



December 15, 2011

RE: Skyway West 2nd & 3rd Additions
Drainage Plan Comments

The following are direct responses to the City of Wichita's comments pertaining to the Drainage Plan referenced above. The comments are dated 11/7/11 and for both Skyway 2nd and 3rd Additions. The numbered bullets correspond directly to the numbered comments in the original document.

A new Drainage Report and Plan is attached with the following comments or revisions included therein. As of the revised plan and this memo, the previous plans dated October 28, 2011 will be considered voided.

Skyway West 3rd

1. The existing CN of an 80 has been used for this plan and model. Although originally using TR-55 for existing fallow conditions, the CN's have now been modified using the CN chart in the Storm Water Manual. A CN of 80 was used for pre-developed conditions in Type C soils.
A CN of 91 is still used as the developed conditions. Based on Table 4-4 of the Manual, industrial cover type is 72% impervious. Using the same table – only the expanded version found directly in TR-55 – this percentage of average cover pertains to a CN of a 91 in a Soil Type C.
2. Since the CN of an 80 was used for existing conditions, the offsite runoff to the upper pond was greatly reduced. Keeping the original outlets in the model, the CPv is now met for the 24 hour period. Also, due to this same reason, the CPv is now met at 24 hours for the lower pond in the same Reserve. Please be aware, that when combined, and when looking only at the CPv flow from the upper pond, this system will have a 40 hour residence time between inflow and outflow.
3. The combined hydrograph is included in the model.
4. The downstream channel is not protected. It is a natural farmland channel in its current state. The site is currently terraced which alters flows across the area. The terraces will need to be removed at development since the adjacent north land will not expect multiple encroachments of runoff onto the property. The overall flow from this site, as well as offsite from the south, has always intended to flow to this point in the basin. Based on existing conditions and the overall basin, this site will not discharge more runoff to this point.
5. The models do not include the offsite from south. As shown on the plan, this runoff will be directed around the detention area in a channel section. The channel section has been sized for at least a 1' freeboard over the 100-year storm. The flow rate from the south property was taken off the Drainage Plan for that development, as noted in the Report. Based on detention for that development, we do

ENGINEERING
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LANDSCAPE
ARCHITECTURE

B a u g h m a n
C o m p a n y , P . A .
315 Ellis Street
Wichita, Kansas 67203
P 316.262.7271
F 316.262.0149



not anticipate timing frequencies to backwater or alter this proposed detention area. Without modeling the 3 or 4 upstream ponds together with this development, the entire potential basin impacts cannot be fully known. Based on known modeling procedures and using the 24 hour design storms, we anticipate the proposed ponds on this property to discharge at roughly the same time as the ponds upstream. Therefore, there would be a lag between the proposed pond peak outflow followed by the peak of the upper ponds (the lag being the time it takes the runoff to the reach this point in the channel and ditch sections upstream and through this property).

6. The structure is a Triple (3) 8'x4' RCBC with a 32' soil saver (approximately 2' in height) on the upstream end.
7. The LiDAR contours appear to sheet flow / shallow concentrated flow across the site. The Hydrogeo database does portray the flow to encroach the site south of the NW corner. Based on site visits, and since this site and the offsite is terraced, the runoff is spread over the entire west line. This site will continue to accept all the offsite runoff, and the area in question is directly adjacent to the detention facility in Reserve B.
8. The report has been revised to state minimum of 15 minutes would be used in the case of the site/basin calculating less than that time period.
9. The report includes a WQv per square foot of disturbance table and summary. Note that the table does not include the dry detention area obtaining 60% of the TSS removal. This is due to variances in TSS removal rates for the many different BMP's when, at this time, there is no site plan for any portion of this property. If developing at the west end of the site and utilizing both dry detention areas – then both may be used in the treatment train calculation. Vice versa, at the east of the site only one may be used in the calculation. For this reason, a total WQv per area was included.
10. Dry detention ponds can only provide 60% TSS removal per the Storm Water Manual. Additional water quality BMP's will need to be provided at the time of site planning, and a treatment train calculation will need to be provided at that time.
11. The Q100 has been revised based on comment 1, the CN for existing conditions has been lowered to an 80. The offsite to the west produces approximately 136 cfs in that event. We do not feel that for 37+ acres that this is unreasonable. Please be aware, this flow has been accepted and will then be detained in the upper detention area in Reserve B.

Skyway West 2nd

1. See responses for Skyway West 3rd, above for more detail. In short, a CN of 80 was used for existing, a minimum Tc of 15 minutes was used if the calculations were less than that figure, and the WQ has been addressed with a table in the Report for WQv per square foot of development.

2. We do not consider there to be 'inherent detention' in a small low lying area in the farm field. During a design storm event, the minimal amount of storage there would be in this area would quickly disappear when modeling the runoff. This would especially be apparent when modeling a basin of 15 acres, Basin 4's area.
When developed, we anticipate the entire basin to flow to the detention area and then have the discharge properly regulated. Some of the current flow may be dissipated and sheet flow onto the residential lots. It is not our intent to try to 'match' this flow with sheet flow after development. Based on the current/revised plan, this runoff will be directed to the detention area and be discharged via the 18" RCP stub. Per the original plan, the pond will tie directly into the SWS system in the adjacent residential subdivision. There is a SWS with an inlet at this location now to accept offsite runoff, as stated in the Report.
The CN of a 91 will continue to be used for this area, as outlined above. The detention in this area has been oversized and will overdetain compared to existing conditions. For example, there appears to be 42 cfs of runoff in existing conditions to this inlet and after development, we expect 14 cfs to be discharged here.
3. It does appear to be the case of the differing 'points of discharge'. But please be aware the 'point' of discharge may not be a specific point but a property, or in this case, the offsite pond. The intent was to show what amount of runoff encroaches the adjacent landowner and not necessarily at which specific points that it encroaches at – especially in this case where it appears that it sheet flows offsite. Upon development, like as stated above, we anticipate the developed runoff to be directed to the detention in order to more properly regulate the outflow from the site. The calculations will not be modified to merely be 'more conservative', although the CN's have been modified based on the Storm Water Manual.
4. No offsite drainage agreements have been obtained at this time. The discharge points being utilized are the same as existing conditions, and detention is provided on site to meet at least current runoff conditions; therefore, offsite drainage agreements are not be required.
5. The current box crossing is not sized for the 100-year event. After meeting with Stormwater about this issue, it was agreed upon that since this roadway is not 'improved' and that the current box is not properly sized for the 100-year event, the reg would not apply in this instance. The site will discharge less in the developed conditions than it currently does. The pipe to the north is a 24" and discharges runoff from the north – which includes a large detention pond which was not modeled as detention. This area drains in the 119th ROW and will continue to do so. There is 70' of ROW as well as a 30' Drainage Easement along the frontage to allow for this offsite flow to continue south and into the RCBC. It has not been our practice to accept offsite ROW runoff onto a private property when the intent and current flow can be contained in the ROW. With a 24" culvert draining the north property, filling on this property should not create backwater to the property to the north.