Civil Engineering Plan Standards & Checklist

For Office Use Only

Project # _____

Drainage Plans *(check if provided; indicate NA if not applicable)*

Poorly prepared drainage plans account for the majority of development problems. It is recommended that a professional engineer prepare the grading and drainage work.

Grading Plan

- ☐ Name and phone number of person preparing grading/drainage plans (preparer should be a professional engineer)
- ☐ Existing contours (used thin dashed lines and label; extend 50' minimum onto adjacent property)
- ☐ Proposed contours (used solid lines and label)
- ☐ Letter of consent for entry or offsite easement from adjacent landowner if proposed grading encroaches onto adjacent property (submitted with the FDP)
- ☐ Contours on all street intersections
- ☐ Top of curb elevation every 50' on streets, alleys, existing and proposed parking lots

  Slope:

  - ☐ Back of street curb to property line: 1/4" per foot
  - ☐ Parking lot top of curb to property line: maximum 3 horizontal to 1 vertical (3:1)
  - ☐ Any unpaved area adjacent to property line is a maximum slope of 3:1
  - ☐ Driveways: 1/4" per foot + 6" from street gutter up to property line
- ☐ Temporary erosion control, as required
- ☐ Existing and proposed inlets (label size)
- ☐ Existing and proposed storm sewer (label size)
- ☐ Drainage area lines
- ☐ Disposal site for excavation (if required)
- ☐ Standard detail sheet for storm sewer
- ☐ Indicate CFS (cubic foot per second) flowing out of the drive(s). A maximum of 10 CFS is permitted.

Drainage Area Map

Runoff calculations for all areas includes:

- ☐ Acreage
- ☐ Runoff coefficient
- ☐ Inlet time
- ☐ 100 year intensity
- ☐ Emergency overflow adjacent to low points in street (paved surface, such as a flume)
- ☐ Inlet size

Drainage from the abutting property must not be impaired by the proposed grading; likewise, drainage to abutting property must not be concentrated or increased by the proposed grading.

Often at the time of the final review and approval, it is necessary to require relocation of proposed driveways, inlets, etc. When this occurs, the property owner should re-evaluate the grading and drainage proposals so as to avoid unnecessary expense, delays, and other undesirable consequences.

Drainage Plans Continued *(check if provided; indicate NA if not applicable)*

Creeks and Channels

- ☐ Label stationing in plan and profile
- ☐ Label flow line on profiles
- ☐ Label high bank on profiles
- ☐ Design water surface on profiles
- ☐ Label hydraulic calculations on profiles
- ☐ Label rock line on profiles
- ☐ Provide a drainage area map
- ☐ Provide computations for runoff/water surface
- ☐ Include cross sections relative to property line
- ☐ Label larger pipe for erosion control
- ☐ Label energy dissipater at outfall for erosion control
- ☐ Specify any other erosion control measures
- ☐ All fill compacted to 95% standard Proctor density
- ☐ Include velocities (not to exceed original stream velocities)
- ☐ Provide parallel streets, alleys, or pedestrian ways adjacent to creeks and/or floodways
- ☐ Creek/channel drainage alterations must be in compliance with ordinances (permits may be required)

Post Construction Storm Water Control

- ☐ Completion of the Storm Water Quality Assessment Worksheet
- ☐ Design and implementation of BMP's on storm water or utility plan

Utility Plans *(check if provided; indicate NA if not applicable)*

Water

- ☐ Water mains are looped
- ☐ Size of trunk lines are in accordance with master water plan
- ☐ Valves on fire hydrant leads and fire lines
- ☐ Valves on main lines between each fire hydrant
- ☐ Maximum distance between fire hydrants is 500' c-c on street for residential
- ☐ Maximum distance between fire hydrants is 400' c-c on street for apartments
- ☐ Maximum distance between fire hydrants is 300' c-c on street for office, retail, commercial, and industrial
- ☐ Fire hydrants are within 300' of all portions of all non-residential buildings
- ☐ Fire hydrants are within 400' of all multi-family or single-family attached dwellings
- ☐ Fire hydrants are within 500' of all single family detached dwellings
- ☐ With fire hydrants, except for single-story or two-story residences, the path of measurement shall be along a minimum of 10' wide unobstructed pathway around the external walls of the structure
- ☐ Fire hydrants are no closer than 25' to an existing or proposed driveway
- ☐ Fire hydrants are no closer than 10' to an existing or proposed radius return
- ☐ Fire hydrants are located 2'-5' behind the curb of a dedicated street or fire lane
- ☐ Show and label the location of the fire department connections (FDC)
- ☐ Include a materials list for your water plan

Utility Plans Continued *(check if provided; indicate NA if not applicable)*

- ☐ Water service (minimum 1” copper Type K) from main line is to 2’ from back of curb, located 5’ upstream of center lot for a residential subdivision
- ☐ Water mains extend to opposite property line or are tied to existing main
- ☐ Mains 12” and larger are profiled
- ☐ Label the locations and size of domestic, irrigation, fire department connection, and riser room water meters
- ☐ Water meters shall not be located in concrete areas
- ☐ Label fire service mains and fire sprinkler systems
- ☐ Label size of water meters
- ☐ Label utility easements up to and including fire hydrant and water meters
- ☐ There shall be a 10’ minimum separation between utility lines
- ☐ Provide the following note on plans: “Contractor to verify location of existing utilities”
- ☐ Include applicable City of Van Alstyne standard detail sheets

Sanitary Sewer

- ☐ Sanitary Sewer are constructed with 8” minimum PVC pipe
- ☐ Clean-outs at the end of all lines less than 12” if within 200’ of a manhole
- ☐ Manholes are placed at change of pipe size, wyes, bends, & service connections greater than 6”
- ☐ Manholes are a maximum of 500’ apart

Minimum slope of sewer lines (velocity > 2 fps):

- ☐ 6’ = 0.75%
- ☐ 8” = 0.36%
- ☐ 10’ = 0.24%
- ☐ 12” = 0.20%
- ☐ 15” = 0.16%
- ☐ 18” = 0.12%

Maximum slope of sewer lines (velocity < 8 fps):

- ☐ 6” = 10.5%
- ☐ 8” = 9.0%
- ☐ 10” = 6.68%
- ☐ 12” = 5.24%
- ☐ 15” = 3.89%
- ☐ 18” = 3.05%

- ☐ Sewer laterals are 10’ downstream from water service or 5’ downstream of center lot in residential subdivisions
- ☐ Minimum lateral size for residential and apartments is 6”
- ☐ Minimum lateral size for commercial and industrial is 6”
- ☐ Label all sewer lines crossing sanitary sewer on profile
- ☐ Label other utility lines crossing sanitary sewer on profile
- ☐ Concrete encasements at creek and utility crossings
- ☐ Stubouts are adjacent to property
- ☐ Benchmarks labeled on all sheets

Utility Plans Continued *(check if provided; indicate NA if not applicable)*

- ☐ Label linear distance and type of pipe
- ☐ Refer to detail sheets for embedment details
- ☐ There is a 10’ minimum separation between utility lines
- ☐ Provide the following note on plans: “Contractor to verify location of existing utilities”
- ☐ Air test and video inspection with new sewer line construction is required
- ☐ Include applicable City of Van Alstyne standard detail sheets

Lift Stations

- ☐ Include pump station layout
- ☐ Include plan view and sections
- ☐ Include electrical power service and details
- ☐ Include provisions for emergency overflow
- ☐ Include manufacturer’s model number
- ☐ Include operation and maintenance notes
- ☐ Must adhere to design criteria of Texas Commission on Environmental Quality
- ☐ Tee and flange valve, with a blind flange on the valve, must be included on the force main side of check valve for emergency overflow protection
- ☐ Include a security fence for the facility
- ☐ Manufacturer’s specifications must be supplied for all equipment and pumps
- ☐ Lift station must not be subject to flooding and must be accessible via all-weather surface

Storm Sewer

- ☐ Include plan and profile of all proposed storm sewers including laterals
- ☐ Include stations on laterals on trunk plan and profile
- ☐ Label size of inlet on plan view
- ☐ Label lateral size on plan view (18” minimum)
- ☐ Label flow line on plan view
- ☐ Label paving station on plan view
- ☐ Label top of curb elevation on plan view
- ☐ Include curve data for storm sewer
- ☐ Label easements with dimensions
- ☐ Use Class III RCP (typical)
- ☐ Label hydraulic gradients and calculations on all sections
- ☐ Storm sewer discharge is at flow line of creek or channel
- ☐ All fill is compacted to 95% standard Proctor density
- ☐ Include headwalls and erosion control at outfall of storm sewers
- ☐ Soffits at pipe size changes to match (typical)
- ☐ Existing and proposed utilities included in plan and profile
- ☐ Label grade on profile
- ☐ Label flow line elevations at every station on profile
- ☐ Label benchmarks on every plan sheet

Utility Plans Continued *(check if provided; indicate NA if not applicable)*

- ☐ 10’ minimum separation between utility lines
- ☐ Emergency overflow in concrete lined flumes
- ☐ Include details of all non-standard items
- ☐ Provide the following note on plans: “Contractor to verify location of existing utilities”
- ☐ Include applicable City of Van Alstyne standard detail sheets

Bridges

- ☐ Lowest member of bridge is a minimum of 2’ above 100 year water service elevation
- ☐ Include soil boring locations on plans
- ☐ Include soils report
- ☐ Include bridge sections upstream and downstream
- ☐ Include structural details and calculations with dead load deflecting diagram
- ☐ Include vertical and horizontal alignment
- ☐ Include hydraulic calculations on all segments

Paving Plans *(check if provided; indicate NA if not applicable)*

Right-of-Way and Pavement Width

(refer to Master Thoroughfare Plan for guidance)

Street R.O.W. pavement width:

- ☐ Single-family and duplex: 50’ R.O.W.; 31’ b-bpavement
- ☐ Schools, parks, apartments: 60’ R.O.W.; 37’ b-b pavement
- ☐ Retail, commercial, industrial, and office: 60’ R.O.W.; 37’ b-b pavement
- ☐ Where required by Thoroughfare plan: 90’ R.O.W.; two 25’ b-b roadways
- ☐ Where required by Thoroughfare plan: 120’ R.O.W.; two 37’ b-b roadways
- ☐ Right-of-way and pavement widths flair at intersection

Alley R.O.W. and Pavement Width:

- ☐ Single family: 18’ R.O.W.; 12’ pavement; 3” invert
- ☐ Apartment, duplex, office, retail, commercial, and industrial: 20’ R.O.W.; 15’ pavement; 5” invert

Design Standards *(check if provided; indicate NA if not applicable)*

Pavement

Concrete Thickness

- ☐ Local streets and alleys: 6” minimum
- ☐ Collector streets: 8” minimum
- ☐ Arterial streets: 9” minimum; 10” in intersections
- ☐ Parking areas: 5” minimum
- ☐ Fire lanes: 6” minimum

Design Standards Continued *(check if provided; indicate NA if not applicable)*

Reinforcement

- ☐ Local streets and alleys: No. 4 rebars 18” on center both ways
- ☐ Collector and arterial streets: No 4. rebars 24” on center both ways

☐ Use Class “C” Concrete (3,600 PSI) in 28 days

☐ Install 6” curb along gutterline and 6” curb along median

☐ Install expansion joints at 600’ intervals

☐ Use lateral saw cuts at 20’ intervals

☐ Use longitudinal saw cuts for streets at 10’6” intervals

☐ Use 2” PVC street lighting conduit from median curb

☐ Use 3” PVC signal conduit at all thoroughfares and/or collector intersections

☐ Use 30’ radius for drives at street intersections

☐ Use arrows to indicate direction of drainage

Sidewalks

☐ Concrete must be 5”-6” thickness, depending on width. See the City Design Manual.

☐ 3,000 PSI in 28 days

☐ Reinforcement: No. 3 rebars, 18” on center both ways

☐ Install expansion joints at 20’ intervals

☐ Install tooled joints at 5’ intervals

☐ Barrier free ramps are to be provided at all street and alley intersections

Screening

☐ Wall layout

☐ Wall Details

☐ Mow pad, if adjacent to paved surface