SADDLE CREEK

SECTIONS 1 & 2

SADDLE CREEK-SECTION 2-FINAL DRAINAGE PLAN

13.04.085 Request by applicant for plan review and approval.

A. All requests for drainage plan approval shall be made by the applicant to the drainage board through the county surveyor's office by the presentation to the surveyor of the drainage plan and the supporting data, all in duplicate, by the close of the business day two full weeks prior to the meeting at which approval of the drainage plan shall be sought.

C. Included with the Drainage Plan shall be the following information regarding the applicant that shall be provided on FORM 801. **Provided-signed by Managing Partner C Wayne Kinney**

13.04.095 Conditions of drainage plan approval.

In order for an applicant to obtain approval of a final drainage plan, the following requirements must be met:

A. The applicant shall be eligible under the terms of this chapter to apply for and obtain drainage plan approval.

B. The drainage plan and supporting submittals required by this chapter shall have been prepared and submitted in a timely and proper manner in accordance with the provisions of this chapter. **Final for Section 1 submitted on 8/20/2018. Revised comments submitted on September 12, 2018, September 26, 2018, October 2, 2018 and November 12, 2018 and email and dated October 2, 2018, email November 5, 2018 (attachment)**

C. The drainage plan and supporting submittals shall reflect compliance with the requirements of this chapter, and compliance with any conditions of approval applied to the plan by the drainage board. **Required Revisions are shown in red. (Blue-meets requirements on initial submittal, red needs response or does not meet requirement, purple-addresses requirements upon submittal of revisions)**

D. The submitted data shall be gathered, analyzed, assembled into the drainage plan and supporting submittals; and shall be certified, and presented to the drainage board all by a civil engineer or land surveyor regularly engaged in stormwater drainage design, and registered to practice in the state of Indiana. **Provided**

E. An easement has been dedicated to house any off-site drainage facilities if such facilities are required to serve the project's stormwater drainage system. **A proposed offsite easement is shown on Baumgart Property for outlet pipe from Detention Basin #1-*for final drainage plan, this easement will need to be recorded and provided as part of final drainage plan submittal-* *na for Section 2***

F. The person, persons, partnership, corporation, or other entity to whom approval of the drainage plan is granted must be the person, persons, partnership, corporation, or entity who will be responsible for

accomplishing the project for which the drainage plan is developed. **CWK Investments-McCutchanville LLC, 9210 Petersburg Road, Evansville, IN 47725**

13.04.125 Building permits conditioned.

The Vanderburgh County building commissioner shall not allow construction of buildings, or other impervious structures or facilities to commence at the site of a project requiring final drainage plan approval until:

A. Such approval has been expressed by the drainage board;

B. And all storm drainage facilities are constructed. **See comment under Section 13.04.130**

13.04.130 Phased development of large projects allowed.

Large projects may be divided into phases for the purpose of constructing drainage facilities and obtaining permits in accordance with the requirements of this chapter. *Discuss phasing and issues with IDNR-see 13.04.16 #11 –work to begin on the east end of property.* **For Section 1 & 2 (east end of property) entire project to be constructed in single phase per submittal. Note, lots 128 and 129 approved by Board on October 2, 2018 as Section 1.**

13.04.140 Information submittal and review schedule.

H. For all new major subdivisions as defined in Title 16 of this code, which major subdivisions are shown to discharge an amount of stormwater in addition to that which is discharged prior to new development and all minor subdivisions, C-0 Through M-3, as defined in Title 16 of this code, which minor subdivisions are zoned for commercial use, the applicant shall notify all adjoining landowners and Registered Neighborhood Associations within 1/2 mile of any development of the proposed Drainage Plan.

1. The notification shall consist of the following language.

"Notice is hereby given that a Drainage Plan for _____ with a location of _____ has been submitted to the Vanderburgh County Surveyors Office, Room 325, Civic Center, Evansville, IN. The submitted Drainage Plan will be heard for approval or disapproval before the Drainage Board meeting on (date and time) at Room 301 of the Civic Center. A copy of the Drainage Plan is available for review in the County Surveyor's Office during normal business hours."

2. Also included in the notice shall be the name of the developer, name of the landowner where the development is to occur and the name of the engineer/engineering firm that has developed the Drainage Plan. **Provided**

3. The notification shall occur by certified mail or delivery using approved overnight services providing that the overnight services obtain a signed receipt. All mailings must be made at least

7 days in advance of the scheduled Drainage Board meeting in which the Drainage Plan is to be heard. *Provide copies of green receipts or other proof of mailing- Provided 5/2/2016 upon review it was found that the required notice did not meet requirements of the code due to notice being sent our prior to filling of the plan and that language addressing the location where the plan could be viewed was not included. New notice sent out and copy of notice along with 19 Green Cards and 7 receipts submitted on June 6, 2016.*

4. For new subdivisions in which approval of a preliminary plan is sought under Section 13.04.150 to satisfy certain requirements of the Area Plan Commission (APC), the mailing shall give notice of the preliminary plan. Once noticed for a preliminary plan, notice will not be required for hearing of the final Drainage Plan unless stated by the Drainage Plan as a condition for approval of the preliminary Drainage Plan.

5. Any required notice under this section may be done in conjunction with notice requirements by the Area Plan Commission provided that the required notice is sent at least 7 days in advance of the scheduled Drainage Board meeting in which the Drainage Plan is to be heard. *New notice sent out May 24th 2016*

13.04.160 Contents of preliminary drainage plan. *Preliminary Approved on June 7, 2016*

A. The contents of the preliminary drainage plan shall include a map based on the most current county planimetric maps, or a topographic map prepared from a more recent aerial photo reconnaissance that provides more accurate data, complete with contour lines, and showing the following:

1. The extent and area of each watershed affecting the design of the drainage facilities for the project; *Six interior watersheds originally proposed (see notes). In addition, four off site watersheds were addressed-OS1 which consists of lots 97 and 98 of Havenwood, OS2 which consists of a portion of Plantation Estates, OS3 which consists of a portion of Bentwood and OS4 which consists of a watershed off of Baumgart Road to the south of the proposed project.*

2. The soil types based on the most current information available from the SWCD; *Soil map provided along with report. The area is partially wooded and partially farmed. Soils consist of Bartle, Bonnie, Hosmer, Muren, Wellston, Wilbur and Zanesville silt loam. Report also provided information on Hydrologic Soil Group which was utilized in construction of hydrographs. A copy of the National Wetland Inventory Map was also provided. The map did not indicate any wetlands within proposed project.*

3. Zone "A" floodplain based on the current FIRM panels; *Panel 108 of 275 provided. Portion of lots 6, 7, 12, 13, 16, 17 and 18 are located in the Floodway of Little Pigeon Creek per special study "Special Flood Hazard Information Report-Little Pigeon & Locust Creeks, Evansville-Vanderburgh county Indiana" USCOE, March 1981. Due to this designation, IDNR Construction in Floodway permit will be required. Plat will need to address issues regarding modifications within this area and special language will be required regarding the easement. County needs to determine any future*

issues regarding maintenance of outlet structures if subdivision is to utilize Plan B under Section 13.04.460 of Drainage Code. In addition, several of the potential home sites are located within the flood zone.

4. The existing man-made and natural waterways, ponds, basins, pipes, culverts, and other drainage facilities or features within or affecting the project; *There are no existing ponds. Two basins proposed are proposed. Culvert locations are provided.*

5. The preliminary layout and design of the streets, and all stormwater drainage facilities, including depressed pavements used to convey or temporarily store overflow from the heavier storms, and all outlets for the storm water drainage facilities *Streets and piping proposed are shown on drawings provided*

6. The existing streams, floodways, and floodplains to be maintained, and new channels to be constructed, their locations, cross sections, profiles, and materials used; *Shown on maps. Drainage easement needs to be altered on lots 87 through 91 and 129 through 131 to reflect true location of drainage on these lots. Provided Cross sections and profiles of existing streams are not provided. Provided on 5/4/2016 Also need drawings on proposed swales. Provided on drawing C112 It appears that a number of locations will require swales to relieve water from uphill properties. This includes (but not limited to) a drain in the area of lots 99 and 112. Provided A drainage easement needs to be shown on lots 75 and 76 for the uphill drainage. Easement shown-an additional easement may be required pending review of this area in the final drainage plan. A drainage easement needs to be shown for the drainage coming off the north side of the Gerald Clements property on Baumgart Road and through lots 77, 78 and 79. Provided How will the existing ditch be handled that goes across the southern portion of lot 75 and crosses lot 72? Easements shown to address*

7. The proposed culverts and bridges to be built, with the proposed materials to be used; *No bridges proposed. Most culvert locations are shown but nothing is shown where street #2 crosses the two existing streams. Provided No information on proposed materials of culverts. Provided on 5/4/2016*

8. Existing detention basins or ponds within the project, or outside the project but affecting it, to be maintained, enlarged, or otherwise altered, together with any new basins or ponds to be built; and their basis of design *Information pending resubmittal of calculations once Tc calculations are revised-see general comments. Provided*

9. The estimated depth and amount of storage required of the basins and ponds, and their available freeboards; *Information pending resubmittal of calculations once Tc calculations are revised-see general comments. Basin 1 storage at 393.84' (pool @ 392.5). Basin 2 storage at 409.78 (pool @ 406)*

10. The estimated location and percentage of impervious surface existing and expected to be constructed at completion of the project. *Utilized average lot size-information conforms with data from UDSA Coil Conservation Service TR55 "Urban Hydrology for Small Watersheds"*

11. Any interim plan which is to be incorporated into the project pending its completion according to the final drainage plan. *Need to be address timing of construction of streets and basins-plan mentions the subdivision will be constructed in phases, but is not clear where the subdivision will begin and the effect of any permitting on timeline of development Provided in revised discussion.*

12. A copy of the Notice of Public Hearing as required by the Area Plan Commission. *Not Provided-Provided on 5/2/2016*

B. Notations and Explanations on the Preliminary Plan. All notations necessary to indicate the existing conditions, and the proposed functions of the various features shown thereon; and shall include the following.

C. Geographic Orientation Required. A north arrow, scale, location insert, and other information necessary for geographic clarification shall be included on a preliminary plan. ***Provided except for Location insert map which should be supplied on the final plans-Provided***

D. Data Required to Accompany Preliminary Plan. Descriptive data sufficient to support the feasibility of the preliminary drainage plan with regard to the requirements of this chapter, including calculations of the predevelopment and post development runoff rates using rainfall data supplied herein shall accompany a preliminary drainage plan. *Utilized Hydrograph method-see notes below*

E. Recommendation of Preliminary Plans Restricted. No preliminary drainage plan shall be recommended to the drainage board by their technical advisors unless the preliminary drainage plan shall be a workable plan according to the same criteria as, and capable of being incorporated into, a final drainage plan. *Submittal with attachments meet code requirements*

F. Determination of Sufficiency. The drainage board shall decide the sufficiency of the preliminary drainage plan, and any conditions or additional requirements to be applied to the preliminary drainage plan. Sufficient with the following conditions

No development shall occur within the area of Basin 1 until approval of necessary state and federal permits-copies of approvals of such permits shall be submitted to the Drainage Board through the Surveyors office upon receipt of approval

The Developer shall submit to the Drainage Board through the Surveyors office any approval of any state/federal permits regarding crossing of potential jurisdictional streams

The Board should consider whether to exclude the outlet pipe of Basin #1 from any Plan B maintenance as this may require the County to permit any future activity when repairing this pipe.

A proposed offsite easement is shown on Baumgart Property for outlet pipe from Detention Basin #1-for final drainage plan, this easement will need to be recorded and provided as part of final drainage plan submittal

13.04.165 Contents of final drainage plan.

The contents of the final Drainage Plan shall include all the items listed above for a preliminary drainage plan, plus:

A. Soils Map. A soils map indicating soils names and their hydrologic classification must be provided for a proposed project; **Provided in Preliminary**

B. Location and Topographic Map. In addition, a location and topographic map must be provided showing the land to be developed, and such adjoining land whose location and topography may affect or be affected by the layout or drainage of the project. The map must also identify all adjoining landowners. The contour intervals shown on the topographic map shall be two and one-half feet for slopes less than four percent; and five feet for slopes four percent or greater; or best available; **Location Map is required-Provided**

C. The location of streams and other stormwater conveyance channels, both natural and man-made; and the vertical and horizontal limits of the one hundred (100) year floodplain, according to FIRM panels, and/or the Building Commissioner; all properly identified;

D. The normal shoreline of lakes, ponds, swamps, and basins, their floodplains, and lines of inflow and outflow; **Provided**

E. The location of existing regulated drains, farm drains, inlets and outfalls; **No regulated drains**

F. The location of the following existing storm and water features:

1. Storm sewers and easements; **Provided**

2. Sanitary sewers and easements; **Existing 8" main located along west property line of Lot 116**

3. Combined sewers and easements; **None located on site**

4. Water lines and easements; **Provided**

and outfalls to any of the above as applies;

G. Wells, septic tank systems, and outfalls, if any; **Per submittal, none known**

H. Seeps, springs, sinkholes, caves, shafts, faults, or other such geological features visible, or of record; **Per submittal, none visible or of record**

I. The limits of the entire proposed project and the limits of the expected extent of land disturbance required to accomplish the project; **Discussion addressed tree removal for the road and a general note regarding construction of homes, however there is still some question as to how much area will be disturbed, especially on the north-will any trees be kept along the north boundary line within the existing drainage easements and the area between the easements and the north line on lots 122-125? Easements shown on revised drawings**

J. The location of the streets, lot lines, and easements; **Provided**

K. A scale, preferably one inch equals fifty (50) feet; **varies-1"=60 and some at 1"=150'**

L. An arrow indicating North. **Provided**

M. On-Site Bench Mark Required. A benchmark is required to be located within the project limits. Approved datum shall be found within the most recently approved Technical Memorandum. **None found Provided on revised Drawing C-102**

N. For all non residential Major Subdivisions and all Minor Subdivisions C-0 through M-3 **(Not Applicable-Residential Subdivision)**

13.04.170 Final drainage plan layout.

A. In addition to the requirements listed for a preliminary drainage plan, the final drainage plan shall depict the following:

1. The extent and area of each watershed tributary to the drainage facilities within the project; **Offsite basins on sheet 3 do not match sheet 2 addressed**

2. The final layout and design of proposed storm sewers, their inlet and outfall locations and elevations, the receiving streams or channels; all with the basis of their design; **Provided**

3. The location and design of the proposed street system, including depressed pavements used to convey or detain overflow from storm sewers and over-the-curb runoff resulting from heavier rainstorms, and the outlets for such overflows; all with their designed elevations; **All overflow from Road #1 (from Baumgart to the overflow swale) will go to the overflow swale between lots 23 and 24. Is the typical V-bottom overflow swale that is created by lot grading adequate to handle all of that runoff, or will a larger swale be required? It will be critical for the streets to have the proper crown so that water is directed into all inlets upstream of the overflow swale. If the upstream curb inlets do not collect the water as designed as a result of an inadequate cross slope, it will increase the chances that this overflow swale between lots 23 and 24 will be overloaded. Calculations show that overflow swale between lots 23 and 24 is adequate**

4. The locations, cross sections, and profiles of existing streams, floodways, and floodplains to be maintained, and the same for all new channels to be constructed; **Provided**

5. The materials, elevations, waterway openings, size, and basis for design of the proposed culverts and bridges; **No bridges proposed. Design of culverts provided. Provide details of P609 including the elevations on the top of the headwall. Is a fence or handrail needed for safety? The height of the drop off could not be determined since no elevations were provided on the headwall. It does not look like the proposed skew of this pipe matches the channel alignment very well, especially on the upstream end. This could require riprap or other bank protection measures. additional riprap provided on the upstream end**

6. Existing ponds and basins to be altered, enlarged, filled, or maintained; and new ponds, basins, swales, to be built, and the basis of their design; **Single Detention pond designed using HydroCad which is based upon TR-20. C soil types utilized for CN values with average lot sized calculations. 25 Year Storm utilized was 5.4" versus 5.62"-where did the 5.4" come from? Revised to 5.62" How was the percentage impervious determined on the Summary for DB#2 and the summary for the creek? Program computed**

7. The location and percentage of impervious surfaces existing and expected to be constructed; **used average lot information for all calculations.**

8. The material types, sizes, slopes, grades and other details of all the stormwater drainage facilities; **Provided for all swales. Provide a detail for a riprap lined swale showing the riprap keyed into the banks and bottom. These types of swales have been filled with riprap on other sites, so having a detail might result in the swales being built properly the first time. Provided**

9. The estimated depth and amount of storage required in the new ponds or basins, the freeboard above the normal pool and highwater pool of wet basins, and details of the emergency overflows from the basins; **Provided except for emergency overflow information Provided**

10. For all controlled release basins, a plot or tabulation of the storage volumes with corresponding water surface elevations, and a plot or tabulation of the basin outflow rates for those water surface elevations; **Provided**

11. The location of any applicable "impacted drainage areas" or other areas designated to remain totally undisturbed, natural, or for common and/or recreational use. **Pipe 609 was designed but it is unclear if it is to be installed as part of Section 1. Not to be installed in Section 1. The pipe installation appears to be within a jurisdictional stream and the status of the permitting needs to be addressed. *This will need to be addressed when the next section is submitted.***

12. The location of Drainage Easements for retention/detention basins, drainage ditches/swales, storm sewers, junction boxes, inlets, or manholes outside of any county right of way. Easements dimensions must be shown on each individual lot to the extent that they can be recreated in the field within the lot boundaries of said lot. **Provide dimensions on lots 10, 13, 14 and 20 on lots lines showing with of DE where it crosses lot lines. Provided Provide dimensions on lots 21-25 for LMSDE (distance from front of lot to LMSDE or another similar reference). . Provided**

Drainage Easements will not be required for retention/detention basins, drainage ditches/swales, storm sewers, junction boxes, inlets, or manholes in the following situations: **Multiple lot residential- easements required.**

B. Protection of Structures From One Hundred Year Flooding. All structures to be occupied as residences or businesses shall have finished floor elevations two feet above the high water calculated to occur during a one hundred (100) year return period storm for the subject building site; and the required floor elevations shall be depicted on the plan drawings for such affected sites. **No homes within this section shown to be within 100 year flood plain**

13.04.175 Submittal of a written drainage design report.

The final drainage plan shall be accompanied by a written report containing the following:

A. Any significant stormwater drainage problems existing or anticipated to be associated with the project; **The following conditions were approved on the preliminary Drainage Plan that are directly part of the Section 1 of the proposed subdivision**

1) That the basins handling the drainage of the watersheds for which they are designed be completely constructed and certified prior to occupancy of any home within the watershed of the corresponding watershed. –*this will be noted as a proposed condition to the Drainage Board*

3) The future buyers of lots downstream of the pond within Bentwood Estates be aware that there is a pond directly upstream of lots 90 through 95 and that approval of the preliminary drainage plan by the Board in no way certifies the technical safety of this structure. Furthermore that the plat clearly show the offsite existence of the lake and state that the outflow from this lake drains directly to the existing stream located on lots 116 through 120. (It appears as if these lot numbers have been changed from the prior submittals). Per submittal, will be noted on plat. *This will be noted as a proposed condition to the Drainage Board*

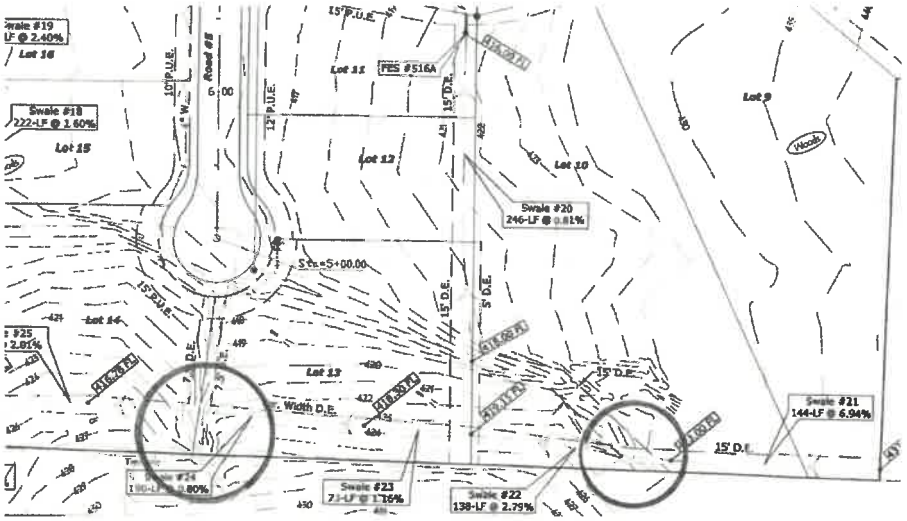
5) The Developer shall submit to the Drainage Board through the Surveyors office any approval of any state/federal permits regarding crossing of potential jurisdictional streams. As the proposed pipe crossing is no longer part of this submittal this will be withheld until a future section is proposed

In addition there was discussion regarding some language be placed in the deeds regarding obstructions within easements. *What is the status of the proposed language?* Provided November 5, 2018 in email

These issues need to be addressed by the Developer in correspondence to the Board.

There was also a considerable amount of discussion regarding the potential for downstream blockage of the drainage coming off of Plantation Subdivision. Please address this issue regarding downstream existing conditions, the location of Drainage Easements, drop in topography and sizing of the large pipe that carries this drainage. Addressed in Discussion.

There are two large swales coming from the south off of the Baumgart Property. An east west swale is shown to intercept these swales. These swales are eroding to the south. It is not clear at what elevation or how these swales will be intercepted and what erosion control measures will be utilized to capture/control this drainage. Has any effort been made to discuss this issue with the adjoining landowner? Provide detail to show what is planned for capture/diversion of these swales. Are the swales to be filled in from the point of intersection to the north? What was the status of discussions with the adjoining landowner? According to Engineer, conversation held with Mr. Baumgart on September 11, 2018 and landowner has no issues. Landowner is planning on attending Board Meeting.



The plans do not show where the runoff from Baumgart Road will go. There is an existing ditch along Baumgart Road on the west side of Road #1. East of Road #1, the runoff currently sheets down the embankment across lot 127. How will these flows be conveyed in the drainage system for Saddle Creek? The engineer responded that it was his opinion that there is not enough water being collected by this road-side ditch to call for a swale along the east line of Lot 127. The water will be routed around the east side of the house and across the back yard to the property line between Lot 127 & 128. A 10' drainage easement split between Lot 127 and 128 will be shown to carry any water from the road side ditch and rear yard of Lot 127 once a house is built. Also a swale will be shown between lots 1 and 2. If the flow is minimal, no changes will be needed. Per the County Engineer, if the concentrated flow coming from the easement into the road results in that area getting eroded, a pipe would need to be extended from curb inlet 502 back to the point where the easement between lots 1 and 2 intersects the road r/w, and then an area drain would be needed at the end of that pipe.

B. The analysis procedure used to identify and evaluate the drainage problems associated with the project; **TR 20 and Rational**

C. Any assumptions or special conditions associated with the use of the procedures, especially hydrologic or hydraulic methods, used to identify and evaluate drainage problems associated with the project; **HydroCad used for basin and P-609 due to size of drainage area.**

D. Discussion of any permits applications submitted or proposed to be submitted to state and/or federal agencies that will affect the timing and/or construction of the Drainage Plan such as but not limited to United States Corp of Engineers 404 permits (both individual and nationwide), Indiana Department of Environmental permits (401 Water Certification and others), Indiana Department of Natural Resource Permits (Construction in Floodway) and any approvals that may be required to discharge to Indiana State Highways. The report should state the status of the application of such permits. For permits that have been approved, copies of the approval document shall be included with the Drainage Design Report including any conditions on approved permits that could affect the implementation of the Drainage Plan; **See 170 A 11.**

E. The proposed design of the drainage control system; **Provided**

F. The results of the analysis of the proposed drainage control system showing that it does solve the project's identified and anticipated drainage problems; **Provided**

G. A detailed description, depiction, and log of all hydrologic and hydraulic calculations or modeling, and the results obtained thereby; together with the input and output files for all computer runs; **Provided**

H. Maps showing individual drainage areas within the project subdivided for use in the analysis thereof. **Provided**

13.04.180 Typical cross sections of drainage facilities.

One or more typical cross sections must be provided for each existing and proposed channel, basin, pond, or other open drainage facility which cross sections:

A. For existing and proposed detention and retention basins and ponds, a minimum of two cross sections per basin with the cross sections being 90 degrees from each other. The cross sections shall show the following: **Only one typical cross section provided Two Sections provided.**

Minimum bottom of the basin, Pool Elevation (wet basins), side slope of the basins including above and below normal pool elevation for wet basins, elevation of water at designed storm, elevation of water at 100 year storm, elevation (bottom) of emergency spillway and elevation of outflow of 100 year storm within emergency spillway, elevation of existing land immediately adjacent to the basin, proposed surrounding topography including required maintenance pathway of new basins, fencing (if provided) and any easements or obstructions that are intersected by the cross section. **Not all information provided-shown on revised submittal-elevation of emergency spillway noted on drawings and depth of outflow provided (0.4')**

B. For existing ditches and streams – sufficient typical cross sections that capture the existing channel throughout the project area. The cross sections shall show the existing configuration and existing land immediately adjacent to all drainage facilities as well as any easements, property lines or obstructions that are intersected by the cross section. For all existing ditches a bottom profile line must also be

provided. The profile line shall also show any existing structures (culverts, bridges, and other crossings), location of crossing utilities or other obstructions within the ditches or streams. **Sufficient information provided with preliminary**

C. For new channels and swales – sufficient typical cross sections that capture the proposed configuration of new channels and swales throughout the project area. The cross sections shall show the proposed configuration of the channels and swales and existing land immediately adjacent to all drainage facilities as well as any easements, property lines or obstructions that are intersected by the cross section. Also a bottom profile line must also be provided. The profile line shall also show any existing structures (culverts, bridges, and other crossings), location of crossing utilities or other obstructions within the ditches or streams. **Provided however See Comment under 175A-addressed in resubmittal regarding Plantation concerns**

D. For large projects and subdivisions which will contain multiple swales, a typical cross section of the swale may be provided combined with a swale table listing each swale. The swale table shall include the slope of each swale (in lieu of profile), depth of water at designed storm and type of erosion control to be utilized on the channel bottom and side slopes. **Provided**

E. Typical Cross sections shall be provided in the following situations where proposed excavation is proposed against no controlled properties: **None shown**

1) for any cut that is proposed within 15' of a property line and the cut is 4' or greater and where such cut is not part of an excavation for a channel or swale.

2) the location of any proposed retaining walls greater than 4' within 15' of a property line.

13.04.350 Grass mix matched to site conditions.

The choice of grass mixture for stabilizing open channels shall be based upon specific site conditions such as shade and sun tolerance, velocity tolerance, and waterway maintenance requirements. The proposed seed mixture to be utilized for stabilizing open channels shall be included in the approved Drainage Plan. **Not provided for channels or basin Tenbarge Green Alliance**

13.04.440 General detention/retention basin design requirements.

The following design principles shall be observed for detention and retention basins:

A. Dry detention facilities designed to become a permanent part of the stormwater drainage system shall be installed with an additional ten (10) percent capacity to allow for sediment accumulation resulting from development, and to permit the pond to function for reasonable periods between cleanings. **Wet basin**

B. Depth of Stored Water. The maximum depth of stormwater to be stored, without a permanent pool shall not exceed four feet; and the maximum depth of stormwater to be stored above a permanent pool shall not exceed four feet. **See Basin Design Chart-Meets code**

C. Finished Floor Elevations Adjacent to Basins. The lowest floor of any building or structure occupied by humans must be at least two (2) feet above the one-hundred (100) year storm water elevation of detention/retention basins. **See Basin Design Chart- can't be determined. Once information is determined these elevations will need to be noted on lots 21-28. Minimum Elevations need to be shown on these lots based upon the criteria. Provided**

D. Earthen Side Slopes 4:1 Maximum Steepness for Basins. All detention and retention basins with grassed, earthen side slopes shall have side slopes no steeper than four horizontal units of measurement to one vertical unit of measurement (4:1) to the base of dry basins, and to the typical low waterline of wet basins. **Meets code**

E. Riprap Side Slopes 2:1 Maximum Steepness for Basins. Wet retention basins with riprap armored side slopes shall have slopes no steeper than two horizontal units of measurement to one vertical unit of measurement (2:1) at any point in the side slope. **No rip rap proposed**

F. Riprap to Extend Two Vertical Feet Below Waterline. The armored portion of the side slope must extend to a minimum depth below the permanent pool elevation of two vertical feet. **No rip rap proposed**

G. Underwater Earthen Side Slopes 2:1 Maximum Steepness. Nonarmored earthen side slopes shall have slopes no steeper than two horizontal units of measurement to one vertical unit of measurement from a point two vertical feet below permanent pool, thence downward. **Meets code**

H. Safety Ledges and/or Fencing of Wet Basins. Safety fencing surrounding the basin, and/or shallow safety ledges shall be provided if deemed necessary by the design engineer or the developer. **County will not comment on this issue-developer needs to determine if this should be required**

I. Outlet Controls to Operate Automatically. Outlet control structures shall be designed to operate as simply as possible, and shall require little or no maintenance for proper operation. **Pipe and open spillway**

J. Designed Water Level Control Required. A controlled positive outlet shall be required to maintain the designed water level in wet basins, and provide the required detention storage above the designed low water level. Wet basins with greater than 0.5 acres of surface area at normal pool shall have a minimum depth of 6 feet over 50% of the basin area and no extensive shallow areas shall be allowed except as required for the safety ledge. **can't be determined without both cross sections provided-appears from cross sections that it will meet criteria; as locations of cross sections are shown on Drawings C-120 the actual width of the basin on the two sections should be noted widths noted on revised drawings**

K. Emergency Spillway Requirements.

1. An emergency overflow spillway shall be provided for the release of storm runoffs exceeding the designed maximum detention volume, or all overflow volumes in emergency conditions, should the normal discharge devices become totally or partially inoperative.

2. A minimum freeboard of one-half foot above the calculated elevation of the design storm detention high water level to the elevation of the spillway flowline peak is required as a safety factor for all basins. **See Basin Design Chart-can't be determined-appears to be 0.1 shy, see chart Additional freeboard provided on emergency spillway**

3. The emergency overflow spillway shall be clearly marked with a defined weir, either grass, rip rap or paved. The emergency overflow spillway velocities shall be calculated and the necessary erosion control materials shall be specified and utilized in the construction of the overflow spillway and receiving stream. Energy dissipation measures must be employed where required.

L. Automatically Operating Emergency Spillway Required. The emergency overflow spillway shall be designed so that it operates openly, automatically, does not require manual attention, and will pass all the one hundred (100) year return period storm flow with a one-half foot vertical minimum above the one hundred (100) year return storm flow to the lowest dirt elevation in the surrounding earthwork. **See Basin Design Chart**

M. Dry Detention Basin Criteria. **Wet Basin**

N. Side Slopes to Remain Stable. All side slopes of a basin shall be constructed stable and shall be maintained in a stable condition by the same criteria as specified herein for open channels. **Not Provided Tenbarge Green Alliance**

O. Wet Basin Cover and Maintenance. The earthen side slopes of wet basins shall be provided with grass cover above the low water elevation, which shall be maintained equal to turfed residential lawns, and in no case shall the cover growth exceed twelve (12) inches in height, or the most current county standard. **Not Provided Tenbarge Green Alliance**

P. Maintenance Pathway for Basins. A flat pathway with a minimum width of ten (10) feet shall be constructed completely around the top of the embankment of all detention/retention basins. **Provided**

Q. Maintenance Easement for Basins. An easement dedicated for the purpose of accessing and maintaining the basin and its appurtenances shall be provided, and the easement shall be configured so that it includes the entire basin, the entire earthwork encompassing the basin, the maintenance pathways into and around the basin, and all inletting and outletting appurtenances of the basin. The basins and maintenance easements shall not be located with the right of way of any county, state or federal road or highway. For all basins at least one easement of at least 10' in width must be provided to access the basin from a public roadway for the purpose of maintaining the basin. **No LMSDE to basin provided.**

Drainage Easement on lots 23-24 converted to LM&SDE For subdivisions in which no public roadway is to be dedicated the easement must be to the nearest private road or public road.

R. Maintenance Report Required for Basin. **Not Provided-maintenance plan provided in write up for all drainage features**

1. A brief and concise report shall be prepared, by the design engineer, consisting of a description of the location, intended function of all parts appurtenant to the basin, together with a description of the ways in which the basin and its appurtenances should be maintained, all worded in language easily understood by residential or commercial property owners; and

2. The maintenance report for all subdivisions or summary of the report shall be included on the plat or shall be referenced on the plat to its location as part of the drainage plan.

S. Copy of Report Must be Submitted With the As-Builts or Record Drawings. A copy of the maintenance report described above shall be included with the as-built plans or Record Drawings required to be submitted hereinabove.

T. No tree limbs, trunks, refuse from legally burnt vegetation, nor construction waste, demolition materials, or other man made material may be buried within the area in which an impounding structure will be located. Notice shall be placed on construction drawings noting the prohibition to the burying of any such materials. Certain natural materials such as large rocks may be located in the bottom of wet basins in order to provide fish habitat or habitat breeding areas provided that such materials are not included within the calculations for required storage volumes and will not block outlet structures. **Note needs to be placed on plans**

U. For small sites of less than 5 acres, infiltration trenches may be utilized instead of a wet or dry basin. In utilizing an infiltration trench, the storage volume is equal to the void ratio multiplied by the total volume of the trench. Information must be provided in advance validating the void ratio as well as testing proposal to validate the void ratio. The infiltration trench must have an outlet that restricts the flow per code provisions. **Not Applicable**

V. No retention basin shall be allowed within the flowline of a Regulated Drain of Vanderburgh County. The County Drainage Board cannot use its rights to discretionary decisions granted under Section 13.04.025 to exempt this restriction. **No regulated drain within project**

BASIN DESIGN CHART-Review			
			Revised
1	Design Capacity	134,687	145,896
2	(Section A) Dry detention facilities designed to become a permanent part of the stormwater drainage system shall be installed with an additional ten (10) percent capacity to allow for sediment accumulation resulting from development, and to permit the pond to function for reasonable periods between cleanings; (#1 x 1.1)	188,464	
3	Normal Pool Elevation or dry basin bottom elevation	402.6	402.6
4	Storage elevation at 25 year storm (50 year for State Highway 100 year for impacted area)	406.01	406.1
5	(Section B) Depth of Stored Water. The maximum depth of stormwater to be stored, without a permanent pool shall not exceed four feet; and the maximum depth of stormwater to be stored above a permanent pool shall not exceed four feet. (#4-#3)	3.41	3.5
6	Elevation of emergency spillway	406.1	406.1 *
7	Q100	Not provided	86.67
8	Depth of flow through emergency spillway at 100 year storm	Not provided	0.4
9	Flow line at 100 year storm #6 +#8		406.5
10	(Section K2) A minimum freeboard of one-half foot above the calculated elevation of the design storm detention high water level to the elevation of the spillway flowline peak is required as a safety factor for all basins. #9-#4 ≥ 0.5		0.4
11	Elevation of top of bank	407.1	407.1
12	(Section L) Automatically Operating Emergency Spillway Required. The emergency overflow spillway shall be designed so that it operates openly, automatically, does not require manual attention, and will pass all the one hundred (100) year return period storm flow with a one-half foot vertical minimum above the one hundred (100) year return storm flow to the lowest dirt elevation in the surrounding earthwork. (#11-#9 ≥ 0.5')		0.6
13	Elevation of home adjacent to basin		409.1
	(Section C) Finished Floor Elevations Adjacent to Basins. The lowest floor of any building or structure occupied by humans must be at least two (2) feet above the one-hundred (100) year storm water elevation of detention/retention basins. (#13-#9 ≥ 2')		2.6

If appears that emergency overflow is set at 406.1 as previous submittal. To meet code should be set at 406.2. *Additional freeboard on emergency spillway is provided so not an issue

13.04.460 Responsibility for drainage facility maintenance.

The installation, maintenance, repair, and replacement of all stormwater drainage facilities, and erosion and siltation control measures for a project during the period of construction, and until final approval by the county engineer, shall be the responsibility of the land developer(s), and/or the property owner(s) of record.

The assignment of responsibility for the maintenance and repair of all stormwater drainage systems and facilities outside of county accepted road rights-of-way after the completion of the project, and final approval thereof by the county engineer, shall be determined before the final drainage plan is approved; and shall be documented by appropriate covenants and restrictions applied to the subdivision and to the property deeds thereof, and shall be printed clearly upon all recorded plats of the project.

General comments as of 4/27/2016 (Preliminary) that pertain to this section of the final drainage plan

For UN-2- allowing basin 5 to leave undetained would be acceptable, however, something will need to be done to divert the undetained runoff from the stub road. Drainage plan revised to capture drainage off of road into planned swale

*A calculation must be done utilizing hydrographic method so that the timing of the runoff from the undetained areas can also be addressed. Therefore the undeveloped 10 year storm for the entire UN-2 area must be compared to the summation of each of the developed areas with storage (#1, #2, #4 and #5) to determine if a single storage for this location will meet the Drainage Code requirements. Hydrograph information should include volume-time graph in addition to the flow-time graph. Provided-outlet pipe was also downsized from 36" to 24" as a result of revised Tc and effort to decrease overall outflow from basin 2-*Outlet pipe further reduced to 18"

GENERAL COMMENTS

The original drawings C-101 and C-102 had a gray shading denoting Section 1. This layer was turned off in the resubmitted drawings. Revised drawings address

The original submittal for the basin showed 134,687 ft^3 required when using 5.2" of rainfall. The revised submittal had 145,896 ft^3 but the fourth page of the write up (chart) still shows the 134,687 ft^3 Revised

Saddle Creek-Final Drainage Plan Section 2

The final drainage plan was submitted on August 20th, 2018 with revisions submitted on September 12th, 2018 September 26th, October 2nd, 2018 and November 12, 2018 and email October 2nd, 2018 and attachment to email dated November 5, 2018. The plan that is requested to be approved consists of the above submitted information along with the following drawings.

Drawings submitted August 20th, 2018

- Drawing 1 Offsite Subbasins
- Drawing 1 Undeveloped Basins

Drawings submitted September 12th, 2018

- C-121
- Drawing 2 Developed Detention Subbasins
- Drawing 3 Developed Storm Sewer Subbasins

Drawings submitted September 26th, 2018

- C-120
- C-101

Drawings submitted October 2nd, 2018

- C-102

Drawings submitted November 12th, 2018

- Drawing 1 Sections 1 & 2 Exhibit

Road plans for Reference Only

- C-107
- C-108
- C-110
- C-113

SADDLE CREEK-SECTION 1-FINAL DRAINAGE PLAN

13.04.085 Request by applicant for plan review and approval.

A. All requests for drainage plan approval shall be made by the applicant to the drainage board through the county surveyor's office by the presentation to the surveyor of the drainage plan and the supporting data, all in duplicate, by the close of the business day two full weeks prior to the meeting at which approval of the drainage plan shall be sought.

C. Included with the Drainage Plan shall be the following information regarding the applicant that shall be provided on FORM 801. **Provided-signed by Managing Partner C Wayne Kinney**

13.04.095 Conditions of drainage plan approval.

In order for an applicant to obtain approval of a final drainage plan, the following requirements must be met:

A. The applicant shall be eligible under the terms of this chapter to apply for and obtain drainage plan approval.

B. The drainage plan and supporting submittals required by this chapter shall have been prepared and submitted in a timely and proper manner in accordance with the provisions of this chapter. **Final for Section 1 submitted on 8/20/2018. Revised comments submitted on September 12, 2018, September 26, 2018, October 2, 2018 and November 12, 2018 and email and dated October 2, 2018, email November 5, 2018 (attachment)**

C. The drainage plan and supporting submittals shall reflect compliance with the requirements of this chapter, and compliance with any conditions of approval applied to the plan by the drainage board. **Required Revisions are shown in red.**

D. The submitted data shall be gathered, analyzed, assembled into the drainage plan and supporting submittals; and shall be certified, and presented to the drainage board all by a civil engineer or land surveyor regularly engaged in stormwater drainage design, and registered to practice in the state of Indiana. **Provided**

E. An easement has been dedicated to house any off-site drainage facilities if such facilities are required to serve the project's stormwater drainage system. **A proposed offsite easement is shown on Baumgart Property for outlet pipe from Detention Basin #1-*for final drainage plan, this easement will need to be recorded and provided as part of final drainage plan submittal-*** *na for Section 1*

F. The person, persons, partnership, corporation, or other entity to whom approval of the drainage plan is granted must be the person, persons, partnership, corporation, or entity who will be responsible for accomplishing the project for which the drainage plan is developed. **CWK Investments-McCutchanville LLC, 9210 Petersburg Road, Evansville, IN 47725**

13.04.125 Building permits conditioned.

The Vanderburgh County building commissioner shall not allow construction of buildings, or other impervious structures or facilities to commence at the site of a project requiring final drainage plan approval until:

A. Such approval has been expressed by the drainage board;

B. And all storm drainage facilities are constructed. **See comment under Section 13.04.130**

13.04.130 Phased development of large projects allowed.

Large projects may be divided into phases for the purpose of constructing drainage facilities and obtaining permits in accordance with the requirements of this chapter. *Discuss phasing and issues with IDNR-see 13.04.16 #11 –work to begin on the east end of property.* **For Section 1 & 2 (east end of property) entire project to be constructed in single phase per submittal. Note, lots 128 and 129 approved by Board on October 2, 2018.**

13.04.140 Information submittal and review schedule.

H. For all new major subdivisions as defined in Title 16 of this code, which major subdivisions are shown to discharge an amount of stormwater in addition to that which is discharged prior to new development and all minor subdivisions, C-0 Through M-3, as defined in Title 16 of this code, which minor subdivisions are zoned for commercial use, the applicant shall notify all adjoining landowners and Registered Neighborhood Associations within 1/2 mile of any development of the proposed Drainage Plan.

1. The notification shall consist of the following language.

"Notice is hereby given that a Drainage Plan for _____ with a location of _____ has been submitted to the Vanderburgh County Surveyors Office, Room 325, Civic Center, Evansville, IN. The submitted Drainage Plan will be heard for approval or disapproval before the Drainage Board meeting on (date and time) at Room 301 of the Civic Center. A copy of the Drainage Plan is available for review in the County Surveyor's Office during normal business hours."

2. Also included in the notice shall be the name of the developer, name of the landowner where the development is to occur and the name of the engineer/engineering firm that has developed the Drainage Plan. **Provided**

3. The notification shall occur by certified mail or delivery using approved overnight services providing that the overnight services obtain a signed receipt. All mailings must be made at least 7 days in advance of the scheduled Drainage Board meeting in which the Drainage Plan is to be heard. *Provide copies of green receipts or other proof of mailing- Provided 5/2/2016 upon review it was found that the required notice did not meet requirements of the code due to notice being*

sent our prior to filling of the plan and that language addressing the location where the plan could be viewed was not included. New notice sent out and copy of notice along with 19 Green Cards and 7 receipts submitted on June 6, 2016.

4. For new subdivisions in which approval of a preliminary plan is sought under Section 13.04.150 to satisfy certain requirements of the Area Plan Commission (APC), the mailing shall give notice of the preliminary plan. Once noticed for a preliminary plan, notice will not be required for hearing of the final Drainage Plan unless stated by the Drainage Plan as a condition for approval of the preliminary Drainage Plan.

5. Any required notice under this section may be done in conjunction with notice requirements by the Area Plan Commission provided that the required notice is sent at least 7 days in advance of the scheduled Drainage Board meeting in which the Drainage Plan is to be heard. *New notice sent out May 24th 2016*

13.04.160 Contents of preliminary drainage plan. ***Preliminary Approved on June 7, 2016***

A. The contents of the preliminary drainage plan shall include a map based on the most current county planimetric maps, or a topographic map prepared from a more recent aerial photo reconnaissance that provides more accurate data, complete with contour lines, and showing the following:

1. The extent and area of each watershed affecting the design of the drainage facilities for the project; *Six interior watersheds originally proposed (see notes). In addition, four off site watersheds were addressed-OS1 which consists of lots 97 and 98 of Havenwood, OS2 which consists of a portion of Plantation Estates, OS3 which consists of a portion of Bentwood and OS4 which consists of a watershed off of Baumgart Road to the south of the proposed project.*

2. The soil types based on the most current information available from the SWCD; *Soil map provided along with report. The area is partially wooded and partially farmed. Soils consist of Bartle, Bonnie, Hosmer, Muren, Wellston, Wilbur and Zanesville silt loam. Report also provided information on Hydrologic Soil Group which was utilized in construction of hydrographs. A copy of the National Wetland Inventory Map was also provided. The map did not indicate any wetlands within proposed project.*

3. Zone "A" floodplain based on the current FIRM panels; *Panel 108 of 275 provided. Portion of lots 6, 7, 12, 13, 16, 17 and 18 are located in the Floodway of Little Pigeon Creek per special study "Special Flood Hazard Information Report-Little Pigeon & Locust Creeks, Evansville-Vanderburgh county Indiana" USCOE, March 1981. Due to this designation, IDNR Construction in Floodway permit will be required. Plat will need to address issues regarding modifications within this area and special language will be required regarding the easement. County needs to determine any future issues regarding maintenance of outlet structures if subdivision is to utilize Plan B under Section 13.04.460 of Drainage Code. In addition, several of the potential home sites are located within the flood zone.*

4. The existing man-made and natural waterways, ponds, basins, pipes, culverts, and other drainage facilities or features within or affecting the project; *There are no existing ponds. Two basins proposed are proposed. Culvert locations are provided.*

5. The preliminary layout and design of the streets, and all stormwater drainage facilities, including depressed pavements used to convey or temporarily store overflow from the heavier storms, and all outlets for the storm water drainage facilities *Streets and piping proposed are shown on drawings provided*

6. The existing streams, floodways, and floodplains to be maintained, and new channels to be constructed, their locations, cross sections, profiles, and materials used; *Shown on maps. Drainage easement needs to be altered on lots 87 through 91 and 129 through 131 to reflect true location of drainage on these lots. Provided Cross sections and profiles of existing streams are not provided. Provided on 5/4/2016 Also need drawings on proposed swales. Provided on drawing C112 It appears that a number of locations will require swales to relieve water from uphill properties. This includes (but not limited to) a drain in the area of lots 99 and 112. Provided A drainage easement needs to be shown on lots 75 and 76 for the uphill drainage. Easement shown-an additional easement may be required pending review of this area in the final drainage plan. A drainage easement needs to be shown for the drainage coming off the north side of the Gerald Clements property on Baumgart Road and through lots 77, 78 and 79. Provided How will the existing ditch be handled that goes across the southern portion of lot 75 and crosses lot 72? Easements shown to address*

7. The proposed culverts and bridges to be built, with the proposed materials to be used; *No bridges proposed. Most culvert locations are shown but nothing is shown where street #2 crosses the two existing streams. Provided No information on proposed materials of culverts. Provided on 5/4/2016*

8. Existing detention basins or ponds within the project, or outside the project but affecting it, to be maintained, enlarged, or otherwise altered, together with any new basins or ponds to be built; and their basis of design *Information pending resubmittal of calculations once Tc calculations are revised-see general comments. Provided*

9. The estimated depth and amount of storage required of the basins and ponds, and their available freeboards; *Information pending resubmittal of calculations once Tc calculations are revised-see general comments. Basin 1 storage at 393.84' (pool @ 392.5). Basin 2 storage at 409.78 (pool @ 406)*

10. The estimated location and percentage of impervious surface existing and expected to be constructed at completion of the project. *Utilized average lot size-information conforms with data from UDSA Coil Conservation Service TR55 "Urban Hydrology for Small Watersheds"*

11. Any interim plan which is to be incorporated into the project pending its completion according to the final drainage plan. *Need to be address timing of construction of streets and basins-plan mentions the subdivision will be constructed in phases, but is not clear where the subdivision will begin and the effect of any permitting on timeline of development Provided in revised discussion.*

12. A copy of the Notice of Public Hearing as required by the Area Plan Commission. *Not Provided-Provided on 5/2/2016*

B. Notations and Explanations on the Preliminary Plan. All notations necessary to indicate the existing conditions, and the proposed functions of the various features shown thereon; and shall include the following.

C. Geographic Orientation Required. A north arrow, scale, location insert, and other information necessary for geographic clarification shall be included on a preliminary plan. ***Provided except for Location insert map which should be supplied on the final plans-Provided***

D. Data Required to Accompany Preliminary Plan. Descriptive data sufficient to support the feasibility of the preliminary drainage plan with regard to the requirements of this chapter, including calculations of the predevelopment and post development runoff rates using rainfall data supplied herein shall accompany a preliminary drainage plan. *Utilized Hydrograph method-see notes below*

E. Recommendation of Preliminary Plans Restricted. No preliminary drainage plan shall be recommended to the drainage board by their technical advisors unless the preliminary drainage plan shall be a workable plan according to the same criteria as, and capable of being incorporated into, a final drainage plan. *Submittal with attachments meet code requirements*

F. Determination of Sufficiency. The drainage board shall decide the sufficiency of the preliminary drainage plan, and any conditions or additional requirements to be applied to the preliminary drainage plan. Sufficient with the following conditions

No development shall occur within the area of Basin 1 until approval of necessary state and federal permits-copies of approvals of such permits shall be submitted to the Drainage Board through the Surveyors office upon receipt of approval

The Developer shall submit to the Drainage Board through the Surveyors office any approval of any state/federal permits regarding crossing of potential jurisdictional streams

The Board should consider whether to exclude the outlet pipe of Basin #1 from any Plan B maintenance as this may require the County to permit any future activity when repairing this pipe.

A proposed offsite easement is shown on Baumgart Property for outlet pipe from Detention Basin #1-for final drainage plan, this easement will need to be recorded and provided as part of final drainage plan submittal

13.04.165 Contents of final drainage plan.

The contents of the final Drainage Plan shall include all the items listed above for a preliminary drainage plan, plus:

A. Soils Map. A soils map indicating soils names and their hydrologic classification must be provided for a proposed project; **Provided in Preliminary**

B. Location and Topographic Map. In addition, a location and topographic map must be provided showing the land to be developed, and such adjoining land whose location and topography may affect or be affected by the layout or drainage of the project. The map must also identify all adjoining landowners. The contour intervals shown on the topographic map shall be two and one-half feet for slopes less than four percent; and five feet for slopes four percent or greater; or best available; **Location Map is required-Provided**

C. The location of streams and other stormwater conveyance channels, both natural and man-made; and the vertical and horizontal limits of the one hundred (100) year floodplain, according to FIRM panels, and/or the Building Commissioner; all properly identified;

D. The normal shoreline of lakes, ponds, swamps, and basins, their floodplains, and lines of inflow and outflow; **Provided**

E. The location of existing regulated drains, farm drains, inlets and outfalls; **No regulated drains**

F. The location of the following existing storm and water features:

1. Storm sewers and easements; **Provided**

2. Sanitary sewers and easements; **Existing 8" main located along west property line of Lot 116**

3. Combined sewers and easements; **None located on site**

4. Water lines and easements; **Provided**

and outfalls to any of the above as applies;

G. Wells, septic tank systems, and outfalls, if any; **Per submittal, none known**

H. Seeps, springs, sinkholes, caves, shafts, faults, or other such geological features visible, or of record; **Per submittal, none visible or of record**

I. The limits of the entire proposed project and the limits of the expected extent of land disturbance required to accomplish the project; **Discussion addressed tree removal for the road and a general note regarding construction of homes, however there is still some question as to how much area**

will be disturbed, especially on the north-will any trees be kept along the north boundary line within the existing drainage easements and the area between the easements and the north line on lots 122-125? Easements shown on revised drawings

J. The location of the streets, lot lines, and easements; Provided

K. A scale, preferably one inch equals fifty (50) feet; varies-1"=60 and some at 1"=150'

L. An arrow indicating North. Provided

M. On-Site Bench Mark Required. A benchmark is required to be located within the project limits. Approved datum shall be found within the most recently approved Technical Memorandum. None found Provided on revised Drawing C-102

N. For all non residential Major Subdivisions and all Minor Subdivisions C-0 through M-3 (Not Applicable-Residential Subdivision)

13.04.170 Final drainage plan layout.

A. In addition to the requirements listed for a preliminary drainage plan, the final drainage plan shall depict the following:

1. The extent and area of each watershed tributary to the drainage facilities within the project; Offsite basins on sheet 3 do not match sheet 2 addressed

2. The final layout and design of proposed storm sewers, their inlet and outfall locations and elevations, the receiving streams or channels; all with the basis of their design; Provided

3. The location and design of the proposed street system, including depressed pavements used to convey or detain overflow from storm sewers and over-the-curb runoff resulting from heavier rainstorms, and the outlets for such overflows; all with their designed elevations; All overflow from Road #1 (from Baumgart to the overflow swale) will go to the overflow swale between lots 23 and 24. Is the typical V-bottom overflow swale that is created by lot grading adequate to handle all of that runoff, or will a larger swale be required? It will be critical for the streets to have the proper crown so that water is directed into all inlets upstream of the overflow swale. If the upstream curb inlets do not collect the water as designed as a result of an inadequate cross slope, it will increase the chances that this overflow swale between lots 23 and 24 will be overloaded. Calculations show that overflow swale between lots 23 and 24 is adequate

4. The locations, cross sections, and profiles of existing streams, floodways, and floodplains to be maintained, and the same for all new channels to be constructed; Provided

5. The materials, elevations, waterway openings, size, and basis for design of the proposed culverts and bridges; No bridges proposed. Design of culverts provided. Provide details of P609 including

the elevations on the top of the headwall. Is a fence or handrail needed for safety? The height of the drop off could not be determined since no elevations were provided on the headwall. It does not look like the proposed skew of this pipe matches the channel alignment very well, especially on the upstream end. This could require riprap or other bank protection measures. additional riprap provided on the upstream end

6. Existing ponds and basins to be altered, enlarged, filled, or maintained; and new ponds, basins, swales, to be built, and the basis of their design; Single Detention pond designed using HydroCad which is based upon TR-20. C soil types utilized for CN values with average lot sized calculations. 25 Year Storm utilized was 5.4" versus 5.62"-where did the 5.4" come from? Revised to 5.62" How was the percentage impervious determined on the Summary for DB#2 and the summary for the creek? Program computed

7. The location and percentage of impervious surfaces existing and expected to be constructed; used average lot information for all calculations.

8. The material types, sizes, slopes, grades and other details of all the stormwater drainage facilities; Provided for all swales. Provide a detail for a riprap lined swale showing the riprap keyed into the banks and bottom. These types of swales have been filled with riprap on other sites, so having a detail might result in the swales being built properly the first time. Provided

9. The estimated depth and amount of storage required in the new ponds or basins, the freeboard above the normal pool and highwater pool of wet basins, and details of the emergency overflows from the basins; Provided except for emergency overflow information Provided

10. For all controlled release basins, a plot or tabulation of the storage volumes with corresponding water surface elevations, and a plot or tabulation of the basin outflow rates for those water surface elevations; Provided

11. The location of any applicable "impacted drainage areas" or other areas designated to remain totally undisturbed, natural, or for common and/or recreational use. Pipe 609 was designed but it is unclear if it is to be installed as part of Section 1. Not to be installed in Section 1. The pipe installation appears to be within a jurisdictional stream and the status of the permitting needs to be addressed. *This will need to be addressed when the next section is submitted.*

12. The location of Drainage Easements for retention/detention basins, drainage ditches/swales, storm sewers, junction boxes, inlets, or manholes outside of any county right of way. Easements dimensions must be shown on each individual lot to the extent that they can be recreated in the field within the lot boundaries of said lot. Provide dimensions on lots 10, 13, 14 and 20 on lots lines showing with of DE where it crosses lot lines. Provided Provide dimensions on lots 21-25 for LMSDE (distance from front of lot to LMSDE or another similar reference). . Provided

Drainage Easements will not be required for retention/detention basins, drainage ditches/swales, storm sewers, junction boxes, inlets, or manholes in the following situations: **Multiple lot residential- easements required.**

B. Protection of Structures From One Hundred Year Flooding. All structures to be occupied as residences or businesses shall have finished floor elevations two feet above the high water calculated to occur during a one hundred (100) year return period storm for the subject building site; and the required floor elevations shall be depicted on the plan drawings for such affected sites. **No homes within this section shown to be within 100 year flood plain**

13.04.175 Submittal of a written drainage design report.

The final drainage plan shall be accompanied by a written report containing the following:

A. Any significant stormwater drainage problems existing or anticipated to be associated with the project; **The following conditions were approved on the preliminary Drainage Plan that are directly part of the Section 1 of the proposed subdivision**

1) That the basins handling the drainage of the watersheds for which they are designed be completely constructed and certified prior to occupancy of any home within the watershed of the corresponding watershed. –*this will be noted as a proposed condition to the Drainage Board*

3) The future buyers of lots downstream of the pond within Bentwood Estates be aware that there is a pond directly upstream of lots 90 through 95 and that approval of the preliminary drainage plan by the Board in no way certifies the technical safety of this structure. Furthermore that the plat clearly show the offsite existence of the lake and state that the outflow from this lake drains directly to the existing stream located on lots 116 through 120. (It appears as if these lot numbers have been changed from the prior submittals). Per submittal, will be noted on plat. *This will be noted as a proposed condition to the Drainage Board*

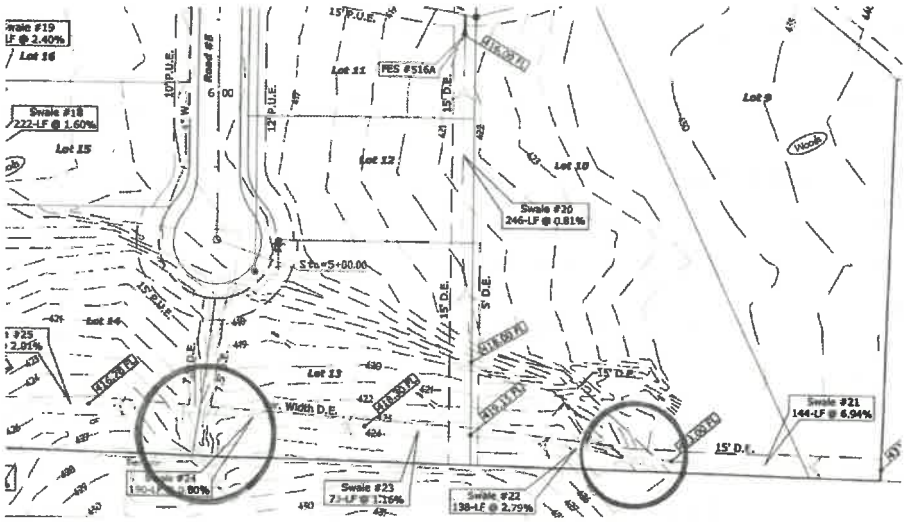
5) The Developer shall submit to the Drainage Board through the Surveyors office any approval of any state/federal permits regarding crossing of potential jurisdictional streams. As the proposed pipe crossing is no longer part of this submittal this will be withheld until a future section is proposed

In addition there was discussion regarding some language be placed in the deeds regarding obstructions within easements. *What is the status of the proposed language?* Provided November 5, 2018 in email

These issues need to be addressed by the Developer in correspondence to the Board.

There was also a considerable amount of discussion regarding the potential for downstream blockage of the drainage coming off of Plantation Subdivision. Please address this issue regarding downstream existing conditions, the location of Drainage Easements, drop in topography and sizing of the large pipe that carries this drainage. Addressed in Discussion.

There are two large swales coming from the south off of the Baumgart Property. An east west swale is shown to intercept these swales. These swales are eroding to the south. It is not clear at what elevation or how these swales will be intercepted and what erosion control measures will be utilized to capture/control this drainage. Has any effort been made to discuss this issue with the adjoining landowner? Provide detail to show what is planned for capture/diversion of these swales. Are the swales to be filled in from the point of intersection to the north? What was the status of discussions with the adjoining landowner? According to Engineer, conversation held with Mr. Baumgart on September 11, 2018 and landowner has no issues. Landowner is planning on attending Board Meeting.



The plans do not show where the runoff from Baumgart Road will go. There is an existing ditch along Baumgart Road on the west side of Road #1. East of Road #1, the runoff currently sheets down the embankment across lot 127. How will these flows be conveyed in the drainage system for Saddle Creek? The engineer responded that it was his opinion that there is not enough water being collected by this road-side ditch to call for a swale along the east line of Lot 127. The water will be routed around the east side of the house and across the back yard to the property line between Lot 127 & 128. A 10' drainage easement split between Lot 127 and 128 will be shown to carry any water from the road side ditch and rear yard of Lot 127 once a house is built. Also a swale will be shown between lots 1 and 2. If the flow is minimal, no changes will be needed. Per the County Engineer, if the concentrated flow coming from the easement into the road results in that area getting eroded, a pipe would need to be extended from curb inlet 502 back to the point where the easement between lots 1 and 2 intersects the road r/w, and then an area drain would be needed at the end of that pipe.

B. The analysis procedure used to identify and evaluate the drainage problems associated with the project; **TR 20 and Rational**

C. Any assumptions or special conditions associated with the use of the procedures, especially hydrologic or hydraulic methods, used to identify and evaluate drainage problems associated with the project; **HydroCad used for basin and P-609 due to size of drainage area.**

D. Discussion of any permits applications submitted or proposed to be submitted to state and/or federal agencies that will affect the timing and/or construction of the Drainage Plan such as but not limited to United States Corp of Engineers 404 permits (both individual and nationwide), Indiana Department of Environmental permits (401 Water Certification and others), Indiana Department of Natural Resource Permits (Construction in Floodway) and any approvals that may be required to discharge to Indiana State Highways. The report should state the status of the application of such permits. For permits that have been approved, copies of the approval document shall be included with the Drainage Design Report including any conditions on approved permits that could affect the implementation of the Drainage Plan; **See 170 A 11.**

E. The proposed design of the drainage control system; **Provided**

F. The results of the analysis of the proposed drainage control system showing that it does solve the project's identified and anticipated drainage problems; **Provided**

G. A detailed description, depiction, and log of all hydrologic and hydraulic calculations or modeling, and the results obtained thereby; together with the input and output files for all computer runs; **Provided**

H. Maps showing individual drainage areas within the project subdivided for use in the analysis thereof. **Provided**

13.04.180 Typical cross sections of drainage facilities.

One or more typical cross sections must be provided for each existing and proposed channel, basin, pond, or other open drainage facility which cross sections:

A. For existing and proposed detention and retention basins and ponds, a minimum of two cross sections per basin with the cross sections being 90 degrees from each other. The cross sections shall show the following: **Only one typical cross section provided Two Sections provided.**

Minimum bottom of the basin, Pool Elevation (wet basins), side slope of the basins including above and below normal pool elevation for wet basins, elevation of water at designed storm, elevation of water at 100 year storm, elevation (bottom) of emergency spillway and elevation of outflow of 100 year storm within emergency spillway, elevation of existing land immediately adjacent to the basin, proposed surrounding topography including required maintenance pathway of new basins, fencing (if provided) and any easements or obstructions that are intersected by the cross section. **Not all information provided-shown on revised submittal-elevation of emergency spillway noted on drawings and depth of outflow provided (0.4')**

B. For existing ditches and streams – sufficient typical cross sections that capture the existing channel throughout the project area. The cross sections shall show the existing configuration and existing land immediately adjacent to all drainage facilities as well as any easements, property lines or obstructions that are intersected by the cross section. For all existing ditches a bottom profile line must also be

provided. The profile line shall also show any existing structures (culverts, bridges, and other crossings), location of crossing utilities or other obstructions within the ditches or streams. **Sufficient information provided with preliminary**

C. For new channels and swales – sufficient typical cross sections that capture the proposed configuration of new channels and swales throughout the project area. The cross sections shall show the proposed configuration of the channels and swales and existing land immediately adjacent to all drainage facilities as well as any easements, property lines or obstructions that are intersected by the cross section. Also a bottom profile line must also be provided. The profile line shall also show any existing structures (culverts, bridges, and other crossings), location of crossing utilities or other obstructions within the ditches or streams. **Provided however See Comment under 175A-addressed in resubmittal regarding Plantation concerns**

D. For large projects and subdivisions which will contain multiple swales, a typical cross section of the swale may be provided combined with a swale table listing each swale. The swale table shall include the slope of each swale (in lieu of profile), depth of water at designed storm and type of erosion control to be utilized on the channel bottom and side slopes. **Provided**

E. Typical Cross sections shall be provided in the following situations where proposed excavation is proposed against no controlled properties: **None shown**

1) for any cut that is proposed within 15' of a property line and the cut is 4' or greater and where such cut is not part of an excavation for a channel or swale.

2) the location of any proposed retaining walls greater than 4' within 15' of a property line.

13.04.350 Grass mix matched to site conditions.

The choice of grass mixture for stabilizing open channels shall be based upon specific site conditions such as shade and sun tolerance, velocity tolerance, and waterway maintenance requirements. The proposed seed mixture to be utilized for stabilizing open channels shall be included in the approved Drainage Plan. **Not provided for channels or basin Tenbarge Green Alliance**

13.04.440 General detention/retention basin design requirements.

The following design principles shall be observed for detention and retention basins:

A. Dry detention facilities designed to become a permanent part of the stormwater drainage system shall be installed with an additional ten (10) percent capacity to allow for sediment accumulation resulting from development, and to permit the pond to function for reasonable periods between cleanings. **Wet basin**

B. Depth of Stored Water. The maximum depth of stormwater to be stored, without a permanent pool shall not exceed four feet; and the maximum depth of stormwater to be stored above a permanent pool shall not exceed four feet. **See Basin Design Chart-Meets code**

C. Finished Floor Elevations Adjacent to Basins. The lowest floor of any building or structure occupied by humans must be at least two (2) feet above the one-hundred (100) year storm water elevation of detention/retention basins. **See Basin Design Chart- can't be determined. Once information is determined these elevations will need to be noted on lots 21-28. Minimum Elevations need to be shown on these lots based upon the criteria. Provided**

D. Earthen Side Slopes 4:1 Maximum Steepness for Basins. All detention and retention basins with grassed, earthen side slopes shall have side slopes no steeper than four horizontal units of measurement to one vertical unit of measurement (4:1) to the base of dry basins, and to the typical low waterline of wet basins. **Meets code**

E. Riprap Side Slopes 2:1 Maximum Steepness for Basins. Wet retention basins with riprap armored side slopes shall have slopes no steeper than two horizontal units of measurement to one vertical unit of measurement (2:1) at any point in the side slope. **No rip rap proposed**

F. Riprap to Extend Two Vertical Feet Below Waterline. The armored portion of the side slope must extend to a minimum depth below the permanent pool elevation of two vertical feet. **No rip rap proposed**

G. Underwater Earthen Side Slopes 2:1 Maximum Steepness. Nonarmored earthen side slopes shall have slopes no steeper than two horizontal units of measurement to one vertical unit of measurement from a point two vertical feet below permanent pool, thence downward. **Meets code**

H. Safety Ledges and/or Fencing of Wet Basins. Safety fencing surrounding the basin, and/or shallow safety ledges shall be provided if deemed necessary by the design engineer or the developer. **County will not comment on this issue-developer needs to determine if this should be required**

I. Outlet Controls to Operate Automatically. Outlet control structures shall be designed to operate as simply as possible, and shall require little or no maintenance for proper operation. **Pipe and open spillway**

J. Designed Water Level Control Required. A controlled positive outlet shall be required to maintain the designed water level in wet basins, and provide the required detention storage above the designed low water level. Wet basins with greater than 0.5 acres of surface area at normal pool shall have a minimum depth of 6 feet over 50% of the basin area and no extensive shallow areas shall be allowed except as required for the safety ledge. **can't be determined without both cross sections provided-appears from cross sections that it will meet criteria; as locations of cross sections are shown on Drawings C-120 the actual width of the basin on the two sections should be noted widths noted on revised drawings**

K. Emergency Spillway Requirements.

1. An emergency overflow spillway shall be provided for the release of storm runoffs exceeding the designed maximum detention volume, or all overflow volumes in emergency conditions, should the normal discharge devices become totally or partially inoperative.

2. A minimum freeboard of one-half foot above the calculated elevation of the design storm detention high water level to the elevation of the spillway flowline peak is required as a safety factor for all basins. **See Basin Design Chart-can't be determined-appears to be 0.1 shy, see chart Additional freeboard provided on emergency spillway**

3. The emergency overflow spillway shall be clearly marked with a defined weir, either grass, rip rap or paved. The emergency overflow spillway velocities shall be calculated and the necessary erosion control materials shall be specified and utilized in the construction of the overflow spillway and receiving stream. Energy dissipation measures must be employed where required.

L. Automatically Operating Emergency Spillway Required. The emergency overflow spillway shall be designed so that it operates openly, automatically, does not require manual attention, and will pass all the one hundred (100) year return period storm flow with a one-half foot vertical minimum above the one hundred (100) year return storm flow to the lowest dirt elevation in the surrounding earthwork. **See Basin Design Chart**

M. Dry Detention Basin Criteria. **Wet Basin**

N. Side Slopes to Remain Stable. All side slopes of a basin shall be constructed stable and shall be maintained in a stable condition by the same criteria as specified herein for open channels. **Not Provided Tenbarge Green Alliance**

O. Wet Basin Cover and Maintenance. The earthen side slopes of wet basins shall be provided with grass cover above the low water elevation, which shall be maintained equal to turfed residential lawns, and in no case shall the cover growth exceed twelve (12) inches in height, or the most current county standard. **Not Provided Tenbarge Green Alliance**

P. Maintenance Pathway for Basins. A flat pathway with a minimum width of ten (10) feet shall be constructed completely around the top of the embankment of all detention/retention basins. **Provided**

Q. Maintenance Easement for Basins. An easement dedicated for the purpose of accessing and maintaining the basin and its appurtenances shall be provided, and the easement shall be configured so that it includes the entire basin, the entire earthwork encompassing the basin, the maintenance pathways into and around the basin, and all inletting and outletting appurtenances of the basin. The basins and maintenance easements shall not be located with the right of way of any county, state or federal road or highway. For all basins at least one easement of at least 10' in width must be provided to access the basin from a public roadway for the purpose of maintaining the basin. **No LMSDE to basin provided.**

Drainage Easement on lots 23-24 converted to LM&SDE For subdivisions in which no public roadway is to be dedicated the easement must be to the nearest private road or public road.

R. Maintenance Report Required for Basin. **Not Provided-maintenance plan provided in write up for all drainage features**

1. A brief and concise report shall be prepared, by the design engineer, consisting of a description of the location, intended function of all parts appurtenant to the basin, together with a description of the ways in which the basin and its appurtenances should be maintained, all worded in language easily understood by residential or commercial property owners; and

2. The maintenance report for all subdivisions or summary of the report shall be included on the plat or shall be referenced on the plat to its location as part of the drainage plan.

S. Copy of Report Must be Submitted With the As-Builts or Record Drawings. A copy of the maintenance report described above shall be included with the as-built plans or Record Drawings required to be submitted hereinabove.

T. No tree limbs, trunks, refuse from legally burnt vegetation, nor construction waste, demolition materials, or other man made material may be buried within the area in which an impounding structure will be located. Notice shall be placed on construction drawings noting the prohibition to the burying of any such materials. Certain natural materials such as large rocks may be located in the bottom of wet basins in order to provide fish habitat or habitat breeding areas provided that such materials are not included within the calculations for required storage volumes and will not block outlet structures. **Note needs to be placed on plans**

U. For small sites of less than 5 acres, infiltration trenches may be utilized instead of a wet or dry basin. In utilizing an infiltration trench, the storage volume is equal to the void ratio multiplied by the total volume of the trench. Information must be provided in advance validating the void ratio as well as testing proposal to validate the void ratio. The infiltration trench must have an outlet that restricts the flow per code provisions. **Not Applicable**

V. No retention basin shall be allowed within the flowline of a Regulated Drain of Vanderburgh County. The County Drainage Board cannot use its rights to discretionary decisions granted under Section 13.04.025 to exempt this restriction. **No regulated drain within project**

BASIN DESIGN CHART-Review			
			Revised
1	Design Capacity	134,687	145,896
2	(Section A) Dry detention facilities designed to become a permanent part of the stormwater drainage system shall be installed with an additional ten (10) percent capacity to allow for sediment accumulation resulting from development, and to permit the pond to function for reasonable periods between cleanings; (#1 x 1.1)	188,464	
3	Normal Pool Elevation or dry basin bottom elevation	402.6	402.6
4	Storage elevation at 25 year storm (50 year for State Highway 100 year for impacted area)	406.01	406.1
5	(Section B) Depth of Stored Water. The maximum depth of stormwater to be stored, without a permanent pool shall not exceed four feet; and the maximum depth of stormwater to be stored above a permanent pool shall not exceed four feet. (#4-#3)	3.41	3.5
6	Elevation of emergency spillway	406.1	406.1 *
7	Q100	Not provided	86.67
8	Depth of flow through emergency spillway at 100 year storm	Not provided	0.4
9	Flow line at 100 year storm #6 +#8		406.5
10	(Section K2) A minimum freeboard of one-half foot above the calculated elevation of the design storm detention high water level to the elevation of the spillway flowline peak is required as a safety factor for all basins. #9-#4 ≥ 0.5		0.4
11	Elevation of top of bank	407.1	407.1
12	(Section L) Automatically Operating Emergency Spillway Required. The emergency overflow spillway shall be designed so that it operates openly, automatically, does not require manual attention, and will pass all the one hundred (100) year return period storm flow with a one-half foot vertical minimum above the one hundred (100) year return storm flow to the lowest dirt elevation in the surrounding earthwork. (#11-#9 ≥ 0.5')		0.6
13	Elevation of home adjacent to basin		409.1
	(Section C) Finished Floor Elevations Adjacent to Basins. The lowest floor of any building or structure occupied by humans must be at least two (2) feet above the one-hundred (100) year storm water elevation of detention/retention basins. (#13-#9 ≥ 2')		2.6

If appears that emergency overflow is set at 406.1 as previous submittal. To meet code should be set at 406.2. *Additional freeboard on emergency spillway is provided so not an issue

13.04.460 Responsibility for drainage facility maintenance.

The installation, maintenance, repair, and replacement of all stormwater drainage facilities, and erosion and siltation control measures for a project during the period of construction, and until final approval by the county engineer, shall be the responsibility of the land developer(s), and/or the property owner(s) of record.

The assignment of responsibility for the maintenance and repair of all stormwater drainage systems and facilities outside of county accepted road rights-of-way after the completion of the project, and final approval thereof by the county engineer, shall be determined before the final drainage plan is approved; and shall be documented by appropriate covenants and restrictions applied to the subdivision and to the property deeds thereof, and shall be printed clearly upon all recorded plats of the project.

General comments as of 4/27/2016 (Preliminary) that pertain to this section of the final drainage plan

For UN-2- allowing basin 5 to leave undetained would be acceptable, however, something will need to be done to divert the undetained runoff from the stub road. Drainage plan revised to capture drainage off of road into planned swale

*A calculation must be done utilizing hydrographic method so that the timing of the runoff from the undetained areas can also be addressed. Therefore the undeveloped 10 year storm for the entire UN-2 area must be compared to the summation of each of the developed areas with storage (#1, #2, #4 and #5) to determine if a single storage for this location will meet the Drainage Code requirements. Hydrograph information should include volume-time graph in addition to the flow-time graph. Provided-outlet pipe was also downsized from 36" to 24" as a result of revised Tc and effort to decrease overall outflow from basin 2-*Outlet pipe further reduced to 18"

GENERAL COMMENTS

The original drawings C-101 and C-102 had a gray shading denoting Section 1. This layer was turned off in the resubmitted drawings. Revised drawings address

The original submittal for the basin showed 134,687 ft^3 required when using 5.2" of rainfall. The revised submittal had 145,896 ft^3 but the fourth page of the write up (chart) still shows the 134,687 ft^3 Revised

CASH WAGGNER & ASSOCIATES, PC
CONSULTING ENGINEERS • LAND SURVEYORS

LETTER OF TRANSMITTAL

DATE: 11.12.18
PROJECT NO.: 15-2184
REFERENCE: Saddle Creek Estates
YOUR FILE NO.:

ATTENTION: Jeff Mueller
COMPANY: Vanderburgh County Surveyor
ADDRESS: Civic Center Complex – Room 325
CITY, ST, ZIP: Evansville, IN 47708
PHONE:

THE FOLLOWING ITEMS:

COPIES:	ORIG./LAST REV. DATE:	DESCRIPTION:
1		Labels
1	11.12.18	Section 1 & 2 Exhibit

ARE TRANSMITTED:

- ☒ PER YOUR REQUEST
- ☐ FOR YOUR FILES
- ☐ FOR REVIEW & COMMENT
- ☐ OTHER

FOR YOUR:

- ☒ APPROVAL
- ☐ USE
- ☐ INFORMATION
- ☐ OTHER

VIA:

- ☐ COURIER
- ☐ FOR PICK UP
- ☐ USPS
- ☐ NEXT DAY ☐ FED EX ☐ UPS ☐ DHL
  - ☐ SATURDAY DELIVERY
  - ☐ TRACKING # ____
- ☒ OTHER DELIVERED

COMMENTS:

If you have any questions or comments, please give me a call. Thank you

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EVANSVILLE, IN 47715
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FROM:

GLEN MERITT, JR., P.E.

CC: File

RECEIVED BY THE VANDERBURGH COUNTY SURVEYOR'S OFFICE 11-12-18

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