proposed design bottom to determine depth to highest ground water elevation by looking for mottling or any other signs of water. Based on experience of reviewing engineers in the area, the maximum design percolation rate recognized shall be 40 inches/hour, as long as the approved test results verify said rate. Therefore, in the example where test results show the percolation rate at above 40 inches/hour, the design permeability for the proposed retention basin would be \( \frac{1}{2} \) times 40 inches/hour, or 20 inches/hour. The design permeability shall incorporate the effects of surface restoration such as topsoil, sod, etc.

D. Required storm water storage volumes shall be determined in the same manner as with detention basins below, with \( Q_{out} \) equal to the seepage rate into the ground, rather than the 0.13 cfs/ac discharge rate. The seepage rate shall be determined by multiplying the design percolation rate (permeability) by the surface area of seepage. For retention basin volume calculations, \( Q_{out} = K’ \times A_s \) where \( K’ = 0.5 \times K_{field} \) (Permeability in inches/hour), and \( A_s \) = basin seepage area (acres).

E. If no positive outlet is available and seepage cannot be accounted for in the design, the basin shall be sized to hold the runoff from a 12” rainfall (approximately 2-1%, 24 hour back to back rainfall depths for Allegan County.), as long as the soils beneath the basin will allow water to percolate into the ground in such a manner that the basin is empty within 72 hours of a storm of up to a 25 Year intensity.

F. Unless the retention basin has an acceptable containment cell, there shall be at least 4’ between the design basin bottom and highest known ground water elevation, as determined by observation, mottling or historical records. If the site has an acceptable containment cell upstream of the leaching portion of the retention basin, there need only be 2’ of separation between the design basin bottom and highest known ground water, as determined above.

G. Retention (infiltration) basins shall be designed to drain completely within 72 hours after a 4% Chance Storm.

H. If permission is obtained from the Drain Commissioner to convey the off-site surface water runoff through the onsite development’s system, then the retention system shall be designed to handle the surface water runoff from said offsite land in its existing
condition. The frequency of the storm to use in determining the volume of off-site surface water runoff to include in a development’s retention system shall be based on the existing capacity of the conveyance system used to convey surface water to the proposed development from off-site land. If the conveyance system for off-site storm water runoff is sheet flow with no existing restriction to flow then the volume shall be based on a 4% chance rainfall.

I. Retention basins shall not be used as sediment basins during construction.

J. A sediment forebay shall be installed for a retention basin. A properly designed containment cell that limits the rate water leaches into the ground may double for use as a sediment forebay.

K. In well drained soil such systems as perforated leaching basins and/or pipe surrounded by stone can be used instead of above ground retention basins. Other types of below ground systems can also be used instead of above ground retention/detention basins. The criteria used to size such systems shall be the same as used to size above ground retention/detention systems. However, in some cases additional water quality treatment devices may be required to protect the ground water.

III. Detention Design Criteria

The volume for storm water detention basins sized by using what is known as the “Modified Chicago Method”, as outlined below, shall be designed using a 1% annual chance rainfall, as shown in Bulletin 71 of the Midwest Climate Center Rainfall Frequency Atlas of the Midwest. If acceptable routing calculations are performed and provided to the Drain Commissioner the detention basin shall be sized for the 25 Year rainfall.

Required Storm Water Storage Volume, \( \text{VOL}_{\text{st}} = \text{VOL}_{\text{in}} - \text{VOL}_{\text{out}} = 3600T_d \left[ Q_{\text{in}} - Q_{\text{out}} \right] \)

\( T_d = \) duration of 100 year rainfall (in hours), varied to find the critical storage volume

\( Q_{\text{in}} = C_d \times i_{100} \times A \) (rational method determination of runoff, in cfs)

\( Q_{\text{out}} = 0.13 \text{ cfs/ac} \times A \) (allowed basin outflow, in cfs)

\( C_d = \) runoff coefficient for the drainage area as developed

\( i_{100} = 100 \text{ year rainfall intensity (in/hr) at all storm durations, } T_d \)

\( A = \) drainage area to detention basin in acres

Example: \( C_d = 0.75 \) (avg. Commercial site); \( A = 20 \text{ acres} \); \( Q_{\text{in}} 0.75 \times 20 \times i_{100} \); \( Q_{\text{out}} = 0.13 \times 20 = 2.6 \)

Storage Vol. = 3600T_d[Q_{\text{in}} - Q_{\text{out}}]

<table>
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<th>( T_d ) (hr)</th>
<th>( i_{100} ) (in/hr)</th>
<th>( Q_{\text{in}} )</th>
<th>( Q_{\text{out}} )</th>
<th>( Q_{\text{in}} - Q_{\text{out}} )</th>
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If the Drain Commissioner agrees to allow off-site surface water runoff to be conveyed through the site’s storm water conveyance system then the detention basin volume shall include the volume of water conveyed to the site with the off-site land in its existing condition based on the capacity of the off-site’s conveyance system. If the off-site conveyance system is sheet flow than the design frequency used shall be the 4% chance rainfall as long as there is no existing restriction to that frequency’s runoff.

NOTE: In some cases a modified Detention-Retention System will be acceptable. Final Design Criteria shall be determined with the Reviewing Engineer in advance of submittal for Review. The main concerns to be considered will be basin surface treatment and proposed maintenance program.

IV. Principal (Low outlet) Spillway Design

A. The principal spillway shall be designed to convey the allowed detention basin release rate of 0.13 cfs per acre when the water level in the basin is at the 100 Year Design High Water Elevation.

B. The standard equations for low outlet sizing are:

Orifice flow: \[ Q_p = 5a(H)^{0.5} \] [reduced-size orifice plate at pipe entrance]

Pressure flow: \[ Q_p = 8a[H/(K_t + fL/D)]^{0.5} \] [outlet pipe under pressure]

Full flow: \[ Q_p = \frac{S^{0.5}D^{2.67}}{(2.18n)} \] [outlet pipe not under pressure]

\[ Q_p = \text{Principal spillway flow rate, in cubic feet per second} \]
\[ a = \text{flow area of orifice or pipe (sf)} \]
\[ H = \text{design hydraulic head (ft)} \]
\[ K_t = \text{combined entrance and exit losses (= 1.0 to 1.8)} \]
\[ f = \text{friction factor (approx. = 190n^2/D^{0.33})} \]
\[ L = \text{length of pipe (ft)} \]
\[ D = \text{pipe diameter (ft)} \]
n = Manning’s roughness coefficient (See Appendix S, Part I. A. 8.)

S = pipe slope (ft/ft)

C. All basins (detention or retention) shall be designed to have at least a 1’ freeboard when the water level is at the Design 100 Year Elevation.

D. If the Drain Commissioner agrees to allow off-site surface water runoff through the development’s storm water runoff conveyance system, instead of routing the off-site water around the development’s conveyance system, then the detention basin shall be designed with a dual primary outlet. The lower outlet shall be designed to handle the proposed development’s surface water runoff only, using a release rate of 0.05 cfs/acre, until the elevation of the water in the basin is at the 20% (5 Year) chance storm level. The secondary outlet shall be installed at the 5 Year storm elevation for the basin. The secondary outlet shall be designed to pass through off-site surface water runoff plus the remainder of the allowable on-site surface water runoff not accounted for with the lower outlet when the water level in the basin is at its design high water elevation.

V. Auxiliary (Emergency) Spillway Design

A. An auxiliary spillway and or overflow path shall be required as protection against blocked primary outlets, extreme rainfall events, etc. Such a spillway/overflow shall be sized to convey the 1% annual chance (100 Year) peak flow from the contributing drainage area as developed. Off-site flow-through runoff shall be included in sizing the auxiliary spillway. The Allegan County Drain Commissioner reserves the right to waive this requirement upon presentation of relevant data from the design engineer.

B. The normal for an auxiliary spillway is asphalt or concrete. If less stable methods, such as staked sod, erosion control fabric, etc., are proposed, the design engineer shall provide evidence that peak spillway velocities are non-erosive.

C. Spillway design shall extend from the berm crest to the outfall channel.

D. Side slopes “m” on trapezoidal and triangular spillways shall be at least 1 vertical on 6 horizontal for weirs designed to bear traffic.

E. The design equations for a spillway weir are:

- Rectangular weir: \( Q_a = CLH^{1.5} \)
- Triangular weir: \( Q_a = 0.75CmH^{2.5} \)
- Trapezoidal weir: \( Q_a = 0.75CmH^{2.5} + CLH^{1.5} \)

\( Q_a \) = auxiliary spillway design flow rate (cfs)

\( C \) = discharge coefficient = 3.3 for sharp-crested weir (i.e. Sheet piling)

\( = 3.0 \) for broad-crested weir of asphalt or concrete
= 2.8 for vegetated or gravel weir (good condition)
= 2.6 for vegetated or gravel weir (poor condition)

L = horizontal spillway length
H = design depth of flow over weir
m = side slope (i.e. m = 3, for an 1v:3h side slope)

F. Other factors may require more detailed considerations than included here. Some examples of contingent factors are: Side suppression of horizontal weirs for deep spillway flows (H/L > 0.20), partial submergence of the weir from downstream controls, alternate orifice procedures and composite spillway structures.

VI. Geometric Constraints for Storm Water Management Basins

A. Retention Basin

All side slopes shall be 1’ vertical on 5’ horizontal (1v:5 h) or flatter.

B. Dry Detention Basin

1. Side slopes shall be 1v:4h or flatter.

2. Basin bottom longitudinal slope shall be 0.5% or steeper.

3. Basin bottom cross slopes shall be 1.0% or steeper.

4. Distance between the inlet and outlet shall be maximized. A minimum length to width ratio of 3:1 is required unless other means are used to extend the flow path.

5. Detention basins that have an impoundment area of 5 acres or more and a hydraulic head of 6 feet or more must meet the requirements of the Dam Safety Section (Part 315) of Act 451, PA 1994.

C. Wet Detention Basin

1. Side slopes above static water level shall be 1v:4h or flatter.

2. Slopes between static water level and 3’ depth shall be 1v:6h or flatter.

3. Side slopes below 3’ depth shall be 1v:3h or flatter.

4. Distance between the inlet and outlet shall be maximized. A minimum length to width ratio of 3:1 is required unless other means are used to extend the flow path.

5. Detention basins that have an impoundment area of 5 acres or more and a hydraulic head of 6 feet or more must meet the requirements of the Dam Safety Section (Part 315) of Act 451, PA 1994.
6. Permanent pools shall be a minimum of 3’ deep in the center of the basin. An aerator may be required to minimize algae growth and mosquito breeding in permanent pools.

VII. Extended Duration Detention Basins

Due to Water Quality concerns, Extended Duration Detention Basins will now be the norm in Allegan County, unless the design engineer can provide information that the receiving stream has been fully developed to the extent that low velocity during the early stages of a storm are not required and the stream has the means to absorb whatever the basin discharges.

Extended duration detention basins shall include all, or portions, of the following features. Note, in some cases the use of acceptable mechanical means of storm water treatment, in lieu of extended duration detention basins, is encouraged and might even be required by the reviewing engineer. The design engineer shall provide sufficient technical data about any device they want to use in lieu of extended duration to the Drain Commissioner and the reviewing engineer. If it is decided a project warrants the use of a certain type of mechanical device to clean up the water, the Drain Commissioner and/or reviewing engineer shall let the developer/designer know.

A. A forebay should be installed to act as a primary settling area. The forebay shall be divided from the main basin by a compacted earthen berm, gabions, or other suitable structure. The capacity of the forebay shall be equivalent to 5% of the 1% annual chance storage volume. An overflow weir between the forebay and basin shall convey the design inflow without overtopping the berm. (See Appendix P for typical two stage design sketch.) The length to width ratio of the forebay shall be a minimum of 1.5 to 1 to a maximum of 4 to 1.

B. A multistage outlet riser may be required to limit outflows from the basin differently for different scales of rainfall.

1. The low outlet basin volume sizing shall be based upon a 50% annual chance (2 Year) rainfall event for the drainage area after development. The allowed discharge from the low outlet shall be limited to 0.05 cfs per impervious acre. The minimum required volume to facilitate the low outlet release rate is: \( V_{SP} = 5000 \text{ cu.ft./impervious acre} \). (\( V_{SP} \) is the stream protection volume.) This will provide protection from the 1.5 Year Storm Event, which is approximately 2.16”. This will also provide protection for the “first flush” from the water shed, which normally has the highest concentration of pollutants. (Note: Stream Protection Volume will be required as long as the discharge from the site is to a natural water course and CA (Rational Runoff Coefficient) x (Area) is greater than 1 acre.) In this case discharge to a natural water course can be by a direct connection or by discharging into a drain, stream or storm sewer that ultimately discharges to the natural water course.

2. The high outlet basin volume sizing shall be based upon a 1% annual chance (100 Year) rainfall event. The allowed cumulative discharge from the low and high riser outlets shall be limited to 0.13 cfs/ac.
C If the allowable discharge rate requires an outlet opening less than 4” in diameter, the discharge shall be controlled by a riser with a stone filter covering the smaller holes to reduce the chance of clogging.

D An emergency (auxiliary) spillway shall be sized to convey the 1% annual chance (100 Year) peak flow from the contributing drainage area as developed, using the assumption that the low flow outlet system is plugged at the start of the design storm. Off-site flow-through runoff shall be included in sizing the auxiliary spillway.

E The use of in-line detention is normally not compatible with extended duration. If an in-line detention system is approved by the Drain Commissioner the size of an extended duration basin shall be based on the same criteria used when sizing a normal detention basin without extended duration with off-site water being conveyed through the development.

F All inlets, outlets and overflow structures shall be designed to have non-erosive velocities or have adequate protection against erosion and scour. Maximum permissible velocities are as follows:

<table>
<thead>
<tr>
<th>Lining Type</th>
<th>Maximum Permissible Velocity (ft/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bare soil</td>
<td>2</td>
</tr>
<tr>
<td>Well Vegetated soil</td>
<td>4</td>
</tr>
<tr>
<td>Erosion resistant lining</td>
<td>8</td>
</tr>
</tbody>
</table>

G The forebay and stream protection volume may be included as part of the required flood control volume.

H The multiple-stage outlets may be designed using the orifice equation, rearranged to solve for area.

\[
A = \frac{Q}{5 \sqrt{H}} \quad \text{(Note, 5 is used instead of c \(2g\)^0.5)}
\]

Where:
- \(A\) = Required area (sft)
- \(Q\) = Required outflow (cfs)
- \(C\) = Orifice Coefficient (approximately 0.6)
- \(2g\) = Two times the gravitation constant (\(g = 32.2\) ft/s)
- \(H\) = Height of design high water level above center of
orifice, unless
tailwater elevation
is higher than
center of orifice.

Outlet devices shall have full design calculations provided for review.

VIII. Additional Considerations to Be Taken Into Account When Designing Storm Water Basins.

A. All riprap used within basins shall be stone unless other material is approved by the Drain Commissioner in advance of preparing the construction plans.

B. An inline concrete manhole, that is at least 5’ in diameter, with a 3’ open bottom sump, filled with stone riprap, will be required when discharge velocities are greater than 8.0 ft/sec.

C. All inlet and outlet pipes should have flared end sections with end section grates for all pipe 10” and larger.

D. Anti-seep collars are required on any pipe passing through the sides of any exterior embankment.

E. In locations, such as in commercial or industrial sites, and in areas where it is desirable to protect the ground water when there is less than 4’ of separation between design bottom and highest known ground water, Spill Containment Cells will be required. See Part XV on page 38 for details.

F. Direct maintenance access shall be provided for equipment in all portions of the basins.

G. Quite often, wet detention is desired over dry basins as long as care is taken to minimize or eliminate mosquito habitat and the basin is made as child proof as reasonably possible.

H. When surface water discharge is within a watershed where thermal impacts (cold water streams and designated drains) are a primary concern, properly constructed and maintained deep wet detention basins shall be considered. See Section X for more information on discharging to cold water streams.

IX. Sedimentation Basins in areas where Direct Surface Water Discharge is allowed.*

A. The basin (square feet of water surface) shall be sized to capture particles greater than 5 microns, which is about 90% of particles in urban runoff. Basin size shall be determined by percentage of drainage area as defined in the following table.

<table>
<thead>
<tr>
<th>Land Use</th>
<th>% of Total Drainage Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freeways</td>
<td>2.8%</td>
</tr>
</tbody>
</table>
Industrial* 2.0%
Commercial* 1.7%
Institutional* 1.7%
Residential 0.8%
Open Space 0.6%

* As long as the discharge from the sites is pollutant & sediment free.

B. The minimum basin volume shall be determined using 0.5 inches of runoff per impervious acre of the total drainage area.

C. The Minimum basin depth shall be 4’ from the normal water surface.

D. Maximum outflow from the sediment basin shall be determined by the equation:

\[ Q_{out} = A \times 43,560 \text{ sq. ft}^2/\text{acre} \times V \]

Where

\[ A = \text{Required surface area of basin.} \]
\[ V = \text{Settling velocity needed to achieve 5 micron control (0.000023 ft/sec)} \]

E. The minimum outlet pipe size shall be 4” in diameter. A multiple opening riser shall be used for the outlet when the above equation indicates the need for a smaller opening. Riser pipes shall have a minimum diameter of 24” and shall be surrounded by stone and gravel. Riser pipes greater than 4’ in height shall be 48” in diameter. Riser pipes shall be constructed of concrete and set on a concrete base. Outlet control structures shall be placed near or within the embankment to facilitate maintenance access. There shall also be a means to completely dewater the detention facility for maintenance purposes unless the basin is designed with thermal impacts in mind.

F. The distance between inlets and outlets shall be maximized. If possible, inlets shall be offset at the opposite longitudinal ends of the facility from the outlet. The length of the flow path across the basin can be maximized by increasing the length to width ratio a minimum of 3:1 and by increasing the dry weather flow path within the system to attain maximum sinuosity.

G. A minimum of 1’ of freeboard is required.

X. Additional Design Requirements for Surface Water Discharge to Thermally Sensitive Streams.
A. When surface water discharge is within a watershed where thermal impacts to cold-water streams and designated drains are a primary concern, deep wet detention basins may be required.

B. The permanent pool should be a minimum of 8’ deep.

C. Additional shade plantings shall be required on the West and South sides of drainage facilities.

D. Onsite infiltration of storm water should be considered where site conditions allow.

XI. Natural Wetlands

A. Wetlands should be protected from damaging modification and adverse changes in runoff quality and quantity associated with land developments. Before approval of the final construction plans, all necessary wetland permits from the MDEQ and local governments must be in place.

B. Direct discharge of untreated storm water to a natural wetland is prohibited. All runoff from the development must be pre-treated to remove sediment and other pollutants prior to discharge to a wetland. Such treatment facilities must be constructed before property grading begins.

C. Site drainage patterns will not be altered in any way that will modify existing water levels in protected wetlands without proof that all applicable permits from the MDEQ and/or local government agencies have been obtained, including the Soil Erosion & Sediment Control Permit.

D. A 25’ permanent buffer strip, vegetated with native plant species, should be maintained or restored around the periphery of all affected wetlands.

E. Wetlands must be protected during construction by appropriate soil erosion and sedimentation control measures.

XII. Buffer Strips

A. Buffer strips are defined as zones where construction, paving, and lawn care chemical applications are prohibited.

B. Buffer strips should be established adjacent to all basins and surface waters through deed restrictions or provisions of condominium master deed documents.

C. Plantings capable of filtering storm water should be preserved or established.

D. The width should be 25’ measured from the top of bank or edge of wetlands.
E. Storm water retention/detention basin design should allow for a 20’ buffer measured from the design high water elevation with the free board contained within the buffer, provided the slope of the buffer/free board area is not greater than 1 vertical on 10 horizontal, except than a very small amount of the buffer area may be as steep as 1 v on 4 h.

XIII. Safety Considerations

A. All drainage system components, especially all ponds/basins, must be designed with safety as a design priority.

B. The side slopes of all open channels should not be steeper than 1v to 3h.

C. The velocities throughout the surface drainage system shall be controlled to safe levels taking into consideration rates and depths of flow.

D. Mosquitoes should be controlled or eliminated by keeping standing water fresh, designing retention basins that will drain rapidly and any other techniques suitable to eliminating the breeding of insects in general and mosquitoes specifically.

XIV. Construction Requirements

A. Insurance

1. Coverage: The Proprietor shall maintain adequate insurance coverage for his own employees, his contractors and subcontractors, and their employees during construction. Satisfactory evidence of public liability and property damage insurance coverage as set forth by the State of Michigan may be requested by the Drain Commissioner.

2. Indemnity: The proprietor shall hold the Drain Commissioner and his agents harmless for acts of omission, negligence or error by the contractor(s) and subcontractor(s), the proprietor’s engineer, or the proprietor. Costs incurred by the Drain Commissioner to defend against criminal or trespass actions resulting from activities of any of the above named parties, as well as judgments awarded by any court of law, shall be paid by the proprietor.

B. Inspection

1. Purpose

   a) By Proprietor: The proprietor shall employ a competent inspector during construction of storm drains and appurtenances to ensure conformity to the approved construction drawings. Written verification in the form of daily logs may be required should the Drain Commissioner feel that the product fails to meet approved industry standards.

   b) By Drain Commissioner: The Drain Commissioner may employ an inspector on behalf of the drainage district should it appear that the installation fails to meet minimum requirements. Spot inspections by the engineer are to verify the proper
construction of the drainage system. Inspection by the Drain Commissioner or his engineer shall not relieve the proprietor’s engineer or the municipal engineer of their obligations.

c) By Others: Other agencies may periodically inspect progress for informational purposes. The presence of such inspectors does not release the proprietor or his engineer from obligations defined elsewhere in these rules.

2. Documentation: The Drain Commissioner may require documentation relative to the contract covering the work to be performed and including the name of the contractor, the items of work involved, the total cost of drainage system and appurtenances, and the proposed construction schedule. A copy of the SE&SC Permit may also be required.

3. Pre-Construction Meeting: The Drain Commissioner shall be invited to all Pre-Construction Meeting relating to the project. The Drain Commissioner may, at his discretion, request that a preconstruction meeting of all involved parties be held if the proprietor does not schedule such a meeting.

4. Costs: Payment of inspection deposits may be required by the Drain Commissioner prior to commencing work. The proprietor will be held responsible for the actual inspection costs incurred by the Drain Commissioner.

C. Proprietor Responsibility

1. General: The proprietor shall take whatever precautions he/she deems necessary in his/her direct relations with his/her contractor in order to ensure that the work performed by the contractor meets the approval of the engineer. The proprietor shall be held totally responsible for the fulfillment of his obligations to the Drain Commissioner.

2. Cleaning: The proprietor shall be responsible for cleaning all sewers, manholes, catch basins, or other structures affected by the development both onsite and offsite before final release.

3. Restoration: All unpaved areas shall have established ground cover before final release. Sodding, seeding, and mulching shall be done in accordance with current MDOT Standard Specifications for Construction.

XV. SPILL CONTAINMENT CELL TO BE USED FOR INDUSTRIAL, COMMERCIAL SITES AND RESIDENTIAL DEVELOPMENTS WITH RETENTION SYSTEM HAVING LESS THAN 4’ OF SEPARATION BETWEEN BASIN BOTTOM AND HIGHEST KNOWN GROUND WATER DEPTH.

A. All sites with petroleum products shall have a petroleum-water separator system of an approved type in an approved location.

B. General
1. A spill containment cell or equivalent storm water filter shall be used to trap and localize incoming sediments, and to capture the pollutant loads from accidental spills of toxic materials (spill containment volume).

2. Sizing

a) The spill containment cell volume shall be calculated as 30% of the water quality volume which is defined as 0.5” of runoff from the site’s impervious area. The equation to use to determine the Water Quality Volume ($V_{wq}$) is: $V_{wq} = 1815 \times (DCIA)$ where: (DCIA) is the “Directly Connected Impervious Area in acres and the constant 1815 is based on 0.5 inch of runoff x 3630 to convert acre-inch to cubic feet. The minimum water quality volume of 550 cft/acre shall be used for sites with less than 30% DCIA.

b) The minimum surface area shall be 25% of the required volume.

c) The length to width ratio shall be a minimum of 3:1 and a maximum of 4:1 to allow for adequate hydraulic length, yet minimize scour velocities.

d) The overflow structure from the spill containment cell shall be sized for the peak inflow from a 10-Year Storm.

e) The top-of-berm elevation between the spill containment cell and the basin shall be a minimum of 1 foot below the outer berm elevation.

f) The spill containment cell shall have a minimum 1 foot deep sump below its inlet & outlet pipes for sediment accumulation.

g) The outlet structure from the spill containment cell shall be designed to draw water from the central portion of the water column within the cell to trap floatables and contain sediments. The inlet side of the structure shall be located a minimum of 1 foot below the normal water level, and a minimum of 1.5 feet from the bottom of the spill containment cell (minimum depth of the permanent pool is 2.5 feet).

3. Material: The spill containment cell shall be lined with impermeable materials extending up to the design high water elevation. A minimum 18” thick clay layer, or an impermeable liner protected with a minimum 12” of soil cover are acceptable alternatives. Maximum allowable permeability shall be $1 \times 10^{-7}$ cm/sec as determined by the geotechnical consultant for clay placement, or manufacturer’s certificate for liner products.
SECTION 5

POLICY STATEMENTS
POLICY STATEMENTS

I. TULIP INTERCOUNTY DRAINAGE DISTRICT (Revised February 11, 2003)

A. EFFECTS AND PURPOSES

These standards provide for the establishment of design criteria for storm water controls and facilities within the Tulip Intercounty Drainage District (herein after referred to as DISTRICT), and recognize the need for approval of the Tulip Intercounty Drain Board (herein after referred to as BOARD) in connection with development within the Watershed. As set forth below, such approval may be obtained by a developer for a development site partly or wholly within the Watershed by the developer’s commitment to construct acceptable storm water management facilities and/or by the developer’s submission of an acceptable drainage plan and/or by payment of Storm Water Management Contributions, when acceptable to the BOARD, in lieu of construction of Storm Water Management facilities.

The purposes of these standards are to minimize flooding, property damage, erosion, nuisances, and to improve drainage and water quality within the Tulip Intercounty Drain (herein after referred to as DRAIN) Watershed.

The basis for these standards arises from the following findings of the BOARD:

1. The BOARD manages and maintains certain existing drainage facilities in the Watershed which have been developed over a number of years for the purposes of collection, storage and conveyance of storm water.

2. These standards are necessary and essential to manage storm water drainage facilities in connection with new development within the Watershed to minimize flooding and to improve drainage from new development.

3. It will be necessary to construct improvements to and extensions of the existing Storm Water Management System within the Watershed to minimize flooding from new development, to minimize existing periodic flooding from existing development or natural causes, to minimize property damage, to minimize erosion, to minimize nuisances, to improve water quality, and to defray the cost of such improvements and extensions through the acceptance of Storm Water Management Contributions in connection with certain new development.

B. DEFINITIONS

For purposes of these standards the words and phrases set forth below shall have the meanings provided. Words used in the singular shall include the plural, and in the plural, the singular. Words used in the present tense shall include the future tense. The word “shall” is mandatory and not discretionary. The word “may” is permissive. Words not defined in this Section or elsewhere in these standards shall be given their common, ordinary meaning unless the context requires otherwise.
1. DEVELOPER means any individual, sub-divider, firm, association, syndicate, partnership, corporation (public or private), trust, or any other legal entity (public or private), trust or any other legal entity (public or private) intending or proposing to effect the development of land where for self or for another.

2. DEVELOPMENT SITE means any land on which work is performed or proposed to be performed which will alter its existing storm water drainage characteristics. For purposes of these standards, a development site shall be considered any land improvement not contained or listed in the exemptions below.

3. DRAINAGE PLAN means a submittal to the BOARD for the review by the Board’s Professional Engineer/Consultant which provides information on the location of the development, the development tributary area to each point of discharge from the development site, indication of the method used to calculate the peak discharge rate, hydrologic and hydraulic calculations for the development and any upstream tributary area, calculation of the final peak discharge rate, calculation of any facility or structure size and configuration, the plan of action to be taken to meet the peak discharge criteria, a development drainage drawing showing all drainage related facilities and structures with existing and final grades, an implementation plan for construction of any and all facilities and structures needed to carry out the overall drainage plan, and any other similar information required by relevant watershed or Storm Water Management plan referred to in these standards. The BOARD may require the drainage plan to define the alignment and boundary of the natural drainage courses, existing and proposed drainage facilities, or sub-drainage areas on the land in question, and to include drawings, profiles, and specifications for the construction of channels, conduits, reservoirs, culverts, bridges, and other drainage facilities reasonably necessary to ensure that storm water, including drainage from other lands which will contribute runoff to the property, will be adequately drained, stored, or otherwise controlled. A schedule of the estimated dates of completing construction for storm water facilities shown on the plan shall also be included. Ownership and maintenance responsibility of the proposed storm drainage facilities shall be clearly defined. A plan for the proper maintenance of privately owned facilities shall be included.

4. STORM WATER MANAGEMENT CONTRIBUTIONS mean fees, money or other contributions approved by the BOARD contributed by the developer as provided in these standards for the purpose of defraying the costs of the Storm Water Management System. These Storm Water Management Fees are paid by the developer, at the BOARD’s option, in lieu of constructing drainage facilities.

5. TULIP INTERCOUNTY DRAINAGE DISTRICT or DISTRICT means the drainage district for the Watershed established pursuant to Chapter 21 of the Drain Code of 1956, as amended, the funds of which are administered by the BOARD.

6. TULIP INTERCOUNTY DRAIN or DRAIN means the storm water drain or conveyance system established pursuant to Chapter 21 of the Drain Code of 1956, as amended, which is continuously or periodically maintained or administered by the BOARD.
7. WATERSHED means all property within the boundaries of the DRAINAGE DISTRICT as generally described in Appendix Q which is incorporated herein by reference.

C. EXEMPTIONS

These standards shall apply to any development site within the Tulip Watershed which requires approval of a plat, a site condominium, a site development plan, building permit, or any other permit for work which will alter storm water drainage characteristics of the development site, provided, however, that these standards shall not apply to the following:

1. The construction of, or additions, extensions, or modifications to individual single-family or two-family detached residential structures located outside mobile home parks.

2. The installation or removal of individual mobile homes within a mobile home park. This exemption shall not be construed to apply to the construction, expansion, or modification of a mobile home park.

3. Plowing, tilling and drainage for the purposes of agricultural production and the construction of any agricultural buildings not requiring building permits.

4. Public streets and right-of-way approved on or before the effective date of these standards (January 26, 1999).

D. DEVELOPMENT SITE STANDARDS

A developer shall not alter the storm water drainage characteristics of a development site or any portion thereof except in accordance with a drainage plan approved pursuant to these standards or as otherwise permitted under these standards.

E. FEDERAL, STATE AND LOCAL REQUIREMENTS

Nothing in these standards shall be construed to relieve the developer from complying with all federal, state and local requirements for design and construction of drainage facilities or from complying with all applicable laws, ordinances, rules or regulations. The BOARD recommends building and/or occupancy permits be issued only when a development site plan is in compliance with Tulip Storm Water Management Standards.

F. CRITERIA

1. All development sites west of M-40 will be required to construct a system for storage and the controlled release of storm water runoff. All development sites east of M-40 that abut the DRAIN will be required to provide either increased floodplain storage or deposit the cost of designing and constructing, including engineering field inspection, an acceptable storm water detention system to the account of the DISTRICT. Those development sites east of M-40 that do not abut the DRAIN and will discharge to a branch drainage system that has adequate capacity shall either deposit the estimated
cost of designing and constructing an acceptable storm water detention system to the account of the DISTRICT or they shall construct increased floodplain storage along the DRAIN on off-site land. The funds deposited to the DISTRICT’s account shall be used to design and construct improvements to and extensions of the existing Storm Water Management System within the Watershed to minimize flooding from new development, to minimize existing periodic flooding from existing development or natural causes, to minimize property damage, to minimize erosion, to minimize nuisances, to improve water quality and to provide a sound scientific basis for such activities through study and survey of the existing DRAIN.

2. Storm Water Management Design and Criteria (page 25 - 39) shall meet the criteria of the respective County that the development is in.

G. DEVELOPMENTS EAST OF M-40

The purpose of Storm Water Management west of M-40 is to insure that the flow of the DRAIN is maintained at or below the existing flow prior to development. However, as development occurs closer to the outlet of the DRAIN, Storm Water Management might delay the time storm water discharges from the site to the point where it will increase the total peak flow for the DRAIN. Therefore, it is in the best interest of the entire DISTRICT if the storm water from development east of M-40 discharges prior to the time that the DRAIN reaches its peak flow. Since it is also the BOARD’s desire to be fair and equitable to all parties, while at the same time doing everything possible to maintain or lower flood levels within the DISTRICT, new development sites east of M-40, next to the DRAIN, may have an option, exercised by the BOARD’s sole discretion, of construction of increased flood plain storage, or of depositing of an amount of money necessary to design and construct an acceptable Storm Water Management System to the DISTRICT’s account, using the same rules as for the area west of M-40. If increase floodplain storage is provided, it shall be equal to the volume of storm water detention required for the rest of the DISTRICT and shall be measured between the 2 year floodplain elevation and the 100 year floodplain elevation. The floodplain elevation used shall be approved by the Michigan Department of Environmental Quality.

All development sites east of M-40 that are not next to the DRAIN shall either deposit the cost of constructing an acceptable Storm Water Management System, including the cost of the land for the system, to the DISTRICT’s account or shall construct acceptable increased floodplain storage next to the DRAIN on off-site land, as long as the drain or storm sewer system that will carry the site’s storm water runoff to the DRAIN has adequate capacity of its own. If the development site’s receiving drain or storm sewer system does not have adequate capacity, an on-site Storm Water Management System may be required or the receiving stream may be required to be improved to the capacity needed to pass the total required design flow. All floodplain storage areas shall be within easements in the name of the Tulip Intercounty Drain Drainage District.

H. REQUIREMENTS FOR DEVELOPMENTS ABUTTING THE TULIP INTERCOUNTY DRAIN
All development sites abutting the DRAIN shall include an easement for the DRAIN, in the name of the Tulip Intercounty Drain Drainage District, in care of the Drain Commissioner in whose county the land is located. The easement shall be at least equal to 100’ of land on each side of the DRAIN. For development sites east of M-40, the easement shall include sufficient additional land to construct increased floodplain storage.

NOTE: The BOARD reserves the right to require the Developer to furnish additional calculations acceptable to the BOARD including, but not limited to, a comparison of the site’s discharge hydrograph to the hydrograph for the DRAIN at the point of discharge. The decision on the need for additional calculations shall be by recommendation of the BOARD’s engineer(s).

I. PERMANENT SEDIMENTATION BASINS

Permanent sedimentation basins shall be installed on all sites that do not have storm water detention basins (or ponds) at the outlet end of the site’s storm sewer system. However, the peak discharge rate from the basin shall reach the drain at the 60% to 70% drain lag time, depending on the accuracy of determining said lag time. The sedimentation basin shall be approved by the BOARD’s engineer(s).

J. DEVELOPMENT WITHIN THE ONE HUNDRED YEAR FLOOD PLAIN

It is the BOARD’s position that it is not advisable to place fill within the 100 year floodplain area. However, if the developer shows that it is not feasible to develop a site without placing fill below the 100 year floodplain elevation and the Michigan Department of Environmental Quality approves fill, there shall be a mitigation amount of cut below the 100 year floodplain in an area close to the proposed development, within the same hydraulic drainage area. The amount of cut shall be equal to at least one and a quarter (1.25) times the amount of fill placed below the 100 year floodplain elevation, unless the developer’s engineer shows that the incoming and outgoing rate of flow to the flood storage area is approximately equal to the rate prior to development. The BOARD’s reviewing engineer(s) shall make the final decision as to the acceptability of the location of the cut.

K. FEES

The minimum engineering review fee for development sites within the Tulip Intercounty Drain Drainage District shall be based on the fee structure of the respective County. If the actual cost of the BOARD’s consultant(s) to review the proposed development exceeds the fees collected, additional fees will be charged based on the current actual hourly rate charged to the BOARD by their consultant(s).

SPECIAL NOTE: It should be noted that the compliance to the above standards does not relieve the developer from obtaining any and all other permits or approvals from other reviewing agencies, such as from local units of governments and from State agencies such as the Michigan Department of Environmental Quality.

Drafted by William E. Chappell, P.E of Driesenga & Associates, Inc. for the Tulip Intercounty Drainage Board
II. Discharge in the Gun River Intercounty Drain Basin.

A. A Hydrologic and Hydraulic (H&H) study was completed as part of the U.S Environmental Protection Agency, Clean Water Act, Section 319 grant project – Gun River Watershed Planning (2000-0164) by Fishbeck, Thompson, Carr & Huber (FTC&H) for the Allegan Conservation District. The Allegan & Barry County Drain Commissioner’s offices have accepted this study as the tool to use when reviewing development in their counties, within the Gun River Basin, downstream of Gun Lake. Therefore, the “Allegan Conservation District Gun River Watershed Hydrologic & Hydraulic Study” shall be included as part of these standards by reference. Anyone planning on developing land within this watershed will be required to comply with the recommendations included within the study and therefore, are encouraged to review a copy of the study prior to starting any development plans. A copy of the study may be reviewed at the offices of the Allegan County Drain Commissioner and the Barry County Drain Commissioner. A reprint of the study may be purchased from FTC&H for the cost of reproduction.

B. While it is not the intent of this section to completely reproduce the H&H study completed by FTC&H, in order to enforce the adaptation of the recommendations of the study, the following key points are included with these standards:

1. The allowable storm water detention basin release rate shall be 0.06 cfs/acre (instead of 0.13 cfs/acre) for all development within the Otsego-Plainwell, Monteith Drain, and the Scott-Whitcomb Drain sub-basins. The volume of the detention basin shall be based on a 100 Year rainfall if the “Modified Chicago Method” (a form of the Rational Formula) or on a 25 Year rainfall if acceptable routing procedures are used.

2. The Required Stream Protection Volumes and Release Rates for Detention Basins shall be determined from Appendix 6 of the H&H Study. Figure 4 from Appendix 6 is shown below:
The above Figure 4 is based on using the U.S. Soil Conservation Service (SCS) Runoff Curve Numbers (CN). (For those who do not know how to determine the CN for the developed watershed, this author refers them to “Computing Flood Discharges for Small Ungaged Watersheds, by Richard C. Sorell, P.E. of the MDEQ Land and Water Management Division. This document may be obtained by going to the website: http://www.deq.state.mi.us/documents/deq-glm-water-scs2003.pdf and downloading it.) The results obtained from the above figure will be used in designing the downstream (lower) end of a detention basin with extended duration and shall be used instead of 0.05 cfs per impervious acre for the low flow discharge with a volume to facilitate the low outlet release of Vsp = 5000 cft/impervious acre. For example, with a CN = 75 the required volume of water in the low end of the basin is 1250 cft/acre of development with an allowable maximum release rate of 0.011 cfs/acre of development.
SECTION 6

SEVERABILITY CLAUSE
SEVERABILITY CLAUSE

If any part of these rules is found to be invalid, such invalidity shall not affect the remaining portions of the rules which can be given effect without the invalid portion, and to this end the rules are declared to be severable.
APPENDIX A

DRAINAGE EASEMENT

IN CONSIDERATION of prospective benefits, exempt pursuant to MCL 207.505 Sec. 5 (a) and MCL 207.526 Sec. 6 (a) and MCL 207.526 Sec. 6 (a), to be derived by reason of the locating, establishing, constructing and maintaining of a certain Drain, NAME OF DEVELOPER, whose address is DEVELOPER’S ADDRESS (hereafter referred to as the “Grantor”), conveys and releases to the Allegan County Drain Commissioner, on behalf of the NAME OF DRAINAGE DISTRICT DRAINAGE DISTRICT, whose address is, 113 Chestnut Street, Allegan, Michigan 49010-1350 (hereafter referred to as the “District”), an irrevocable easement and right-of-way in which to construct, maintain, repair, replace, and/or remove drains, over, across, under and through the following parcel of land situated in the city/township/village of city/village/township name, Allegan County, Michigan, and legally described as follows:

LEGAL DESCRIPTION OF PARENT PARCEL
(Include Parcel Number)

(hereafter referred to as the Parent Parcel), the easement and right-of-way to be located as follows:

LEGAL DESCRIPTION OF EASEMENT AND RIGHT-OF-WAY, including the route & course

The conditions of this easement are such that:

1. The District’s rights and obligations are limited to the maintenance, repair, and replacement of the drainage facilities, in accordance with the provisions of the Drain Code. The cost of which may be assessed to the benefiting properties as shown in Exhibit ___.

2. The Grantor shall retain all other property rights and obligations, including turf maintenance. No buildings, construction, fences, shrubs, or decorative landscaping of any kind or nature shall be placed within the easement and right-of-way described above. If the District shall, in the exercise of its rights, disturb the easement and right-of-way, then the District shall only be obliged to restore the ground to its original grade, place 2 - 3” of topsoil, seed, fertilizer and mulch.

3. Should the district in the reasonable discharge of its obligations be required to enter upon the Parent Parcel it shall have the right to do so. If the District shall, in the exercise of its foregoing powers, disturb the Parent Parcel described, then the District shall restore it to its original condition.
4. Prior to each exercise of rights granted herein, the district shall make reasonable efforts to serve notice on the Grantor of its intent to enter upon the easement and right-of-way. In cases of emergency no prior notice need be given.

5. By this conveyance the Grantor releases the District from any and all claims for damage arising from or incidental to the exercise of any of the foregoing powers.

This Grant of Easement is intended to run with the land and shall be binding upon and shall inure to the benefit of the parties hereto, their respective heirs, personal representatives, successors and assigns, and may not be amended or modified without written approval of the Allegan County Drain Commissioner acting on behalf of the District. Any amendment or modification to this Grant of Easement shall be by an instrument in recordable form executed by both the Grantor and the District and recorded at the office of the Allegan County Register of Deeds.

WITNESS, our hand and seals, dated this ____ day of (month), year

_____________________________________
(type or print name of landowner)

_____________________________________

STATE OF MICHIGAN )
COUNTY OF _________ ) ss.

On this (day) of (month), (year), before me, a Notary Public in and for said County, personally appeared (name(s) of landowner(s)), to me known to be the person(s) described in and who executed the foregoing instrument, and they acknowledge that they executed the same as their free act and deed.

_____________________________________
(print or type name of Notary if seal is not used)

(Name of) County, Michigan

My Commission expires: (date commission expires)

This instrument prepared by:
(name of preparer, business name & address of preparer)
APPENDIX B

DETENTION BASIN EASEMENT

This indenture, entered into this _____ day of _______________, _____ by , (hereafter referred to as the “Grantor”), and the DEVELOPMENT OR DRAIN NAME Drainage District, a public body corporate, 113 Chestnut Street, Allegan, MI 49010-1350 (hereafter referred to as the “District”) 

WHEREAS, the Grantor is developing certain property located in the CITY/ TOWNSHIP/ VILLAGE of NAME OF CITY/TOWNSHIP/VILLAGE, County of Allegan, to be known as ___________.

WHEREAS, the Grantor, in order to develop said property in the manner it desires, finds it necessary to construct a storm water detention basin for the benefit of the property and to give the district certain easement rights therein.

NOW THEREFORE, in consideration of the respective covenants contained herein, the parties agree as follows:

1. IN CONSIDERATION of prospective benefits, exempt pursuant to MCL 207.505 Sec. 5 (a) and MCL 207.526 Sec. 6 (a), the Grantor does hereby grant, warrant and convey to the District, an easement for storm water detention over, across and within the following described land in the city/township/village of name of city/township/village , County of Allegan, State of Michigan, described as follows:

   LEGAL DESCRIPTION OF STORM WATER DETENTION EASEMENT

2. The Grantor agrees for itself, it’s heirs, administrators, successors, and assigns, that it shall be the property owner’s responsibility to maintain the easement area grounds including the removal of debris in such a manner that the proper functioning of the detention basin is not interfered with, and that the property owner will not make any changes in size, shape, capacity, rate of flow, rate of outflow, or changes in any other characteristics of the detention pond without the prior written approval of the Allegan County Drain Commissioner acting on behalf of the district, which approval can only be given by the way of amendment to this instrument properly recorded. Also that no buildings, construction, fences, shrubs, or decorative landscaping of any kind or nature shall be placed within the described easement and right-of-way.

3. The drainage district shall be responsible for the maintenance and control of the hydraulic functioning of the detention basin pursuant to MPA 40, DRAIN CODE OF 1956, as amended, or successor statute. Cost for maintenance by the DEVELOPMENT OR DRAIN NAME DRAINAGE DISTRICT may be charged against the property owners within the plat
(development) pursuant to MPA 40, DRAIN CODE OF 1956, as amended, or its successor statute. The property owner on whose parcel the easement rests is responsible for the turf maintenance.

4. The Grantor, its heirs, administrators, successors, and assigns, shall save and hold the District, its officers, employees, and agents harmless and indemnify the District against any claim or suit which seeks damages for an injury, death, or damage resulting from the construction, operation and existence of the detention pond.

5. The District agrees to maintain the detention basin outlet in accordance with the provisions under MPA 40, Drain Code of 1956, as amended. It is further understood that a provision of these statutes allow the District to specially assess the property owners in the plat if it so chooses.

6. In the event the basin grounds are not properly maintained, or changes are made to the easement area pursuant to paragraph 2 above, which impair the function of the detention basin easement, the District may order the property owner(s), upon whose property the changes are located, or improper maintenance has occurred, to make the necessary repairs or maintenance immediately. If such ordered repairs or maintenance are not completed within five (5) days, the District shall perform such maintenance or have such repairs made at the property owner’s expense. All costs incurred by the District shall be billed to the property owner(s) and shall become a lien against the property(ies) in accordance with MPA 40, Drain Code of 1956, as amended.

WITNESS, our hand and seals, dated this ___ day of (month), year

_____________________________________
(type or print name of landowner)

_____________________________________
(print or type name of Notary if seal is not used)

STATE OF MICHIGAN    )
COUNTY OF _________  ) ss.

On this (day) of (month), (year), before me, a Notary Public in and for said County, personally appeared (name(s) of landowner(s)), to me known to be the person(s) described in and who executed the foregoing instrument, and they acknowledge that they executed the same as their free act and deed.

_____________________________________
(print or type name of Notary if seal is not used)

_________________________ (Name of) County, Michigan

My Commission expires: (date commission expires)

This instrument prepared by:
(name of preparer, business name & address of preparer)
APPENDIX C

County Drain Release of Right-of-Way

RELEASE OF RIGHT-OF-WAY

Proper Parcel No. ______________

For and in consideration of prospective benefits to be derived by reason of the locating, establishing, constructing, maintaining, and improving of a certain Drain under the supervision of the [Drain Commissioner] of the County of [______________] and State of Michigan, as hereinafter described,

** Note to Preparer: Grantee’s marital status and rights of survivorship must come from the recorded deed.**

[___________________] and [_________________], (husband and wife), as tenants by the entirety, of [___________________], Michigan [______________], (do/does) hereby convey and release to the [_______________________], the Right-of-Way for a certain Drain, hereinafter more particularly designated and described, over and across the following land owned by (him, her, them), and situated in the (City of/Village of/Township of) [______________], County and State aforesaid, which lands owned are described as follows:

The Right-of-Way or Easement is described as:

PERMANENT EASEMENT:_______________________________________ SEE EXHIBIT A.

TEMPORARY EASEMENT:_______________________________________ SEE EXHIBIT A.

Said temporary easement is intended for construction activities.

Said temporary easement to terminate at the end of the one-year guarantee period after final completion of the petitioned project.

[Additional consideration of _________________ Dollars ($______________) is paid herewith.]

Note to preparer: If no money is paid, include the following language here. [Exempt pursuant to: MCL 207, 505 Sec. 5. (a) and MCL 207.526 Sec.6 (a).]
[NAME DRAIN], [COUNTY], MICHIGAN ** Note to typist: The drain name, county, and state should appear at the top of each page following the cover page.**

The Right-of-Way hereby conveyed and released is for the sole and only purpose of constructing, maintaining, and improving over and across said premises a certain Drain, petition for which in writing was made on ______________, 20___, by ____________________, and the necessity for which has been determined by the [Board of Determination hearing date of ________________ Hearing of Necessity on ________________ __________, 20___], the route and course of said Drain is described as follows, to wit:

[MAIN:
[Insert Description here]; or
[SEE EXHIBIT B]; or
the route and course description is recorded in the Final Order of Determination on file at the office of the Allegan County Drain Commissioner].

[BRANCH:] [EXTENSION:]

This conveyance is based upon the above-described line of route and shall be deemed to include the extreme width of said Drain as shown in the survey thereof, to which survey reference is hereby made for a more particular description and includes a release of all claims to damages in any way arising from or incident to the operating and maintaining of said Drain across said premises; and also sufficient ground on either side of the center line of said Drain, for the construction thereof; and shall be deemed a sufficient conveyance to vest in the Drainage District an easement in said land for the uses and purposes of drainage together with such rights of entry upon, passage over, deposit of excavated earth and storage of material and equipment on such land, as may be necessary or useful for the construction, maintenance, cleaning out, and repair of such Drain.

WITNESS, our hand and seals, dated this ____ day of (month), year

_____________________________________
(type or print name of landowner)

______________________________
(print or type name of Notary if seal is not used)

STATE OF MICHIGAN )
COUNTY OF __________ ) ss.

On this (day)of (month), (year) , before me, a Notary Public in and for said County, personally appeared (name(s) of landowner(s)), to me known to be the person(s) described in and who executed the forgoing instrument, and they acknowledge that they executed the same as their free act and deed.

______________________________
(Name of) County, Michigan

My Commission expires: (date commission expires)

This instrument prepared by:
(name of preparer, business name & address of preparer)
APPENDIX D

FLOODING EASEMENT

This Agreement, made and entered into this _____ day of ___________, 20___, for and in consideration of $ _________________ and prospective benefits to be derived by reason of the construction, operating, improving, and maintaining of a certain Drain under the supervision of the Allegan County Drain Commissioner as hereinafter described, ______________, (the landowners) do hereby convey and release to __________________ Allegan County Drain Commissioner on behalf of the Allegan County Drainage District, (the “Drainage District”) a public body corporate of 113 Chestnut Street, Allegan, MI 49010-1350, an Easement for the __________________ Drain situated in the County and State aforesaid. Landowners do hereby convey and release to the Drainage District a Drainage Easement with an elevation of approximately _______________ feet above mean sea level, NGVD, 1929 or NAVD, 1988 datum, for drainage purposes and flood control.

WHEREAS, Landowners are the owners of lands in the aforesaid County described as:

WHEREAS, the Drainage District wishes to obtain an easement from Landowners in the event that there is an increase in the velocity or quantity of water flowing onto Landowners’ property as a result of the construction, maintenance, improvement, or operation of the Drain.

NOW THEREFORE, the parties agree as follows:

1. Landowners hereby grant, convey and release unto Drainage District as Easement over and upon their lands for the purpose of allowing for increases in velocity or quantity of water flow onto landowners’ property.

2. Said Easement is described separately as follows:

3. Landowners, their heirs, executors, administrators, successors, and assigns reserve their rights and privileges to the area encompassed by the Easement as may be used and enjoyed to include the planting and harvesting of agricultural crops so long as the use(s) do not interfere with or abridge the rights granted to an easement hereby acquired by the Drainage District.

4. Landowners, their heirs, executors, administrators, successors, and assigns hold Drainage District harmless to all claims to damages in any way arising from or incident to the drainage and any increased flow onto said premises by reason of the drain and maintenance or improvement thereof. During the time of maintenance and improvement of said drain, or at any time in the future, such release for damages releases the Drainage District, its successors and assigns from any damages whatsoever arising out of the flooding of said lands within the easement right-of-way to any depth at any time in the future by reason of the construction of such drainage improvements and the flooding caused by such construction or their use during the time of construction or at any time in the future.
5. This easement may be terminated in whole or in part by written agreement of all of the parties.

6. This conveyance shall be deemed sufficient to vest in the Drainage District an Easement in said lands for the uses and purposes of any increased flow onto Landowners’ property.

WITNESS, our hand and seals, dated this ___ day of ___ , year

WITNESS

______________________________    ________________________________
(type or print name of witness)       (type or print name of landowner)

______________________________
STATE OF MICHIGAN  )
                ) ss.

COUNTY OF _________  )

On this ___ day of ___ , ___ , before me, a Notary Public in and for said County, personally appeared ___(name(s) of landowner(s)), to me known to be the person(s) described in and who executed the forgoing instrument, and they acknowledge that they executed the same as their free act and deed.

______________________________
(print or type name of Notary if seal is not used)

______________________________
(Name of) ___County, Michigan

This instrument prepared by:

(name of preparer, business name & address of preparer)

When Recorded Return to
Allegan County Drain Commissioner
113 Chestnut Street
Allegan, Michigan 49010-1350
CERTIFICATION OF NO NET INCREASE OF STORM WATER

[Development Name]
[Locations]
Allegan County, Michigan

I, _______________________________, a Licensed Professional Engineer in the State of _____________, do hereby certify that:

1. The lands to be developed naturally drain into the area located offsite on private property.

2. The development will not discharge storm water at a greater rate than pre-development conditions for the design discharge.

3. The development will not discharge concentrated storm water directly to off-site property where it was not historically concentrated.

4. The development will not discharge a greater volume of storm water onto offsite property where no surface water outlet is available.

_______________________________
Signature

_______________________________
Type/Print Name

_______________________________
Date

_______________________________
Engineer’s Seal
APPENDIX F

AGREEMENT FOR THE ESTABLISHMENT OF A COUNTY DRAIN AND COUNTY DRAINAGE DISTRICT
PURSUANT TO SECTION 433 OF ACT NO. 40 OF THE PUBLIC ACTS OF 1956, AS AMENDED

THIS AGREEMENT, made and entered into this ______ day of ___________________, 2001, by and between the ALLEGAN COUNTY DRAIN COMMISSIONER, 113 Chestnut, Allegan, Michigan 49010-1350, hereinafter referred to as “Drain Commissioner” on behalf of the proposed NAME OF DEVELOPMENT OR DRAIN Drainage District; and (the developer’s name), whose address is ____________, hereinafter referred to as “Landowner”.

WITNESSETH:

WHEREAS, Section 433 of Act Number 40 of the Public Acts of 1956, as amended, authorizes the Drain Commissioner to enter into an Agreement with Landowner to establish a drain which was constructed by the Landowner to service an area on lands owned by Landowner as a County Drain; and

WHEREAS, Landowner, pursuant to Section 433 of Act No. 40 of the Public Acts of 1956, as amended, wishes to provide drainage service to its own lands and has requested same to be established and dedicated as a county drain under the jurisdiction of the Allegan County Drain Commissioner; and

WHEREAS, Landowner has been advised and understands and agrees to assume the total cost of the construction of the drain to include engineering, inspection, easement acquisition, legal and administrative expenses and costs related or associated with this Agreement; and

WHEREAS, Landowner understands that the Drain constructed, or to be constructed, pursuant to this Agreement, when finally accepted by the Drain Commissioner, will be known as the ________ Drain (See Exhibit A for route and course description) and that the lands owned by the Landowner described in Exhibit B will be known and constituted as the Drain Drainage District; and

WHEREAS, Landowner further understands that as the owner of the lands included in this Agreement in the City/Township/Village of __________ in which said Drain and the lands to be drained thereby are located, that these above described lands will hereafter be subject to assessments for the cost of construction, operation, inspection and maintenance of the Drain; and

WHEREAS, Landowner has agreed to assume and pay all costs as set forth herein; and

WHEREAS, Landowner has obtained, at Landowner’s own expense, a certificate from a registered professional engineer satisfactory to the Drain Commissioner to the effect that the existing drain is the only reasonably available outlet for the drain and that there is sufficient capacity in the existing outlet for the
proposed drain to serve as an adequate outlet, without detriment to or diminution of the drainage service which the outlet presently provides. A copy of said certificate is attached hereto as Exhibit C.

NOW, THEREFORE, in consideration of the premises and covenants of each, the parties hereto agree to as follows:

The Drain Commissioner agrees to establish the NAME OF DEVELOPMENT Drain as a County Drain, subject to the provisions of this Agreement, upon the completion of the construction and inspection of the Drain. The route and course of the Drain is legally described in Exhibit A. The Drainage District shall be established and composed of the lands legally described in Exhibit B.

Landowner agrees that construction of the drainage facilities shall comply with the standards and specifications of the Allegan County Drain Commissioner’s Office and in compliance with all generally accepted construction methods.

Landowner agrees hereto to assume all costs of the project set forth in the above-mentioned plans, specifications and project designs. Said cost shall include all costs set forth in this Agreement, to specifically include:

- Actual expenses incurred by the Drainage District for inspection of the construction of the Drain.
- If the inspection determines there are deficiencies with the drainage facilities, landowner agrees to correct said deficiencies at his/her expense.
- The establishment of a permanent maintenance fund in an amount of 5% of the construction cost but not to exceed $2,500.00. Said payment shall not relieve the subject property from any future assessments levied pursuant to the Drain Code of 1956, as amended. The Landowner shall deposit said Balance Due with the Drainage District, to be used only for the purposes herein set forth and agreed upon.

The foregoing payment of the cost of the project is agreed and understood as being for the sole benefit of the Drainage District at large or part thereof, and that such payment shall not relieve the subject property from any future assessments levied pursuant to the Michigan Drain Code of 1956, as amended, for construction improvements and/or maintenance of the Drain arising by virtue of proper and legal petitions and hearings and procedures thereon.

The Landowner shall provide the Allegan County Drain Commissioner and/or the Drainage District at the time of approval with a Bond or Letter of Credit in the sum of 110% of the remaining construction cost of the Drain, to remain in effect until final acceptance of the project by the Drainage District.

It is agreed that the Landowner shall convey to the Drainage District a map and description of the Drainage District and such easement or rights-of-way as may be necessary to accomplish the purposes herein set forth and do so without charge therefore.

The Landowner further agrees to provide, without charge, one (1) set of reproducible mylar “As Built Plans” of the Drain (plan & profile drawings), which shall include design calculations showing flow rates, imperviousness factors, drainage district and sub-districts, easements and right-of-way locations, and any other data needed by the Drainage District for proper drain operation.

Landowner shall secure all necessary permits or authorizations as may be required by local, state or federal law and provided copies of all correspondence and reports involving any governmental agency with respect to the Drain.
Landowner agrees that said lands shall hereafter be liable for assessments levied for all costs incurred by the Drainage District, including for the operation, maintenance and improvement of the Drain, as provided in the Drain Code of 1956, as amended.

Landowner agrees to indemnify and hold harmless the Drain Commissioner for any and all claims, damages, lawsuits, costs and expenses arising out of or incurred as a result of the Drain Commissioner assuming responsibility for the Drain under federal, state and/or local laws, standards, specifications and the administrative and judicial interpretation thereof.

Modification, amendments or waivers of any provisions of this Agreement may be made only by the written mutual consent of the parties.

This Agreement shall become effective upon its execution by the Landowner and by the Drainage District and shall be binding upon the successors and assigns of each party.

IN WITNESS WHEREOF the parties hereto have caused this agreement to be executed by their duly authorized officers as of the day and year first above written.

WITNESS, our hand and seals, dated this ___ day of (month), year

LANDOWNER

(type or print name of landowner)

STATE OF MICHIGAN )

COUNTY OF _________ ) ss.

On this (day) of (month), (year), before me, a Notary Public in and for said County, personally appeared (name(s) of landowner(s)), to me known to be the person(s) described in and who executed the foregoing instrument, and they acknowledge that they executed the same as their free act and deed.

(print or type name of Notary if seal is not used)

_____________ (Name of) County, Michigan

My Commission expires: (date commission expires)
STATE OF MICHIGAN )
         ) ss.
COUNTY OF _________ )

On this (day) of (month), (year) , before me, a Notary Public in and for said County, personally appeared (name of Drain Commissioners), to me known to be the person described in and who executed the forgoing instrument, and they acknowledge that they executed the same as their free act and deed.

(print or type name of Notary if seal is not used)

_____________ (Name of) County, Michigan

My Commission expires: (date commission expires)

This instrument prepared by:
(name of preparer, business name & address of preparer)

When Recorded Return to
Allegan County Drain Commissioner
113 Chestnut Street
Allegan, Michigan 49010-1350
ENGINEER’S CERTIFICATE

I, __________________________, a Registered Professional Engineer, do certify that:

The lands to be developed naturally drain into the area to be served by the constructed or to be constructed drain, or that the said drain is the only reasonably available outlet for drainage from lands to be developed.

To my knowledge, there is existing capacity in the existing outlet to serve the lands to be developed without detriment or diminution of the drainage service provided or to be provided in the foreseeable future.

_________________________________
_________________________________

Date: ______________________________

_______________________________
Engineer’s Seal
APPENDIX G

AGREEMENT FOR THE EXTENSION OF A COUNTY DRAIN AND COUNTY DRAINAGE DISTRICT PURSUANT TO SECTION 433 OF ACT NO. 40 OF THE PUBLIC ACTS OF 1956, AS AMENDED

THIS AGREEMENT, made and entered into this _______ day of ____________________, _______, by and between the, ALLEGAN COUNTY DRAIN COMMISSIONER, 113 Chestnut Street, Allegan, Michigan 49010-1350, hereinafter referred to as “Drain Commissioner” on behalf of the proposed NAME OF DEVELOPMENT Drain Drainage District; and ________, whose address is ____________, hereinafter referred to as “Landowner”.

WITNESSETH:

WHEREAS, the Drain is an established county drain under the jurisdiction of the Allegan County Drain Commissioner pursuant to Act No. 40 of the Public Acts of 1956, as amended; and

WHEREAS, Section 433 of Act Number 40 of the Public Acts of 1956, as amended, authorizes the Drain Commissioner to enter into an Agreement with Landowner to extend the Drain, with said extension constructed by the Landowner to service an area on lands owned by Landowner as a County Drain; and

WHEREAS, Landowner, pursuant to Section 433 of Act No. 40 of the Public Acts of 1956, as amended, wishes to provide drainage service to its own lands and has requested same to be established and dedicated as a part of the Drain under the jurisdiction of the Allegan County Drain Commissioner; and

WHEREAS, Landowner has been advised and understands and agrees to assume the total cost of the construction of the drain to include engineering, inspection, easement acquisition, legal and administrative expenses and costs related or associated with this Agreement; and

WHEREAS, Landowner understands that the Drain constructed, or to be constructed, pursuant to this Agreement, when finally accepted by the Drain Commissioner, will be known as the Drain (See Exhibit A for route and course description of entire drain as extended) and that the lands owned by the Landowner described in Exhibit B will be included in the Drain Drainage District (See Exhibit B for description of drainage districts as extended; and

WHEREAS, Landowner further understands that as the owner of the lands included in this Agreement in the City/Township/Village of ____________ in which said Drain and the lands to be drained thereby are located, that these above described lands will hereafter be subject to assessments for the cost of construction, operation, inspection and maintenance of the Drain as extended; and
WHEREAS, Landowner has agreed to assume and pay all costs as set forth herein; and
WHEREAS, Landowner has obtained, at Landowner’s own expense, a certificate from a registered professional engineer satisfactory to the Drain Commissioner to the effect that the existing drain is the only reasonably available outlet for the drainage from the lands to be added and that there is sufficient capacity in the existing outlet for the proposed drain to serve as an adequate outlet, without detriment to or diminution of the drainage service which the outlet presently provides. A copy of said certificate is attached hereto as Exhibit C.

NOW, THEREFORE, in consideration of the premises and covenants of each, the parties hereto agree to as follows:

The Drain Commissioner agrees to establish the drainage system as described in Exhibit A as an extension of the Drain, subject to the provisions of this Agreement, upon the completion of the construction and inspection of the Drain. The route and course of the entire Drain extension is legally described in Exhibit A. The Drain Drainage District shall be established and composed of the lands legally described in Exhibit B.

Landowner agrees that construction of the drainage facilities shall comply with the standards and specifications of the Allegan County Drain Commissioner’s Office and in compliance with all generally accepted construction methods.

Landowner agrees hereto to assume all costs of the project set forth in the above-mentioned plans, specifications and project designs. Said cost shall include all costs set forth in this Agreement, to specifically include:

Actual expenses incurred by the Drainage District for inspection of the construction of the Drain. If the inspection determines there are deficiencies with the drainage facilities, landowner agrees to correct said deficiencies at his/her expense.

Replenish the permanent maintenance fund in an amount not to exceed $2,500.00 and/or 5% of the construction cost. Said payment shall not relieve the subject property from any future assessments levied pursuant to the Drain Code of 1956, as amended. The Landowner shall deposit said Balance Due with the Drainage District, to be used only for the purposes herein set forth and agreed upon.

The foregoing payment of the cost of the project is agreed and understood as being for the sole benefit of the Drainage District at large or part thereof, and that such payment shall not relieve the subject property from any future assessments levied pursuant to the Michigan Drain Code of 1956, as amended, for construction improvements and/or maintenance of the Drain arising by virtue of proper and legal petitions and hearings and procedures thereon.

The Landowner shall provide the Allegan County Drain Commissioner and/or the Drainage District at the time of approval with a Bond or Letter of Credit in the sum of 110% of the remaining construction cost of the Drain, to remain in effect until final acceptance of the project by the Drainage District.

It is agreed that the Landowner shall convey to the Drainage District a map and description of the Drainage District and such easement or rights-of-way as may be necessary to accomplish the purposes herein set forth and do so without charge therefor.

The Landowner further agrees to provide, without charge, one (1) set of “As Built Plans” of the Drain, which shall include design calculations showing flow rates, imperviousness factors, drainage district and sub-districts, easements and right-of-way locations, and any other data needed by the Drainage District for proper drain operation.

Landowner shall secure all necessary permits or authorizations as may be required by local, state or federal law and provided copies of all correspondence and reports involving any governmental agency with respect to the Drain.

70 Revised January 19, 2010
Landowner agrees that said lands shall hereafter be liable for assessments levied for all costs incurred by the Drainage District, including for the operation, maintenance and improvement of the Drain, as provided in the Drain Code of 1956, as amended.

Landowner agrees to indemnify and hold harmless the Drain Commissioner for any and all claims, damages, lawsuits, costs and expenses arising out of or incurred as a result of the Drain Commissioner assuming responsibility for the Drain under federal, state and/or local laws, standards, specifications and the administrative and judicial interpretation thereof.

Modification, amendments or waivers of any provisions of this Agreement may be made only by the written mutual consent of the parties.

This Agreement shall become effective upon its execution by the Landowner and by the Drainage District and shall be binding upon the successors and assigns of each party.

IN WITNESS WHEREOF the parties hereto have caused this agreement to be executed by their duly authorized officers as of the day and year first above written.

WITNESS, our hand and seals, dated this ____ day of (month), year

LANDOWNER

_____________________________________
(type or print name of landowner)

STATE OF MICHIGAN  )
    ) ss.
COUNTY OF _________  )

On this (day) of (month), (year), before me, a Notary Public in and for said County, personally appeared (name(s) of landowner(s)), to me known to be the person(s) described in and who executed the foregoing instrument, and they acknowledge that they executed the same as their free act and deed.

(print or type name of Notary if seal is not used)

_____________________________________
(Name of) County, Michigan

My Commission expires: (date commission expires)
STATE OF MICHIGAN  )
COUNTY OF _________  ) ss.

On this (day) of (month), (year), before me, a Notary Public in and for said County, personally appeared (name of Drain Commissioner), to me known to be the person(s) described in and who executed the foregoing instrument, and they acknowledge that they executed the same as their free act and deed.

(print or type name of Notary if seal is not used)

________________________ (Name of) County, Michigan

My Commission expires: (date commission expires)

This instrument prepared by:
(name of preparer, business name & address of preparer)

When Recorded Return to
Allegan County Drain Commissioner
113 Chestnut Street
Allegan, Michigan 49010-1350
AGREEMENT FOR THE ESTABLISHMENT OF A COUNTY DRAIN
AND COUNTY DRAINAGE DISTRICT
PURSUANT TO SECTION 433 OF ACT NO. 40
OF THE PUBLIC ACTS OF 1956, AS AMENDED

This Agreement entered into the __________ day of ____________________, 20___, by and between the,
Allegan County Drain Commissioner (“Drain Commissioner”), 113 Chestnut Street, Allegan, MI 49010-
1350 and NAME OF DEVELOPER, a Michigan limited liability company, with offices located at
________________________________________ (“Landowner/Developer”).

Whereas, Landowner/Developer is the owner of certain real property as legally described in Exhibit A
attached hereto; and

Whereas, Landowner/Developer proposes to develop and construct a residential development on said lands
to be known as ____________________; and

Whereas, Landowner/Developer proposes to construct a storm sewer system (“the system”) to serve all or a
portion of the proposed Development; and

Whereas, Landowner/Developer proposes to dedicate the system as a county drain under the jurisdiction
and control of the Drain Commissioner pursuant to Section 433 of the Michigan Drain Code of 1956, as
amended (MCL 280.433); and

Whereas, the Drain Commissioner has agreed to accept the system as an established county drain once
constructed upon terms and conditions.

Now therefore it is hereby agreed:

1. That Landowner/Developer shall construct the system consistent with plans and specifications
approved by the Drain Commissioner. Such plans and specifications shall be prepared and submitted under
seal of a registered professional engineer.

2. That construction of the system shall not commence until such time as the Drain Commissioners
reviews and approves all necessary plans, specifications, soil reports or other documentation deemed
necessary by the Drain Commissioner to give his review and approval.

3. That Landowner/Developer, its assigns or successors in interest shall be responsible for payment of
all costs in the engineering, inspection and construction of the system and all legal fees incurred in the
preparation of this Agreement.
4. That Landowner/Developer, its assigns or successors in interest shall secure all necessary federal, state and local permits, approvals and authorizations and provide copies of same for the Drain Commissioner.

5. That Landowner/Developer proposes the creation of the ____________________ Association (“the Association”) with mandatory membership of those landowners whose property will be served by the system. Landowner/Developer shall prepare and record with the Allegan County Register of Deeds all documentation relative to the creation of the Association and the duties and obligations of the Association relative to the operation and maintenance of the system, including provisions for the payment of all costs for the operation and maintenance of the system.

6. Landowner/Developer shall prepare a description of the drainage district proposed to be served by the system to include legal descriptions of the district boundaries, a map setting forth and determining the boundary of the drainage district and each property located therein (Exhibit A), a map showing the route and course of the system (Exhibit B).

7. That Landowner/Developer, its assigns or successors in interest shall be responsible for the operation and maintenance of the system and shall be responsible for the payment of all costs associated therewith.

8. That construction, operation and maintenance of the system shall comply with all requirements of federal, state and local statute, law, rule, ordinance and/or regulation.

9. That the Drain Commissioner shall have the right to inspect the system during construction, prior to acceptance, to determine if said construction complies with the approved plans and specifications, Landowner/Developer, its agents or successors in interest shall cause, at its own expense, the necessary modifications or reconstruction to comply with the approved plans and specifications.

10. The Landowner/Developer shall, at no expense to the Drain Commissioner, grant and convey easements over the system for purposes of the future operation, maintenance and improvement of the system. Said easements to be made to the _________________ Drain Drainage District, in a form acceptable to the Drain Commissioner.

11. That if, following construction the Drain Commissioner approves the system it shall become an established county drain under the jurisdiction and control of the Drain Commissioner and all the properties within the Drainage District shall be subject to special assessment for the operation, maintenance and improvement of the system, subject to the provisions of a maintenance agreement executed separately and attached hereto as Exhibit D.

12. Landowner/Developer, at its expense, has secured a certificate from a registered professional engineer to the effect that the system is the only reasonably available outlet and that there is sufficient capacity in the existing outlet for the system to serve as an adequate outlet without detriment to or diminution of the drainage service which the outlet presently provides as required in MCL 280.433(7). Said certificate is attached as Exhibit C.

13. That Landowner/Developer shall provide to the Drain Commissioner two sets of as built drawings of the system.

14. That Landowner/Developer shall be responsible for and pay all costs incurred by the Drain Commissioner in the review of plans and specifications, inspection, administration and preparation of this Agreement including, but not limited to engineering consultations and legal fees.
15. That Landowner/Developer, its assigns or successors in interest do hereby agree to indemnify, hold harmless and defend the Drain Commissioner and the Drain Drainage District from any and all claims for damages or injury, contractual, to person or property, arising out of the construction of the system. Further, Landowner/Developer agrees to secure waivers of lien or claims by any and all contractors involved in the construction of the system.

16. That once executed this Agreement shall be recorded with the Allegan County Register of Deeds, Landowner/Developer shall pay all recording fees and costs.

17. This Agreement and the attached Maintenance Agreement constitute the whole of the party’s agreement which is deemed to run with the land and is binding of the parties, their assigns and successors in interest.

IN WITNESS WHEREOF the parties hereto have caused this agreement to be executed by their duly authorized officers as of the day and year first above written.

WITNESS, our hand and seals, dated this ___ day of (month), year

LANDOWNER

_____________________________________
(type or print name of landowner)

STATE OF MICHIGAN  )
COUNTY OF _________ ) ss.

On this (day)of (month), (year), before me, a Notary Public in and for said County, personally appeared (name(s) of landowner(s)), to me known to be the person(s) described in and who executed the forgoing instrument, and they acknowledge that they executed the same as their free act and deed.

_____________________________________
(print or type name of Notary if seal is not used)

______________________________________
(Name of) County, Michigan

My Commission expires: (date commission expires)
STATE OF MICHIGAN  )
COUNTY OF _________  ) ss.

On this (day) of (month), (year), before me, a Notary Public in and for said County, personally appeared (name of Drain Commissioner), to me known to be the person(s) described in and who executed the forgoing instrument, and they acknowledge that they executed the same as their free act and deed.

(print or type name of Notary if seal is not used)

___________ (Name of) County, Michigan

My Commission expires: (date commission expires)

This instrument prepared by:
(name of preparer, business name & address of preparer)

When Recorded Return to
Allegan County Drain Commissioner
113 Chestnut Street
Allegan, Michigan 49010-1350
APPENDIX I

MAINTENANCE AGREEMENT

This Agreement entered into the __________ day of ____________________, 20___, by and between the, Allegan County Drain Commissioner (“Drain Commissioner”), 113 Chestnut Street, Allegan, Michigan, 49010-1350 and NAME OF DEVELOPER, a Michigan limited liability company, with offices located at ____________________________________ (“Landowner/Developer”).

Whereas, Landowner/Developer is the owner of certain real property as legally described in Exhibit A attached hereto; and

Whereas, Landowner/Developer proposes the construction of a storm sewer system (“the system”) to serve all or a portion of the properties to be developed on the lands described in Exhibit A; and

Whereas, Landowner/Developer and the Drain Commissioner have entered into an Agreement to provide for the dedication of the system as an established county drain, upon certain terms and conditions; and

Whereas, Landowner/Developer proposes the creation of a Landowners Association with the development (____________________) to be known as the ____________________ Association (“Association”); and

Whereas, Landowner/Developer has requested the Drain Commissioner to enter into this Agreement to provide the maintenance and operation of the system.

Now therefore it is hereby agreed:

1. That Landowner/Developer, its assigns and successors in interest, to include the Association, once created, shall be responsible for the operation and maintenance of the system and for the payment of all costs associated therewith.

2. That Landowner/Developer, its assigns and successors in interest do grant and convey to the Drain Commissioner the right of entry on to the property for purposes of inspection of the system to determine the need for maintenance or improvement.

3. That Landowner/Developer, its assigns and successors in interest shall cause an inspection of the system to be made at least annually, before June 1st of each year and shall provide the Drain Commissioner with a copy of all inspection reports by no later than July 30th of each year.
4. That if required, Landowner/Developer, its assigns and successors in interest shall retain the services of a licensed operator for the system and pay all costs attendant thereto.

5. That Landowner/Developer, its assigns and successors in interest shall operate and maintain the system in compliance with all federal, state and local statutes, laws, ordinances, authorizations, rules, regulations and permits.

6. That in the event that any inspection report indicates the need for maintenance or improvement to any part of the system, Landowner/Developer, its assigns and successors in interest shall cause such work to be done in a timely manner.

7. That if as a result of an inspection, the Drain Commissioner determines the need for maintenance or improvement of the system, he shall notify the Landowner/Developer, its assigns and successors in interest of the necessary maintenance, setting forth the specific details thereof, in writing upon receipt of notice from the Drain Commissioner, Landowner/Developer, its assigns or successors in interest shall cause the specified maintenance and improvement to be completed within 30 days of the receipt of notice or such time period as may otherwise be specified by the Drain Commissioner. In the event that the work specified by the Drain Commissioner is not completed in the specified time, Drain Commissioner shall cause the work to be performed and Landowner/Developer, its assigns or successors in interest shall be responsible for the payment of all costs therefore incurred by the Drain Commissioner, payment to be made within 30 days of invoice. If payment is not made the Drain Commissioner is authorized to seek collection by all means allowed under law or may levy special assessment against properties benefiting from the system, which special assessment will be a lien against the lands until paid or collected as allowed for the collection of taxes and assessments under the laws of the State of Michigan.

8. That Landowner/Developer shall notify, in writing, of the name and address and telephone number of any assigned or successors in interest.

9. That Landowner/Developer, its assigns and successors in interest shall be responsible for all costs incurred by the Drain Commissioner for the operation, maintenance or improvement of the system, inspection and engineering costs, administration costs, attorneys fees and costs including fees and costs incurred in the preparation of this document.

10. That Landowner/Developer, its assigns or successors in interest agree to hold harmless, defend and indemnify the Drain Commissioner, his employees, agents and contractors and the County of Allegan from any and all liability or enforcement action arising out of the operation, maintenance or improvement of the system including any and all claims for damages or injury to person or property and any and all civil and criminal sanctions, penalties, fines or costs.

11. That this Agreement, together with the Agreement to establish the system as a county drain constitute a whole of the Agreement of the parties and is binding on their assigns and successors in interest and is deemed to run with the land described in Exhibit A.
12. Once executed this Agreement shall be recorded with the Allegan County Register of Deeds, Landowner/Developer shall pay all costs of recording and all legal fees incurred in the preparation of this agreement.

IN WITNESS WHEREOF the parties hereto have caused this agreement to be executed by their duly authorized officers as of the day and year first above written.

WITNESS, our hand and seals, dated this ___ day of (month), year

LANDOWNER

_____________________________________
(type or print name of landowner)

_______________________________

STATE OF MICHIGAN       )
COUNTY OF ___________     ) ss.

On this (day) of (month), (year), before me, a Notary Public in and for said County, personally appeared (name(s) of landowner(s)), to me known to be the person(s) described in and who executed the foregoing instrument, and they acknowledge that they executed the same as their free act and deed.

____________________________________
(print or type name of Notary if seal is not used)

_______________________________ (Name of) County, Michigan

My Commission expires: (date commission expires)
STATE OF MICHIGAN  
) 
COUNTY OF _________  
) ss.
On this (day) of (month), (year) , before me, a Notary Public in and for said County, personally appeared (name of Drain Commissioner), to me known to be the person(s) described in and who executed the forgoing instrument, and they acknowledge that they executed the same as their free act and deed.

(print or type name of Notary if seal is not used)

___________ (Name of) County, Michigan

My Commission expires: (date commission expires)

This instrument prepared by:
(name of preparer, business name & address of preparer)

When Recorded Return to
Allegan County Drain Commissioner
113 Chestnut Street
Allegan, Michigan 49010-1350
APPENDIX J

MAINTENANCE PLAN AND BUDGET

“XYZ” Leasing Company
Storm Water Management System Maintenance Plan
For
“XYZ” Development

1. Responsibility for Maintenance
   a. During construction, it is the developer’s responsibility to perform the maintenance.
   b. Following construction, it will be the responsibility of “XYZ” Company to perform the maintenance.
   c. If “XYZ” Company fails to act within the time frame specified, the [City/Township of _________] will perform the needed maintenance and assess the costs against the property owners within the [subdivision] [condominium association] [other type of development].

2. Time Frame for Corrective Action
   a. Routine Maintenance: Corrective action shall be completed within 30 days of regularly scheduled inspection or notification that action is required.
   b. Emergency Maintenance: Corrective action shall be completed within 36 hours of notification unless threat to public health, safety, and welfare requires even more immediate action.

3. Source of Financing
   a. “XYZ” Company will pay for all maintenance activities on a continuing basis. The funding source will be [describe].

4. Maintenance Tasks and Schedule
   a. See attached drawings of storm water management system.
   b. See attached Table No. 1

5. Annual Maintenance Budget
   a. The annual maintenance budget for “XYZ” development is itemized as follows:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<tr>
<td>2.</td>
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<td>3.</td>
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<tr>
<td>4.</td>
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<td>5.</td>
<td></td>
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<tr>
<td>6.</td>
<td></td>
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</tbody>
</table>

   TOTAL $
6. Written documentation of maintenance inspections, maintenance activities and expenditures will be kept on file at ________________.

**TABLE No. 1**
**“XYZ” DEVELOPMENT**
**STORM WATER MANAGEMENT SYSTEM**
**MAINTENANCE TASKS AND SCHEDULE**

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Storm Sewer &amp; Culverts</th>
<th>Ditches &amp; Swales</th>
<th>Detention Basins</th>
<th>Infiltration Basins</th>
<th>Proprietary Pre-treatment Systems</th>
<th>Inspection Schedule</th>
<th>Maintenance Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean catch basin sumps</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bi-annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remove debris from pipes, open channels and outlet structures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bi-annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remove sediment accumulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bi-annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remove floatables and debris</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bi-annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repair erosion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bi-annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Replace riprap</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bi-annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repair / replace structural components</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Annually by professional engineer direction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintain vegetative Buffers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bi-annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mowing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Determined based on use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trim brush/trees</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bi-annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refresh/replace infiltration/filter media</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bi-annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance of wetland vegetation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bi-annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pump and haul from spill containment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bi-annually</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX K

SECTION 425 DRAINAGE AGREEMENTS

A. Use: Section 425 of the Michigan Drain Code addresses the addition of branch drains to serve lands entirely within an existing drainage district, and the enclosure or enlargement of an existing drain. Under this paragraph, the proprietor must petition the Drain Commissioner or Intercounty Drainage Board for permission to construct or improve the additional drainage for public use.

B. Submittals

1. Application/Petition: The proprietor is required to submit an application to Layout a Drainage District and a Petition to Locate, Establish, and Construct a Drain. An acceptable application/petition is included in Appendix L.

2. Legal Descriptions: The proprietor’s engineer or surveyor shall provide centerline description of the drains or branches, and a complete legal description of the drainage area affected. The description shall list each parcel and the acreage located within the drainage sub-district. In addition the engineer shall complete an apportionment data sheet for the sub-district.

3. Certification: The proprietor’s engineer shall include a sealed and dated statement attesting to the adequacy of existing receiving drains. A standard form for “Certification of Adequate Outlet” shall be the same as Exhibit C in a 433 Agreement.

C. Costs: The proprietor shall reimburse the Drain Commissioner for publishing and legal expenses. In addition, the proprietor shall deposit into the maintenance account for the drain, a non-refundable maintenance fee in the amount required by Section 433 of the Michigan Drain Code.
APPENDIX L

APPLICATION FOR LYING OUT AND DESIGNATING
A COUNTY DRAINAGE DISTRICT UNDER
SECTION 425 OF THE DRAIN CODE OF 1956
STATE OF MICHIGAN C.L. 70 280.433 (5) & (7)
AND PETITION TO LOCATE, ESTABLISH, AND CONSTRUCT A DRAIN

TO THE COUNTY DRAIN COMMISSIONER,
COUNTY OF ALLEGAN, STATE OF MICHIGAN:

Your petitioner respectfully shows that he is the only freeholder and owner in the City or Township of ______________________, in the County of Allegan, State of Michigan of the lands included in this application and that the proposed drain shall be entirely located within the City or Township of ______________________.

Your Petitioner further respectfully shows that the person signing this petition constitutes the only freeholder and owner of land included in the application in the City or Township of ______ which said proposed drain and the lands to be drained thereby are located and that as the owner of the land he/she is the only one liable to an assessment for the construction of the proposed drain.

Your petitioner further makes application and hereby respectfully asks you to lay out and designate a drainage district in the City or Township of ______________________, County of Allegan, State of Michigan, under the provisions of Act 40 Public Acts of Michigan, 1956, as amended. The location and route of said proposed drain is to be set forth on the attached riders.

Your petitioner agrees to pay the cost incurred by the Drain Commissioner in establishing this drainage district.

IN WITNESS WHEREOF the parties hereto have caused this agreement to be executed by their duly authorized officers as of the day and year first above written.

WITNESS, our hand and seals, dated this ____ day of (month), year

WITNESS
_________________________________    _____________________________________
(type or print name of witness)       (type or print name of landowner)

STATE OF MICHIGAN   )
) ss.
COUNTY OF _________   )

On this (day) of (month), (year), before me, a Notary Public in and for said County, personally appeared (name(s) of landowner(s)), to me known to be the person(s) described in and who executed the forgoing instrument, and they acknowledge that they executed the same as their free act and deed.

_________________________    ___________________________
(print or type name of Notary if seal is not used)       (Name of) County, Michigan

My Commission expires: (date commission expires)
APPENDIX M

RATIONAL METHOD RUNOFF COEFFICIENTS, Cd

<table>
<thead>
<tr>
<th>Land Use Description</th>
<th>10% annual chance design</th>
<th>1% annual chance design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Water</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Concrete or asphalt surfaces</td>
<td>0.90</td>
<td>1.00</td>
</tr>
<tr>
<td>Roof covered surfaces</td>
<td>0.90</td>
<td>1.00</td>
</tr>
<tr>
<td>Gravel surfaces</td>
<td>0.50</td>
<td>0.60</td>
</tr>
<tr>
<td>Sandy soil, &lt; 2% slope</td>
<td>0.10</td>
<td>0.12</td>
</tr>
<tr>
<td>Sandy soil, 2% to 7% slope</td>
<td>0.15</td>
<td>0.18</td>
</tr>
<tr>
<td>Sandy soil, &gt; 7% slope</td>
<td>0.20</td>
<td>0.24</td>
</tr>
<tr>
<td>Heavy soil, &lt; 2% slope</td>
<td>0.17</td>
<td>0.20</td>
</tr>
<tr>
<td>Heavy soil, 2% to 7%</td>
<td>0.22</td>
<td>0.26</td>
</tr>
<tr>
<td>Heavy soil, &gt; 7% slope</td>
<td>0.30</td>
<td>0.36</td>
</tr>
</tbody>
</table>

Normal ranges of C for the following land uses:

<table>
<thead>
<tr>
<th>Land Use Description</th>
<th>10% annual chance design</th>
<th>1% annual chance design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial and Industrial</td>
<td>0.50 – 0.95</td>
<td>0.60 - 1.00</td>
</tr>
<tr>
<td>Multifamily Residential</td>
<td>0.40 – 0.75</td>
<td>0.48 - 0.90</td>
</tr>
<tr>
<td>Single Family Residential</td>
<td>0.25 – 0.50</td>
<td>0.30 - 0.60</td>
</tr>
<tr>
<td>Rural Residential &amp; Agricultural land</td>
<td>0.15 – 0.30</td>
<td>0.18 - 0.36</td>
</tr>
</tbody>
</table>

Composite runoff coefficients are determined by averaging the proportions of the above land uses. For example, a 10-acre site on heavy soils with a 1% slope, with 2 acres of pavement/roof, 1.5 acre of gravel parking and a 1-acre pond:

\[ C = \frac{2 \times 0.90 + 1.5 \times 0.50 + 1 \times 1.00 + 5.5 \times 0.17}{10} = 0.45 \] for 10% annual chance design

\[ C = \frac{2 \times 1.00 + 1.5 \times 0.60 + 1 \times 1.00 + 5.5 \times 0.20}{10} = 0.50 \] for 1% annual chance design
APPENDIX N

Bulletin 71 Rainfall Depth - Duration - Frequency Tables for Allegan County, Michigan

Rainfall Depth (inches) for given recurrence interval

<table>
<thead>
<tr>
<th>Duration</th>
<th>50% annual chance (2 year)</th>
<th>10% annual chance (10 year)</th>
<th>4% annual chance (25 year)</th>
<th>1% annual chance (100 year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 min.</td>
<td>0.28</td>
<td>0.42</td>
<td>0.53</td>
<td>0.74</td>
</tr>
<tr>
<td>10 min.</td>
<td>0.50</td>
<td>0.74</td>
<td>0.93</td>
<td>1.29</td>
</tr>
<tr>
<td>15 min.</td>
<td>0.64</td>
<td>0.95</td>
<td>1.20</td>
<td>1.66</td>
</tr>
<tr>
<td>30 min.</td>
<td>0.88</td>
<td>1.30</td>
<td>1.65</td>
<td>2.28</td>
</tr>
<tr>
<td>1 hour</td>
<td>1.11</td>
<td>1.65</td>
<td>2.09</td>
<td>2.89</td>
</tr>
<tr>
<td>2 hour</td>
<td>1.37</td>
<td>2.04</td>
<td>2.58</td>
<td>3.57</td>
</tr>
<tr>
<td>3 hour</td>
<td>1.52</td>
<td>2.25</td>
<td>2.85</td>
<td>3.94</td>
</tr>
<tr>
<td>6 hour</td>
<td>1.78</td>
<td>2.64</td>
<td>3.34</td>
<td>4.61</td>
</tr>
<tr>
<td>12 hour</td>
<td>2.06</td>
<td>3.06</td>
<td>3.87</td>
<td>5.35</td>
</tr>
<tr>
<td>24 hour</td>
<td>2.37</td>
<td>3.52</td>
<td>4.45</td>
<td>6.15</td>
</tr>
</tbody>
</table>

Bulletin 71 Rainfall Intensity - Duration - Frequency Tables for Allegan County, Michigan

Rainfall Intensity (in/hr) for given recurrence interval

<table>
<thead>
<tr>
<th>Duration</th>
<th>2 year</th>
<th>10 year</th>
<th>25 year</th>
<th>100 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 min.</td>
<td>3.36</td>
<td>5.04</td>
<td>6.36</td>
<td>8.88</td>
</tr>
<tr>
<td>10 min.</td>
<td>3.00</td>
<td>4.44</td>
<td>5.58</td>
<td>7.74</td>
</tr>
<tr>
<td>15 min.</td>
<td>2.56</td>
<td>3.80</td>
<td>4.80</td>
<td>6.64</td>
</tr>
<tr>
<td>30 min.</td>
<td>1.76</td>
<td>2.60</td>
<td>3.30</td>
<td>4.56</td>
</tr>
<tr>
<td>1 hour</td>
<td>1.11</td>
<td>1.65</td>
<td>2.09</td>
<td>2.89</td>
</tr>
<tr>
<td>2 hour</td>
<td>0.68</td>
<td>1.02</td>
<td>1.29</td>
<td>1.78</td>
</tr>
<tr>
<td>3 hour</td>
<td>0.51</td>
<td>0.75</td>
<td>0.95</td>
<td>1.31</td>
</tr>
<tr>
<td>6 hour</td>
<td>0.30</td>
<td>0.44</td>
<td>0.56</td>
<td>0.77</td>
</tr>
<tr>
<td>12 hour</td>
<td>0.17</td>
<td>0.26</td>
<td>0.32</td>
<td>0.44</td>
</tr>
<tr>
<td>24 hour</td>
<td>0.10</td>
<td>0.15</td>
<td>0.18</td>
<td>0.26</td>
</tr>
</tbody>
</table>
APPENDIX O

NON-MANDATED DETENTION ZONES

(unless required by other federal, state or local standards and specifications),

Storm water retention/detention is the standard for all development in Allegan County unless the design engineer can adequately satisfy one of the following conditions:

1. Verify that the receiving water(s) possess capacity to convey the increased flows safely and with no negative downstream impacts due to increased flow rates, water levels or velocities; or

2. Verify that the peak flow of the receiving water(s) will not be increased by the proposed development; or

Although satisfying one or more of the above criteria may relieve a developer from installing storm water detention, the Drain Commissioner reserves the right to water quality improvement features, or specify that additional flood plain storage volume be excavated in lieu of detention. The required volume of increased flood plain storage will be equivalent to that calculated by the standard detention basin methodology, and will be measured in the field as the volume excavated below the 1% annual chance and above the 50% annual chance flood plain elevations of the adjacent water course. No detention is required for the following jurisdictions at the stated outlet locations when outletting directly into:

The Tulip Intercounty Drain East of M-40.
Exhibit 1
Typical 2 Stage Extended Detention Basin

TOP VIEW

SIDE SLOPE
4:1 MAXIMUM (H:V)

EMBANKMENT

RIP RAP

INLET

LOW FLOW

FOREBAY

CHANNEL

RISER

OUTLET

ACCESS ROAD

SPILLWAY

SIDE VIEW

EMERGENCY SPILLWAY ELEVATION
DESIGNED TO PASS THE 100 YEAR STORM

RISER WITH HOOD

FLOOD CONTROL ELEVATION (20 YEAR STORM)

STREAM PROTECTION ELEVATION (10 YEAR STORM)

PERFORATED RISER
ENCASSED IN GRAVEL JACKET

SOURCE: GUIDE BOOK OF BMPs FOR MICHIGAN WATERSHEDS, MDEQ (MODIFIED FOR OTTAWA COUNTY DRAIN COMMISSIONER)
APPENDIX R

Requirements for Digital Submission of Drawings
to the Allegan County Drain Commissioner’s Office

The following separate layers should be included:

1. Lot Numbers
2. Lot Lines
3. Lot Dimensions
4. ROW Dimensions
5. ROW Names
6. Subdivision Boundaries
7. Water/Storm/Hydrants/Sewer Lines/Culverts
8. Easements
9. Easement Dimensions
10. Contours
11. Any other features of value in determining overall drainage requirements

Technical Notes:

1. All lines must be snapped closed. (no dangles, overstrikes, or understrikes)
2. All files should be in a .dxf format.
3. Lot and ROW Dimensions layers should nothing extra other than leaderlines.
4. Layers should have a reasonable label of what can be found on each layer.
5. To insure the files come intact they should be zipped.
6. E-mail (the Allegan County LIS Department), Diskettes or CD are acceptable ways to receive the files.
7. Hatching should all be on one layer with no other items.
8. Layout design, as well as any tables, should be in one layer
APPENDIX S  
STORM SEWERS & STRUCTURES

I. Storm Sewer Design

A. Sizing

1. All storm sewers shall be sized to convey runoff from a 10-Year Storm event unless a system being conveyed from off-site to the on-site sewer has a higher frequency design. The Rational Method is the normal acceptable means to determine the amount of runoff to design the storm sewer to convey surface water runoff. The Rational Method is: 

\[ Q = C_d I A \]

where:

- \( Q \) = flow in (cfs)
- \( C_d \) = Rational Runoff Coefficients (See Appendix M)
- \( I \) = Rainfall Intensity for design frequency @ \( t_c \) (Time of Concentration for area being served by conveyance system) (See Appendix N)
- \( A \) = area being served in terms of acres

\[ t_c = \left( \frac{2L}{3n} \right)^{0.467} \]  

where:

- \( L \) = length water travels from extreme upstream point to design location for sewer
- \( n = \) Surface Coefficient of land traversed by water, where:
  - Smooth Impervious surface: \( n = 0.02 \)
  - Smooth bare packed soil: \( n = 0.10 \)
  - Poor grass, cultivated or moderately rough bare surface: \( n = 0.20 \)
  - Pasture or average lawn: \( n = 0.40 \)
  - Deciduous Timberland: \( n = 0.60 \)
  - Conifer Timberland or Timberland with deep forest litter: \( n = 0.80 \)
- \( s \) = slope of land or difference in elevation between the extremity of drainage area and the design point in question in terms of feet/foot

The normal starting \( t_c \) used for a storm sewer system is no less than 15 minutes.

2. Storm sewer design shall be done using the Manning’s Equation which is:

\[ Q = \left[ \frac{1.49 AR^{2/3} S^{1/2}}{n} \right] \]

Where:

- \( Q \) = Discharge (cfs)
- \( A \) = Wetted Area (sq. ft.)
- \( R \) = Hydraulic Radius (ft.)
- \( S \) = Slope (ft./ft.)
- \( n = \) Manning’s Coefficient

3. Surcharging of storm sewers during the 10% annual chance design storms will not be permitted; unless the developer’s engineer provides calculations showing surcharging during a 4% annual chance storm will be no higher than 6” below the top of castings of all catch basins within the project. Entrance and exit losses in manholes, catch basins and at inlets & outlets shall be accounted for when determining the hydraulic grade line. Each entrance and exit loss shall be equal to at least \( \frac{1}{2} \) the Velocity Head (\( h_v \)), where:

\[ h_v = \frac{V^2}{2g} \]
V = velocity in the sewer 
g = 32.2 ft./sec^2

4. Any storm sewer that will fall under the jurisdiction of the Drain Commissioner shall be at least 12” in diameter.

5. The minimum cover over the top of a storm sewer line shall be at least 2’.

6. Restricted conveyance systems designed to create backflow into storm water storage facilities are not permitted. A storm sewer line shall not be used as both an inlet and outlet line to storm water detention basins, etc.

7. Minimum & Maximum Slopes for Concrete Storm Sewers without special design considerations are as follows: (n = 0.013)

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>Minimum Slope (ft./ft.) {for V = 2.5 fps}</th>
<th>Maximum Slope (ft./ft.) {for V = 10 fps}</th>
</tr>
</thead>
<tbody>
<tr>
<td>12&quot;</td>
<td>0.0031</td>
<td>0.0484</td>
</tr>
<tr>
<td>15&quot;</td>
<td>0.0023</td>
<td>0.0360</td>
</tr>
<tr>
<td>18&quot;</td>
<td>0.0018</td>
<td>0.0283</td>
</tr>
<tr>
<td>21&quot;</td>
<td>0.0015</td>
<td>0.0230</td>
</tr>
<tr>
<td>24&quot;</td>
<td>0.0013</td>
<td>0.0193</td>
</tr>
<tr>
<td>27&quot;</td>
<td>0.0011</td>
<td>0.0165</td>
</tr>
<tr>
<td>30&quot;</td>
<td>0.0009</td>
<td>0.0143</td>
</tr>
<tr>
<td>36&quot;</td>
<td>0.0007</td>
<td>0.0112</td>
</tr>
<tr>
<td>42&quot;</td>
<td>0.0006</td>
<td>0.0091</td>
</tr>
<tr>
<td>48&quot;</td>
<td>0.0005</td>
<td>0.0076</td>
</tr>
<tr>
<td>54&quot;</td>
<td>0.0004</td>
<td>0.0065</td>
</tr>
<tr>
<td>60&quot;</td>
<td>0.0004</td>
<td>0.0057</td>
</tr>
<tr>
<td>66&quot;</td>
<td>0.0004</td>
<td>0.0050</td>
</tr>
</tbody>
</table>

8. Design Manning’s to use when solving for capacity of storm sewers are as follows:
   a. Concrete Pipe Design n = 0.013
   b. SLCPP (Smooth Lined Corrugated Plastic Pipe) n = 0.012
   c. Solid Wall Plastic: n = 0.011

B. End Treatment
   Outlet protection shall be provided as necessary to prevent erosion. Energy dissipaters designed in accordance with the procedures used in FHWA publication HEC No. 14 shall be provided at all pipe outfalls where the velocity will be high and potentially erosive. The velocity at the outlet of any storm sewer should not exceed 8 fps without approval.

C. Manholes & Catch Basins
   1. Manhole spacing shall not exceed 350’ for sewers less than 42” and 600’ for larger sewers.
   2. Manholes shall be placed at all changes in pipe direction, pipe size, pipe slope, and all inlet connection locations.
   3. Pipe inverts at junctions should be designed to minimize junction losses by matching the 0.8 points of pipe diameters.
   4. Minimum inside diameter of all manholes and catch basins shall be 48”. The minimum inside diameter for inlets shall also be 48” unless there is a single 12” outlet pipe with no inlet line, then the minimum inside diameter may be 24”.
   5. Inlet structures shall be placed at all low points of streets and yards, and be spaced such that surface water runoff does not flow more than a maximum of 350’. Spacing and/or the number of inlet structures required to accommodate the flows in streets, private
drives, and parking areas shall be provided based on inlet capacity with no ponding occurring during a 10-Year Storm.
6. No more than 150’ of street drainage will be allowed to flow around a corner.
7. No flow will be allowed across a street intersection.
8. All structures receiving surface water run-off shall have a sump not less than 24” deep.

D. Material
1. Storm sewer pipe shall be reinforced concrete or smooth interior wall polyethylene in accordance with MDOT Standard Specifications.
2. Pipe joints shall be designed to prevent excessive infiltration or exfiltration.
3. Manholes and catch basins shall be in accordance with MDOT Standard Specifications.
4. Connections to manholes shall be made with a resilient connector for non-concrete pipe diameters 24” or less. Concrete pipe connections shall be made by grouting the inside and outside wall of the structure.

II. Culverts & Bridges

A. Sizing
1. For drainage areas of 2 square miles or more, crossings must meet the requirements of the Floodplain Control Section (Part 31) of Act 451, PA 1994.
2. Bridges over streams that can carry canoe traffic shall have a minimum of 4.3’ freeboard to the underside (low chord) of the bridge during normal flow. Bridges shall be designed for a 100-Year Flood.
3. Culverts shall be designed for a minimum 25-Year Storm with an outlet velocity of no more than 8 fps. A maximum of 1’ of inlet submergence may be permitted, if water does not back up out of the easement area for the drain. The effect of the 100-Year Storm should be reviewed to ensure no adverse increase in water elevation off of the development property or flooding of structures within the development.
4. Sizing of culverts and bridges shall include consideration for entrance and exit losses, and tail water conditions.
5. Minimum diameter of a drive culvert shall be 12”.
6. Minimum diameter of a road crossing culvert shall be 18”.

B. End Treatment
Headwalls, wingwalls, and all other end treatments shall be designed to ensure the stability of the surrounding soil. MDOT, Allegan County Road Commission, or Manufacturer’s designs may be used.

C. Material
Culverts may be reinforced concrete pipe, corrugated steel pipe, or pipe arch in accordance with MDOT Standard Specifications. If a culvert is to be under a public road, it shall also meet the standards of the Allegan County Road Commission.
III Grassed Waterways

A. Sizing
1. The minimum required discharge capacity shall be for a 10-Year Storm with at least 0.5’ of freeboard to top of bank.
2. Velocities, capacities, and friction losses shall be based on Manning’s Formula.
3. A minimum “n” = 0.035 shall be used as the roughness coefficient for open channels, unless special treatment is given to the bottom and sides.
4. Minimum bottom width for grassed waterways shall be 2’.
5. Minimum bottom slope shall be 0.5%.

B. SE&SC
1. Grassed waterway flow velocities shall be neither siltative nor erosive. The minimum velocity for vegetative channels shall be 1.5 fps. The maximum velocity shall be 4 fps without special cover. Riprap protection or equivalent erosion control measures shall be used where the velocity exceeds 4 fps, up to maximum allowable design velocity of 8 fps.
2. Where maximum velocities are exceeded due to channel slope, rock check dams, or grade control structures shall be used to reduce overall velocities.
3. Erosion control blankets shall be used to protect bare channels.

C. Layout
1. Outlets into the grassed waterway shall enter at an angle of 90 degrees or less with the direction of flow.
2. A minimum clearance of 4’ is required between vegetated swale and ditch inverts and underground utilities unless special provisions are approved. In no case will less than 2’ of clearance be allowed.
APPENDIX T

REPAIR BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, (the developer’s name) herein after known as the Principle, and _____________________, as Surety, are held and firmly bound onto the Allegan County Drain Commissioner, acting on behalf of the proposed (Name of Development) Drain Drainage District, herein after known as the Owner, in the sum of (10% of the construction cost with a not to exceed total of $5000.00) _____________________ dollars ($_______) to be paid to the Owner for which payment will and truly be made, we jointly and severally bind ourselves, our heirs, our executors, administrators, and assigns, firmly by these presents.

Sealed with our seals and dated this _____ day of _____________, 20____.

WHEREAS, the above named principle has entered into a certain written contract with the Allegan County Drain Commissioner dated _____________, 20___, wherein the principle agreed as follows:

_____________________________________________________________________________

Now THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH that by and under said Contract, the above named principle has agreed with the Owner, for a period of one (1) year from the date of acceptance of the Drain by the owner, to keep in good order and repair any defect in all work done under said Contract, either by the principle or his subcontractors, or his suppliers, that may develop during said period due to improper materials, defective equipment, workmanship or arrangements; any other work affected in making good such imperfections, shall also be made good, all without expense to the Owner, excepting only such part or parts of said work as may have been disturbed without the consent or approval of the principle after final acceptance of the work, and that whenever directed so to do by the Owner, by notice served in writing, either personally or by mail, on the Principle, legal representative, successor, or on the Surety, he will at once make such repairs as directed by the Owner; and in the case of failure to do so within one (1) week from the date of service of such notice, then the Owner shall have the right to purchase such materials and employ such labor and equipment as may be necessary for the purpose and to undertake to do and make such repairs, and charge the expense thereof to and receive same from said Principle or Surety. If any repair is necessary to be made at once to protect live and property, then and in that case, the Owner may take immediate steps to repair or barricade such defects
without notice to the Contractor. In such accounting the Owner shall not be held to obtain the lowest figure for doing the work or any part thereof, but all sums actually paid therefore shall be charged to the Principle or Surety. In this connection, the judgment of the Owner is final and conclusive. If the said Principle, for a period of one (1) year from the date of acceptance of the Drain by the Owner, shall keep such work so constructed under the contract in good order and repair, excepting only such part or parts of such work as may have been disturbed without the consent or approval of said Principle after the final acceptance of the same, and shall, whenever notice is given as herein specified, at once proceed to make repair as is said notice directed or shall reimburse the Owner for any expense incurred by making such repairs should the Principle or Surety fail to do as hereinbefore specified, and shall fully indemnify, defend and save harmless the said Owner from all suits and actions for damages of every name and description brought or claimed against it for or on account of any party or parties, by or from any of the acts or omissions or through the negligence of said Principle, servants, or employees, in the prosecution of the work included in the said Contract, and from any and all claims arising under the Workmen’s Compensation Act, so-called, of the State of Michigan, then the above obligation shall be void, otherwise to remain in full force and effect.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed by their respective authorized officers this _____ day of __________, 20____.

Signed, Sealed and Delivered
In the presence of:

____________________________________  ________________________________ (L.S.)

____________________________________  ________________________________ (L.S.)

____________________________________  ________________________________ (L.S.)
## APPENDIX U

**DESIGN CHECKLIST FOR PRELIMINARY PLATS AND DEVELOPMENTS**

<table>
<thead>
<tr>
<th>Development Name:__________________________</th>
<th>Date:__________________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location:___________________________________</td>
<td>Reviewed by:_________________</td>
</tr>
<tr>
<td>Developer/Owner:_____________________________</td>
<td>____________________________</td>
</tr>
<tr>
<td>Contact Person:______________________________</td>
<td>Telephone:__________________</td>
</tr>
<tr>
<td>Fax:____________________</td>
<td>e-mail __________________</td>
</tr>
<tr>
<td>Developer’s Engineer:________________________</td>
<td>Contact Person:________________</td>
</tr>
<tr>
<td>Telephone:__________________</td>
<td>Fax:____________________</td>
</tr>
<tr>
<td>e-mail __________________</td>
<td>Reviewing Agency:______________</td>
</tr>
<tr>
<td>Contact Person:______________________________</td>
<td>Telephone:__________________</td>
</tr>
<tr>
<td>Fax:____________________</td>
<td>e-mail __________________</td>
</tr>
</tbody>
</table>

### General

<table>
<thead>
<tr>
<th>Provided/ Satisfactory</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Development name/subdivision number.</td>
<td>______</td>
</tr>
<tr>
<td>2. Description of location (including section and fractional portion thereof, town and range, township, city, or village and county, Michigan).</td>
<td>______</td>
</tr>
<tr>
<td>3. Location Map.</td>
<td>______</td>
</tr>
<tr>
<td>4. Name, address, and telephone number of proprietor.</td>
<td>______</td>
</tr>
<tr>
<td>5. Name, address, and telephone number of engineer or surveyor.</td>
<td>______</td>
</tr>
<tr>
<td>6. North arrow and scale.</td>
<td>______</td>
</tr>
<tr>
<td>Legend</td>
<td>Provided/ Satisfactory</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>7. Development boundary and total acres</td>
<td></td>
</tr>
<tr>
<td>8. Identification of all adjoining parcels (for subdivisions show lot number, subdivision name liber, and page numbers; for metes and bounds parcels show permanent parcel number).</td>
<td></td>
</tr>
<tr>
<td>9. Overall property description metes and bounds (with ties to government corner).</td>
<td></td>
</tr>
<tr>
<td>10. Lot dimensions (scales or computed).</td>
<td></td>
</tr>
<tr>
<td>11. Lot numbers.</td>
<td></td>
</tr>
<tr>
<td>12. Building setback lines.</td>
<td></td>
</tr>
<tr>
<td><strong>Topographical</strong></td>
<td></td>
</tr>
<tr>
<td>13. Existing buildings (label those under construction with address), parks, cemeteries above &amp; below ground utilities, railroads, etc.</td>
<td></td>
</tr>
<tr>
<td>14. Existing roads (with name, ROW width, and type of surface).</td>
<td></td>
</tr>
<tr>
<td>15. Proposed roads (with name, ROW width, and type of surface).</td>
<td></td>
</tr>
<tr>
<td>16. Existing contours (no greater than a 2’ interval inside the plat &amp; no greater than a 10’ interval outside the plat) in NGVD, 1929 or NAVD, 1988.</td>
<td></td>
</tr>
<tr>
<td>17. Typical lot grading plan (detail, statement, or drainage arrows).</td>
<td></td>
</tr>
<tr>
<td>18. Available soils data, soil boring logs, and locations (including ground elevation and water table information).</td>
<td></td>
</tr>
<tr>
<td>Provided/ Satisfactory</td>
<td>Comments</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>19. Vegetation (i.e. forested areas).</td>
<td></td>
</tr>
</tbody>
</table>

**Drainage**

<table>
<thead>
<tr>
<th>Provided/ Satisfactory</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Offsite watershed areas (with boundaries and acreage to be shown on location map).</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>21. All existing drainage courses and structures (with proper labeling as to type, size, and invert elevations).</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>22. County drains (permission required to connect).</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>23. Proposed drainage systems (clearly identify all open and enclosed portions).</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>24. Floodplain contour (existing and proposed).</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>25. Wetlands (existing and proposed).</td>
<td></td>
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<tr>
<td>26. Buffers provided.</td>
<td></td>
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<tr>
<td>27. Proposed storm water facilities (detention/retention). Make sure facilities are in a feasible location.</td>
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</table>

**Easements**

<table>
<thead>
<tr>
<th>Provided/ Satisfactory</th>
<th>Comments</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>28. Utility easements (with dimensions and type of utility).</td>
<td></td>
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<tr>
<td></td>
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<tr>
<td>29. Existing and proposed drainage easements.</td>
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<tr>
<td>30. Offsite drain easements or right-of-way.</td>
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</table>

**Maintenance**

<table>
<thead>
<tr>
<th>Provided/ Satisfactory</th>
<th>Comments</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>31. Identification of agency proposed to assume ownership of the storm water management system.</td>
<td></td>
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</tbody>
</table>

**Fee**

<table>
<thead>
<tr>
<th>Provided/ Satisfactory</th>
<th>Comments</th>
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<tr>
<td></td>
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<tr>
<td>32. Development fee.</td>
<td></td>
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</tbody>
</table>
APPENDIX V

SUBMITTAL CHECKLIST FOR FINAL PLATS, ETC. WITH PUBLIC ROADS

(Final plats, developments with public roads or downstream drainage course to be dedicated and improved as a county drain, and private developments that wish to be established as a county drainage district).

DEVELOPMENT NAME: _______________________ DEVELOPER: _______________________

LOCATION: ________________________________ ENGINEER: _________________________

**Initial Reviews**

<table>
<thead>
<tr>
<th></th>
<th>Date (s) Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Preliminary plat (including site plan, grading &amp; drainage plan, and engineering calculations) and review fees:</td>
<td></td>
</tr>
<tr>
<td>Submitted:</td>
<td></td>
</tr>
<tr>
<td>Approved:</td>
<td></td>
</tr>
<tr>
<td>2. Construction drawings:</td>
<td></td>
</tr>
<tr>
<td>Submitted:</td>
<td></td>
</tr>
<tr>
<td>Approved:</td>
<td></td>
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</tbody>
</table>

Construction drawings shall contain at least the following:

a. Proposed Contours  
b. Calculation of runoff  
c. Inlet capacity & spacing  
d. Pipe size & slope  
e. Pipe material  
f. If pipe is to be submerged (requires prior approval from Drain Commissioner)  
g. The design high water level in relation to low top-of-casting elevation  
h. Storm water management facility selected with design calculations  
i. Lowest allowable (minimum) basement floor & opening elevation in structures.  
j. Any Pretreatment system  
k. Hydraulic calculations for pipe  
l. Design of any overflow spillway  
m. Side slopes of all drainage facilities including detention/retention basins, drains etc  
n. All soil erosion controls needed for the site.

**Prior to Construction**

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>3. Evidence of contractor’s insurance coverage.</td>
<td></td>
</tr>
<tr>
<td>4. Construction contact information.</td>
<td></td>
</tr>
</tbody>
</table>
| 5. Soil erosion and sedimentation control permit  
(Part 91 Act 451, P.A. 1994); NPDES storm water  
Notice of Coverage for over 5 acres disturbed. |                         |
6. Inspection deposit paid.

7. Recordable rights-of-way for downstream properties, or “flooding” easement agreement submitted.

8. Certification of adequacy of existing receiving drains/no net increase in storm water

or

Approval has been given for any improvements Required to existing county drains.

Prior to Final Plat Approval

Date(s) Completed

9. Certification that county drains and storm water system have been improved in accordance with approved construction drawings (same as item No. 17)

or

The proprietor has entered into an agreement with the Drain Commissioner and has posted surety for faithful performance of the agreement.

10. Recordable release of rights-of-way within the plat provided in the name of the drainage district.

11. 425 Application and legal description submitted.

or

A drainage district has been established (adjusted).
433 Agreement and legal descriptions submitted.

or

A letter of commitment from the local municipality, Governmental agency, or association has been executed.

12. Maintenance fee submitted (per Sections 425 and 433).


15. Guarantee for repairs (repair bond) of any defects in the work for a period of one year.
Upon Completion of Construction


17. Certification that county drains and storm water system have been improved in accordance with approved construction drawings (same as item No. 9).

18. Release of surety (posted per item No. 9).

1 Year After Final Completion of Construction

# APPENDIX W

## SUBMITTAL CHECKLIST

(Private Developments)

<table>
<thead>
<tr>
<th>DEVELOPMENT NAME: ____________________</th>
<th>DEVELOPER: ____________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCATION: ____________________________</td>
<td>ENGINEER: ______________________</td>
</tr>
</tbody>
</table>

### Initial Reviews

1. Preliminary drawings (including site plan, grading and drainage plan, and engineering calculations) and review fees:
   - Submitted: ____________________
   - Approved: ____________________

2. Construction drawings:
   - Submitted: ____________________
   - Approved: ____________________

### Prior to Construction


4. Inspection deposit paid (if Drain Commissioner will inspect).

5. Recordable rights-of-way for downstream properties, or “flooding” easement agreement submitted.

6. Certification of adequacy of existing receiving drains/
   no net increase in storm water.
   - or Approval has been given for any improvements required
     To existing county drains.

7. The proprietor has entered into an agreement with the Drain Commissioner for county drains to be improved and has posted surety for faithful performance of the agreement.


10. Guarantee for repairs (repair bond) of any defects in the work on a county drain for a period of one year.
<table>
<thead>
<tr>
<th>Upon Completion of Construction</th>
<th>Date (s) Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Construction record drawings. (As-Built drawings)</td>
<td>__________________</td>
</tr>
<tr>
<td>12. Certification that county drains and storm water system</td>
<td>__________________</td>
</tr>
<tr>
<td>have been improved in accordance with approved construction drawings.</td>
<td>__________________</td>
</tr>
<tr>
<td>13. Release of surety (posted per item No. 7).</td>
<td>__________________</td>
</tr>
</tbody>
</table>

**1 Year After Final Completion of Construction**

<table>
<thead>
<tr>
<th>14. Return repair bond.</th>
<th>__________________</th>
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</thead>
</table>
APPENDIX X
APPLICATION TO CROSS OR PARALLEL A COUNTY DRAIN
Allegan County Drain Commissioner’s Office
113 Chestnut Street, Allegan, MI 49010-1350

NAME OF DRAIN: __________________________________________________________

APPLICANT:
   Company:   __________________________________________________________
   Address:   __________________________________________________________
   Phone:    __________________________________________________________
   Representative:  ____________________________________________

   Owner ( )       Agent ( )

Applicant agrees to abide by current rules and specifications of the Allegan County Drain
Commissioner’s Office (the Owner), and to hold the Owner and the named Drainage District harmless in
the event of injury to persons, lands, and properties sustained during the permitted activity. Applicant
agrees to promptly reimburse the Owner for costs incurred to defend against any action brought against the
Owner or District by an aggrieved party resulting from the permitted activity.

Signature: ____________________________   Date: ________________________________

ACTIVITY (describe):
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________

LOCATION:
City/Village: ___________________ Township ____________________ Section: ____________
(Describe location to nearest section line and quarter post)
_______________________________________________________________________________
_______________________________________________________________________________

ATTACHMENTS (check):
   ________ Construction Plans    ________ Other (name):

(Office Use Only)
Reviewed by __________________________
Approved by ___________________________   Date: ________________________________

Bond:  Y ( )     N  ( )       Owner’s Protective Policy:   Y ( )      N  ( )
   Amount: $__________________  Date: _______________________________
   Surety: ____________________  Surety: ______________________________
   Expiration Date: _____________

Final Inspection and Approval
By: ____________________________   Date: ________________________________
Appendix Y

PERMIT TO CROSS OR PARALLEL A COUNTY DRAIN

The Drain Drainage District, by and through the Allegan County Drain Commissioner (hereinafter “Drain Commissioner”), does hereby grant permission to _____________________ of _______________________ and use a portion of the established right-of-way/easement for the _______________________ Drain in _____________________ Township(s), Allegan County, Michigan. This permit is issued for the sole and only purpose of allowing Permittees the following use:
____________________________________________________________________________________
____________________________________________________________________________________
________________________________________________________________________________.

In consideration of granting this permit, Permittees does hereby agree to comply with all terms and conditions as set forth in this permit, together with the rules and regulations as established by the Allegan County Drain Commissioner, said rules and regulations are as follows:

1. All utilities and/or facilities must be a minimum of five (5) feet below the established drain bottom (may be lower than existing drain bottom) when crossing or paralleling a county drain or right-of-way.

2. Any structures removed such as headwalls, wingwalls, concrete slabs, riprap, erosion protection, tiling and culverts - metal or concrete, must be replaced with new material and reconstructed to original condition or better.

3. All ditch banks, when disturbed, must be reshaped to original slope as long as the minimum side slope is 1v on 2h, compacted, top soiled, and seeded, fertilized, and mulched or hydro seeded.

4. A minimum of seventy-two (72) hours notice is required to the inspection department prior to any construction that will involve a county drain.

5. Equipment and materials may not be stored in any way so as to cause blockage of a county drain.

6. Permittees is responsible for maintaining all storm drainage during the time of construction, whether by use of pumping equipment or construction of a bypass system.

7. Permit fee will be Fifty Dollars ($50.00), payable by check to the Allegan County Drain Commissioner. Prior to issuance of a permit, proof of Contractor’s Liability Insurance must be filed with the Office of the Drain Commissioner, with the named insured, in compliance with the Allegan County Drain Commissioner’s standards. Also, indemnity insurance, in the amount of $1,000,000 is required.

8. This permit does not relieve applicant from meeting any application requirement of law or other public bodies or agencies. Additionally, the issuance of this permit does not relieve the utility of any future expense for relocation of said utility to accommodate for future drain improvements.

9. Permittees shall be responsible for and pay all costs for engineering and inspection services incurred by the Allegan County Drain Commissioner in the review of the Permit Application and inspection of work performed hereunder. Payment to be made within thirty (30) days of invoice.
10. Other: ______________________ further agrees, either to pay any increased cost to the Drainage District due to this utility occupying said drain, said cost to be determined as a separate bid item during construction or reconstruction, or if determined by the Allegan County Drain Commissioner, the Utility Company occupying said drain right-of-way, shall relocate or lower if the location of the utility shall increase the cost of performing drain improvements or drain maintenance.

All expenses pertaining to said relocations shall be paid for by the owner of the utility company. Relocation shall be completed within ninety (90) days from receipt of written request by the Drain Commissioner.

Additional time may be granted by the Drain Commissioner if he/she determines it necessary.

Permittees does hereby acknowledge and agree that, in the event the area of the right-of-way for which this permit is granted is necessary for future maintenance and operation of the __________ Drain, Permittees at its own expense, shall remove all conflicting facilities, structures, pipelines, cables, and other appurtenances to said use in and during the time of the maintenance of said Drain. Upon request of the Drain Commissioner, said utility will be relocated within ninety (90) days from said request.

Further, Permittees shall hold harmless and indemnify the Allegan County Drain Commissioner, the Drain Drainage District, and their employees, agents or contractors from any injury to person or property sustained as a result of the placement of the uses specified herein.

Further, this permit is subject to additional terms and conditions as follows:
_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________

ACKNOWLEDGMENT AND AGREEMENT

The terms and conditions of this permit and attachments hereto are acknowledged by ______________________(Permittees) of ______________________________.

Dated:____________________

WHEREFORE, this permit is granted this _______ day of ____________, 20__. 

_________________________________
Allegan County Drain Commissioner
SECTION 8

FEES
FEES

I. REVIEW FEES FOR PLATS & SITE CONDOMINIUMS

A. County Administrative Fees $200.00

B. Preliminary Plat Fees
   1. For developments with 20 or less lots $200.00
   2. For developments with 21 or more lots $10.00 per lot

C. Construction Plan Review Fees
   1. Open drains $0.25 per foot
   2. Enclosed drains $0.60 per foot
   3. Rear yard drainage patterns within drainage easements $0.25 per foot
   4. Detention/Retention basins (ponds) (greatest distance across) $0.60 per foot

D. Fees fund the review of plans by the Drain Commissioner’s engineer. If the expense to
   review the proposed development exceeds the amount of fees collected, the Commissioner
   shall charge additional fees to cover the actual cost.

E. Any recording fees incurred due to registering a document are the responsibility of the
   proprietor.

III. REVIEW FEES FOR MISCELLANEOUS DEVELOPMENTS

A. County Administrative Fee $50.00

B. For projects less than 1 acre $350.00

C. For projects 1 to 10 acres $500.00

D. For projects 10+ to 19 acres $750.00

E. For projects over 19 acres $1000.00

F. Fees fund the review of plans by the Drain Commissioner’s engineer. If the expense to
   review the proposed development exceeds the amount of fees collected, the Commissioner
   shall charge additional fees to cover the actual cost.

G. Any recording fees incurred due to registering a document are the responsibility of the
   proprietor.
SECTION 9

GLOSSARY
GLOSSARY

As Built Plans (also known as Construction Record Drawings)
Revised construction plans drawn in accordance with all field changes.

Bank Full Flood
A condition where flow completely fills the stream channel to the top of bank. In undisturbed watersheds, this occurs on average every 1.5 to 2 years and controls the shape and form of natural channels.

Base Flow
The portion of stream flow that is not due to rainfall runoff or snow melts, usually generated by ground water seepage or discharges from lakes or wetlands.

Best Management Practice (BMP)
A practice or combination of practices that best prevent or reduce storm water runoff quantity or quality impacts.

Buffer Strip
A zone where plantings capable of filtering storm water are established or preserved, and where construction, paving and chemical applications are prohibited. These are generally established adjacent to open watercourses and/or wetlands.

Catch Basin
A storm water inlet structure designed to collect and convey water into storm sewer system, designed so that sediment falls to the bottom of the catch basin below the pipe elevation.

Check Dam
(a) An earthen, aggregate or log structure, placed in conveyance channels to reduce runoff velocity, promote sediment deposition, and enhance infiltration.
(b) A log or gabion structure placed perpendicular to a stream to enhance aquatic habitat.

Design High Water Level
The high water level in a storm water conveyance channel or facility calculated using the specified design criteria, which will not result in over bank flow in the channel or outflow from the facility via the emergency overflow spillway.

Design Maximum Water Level
The water level in a storm water facility calculated for a design discharge of the emergency overflow spillway.

Design Storm
A rainfall event of specified size, duration and return frequency, (e.g., a 10 year storm is a storm that is exceeded once every 10 years). A Design Storm is typically used to calculate the runoff volume and peak discharge rate for sizing conveyance systems (streams, pipes, etc.), detention basins and/or retention basins.
**Detention Basin**

A constructed or natural basin that temporarily stores water before discharging into a conveyance system. Basins can be classified into four groups:

(a) **Dry Detention Basin**

A basin that remains dry except for short periods following large rainstorms or snowmelt events. This type of basin is least effective at removing pollutants.

(b) **Extended Dry Detention Basin**

A dry detention basin that has been designed to increase the length of time that storm water will be detained, typically between 24 - 40 hours. This type of basin is less effective than a wet basin at removing nutrients such as phosphorus and nitrogen, unless a shallow marsh is incorporated into the lower stage of the design.

(c) **Wet Detention Basin**

A basin that contains a permanent pool of water that will more effectively removes nutrients in addition to other pollutants.

(d) **Extended Wet Detention Basin**

A wet detention basin that has been designed to increase the length of time that storm water will be detained, typically between 24 - 40 hours.

**Drain Use Permit**

A permit issued by the Allegan County Drain Commissioner for any work done within a county drain or drain easement such as crossing, cleaning out or relocating.

**Dual Cell Basin**

A detention or infiltration basin preceded by a spill containment cell.

**Easement**

A legal right, granted by a property owner to another entity, allowing that entity to make limited use of the property involved for a specific purpose. The Drain Commissioner secures temporary and permanent easements over and adjacent to county drains for the purpose of construction and maintenance access. Easements are recorded on the title to the land and transfer with the sale of land. Also known as a right-of-way.

**Engineer**

Professional Engineer hired by the Drain Commissioner to review projects on his/her behalf.

**First Flush**

The delivery of a highly concentrated pollutant loading during the early stages of a storm due to the washing effect of runoff on pollutants that have accumulated on the land.

**Freeboard**

The vertical distance from the top of an embankment to the maximum water elevation encountered during the design storm. This space is required as a safety margin in a pond, basin or channel.
French Drain
A subgrade drain consisting of a trench filled with aggregate to permit water movement through the trench and into the soil. The trench may also contain perforated pipe to enhance the efficiency of the system.

Headwater Stream
The smallest streams in a drainage network defined as first- and second-order streams. Headwater streams represent a majority of the drainage network and are exceptionally vulnerable to watershed development.

Hot Spot
An area where land use or activities generate highly contaminated runoff, with a concentration of pollutants in excess of those typically found in storm water.

Invert
The elevation of the bottom interior surface of a conduit at any given cross section.

Natural Drawdown
The gradual reduction in water level in a pond or basin due to the combined effect of infiltration and evaporation.

Non-point Source Pollution
Storm water conveyed pollution that is not identifiable to one particular source, and occurs at locations scattered throughout the drainage basin. Typical sources include erosion, agricultural activities, and runoff from urban lands.

NAVD 1988
North American Vertical Datum with re-adjustment from 1988 period based on Sea Level Datum and re-adjusted from coast to coast based on new survey datum more accurate across the nation. Locally there is no accuracy difference. Note that NAVD 88 + 0.40’ = NGVD 29 in this area.

NGVD 1929
National Geodetic Vertical Datum with adjustment based on datum from 1929 based on Sea Level.

One Hundred Year Flood (100-year flood)
The flood that has a 1 percent chance of being equaled or exceeded in any given year.

Ordinary High Water Mark
The line between upland and bottomland that persists through successive changes in water level, below which the presence of water is so common or recurrent that the character of the soil and vegetation is marked differently from the upland.

Peak Discharge
The maximum rate of storm water flow, referenced to a specific design storm event.
**Plunge Pool**
A small permanent pool located at either the inlet to, or outfall from a BMP. The primary purpose of the pool is to dissipate the velocity of storm water runoff.

**Pretreatment**
Technique to capture or trap course sediments within runoff before they enter a BMP to preserve storage volume or prevent clogging.

**Professional Engineer**
Professional Engineer registered or licensed in the State of Michigan.

**Professional Surveyor**
Professional Surveyor registered or licensed in the State of Michigan.

**Proprietor**
Any person, firm, association, partnership, corporation (or any combination) who submits a site plan for drainage review, (may also be referred to as developer or owner.)

**Release Rate**
The maximum allowed rate of discharge in volume per unit time (i.e. cubic feet per second) from a detention facility or site.

**Retention Basin**
A storm water management facility designed to capture runoff that does not discharge directly to a surface water body. The water is “discharged” by infiltration or evaporation.

**Runoff Coefficient, C**
The ratio of the amount of water that is NOT absorbed by the surface to the total amount of water that falls during a rainstorm. (i.e. $C = 0.67$ implies $\frac{2}{3}$ of rainfall runoff, $\frac{1}{3}$ is absorbed, or otherwise held.)

**Sediment Forebay**
A small separate storage area near the inlet to a storm water facility, used to trap and settle incoming sediments before they can be delivered to the basin.

**Short Circuiting**
The passage of runoff through a pond or basin in less than the theoretical or design detention time.

**Sheet flow**
Runoff which flows over the ground surface as a thin, even layer, not concentrated in a channel.

**Spill Containment Cell**
The first cell of dual cell detention and infiltration basins (or storm water wetlands) designed to provide controlled removal of oils and grease, course to fine sediments, and the pollutants
associated with them to protect ground water and surface water quality, and provide for a containment area in the case of an accidental spill.

**Storm Water Wetlands**
A detention area consisting of deep water, low marsh, and high marsh zones that create conditions suitable for the growth of marsh plants. Storm water wetlands area designed to maximize pollutant removal through wetland uptake, retention, and settling. These constructed systems are not located within delineated natural wetlands.

**Swale**
A natural depression or wide shallow ditch used to convey, store and/or filter runoff.

**Underdrain**
Perforated pipe installed to collect and remove excess rainfall infiltration into the ground. Also installed to control the maximum elevation of groundwater.
SECTION 10

ACKNOWLEDGEMENT
ACKNOWLEDGEMENT

The Allegan County Drain Commissioner hereby acknowledges that this document was put together based on the review of the Standards established for the:

Kalamazoo County Drain Commissioner

Kent County Drain Commissioner

Ottawa County Drain Commissioner

Van Buren County Drain Commissioner

The standards were also put together with the contributions of the firm of Fishbeck, Thompson, Carr & Huber, Inc.

In closing, we acknowledge that these Standards were compiled by William E. Chappell, P.E. of Driesenga & Associates, Inc.