Project No. _____ Engr._____
Project Name _____ Date_____

Stormwater Plan Review Checklist

General

_____1. Is the development in the floodplain? _____
If yes – Is work being proposed in the floodplain? _____
If yes - Has impact analysis been provided? _____
Has compensatory storage issues been addressed? _____
In FEMA floodplains, a CLOMR must also be provided. _____

_____2. Is detention required for the site?
If yes – Has HEC1 analysis been provided?
Detention is required if there is impact on other properties. Impact analysis may be required.

_____3. Check overall plan and storm sewer layout.

_____4. Check discharge locations. Make sure there are no problems with where water is being discharged. (Erosion.)

_____5. Check for offsite waters coming onto the site. Provisions need to be made to receive and pass offsite waters. On PFPI appropriate easements may be required.

_____6. Any development that drains to 121st and Yale must pay a storm water development fee ($4,000/acre). This fee is in addition to the fee-in-lieu-of detention. All new development within this area must connect to the Yale Ave. storm sewer system.

_____7. If a development is working and/or discharging storm water into ODOT's, OTA's, RR's, etc. right-of-way, a release letter must be received by that agency prior to approval of the plans.

_____8. Check drainage area map(s) and drainage summary chart. Make sure runoff coefficients and Tcs are reasonable. Run through the numbers for each drainage area.

_____9. Check inlet size.

_____10. Check storm sewer size. Profiles need to be shown for all storm sewer. On each profile, the slope, length, design Q, HGL/EGL need to be shown.

_____11. Check the HGL/EGL to make sure that it was calculated per the criteria manual.

_____12. Check the site grading. Make sure water will not back up into any buildings and that it has an emergency overflow path.

_____13. Read and check the special provisions language. Attach copies to this form.

Floodplains

_____1. All floodplain areas through a development, especially a residential development, must be placed in a Reserve Area. The Reserve Area must be donated to the City of Tulsa.

_____2. If property is in the floodplain, impact analysis and compensatory storage issues need to be addressed. Impact analysis may show some improvements are necessary.

_____3. In FEMA floodplains, CLOMRs are required for any/all work within the floodplain. Permits/PFPIs cannot be approved until the CLOMR has been approved by FEMA.

_____4. Compensatory storage is required for any fill work brought into the floodplain (1:1 ratio). A cut/fill summary chart and cross sections need to be shown on the plans for verification.

_____5. 404 permit inquiries need to be made by the consultant when working in or adjacent to channels.

Detention Determinations/Facilities

_____1. Need to look at impact analysis.
Is there down stream flooding of structures? _____
Is it in watershed without regional detention specified? _____
Are there known down stream problems? _____
If yes to any one of these, detention is required.

_____2. All properties, private and publicly held must have impact analysis.

_____3. Fee-in-lieu-of detention is $0.10/sf of increased impervious area.

_____4. Detention facilities need to be placed in a reserve area. If it serves only one lot with one property, owner, then an easement will suffice. In multi-lot developments, detention facilities must be placed in a reserve area and dedicated to a “property owners association” for ownership/maintenance.

_____5. HEC-1/HCE-HMS models need to be used to determine hydrographs and routings through detention facilities.

_____6. A detention “summary chart” needs to be shown on the plans.

Stormwater Plans Review

_____1. All public storm sewers must be sized to handle the 100-year event. The criteria manual discusses a 5-year pipe system with a 100-year overland flow component. This type of system is not longer accepted.

_____2. For small developments along arterial streets, in "in-fill" areas, and in downtown, every effort must be made to collect runoff onsite and convey it into a storm sewer system. Sheet flow into the street is not allowed.

_____3. Emergency overland relief is required for inlets in a sump should the inlet/sewer plug up (for whatever reason). Overland drainage easements are required if the relief is outside a public right-of-way.

_____4. ODOT paved ditches are required for ditches along an arterial street where applicable. The ditch must be constructed for the entire length of the development. The only exceptions are: 1) A street widening project is eminent within the next few months; 2) a storm sewer system w/appropriate drop inlets is constructed in the ditch; or 3) the development is at the top of a crest and the water flowing through the ditch is negligible.

_____5. HDPE is **not** allowed in public storm sewer systems.

_____6. HDPE is allowed in private systems only if the trench is backfilled with Type A aggregate.

_____7. CGMP is **not** allowed in public or private storm sewer systems.

_____8. For RCB culverts/bridges, 1' of freeboard is required between the 100-year water surface elevation and the inside, top of the RCB.

_____9. No 90° bends at manholes for storm sewers 36" and larger. (Strictly enforced in the sandy soil areas of South Tulsa.)

_____10. In sandy soils, the minimum slope for a storm sewer is 0.5%. With recent experiences in South Tulsa, this minimum slope will help keep the velocities up and avoid siltation problems.

_____11. In sandy soils, storm sewer joints need to be specified with the sanitary sewer spec. and/or need to be wrapped with a Cadi-Lok type wrap.

_____12. All public storm sewers need to be backfilled with Type A aggregate. The City's bedding detail needs to be shown on the plans.

_____13. The maximum time of concentration to ***any*** inlet on a storm sewer system is 10 minutes for a residential development and 5 minutes for a commercial development.

_____14. In calculating Tc's, equation 703 is not accepted to calculate Ti. Ti needs to be calculated using Figure 702.

Stormwater Plat Reviews General Checklist

_____1. All public storm sewers are required to be in an easement. The easement can be a utility easement or storm sewer easement. Refer to Figure 301 for minimum easement widths.

_____2. All detention facilities are required to be in a dedicated reserve area. The reserves are to be maintained by the "association". Standard language needs to be included in the plat covenants.

_____3. All floodplain areas need to be placed in a dedicated reserve. The reserve can be dedicated to the City or to a property owner's association for maintenance. (Preferably to the City) Refer to the criteria manual for width requirements. Standard language needs to be included in the plat covenants. Overland drainage easements for floodplain areas are not allowed.

_____4. When dealing with dedicated reserve areas, verify that a property owner's association is being established to maintain the reserve.

Easements (Separate Instrument)

_____1. For separate instrument easements, the developer must submit:
_____ An ownership affidavit from an abstract company (ie: Guaranty Abstract) or a letter from an attorney stating who owns the property.
_____ A signed and sealed by a PLS legal description (type font must be 12 pt)
_____ A plot plan.

_____2. Once the above items are received, they are sent to Jeff Cooper with a memo stating:
_____ the type of easement needed;
_____ the type of permit (PFPI or WSDP);
_____ the easement satisfies the permit requirements.

_____3. Jeff prepares the easement document (<u>not the developer/engineer</u>) for the developer to sign.

_____4. The PFPI or WSDP cannot be released until the developer returns the signed document.

CONSULTANT ENGINEER FIRM: _____

PROJECT MANAGER: _____

PROJECT ENGINEER, STORMWATER: _____

LEAD ENGINEER, STORMWATER: _____