ENGINEERING

# PRIVATE DEVELOPMENT
# PLAN REVIEW GUIDE JANUARY 2021

***(To be included with the Initial Plan Submittal to the City)***

**Please note the following information is intended to assist the design engineer in preparation of civil drawings for review by City Staff. The following checklist is not intended to be a definitive list of all information, or a list of design requirements. Refer to City design manuals for complete design information.**

DATE:_____ PD, ZONING OR SUP#:_____

ADDITION NAME:_____

PROJECT TITLE:_____

PROPERTY OWNER:

CONTACT NAME:_____ EMAIL:_____

COMPANY:_____ 2ND EMAIL:_____

ADDRESS:_____ PHONE:_____

DEVELOPER (IF DIFFERENT THAN OWNER):

CONTACT NAME:_____ EMAIL:_____

COMPANY:_____ 2ND EMAIL:_____

ADDRESS:_____ PHONE:_____

**"I, the undersigned Engineer of Record, hereby certify that I have reviewed the Civil Engineering Plan Submittal Process packet, and that the information provided herein is correct and complete to the best of my knowledge."**

COMPLETED BY (ENGINEER OF RECORD): TX PE #:_____ TX FIRM #:_____

SIGNATURE:_____ CONTACT NAME:_____

COMPANY:_____ EMAIL:_____

ADDRESS:_____ PHONE:_____

ENGINEER'S JOB #:_____

NOTES (PROVIDE ANY SPECIFIC INFORMATION OR QUESTIONS TO BE ADDRESSED):

| |
|---|
| |

CHECKED BY STAFF:_____ X#_____ DATE RECEIVED:_____

**The following items shall be required, when applicable, for completion of the construction plans. Please use the check-boxes on the left to verify the completeness of information submitted.**

## I. MISCELLANEOUS:

- ☐ A. Review plans & checklist shall be marked accordingly and returned back to the City with plan submittal.
- ☐ B. All plans, including Standard Construction Detail Sheets shall be signed and sealed for construction by a Licensed Professional Engineer in the State of Texas.
- ☐ C. All plans for Paving, Drainage, Water and Wastewater, shall be provided on plan/profile sheets. If information is shown on separate sheets, they shall be cross referenced by sheet number.
- ☐ D Plan plot size shall be 22" x 34" to allow for ½ size plots.
- ☐ E. Use the City of Grand Prairie CAD Standards.
- ☐ F. Plan Submittal:
  1. ***Initial Submittal:*** Electronic submittal of the complete plan set along with a completed and the signed Private Development Plan Review Checklist, to be uploaded to project specific file.
  2. ***Second Submittal:*** Single PDF of the complete revised plan set to be uploaded to the project file; three (3) complete full-size (22"x34") bound sets of the revised plans, one (1) half-size (11"x17") color copy of the previous plan mark-up shall be delivered to the Engineering Department.
  3. ***Subsequent Submittals:*** Single PDF of the complete revised plan set to be uploaded to project specific file; two (2) complete full-size (22"x34") bound sets of the revised plans, and the previous plan mark-up shall be delivered to the Engineering Department.

## II. GENERAL PLAN INFORMATION:

- ☐ A. Use the following general sheet lay-out:
  Cover Sheet, Plat, General Notes and Sheet Index, Right-of-way Strip map (if applicable), Dimensional Control Plan, Grading, Paving, Drainage/Detention, Utility, Erosion Control Plan, Lighting, Specific Detail Sheet(s), City Standard Detail Sheet(s), City Standard Testing Notes
- ☐ B. City Tracking Numbers:
  1. City Project Number (X#) to be issued by the City of Grand Prairie
     (*To be included on the standard title sheet only)*
  2. City Vault File Number to be issued by the City of Grand Prairie <u>at release of construction</u>
     (*To be included on <u>each</u> sheet)*
- ☐ C. Coordinates for point of design origin and one other design point
  (*To be included on each sheet using NAD 1983 State Plane Texas North Central FIPS 4202 Feet Coordinate System)*
- ☐ D. All details needed for construction of the project to be included in the plan set.
  Do not refer to details in other agency standards
- ☐ E. Include the project site address under the project name
- ☐ F. Provide names, physical addresses, phone numbers and email addresses for Owner, Developer and Engineer

## III. TITLE SHEET:

- ☐ A. Include City of Grand Prairie Standard Title Sheet for Private Development
- ☐ B. Blank Address Block

## IV. PLAT:

- ☐ A. Include copy of current final plat. Closure (3rd Order) – Attach print-out.
- ☐ B. Fifteen foot (15') minimum utility easements on both sides of the street ROW (Typ.)
- ☐ C. Floodplain shall be within a drainage easement or Storm Water Management Area dedicated to the City fee simple
- ☐ D. Show and label the fully developed floodplain with flood elevations and the limits of the FEMA floodplain and floodway
- ☐ E. Detention/Retention basins shall be in drainage and detention easements
- ☐ F. Specify minimum finished floor elevation for structures on all lots within 200'of the floodplain or within 50' of pond, creek, or other body of water
- ☐ G. Provide standard maintenance and disclaimer note for detention/retention basins and/or earthen channels
- ☐ H. Provide and show Erosion Hazard setbacks for natural or proposed channels and basins

**V. GENERAL NOTES and/or STANDARD TESTING NOTES:**

- ☐ A. Current City of Grand Prairie General Notes
- ☐ B. Current City of Grand Prairie Standard Testing Notes

**VI. OFF-SITE RIGHT-OF-WAY AND EASEMENTS:**

- ☐ A. Strip map showing location and ownership of all needed off-site right-of-way easement parcels in relation to total project submitted
- ☐ B. Metes and bounds descriptions, individual parcel maps and copies of recorded owner's deeds for each parcel attached
- ☐ C. All descriptions and parcel maps to bear the seal of Texas Registered Land Surveyor
- ☐ D. Record information shown for easements not dedicated or recorded by plat

**VII. DIMENSION CONTROL PLAN:**

- ☐ A. Provide State Plane Coordinate System for all control points
- ☐ B. Provide and reference vertical control Bench Mark information tied to two City GPS control Points
- ☐ C. Provide dimension, coordinates and offsets sufficient to allow a competent surveyor to stake the work for construction
- ☐ D. Fully dimensioned fire lanes shown

**VIII. GRADING PLAN:**

- ☐ A. Proposed grading plan with flow arrows and contours for businesses and spot elevations for residential per UDC Art. 14.5.3 and reference vertical control Bench Mark information tied to two City GPS control points
- ☐ B. Include an area approximately 100' minimum outside project limits to show existing grades in the area, and to ensure proper drainage
- ☐ C. Positive drainage shall be provided away from all structures
- ☐ D. Lowest Finished Floor Elevations (LFE) shown for industrial and commercial structures and SFR shall be a minimum of ___' above the street grade where possible
- ☐ E. Include the project site address under the project name (temporary address as a minimum)
- ☐ F. Show all existing and proposed storm drains in the project area and label clearly
- ☐ G. Slopes shall not be steeper than 4:1 without a slope stability analysis prepared by a geotechnical engineer. Design shall facilitate maintenance.
- ☐ H. Show names of property owners adjacent to the site
- ☐ I FEMA floodplains and floodways with current BFE elevations
- ☐ J. Retaining Wall Design
  1. Spot elevations for top of wall and base of wall at ends/PVIs/bends of wall
  2. Specific structural detail for walls over four (4) vertical feet in height from bottom of footing to top of wall, sealed by a registered professional engineer licensed to practice in the State of Texas
  3. Provide at least one cross section view at the highest point of the wall showing proposed ground slopes on each side of retaining walls and the structural designs
  4. All retaining walls, including footings, must be on private property and outside of utility/drainage easements, storm water management areas, floodways, floodplains, and rights-of-way

**IX. STREET PAVING:**

- ☐ A. Right-of-Way (ROW) dimension shown for all existing and proposed street (as per City of Grand Prairie's Thoroughfare Plan)
  1. Residential (LU) - 2 Lane Undivided - 50 Feet
  2. Collector (C2U) - 2 Lane Undivided - 70 Feet**
  3. Minor Arterial (M4U) - 4 Lane Undivided - 70 Feet **
  4. Arterial (P4D) - 4 Lane Divided - 100 Feet*
  5. Major Arterial (P6D) - 6 Lane Divided - 120 Feet *

  *** 10 ft. additional at intersections with collectors or arterials.*

  ** 10 ft. additional per turn lane where more than one turn lane is required*
- ☐ B. Additional street ROW Required *(List and attach on separate sheet if needed)*
  If yes, street _____
  dedication _____
- ☐ C. Alignment of proposed street with existing streets (*Min. 250' offset*).
- ☐ D. All arterial/arterial and arterial/collector intersections to be contour graded with 0.2-foot contour intervals
- ☐ E. Extension of Collectors and Arterials (As per current Thoroughfare Plan)
- ☐ F. Provide Striping Plan

☐ G. Final Street Paving Plans

1. Minimum Street Centerline Radius (R) &Pavement Thickness (T)

| | | |
|---|---|---|
| Residential | R = 350' | T=6" * |
| Collectors | R = 550' | T=7" * |
| Minor Arterials | R = 850' – 1,050' | T=8" * |
| Arterials | R = 1,050' | T=8" * |

* *Label paving thickness and strength of concrete, reinforcing bar size and spacing, depth of stabilized subgrade (Lime or Cement) for each street and as applicable*

2. Provide tangents between curves and show all curve data
3. Provide street curb radius and corner clips as per UDC
4. No Street with one point of access should be longer than 600 feet. Turn around required at dead end streets longer than 150 feet
5. Block Length: >500 ft. and <1,200 ft. Measured centerline to centerline
6. Minimum Grade = 0.6% Desirable (0.5% min. with approval of Engineering)
   Maximum Grade = 7.0% Desirable (10.0% max. with approval of Engineering)
   Maximum Fire Lane Grade = 6.0%
   Maximum Fire Lane Cross-slope = 3.0%
7. Show and label all Lots and Blocks
8. Show typical sidewalk locations and label if proposed or to be built by the builder or developer
9. Show and label all easement types and widths
10. Show & label all Water, Wastewater & Storm Drain in plan views with sizes
11. Show station and top of curb elevations at all street curb returns in plan view
12. Show flow arrows along all gutter lines including side streets in plan view
13. Handicap ramps to be installed at all intersections with street paving
14. Provide full profile and hatch fill areas in profile. And Note: "Compacted Fill to 95% STD Proctor Density"

☐ H. Reference vertical control Bench Mark information tied to two City GPS control Points on all Plan/Profile Sheets
☐ I. Horizontal and vertical sight distance clearances
☐ J. Plan size Scale: 1" = 40' Horizontal, 1" = 4' Vertical (Minimum)

**X. DRAINAGE AND FLOODPLAIN:**

☐ A. Attach 404 permit or certification that site is not subject to 404
☐ B. If this project requires a CLOMR or CLOMR-F, provide documentation showing compliance with Endangered Species Act
☐ C. Drainage area map per the current edition of the Drainage Design Manual (DDM)

1. Depict drainage sub-areas on- and off-site. Label all pipes & sizes
2. Depict fully developed floodplain & FEMA floodplain/floodway lines with flood elevations and Lowest Finished Floor Elevations
3. Show and label ALL existing and proposed storm drain mains and laterals with sizes and type of pipe
4. Show all required erosion hazard setbacks per manual criteria

☐ D. Hydrologic computations per procedures specified in DDM

1. Calculations with flow paths shown for all times of concentration that are greater than minimum time to inlet
2. Calculations shown for each sub area including runoff coefficients, intensities, times of concentration, and runoff for $Q_2$, $Q_{10}$, and $Q_{100}$ with summation at system junctures

☐ E. Storm drains designed per the DDM

1. Calculations shown for inlets
2. Minimum main size is 24 inches
3. Only recessed curb inlets specified on curbed streets/alley/driveways.
4. No storm drain mains proposed passing in and out of inlets unless inlet is designed as a junction box of at least six (6) feet deep as required to safely accommodate all energy losses
5. Proposed inlets in five-foot (5) increments and to be placed uphill of intersecting property lines
6. Grate inlets allowed on privately maintained lines only, unless approved by drainage engineer
7. All proposed grate inlets to be sized based on 50% clogging
8. All inlets shall have lateral connection to the main – 18 inches minimum
9. Laterals draining sumps shall be 24 inches minimum diameter with the pipe velocity designed for at least 2.0 fps at uniform flow depth for the pipe invert slope during partial flows
10. Storm Drain Manholes or Junction Boxes at vertical changes in grade, 550 feet maximum spacing for five (5) feet diameter or less and 1,000 feet spacing maximum on larger diameter conduits
11. Storm drain outfalls designed per the DDM Section 8.2G

12. Maximum 5 cfs for $Q_{100}$ for sheet flow from each driveway and 4 cfs for $Q_{10}$ per gutter through thoroughfare intersections with approved analysis for the cumulative effect. Maintain one ten-foot (10') dry lane in each direction for major thoroughfares for the 100-year flood
13. Label depth and spread of flow in streets and alleys
14. Depth of flow in private parking lots is limited to 6-inches in automobile parking lots and 9-inches in truck dock and truck parking areas
15. Inlet calculations of $Q_{10}$ on grade and $Q_{100}$ at sags
16. Storm drain plans and profiles with 100-year hydraulic grade line ($HGL_{100}$) shown
17. Storm Drain Hydraulic Calculations Tables for 10- and 100-year flows showing all losses per DDM Sections: 8.4 "Calculation of the Hydraulic Grade Line", 8.5 "Pressure Flow", 8.6 "Starting Tailwater Conditions" and 8.7 "Minor Losses" for all pipe control points including a lateral loss point for lateral line starting calculations. Street flow as well as pipe flow must be shown in the H.G.L. table for 100-year flows.
18. Minimum change in Hydraulic Grade is 0.00 feet at each point specified in Tables
19. Show on all profiles $Q_c$, $Q_a$, $V$, $S_f$, $V^2/2g$, and $V_{out}$ ($V_u$, $D_u$, & $F_r$ for partial flow) for closed conduits, include *TW* and *HW* for culverts
20. Check for slug flow for invert grades exceeding 10 percent and upsize conduit as necessary
21. Label on all plan and profile sheets to construct concrete collars at all pipe size and conduit grade changes (PVIs)
22. Place headwalls at the Right-of-Way line as minimum
23. Show all inlet and outfall grading required to properly tie to existing grades. Show on plan and profile views with proposed cross sections to define work and reference vertical control Bench Marks tied to two City GPS control points
24. Reference vertical control Bench Mark information tied to two City GPS control points
25. HEC HMS analysis required if hydrographs are to be developed for sub-areas, routed and/or combined, regardless of sub-area size, to size drainage facilities
26. Provide calculations, analyses, or record drawings to prove the outfalls are adequate to accept project discharges based on current design criteria
27. Storm drain alignment curvature must correspond to manufacturer recommendations, or "radius" pipe specified

☐ F. Open channels shall be designed and analyzed per the DDM

1. Channel plans and profiles with hydraulic grade line (*HGL*), $Q$, $V$, $D$, $n$, $S_o$, and $F_r$
2. Flood study required if filling in floodway/floodplain, and all open channels. Streams to remain natural
3. Velocities in channels including streams shall conform to Table 9.1 of the DDM
4. Channel sections specifications shall conform to the DDM; unless prohibited by federal regulations concrete flume invert provided for permanent earth channels
5. Any increase in flood elevations or construction within the floodway requires a submitted CLOMR to FEMA prior to construction
6. Fill placed in the floodplain requires a LOMR and Floodplain Development Permit
7. Place a note on the plans that all earthen channels and basin slopes shall be covered with Erosion control mats after seeding. Hay or straw products are not permitted for BMPs

☐ G. Detention/Retention ponds shall be designed and analyzed per the DDM

1. Provide pre and post-development drainage area maps and calculations
2. Provide a brief narrative statement describing the purpose of detention and the methodology used to establish the basin release rates
3. Basin, dam and outlet works are in detention & drainage easement
4. Design includes plan and sections of spillway that can convey the incoming 100-year flood with energy dissipater and erosion control
5. Design incorporates required freeboard
6. Maximum 4:1 earthen slopes
7. Retaining walls allowed in detention and drainage easements. Retaining wall plans must be included.
8. Provide the standard maintenance note for detention/retention basins
9. Provide a means to access the bottom of the basin for maintenance
10. Provide a four (4) foot high chain link fence with gate for maintenance around the 100-year flood pool, for safety. Basins within 120 feet of a Collector or Arterial shall be fenced with four (4) foot high wrought iron fence equal in design to a Type 2 Screening Fence.
11. Provide a landscape and irrigation plan for the pond sides and bottom per UDC Article 8. Basins shall be stabilized per Section 11.1 of the DDM (Full sod required for ponds less than 2 (two) acres of surface area and noted within the plans)

12. Stage-storage-discharge curves for outfall
13. Plot of inflow and outflow hydrographs
14. Provide MRM/THM calculations or hydrograph input data
15. Basin shall have minimum slope of 0.5 percent (0.5%) for required concrete pilot channel with minimum one percent (1%) cross slopes for earth surfaces

☐ H. Provide City standard construction details and other engineered details
☐ I. Include Bench Marks on all Plan/Profile Sheets
☐ J. Plan size Scale: 1" = 40' Horizontal, 1" = 4' Vertical (Minimum)
☐ K. All computer programs used in hydrologic and hydraulic computations are approved by the City of Grand Prairie and are the latest available versions

**XI. WATER AND WASTEWATER (Use Water/Wastewater Master Plans and the "Wastewater Design Criteria"):**

☐ A. Show and label existing Water and Wastewater Mains *(Size and Direction of Flow (as applicable))*
☐ B. Minimum Water and Wastewater Pipe Size is 8"
☐ C. Proposed Water Distribution System
1. Fire Hydrants Shown
   a. Residential - 800 FT. Maximum Spacing
   b. Commercial and Industrial - 300 FT. Maximum Spacing
   c. Maximum fire hydrant dead end is 150'
   d. Location of fire hydrant shall comply with the current City standard detail
2. Water Mains 12 Inches and Greater to be Shown in Profile

☐ D. Dead-end lines and stub-outs to be valved, extend one joint of pipe, cap and blocked
☐ E. Concrete encasement is required for water mains that cross wastewater mains or services per the TCEQ standards
☐ F. Penetrations of water or wastewater through storm drain pipes, boxes or structures are not allowed.
☐ G. Wastewater Service Area Map with calculations (Onsite & Offsite)
1. Connection to Gravity Main required when property is within 300' of a Public Main

☐ H. Proposed Wastewater Collection System and System Profile Plans
1. Manholes:
   a. Spacing - 500 Feet or Less and at Ends of Lines for mains smaller than 18", otherwise it shall be 750' max. on larger mains
   b. Install manholes at Junctions, Bends, & Ends of Lines (No cleanouts)
   c. Specify & show outside drop connections for all drops over 2'
   d. Design engineer shall specify if pre-cast or cast-in-place manholes are used
2. Show all Water, Wastewater and Storm Drain conflicts in profile
   a. Provide Concrete Cap or specify easement type as required
   b. Steel encasement shall be designed per City Standards
3. Label all pipe material and the Standard Dimensional Ration in the plan/profile
4 Wastewater Lift Stations
   a. Plans shall comply with City of Grand Prairie standards and show location and lot size
   b. Adequate access and fence around station
   c. Layout of station, wet well, valve pit, isolation valves and bypass connections shall comply with City requirements

☐ I. Include City of Grand Prairie Standard details
☐ J. Reference vertical control Bench Mark information tied to two City GPS control points on all Plan/Profile Sheets
☐ K. Plan size Scale: 1" = 40' Horizontal, 1" = 4' Vertical (Minimum)
☐ L. Sewer Taps must comply with the current Plumbing Code and Requirements for sampling by Environmental Services for Commercial, Commercial (Multi-family), and Industrial uses

**XII. EROSION CONTROL PLAN:**

☐ A. Must be site specific, meet the requirements of the Construction General Permit and be prepared by a qualified professional for the Developer/Owner and Contractor prior to preparation of the NOI and the start of construction
☐ B. Erosion Control Plan provided with plans referencing city standard erosion control construction details. The note shall read as follows: *"All erosion control devices shall be constructed and maintained in compliance with City Standard Erosion Control Construction Details, sheets attached".* The appropriate sheet numbers shall be used in the notation.
☐ C. The grading plan shall be used as the erosion control base with all drainage pattern flow arrows shown for site and adjoining properties and streets
☐ D. Provide the project site address
☐ E. Estimate and provide the total disturbed area in acres

- ☐ F. Provide a construction waste management plan and add note "Contractor shall police site regularly and keep site free of trash and construction debris"
- ☐ G. Provide a concrete truck washout area with location and standard detail if concrete pour work is involved
- ☐ H. Provide a legend of proposed erosion control devices
- ☐ I. If the total disturbed area is 10 acres or greater, provide a sedimentation basin with location and design construction details
- ☐ J. Include City of Grand Prairie standard construction details and special BMP details
- ☐ K. Wattles for Erosion Control allowed only by written permission of the City Engineer
- ☐ L. Comply with the current City Requirements for "Erosion Control Plans for Developments" as posted on the Engineering Department web site, address given below
  https://www.gptx.org/Departments/Engineering/Drainage-and-Stormwater-Management

**XIII. STREET LIGHTING:**

- ☐ A. Existing street lights with type and wattage shown
- ☐ B. New street lights with type and wattage shown *(Coordinate with ONCOR)*
- ☐ C. Street lights shown at all intersections and with spacing:
  **Residential < 500'** **Arterials < each roadway**
  **Minor Arterials < 400' (< 280' desirable)** **Commercial / Industrial < 400' (<280' desirable)**
- ☐ D. Plan size Scale: 1" = 100' Horizontal

**XIV. PERMITS AND BONDS (Note; All may not apply):**

- ☐ A. Texas Department of Transportation (TxDOT) )
- ☐ B. Corps of Engineers (404 and Wetland Permits)
- ☐ C. Federal Emergency Management Agency (FEMA)
- ☐ D. Storm Water Pollution Prevention Plan (SWPPP)
- ☐ E. Texas Commission on Environmental Quality (TCEQ)
  1. Small Construction Activity – Signed Construction Site Notice (CSN) submitted to City prior to construction
  2. Large Construction Activity – NOI submitted by prime contractor in advance of all earth disturbing activity to TCEQ with NOI and CSN copy to City
- ☐ F. Trinity River Authority (TRA)
  1. Point Of Entry (POE) Permit
  2. Permit to work within their easements
- ☐ G. Corridor Development Certificate (NCTCOG/COE)
- ☐ H. Floodplain Development Permit (City)
- ☐ I. City of Grand Prairie Earthwork Permit
- ☐ J. Public Works Construction Permit- Paving
  Public Works Construction Permit- Utilities
- ☐ K. City of Grand Prairie Building Permit
- ☐ L. Electric transmission lines and petroleum/gas pipelines crossings

**XV. GENERAL INFORMATION:**

- A. All work shall be performed using the State Plane Coordinate System 1983 Projections, using the North American 1983 (NAD83) Datum (referenced ellipsoid GRS80) Texas North Central Zone.
- B. City of Grand Prairie Cad Standards, Title Sheet, General Notes, Paving, Water, Wastewater, Storm Drain, SWPPP and other miscellaneous Standard Construction Details can be downloaded from City's FTP site at:
  **https://www.gptx.org/engineering-standards**
- C. Street marker Fees-Paid Prior to final plat recording.
- D. A separate clearing and grubbing and earthwork permit is required with payment of fee and approval of grading and erosion control plans if earth disturbing activities is to be done ahead of construction and building permit.
- E. Escrow fees and Pro-rata fees - Paid Prior to final plat recording (For Water, Wastewater, Street, Etc.)
- F. Developer Participation Agreement - Submit prior to Final Plat for City Council Approval – (Funds paid by City per the executed agreement or upon Project Acceptance)
- G. Impact fees, meter, and tap fees shall be due at time of Building Permit.
- H. Pro-Rata Agreement - Submit after project acceptance.