City of New Braunfels
Construction Plan Set and Report Requirements

2019

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1 Introduction

1.1 Purpose

The purpose of this document is to provide construction plan sheet and report requirements for public infrastructure permitted through the City of New Braunfels including capital improvements and public improvements associated with platting. The requirements provide:

- Clarification of construction plan set and report requirements;
- Consistency in construction plan set and report development;
- Expedited construction plan set and report review and approval; and
- An accurate record for future reference.

A consistent and uniform construction plan set also allows for construction inspector and contractor teams to oversee and perform construction efficiently and accurately.

Capital improvements are defined as public infrastructure prepared and constructed by the City of New Braunfels or utility providers. Capital improvements may include streets, sidewalks, water systems, wastewater systems, and stormwater projects.

Public improvements are defined in the City of New Braunfels Code of Ordinances and mean facilities, infrastructure and other appurtenances which serve a public purpose in providing a needed service or commodity. Required public improvements may include, but shall not be limited to, street construction, including any necessary median openings and left turn lanes on major thoroughfares; water lines and pumping stations; sanitary sewer lines and lift stations; storm drainage structures and storm water management devices; water quality and erosion controls; and any required public sidewalks, street lights and street name signs. Construction plans are defined as drawings and technical specifications, providing a graphic and written description of the character and scope of the work to be performed in construction of a subdivision.

All construction plans and reports shall be prepared, signed and sealed by registered professional engineer in accordance with the Texas Engineering Practice Act and Rules. Construction plans, reports and specification shall be prepared in accordance good engineering practice and conform to the standards established by the city. The responsibility for the design is with the engineer of record.

1.2 Applicability

The requirements apply to all public infrastructure projects permitting through the City of New Braunfels including capital and public improvements.

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2 Construction Plan Set

The following information is intended to assist in the preparation, review and approval of construction plans for public infrastructure permitted by the City of New Braunfels. The information listed under each plan sheet is required and should be shown on the respective sheets. Additional sheets may be required by the engineer of record.

2.1 Construction Plan Sheet Sequence

The following plan sheet sequence is required for all construction plans.

1. Cover Sheet
2. General Notes
3. Estimate, Quantity and Summary Sheets (Capital Improvements)
4. Subdivision Masterplan (Public Improvements)
5. Subdivision Plat (Public Improvements)
6. Temporary Traffic Control Plan
    - 6.1. Traffic Control Plan Sheets
    - 6.2. Standards
7. Roadway Details
    - 7.1. Roadway Plan and Profile Sheets
    - 7.2. Roadway Typical Sections
    - 7.3. Intersection Details
    - 7.4. Driveway Details
    - 7.5. Pavement Design Details
    - 7.6. Miscellaneous Details
    - 7.7. Standards
8. Traffic Items
    - 8.1. Signing and Pavement Marking Plan Sheets
    - 8.2. Traffic Signal Sheets
    - 8.3. Standards
9. Drainage Details
    - 9.1. Pre-Development Drainage Area Map
    - 9.2. Post-Development Drainage Area Map
    - 9.3. Hydraulic Calculation Sheets
    - 9.4. Culvert Layouts
    - 9.5. Drainage Plan and Profile Sheets
    - 9.6. Detention/Retention Sheets
    - 9.7. Water Quality Sheets
    - 9.8. Miscellaneous Details
    - 9.9. Standards
10. Grading Plan
11. Utilities

11.1. Water System Plan Sheets
11.2. Wastewater System Plan and Profile Sheets
11.3. Standards (for each utility type)

12. Environmental Sheets
    12.1. Storm Water Pollution Prevention Plans
    12.2. Erosion Control Standards
13. Miscellaneous Items
    13.1. Bridge Details and Standards
    13.2. Retaining Wall Details and Standards
    13.3. Removal Sheets
    13.4. Landscaping and Irrigation Sheets

2.2 Construction Plan Sheet Contents

The following information shall be shown on all plan sheets:

- North arrow, scale and legend
- Title block, title and sheet number
- Engineer's seal with signature and date
- Approved street names for all existing and proposed streets
- Project or subdivision boundary
- Limits of existing and proposed flood hazard areas

The following subsections provide an outline and describe the information that must be provided in the construction plan set. Some of information may not be applicable depending on the project.

2.2.1 Cover Sheet

- Project name, legal description, address or location, and type of plans
- Provide contact information for owner, developer and engineer
- Engineer's seal with signature and date
- Location map with north arrow and scale
- Index of sheets in the order provided
- The following notes:
    - ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER OF RECORD. IN ACCEPTING THESE PLANS, THE CITY OF NEW BRAUNFELS MUST RELY UPON THE ADEQUACY OF THE WORK OF THE ENGINEER OF RECORD.
    - IF CONSTRUCTION HAS NOT COMMENCED WITHIN ONE-YEAR OF CITY APPROVAL FOR CONSTRUCTION INSPECTION, THAT APPROVAL IS NO LONGER VALID.
    - GAS UTILITIES ARE NOT INCLUDED IN THE CIVIL CONSTRUCTION PLANS. FINAL GAS UTILITY DESIGN SHALL BE APPROVED BY THE CITY FOR ANY WORK WITHIN PUBLIC RIGHT-OF-WAY.
- Notes indicating the following:
    - Type of development drainage category (Type 1, 2, or 3)

- FEMA defined flood hazard area in which the project is located with the effective FIRM panel number and date
- Edwards Aquifer jurisdictional zone (Recharge, Transition, Contributing), if any, the project is in

2.2.2 General Notes

- City of New Braunfels Engineering Division Construction Plan Notes (*latest version on website*)
- Sequence of Construction (include construction phasing, temporary traffic control and installation and removal of storm water best management practices)
- Notes required by other regulatory agencies
- Project specific notes as deemed necessary by engineer of record

2.2.3 Estimate, Quantity and Summary Sheets (Capital Improvements)

2.2.4 Subdivision Master Plan (Public Improvements)

- Copy of approved or current master plan (for plans associated with platting)
- The following master plan information:
  - Status: submitted for review, preliminary, final
  - Status Date: submitted date or approval date
  - Revisions: list, clouded, or additional redline sheet

2.2.5 Subdivision Plat (Public Improvements)

- Copy of Approved Plat or Current Plat (for plans associated with platting)
- The following plat information:
  - Status: submitted for review, preliminary, final
  - Status Date: submitted date or approval date
  - Revisions: list, clouded, or additional redline sheet

2.2.6 Temporary Traffic Control Plan

- Traffic Control Plan Sheets
  - Channelization device type, locations, and spacing
  - Traffic barricades
  - Detour routes and signing
  - Flagger locations
  - Message boards
  - Phasing plan
- Standards

2.2.7 Roadway Details

- Roadway Plan and Profile Sheets
  - Plan View
    - Horizontal alignments with points of curvature, points of tangency and curve data labeled
    - Existing and proposed contours

        - Right-of-way width
        - Street pavement width
        - Curb radii for curb returns, knuckle sacs, cul-de-sacs, etc.
        - Spot elevations around cul-de-sacs and along washout crowns
        - Sight triangles at street intersections
        - Sidewalk layout and construction plan
        - Pedestrian curb ramp type
        - Drainage and utility crossing locations
        - End of roadway markers and header curbs at street stub-outs
    - Profile View
        - Vertical alignment including PVC, PVI, PVT, crest/sag location, curve length, algebraic grade difference, and "K" values
        - Existing and proposed ground profile at center line, right-of-way, and top of curb
        - Drainage and utility crossing locations and elevations
- Roadway Typical Sections
    - Right of way width
    - Pavement width
    - Pavement cross section
    - Sidewalk location and dimensions
    - Note referencing geotechnical report
- Intersection Details
- Driveway Details
- Pavement Design Details
- Miscellaneous Details
- Standards
    - Curb and Gutter
    - Driveway
    - Sidewalk
    - ADA Ramp

2.2.8 Traffic Items

- Signing and Pavement Marking Plan Sheets
    - Signs (type, size, TMUTCD code designation, etc.)
    - Pavement markings (type, color, size, etc.)
    - Sign mounting details
    - Sidewalk ramp locations and type
- Traffic Signal Sheets
    - Estimate and quantity sheet
    - Existing traffic control
    - Proposed traffic control
    - Elevation sheets

        - Traffic signal elevation
        - Utility elevation
    - Detail sheets
        - Poles
        - Ground boxes
        - Wiring diagrams
        - Conduit and conductor tables
        - Detectors
        - Foundations
        - Down-guys
        - Signal head mounting details
        - Signal phasing
    - Specifications
- Standards

2.2.9 Drainage Plans

- Pre-Development Drainage Area Map
    - Existing contours
    - Existing drainage infrastructure (pipes, channels, ponds, inlets, etc.)
    - Drainage easements on and adjacent to site
    - Watershed delineations
    - Off-site areas contributing to the site
    - Time of concentration paths
    - Flow arrows
    - Drainage area calculations summary
    - Points of discharge (points where flow exits property)
    - Flow summary table at each point of discharge
- Post-Development Drainage Area Map
    - Existing contours
    - Proposed contours
    - Existing drainage infrastructure (pipes, channels, ponds, inlets, etc.)
    - Proposed drainage infrastructure (pipes, channels, ponds, inlets, etc.)
    - Drainage easements on and adjacent to site
    - Watershed delineations
    - Off-site areas contributing to the site
    - Flow arrows
    - Time of Concentration paths
    - Drainage area calculations summary
    - Points of discharge
    - Flow summary table at each point of discharge
    - Comparison of flows to Pre-Development conditions
- Drainage Infrastructure Plans (storm sewer, channels, culverts)

    - Plan View
        - Existing contours
        - Proposed contours
        - Right-of-way, easements, etc.
        - Horizontal layout of infrastructure
        - Inlet/manhole/headwall locations
        - Access ramps/paths
    - Profile View
        - Utility crossings
        - Hydraulic grade line for 25- and 100-yr events
        - Slopes
        - Flow line elevations
        - Profile of existing grade at centerline
        - Profile of proposed grade at centerline
        - Vertical layout of infrastructure including flowlines
        - Cross section or pipe size (indicate depth of channel)
        - Pipe material
        - Energy dissipation
    - Calculations (on plans)
        - Discharge (all required frequencies)
        - Velocity (2-yr, design, and check)
        - Flow Depth (2-yr, design, and check)
- Detention/Retention Plan
    - Existing contours
    - Proposed contours
    - Maintenance access (minimum 12-feet wide with maximum 6:1 slope)
    - 100-year water surface elevation with 1-foot freeboard
    - Stage, storage, and discharge summary table (2-yr, 10-yr, 25-yr, and 100-yr events)
    - Spillway, weir, and outlet details, size, specifications, and location
    - Vegetation requirements
    - Concrete pilot channel with a minimum slope of 0.25% to convey runoff from entry points to outlet
    - Cross sections indicated side slopes
- Water Quality Plan
    - Calculations for minimum extended detention volume, water quality volume, and water quality volume with safety factor
    - Flow path for detention filtration
    - Orifice details and sizing calculations
    - Existing contours
    - Proposed contours
    - Maintenance access
    - Cross sections indicated side slopes

- Drainage Details
    - Maintenance schedule for all infrastructure types

2.2.10 Grading Plan

- Grading Plan
    - Existing contours
    - Proposed contours
    - Finished floor elevations for buildable lots adjacent to stormwater conveyance systems
    - Survey control information: benchmarks, permanent monuments, and control points
    - Flow arrows, high points, low points, etc.
    - Existing and proposed drainage features
    - Retaining walls
- Compaction requirements
- Note stating:
  STRIPPING OF VEGETATION FROM PROJECT SITES SHALL BE PHASED SO AS TO EXPOSE THE MINIMUM AMOUNT OF AREA TO SOIL EROSION FOR THE SHORTEST POSSIBLE PERIOD OF TIME PER THE NEW BRAUNFELS DRAINAGE AND EROSION CONTROL DESIGN MANUAL SEC.12.2(N).

2.2.11 Utility Plans

All proposed water or wastewater service plans and specifications shall be prepared in accordance with utility provider requirements. At minimum, the City of New Braunfels requires the following:

- Water and Wastewater System Layouts
    - Front lot line dimensions
    - Roadway names and widths
    - Lot and block numbers
    - Layout of facilities
    - Location of appurtenances
- Wastewater Profiles
    - Station numbers
    - Existing ground line
    - Proposed ground line
    - Flow line elevations at manholes
    - Pipe slopes
    - Manhole and cleanout locations
- Notes on all utility plan sheets stating:
    - ALL UTILITIES TO BE CONSTRUCTED PRIOR TO STREETS.
    - NO VALVES, HYDRANTS, CLEANOUTS ETC. SHALL BE CONSTRUCTED WITHIN CURBS, SIDEWALKS, OR DRIVEWAYS.
    - The Utility Trench Compaction Note from the City of New Braunfels Engineering Division Construction Plan Notes (*latest version on website*).

- If the project includes trench depths greater than five feet, note stating:
  THIS PROJECT INCLUDES UTILITY INSTALLATIONS GREATER THAN 5-FEET IN DEPTH LOCATED IN PUBLIC RIGHT-OF-WAY OR EASEMENTS. DEEP TRENCHES POSE COMPACTION TESTING AND CONSTRUCTION CHALLENGES AND CITY METHODS FOR TESTING AND COMPACTION MAY NOT BE ACHIEVABLE. A UTILITY COMPACTION PLAN WILL BE REQUIRED AND MUST BE SUBMITTED FOR APPROVAL TO CITY PRIOR TO UTILITY INSTALLATION.

2.2.12 Environmental Sheets

- Storm Water Pollution Prevention Plans
  - Existing and proposed drainage infrastructure
  - Existing and proposed contours
  - Staging, storage, and spoils locations
  - Erosion control measures: silt fence, inlet protection, rock berms, seeding, temporary construction entrances, etc.
  - Limits of disturbed area
  - Adequate erosion control measures provided at all locations where runoff leaves the site, around the staging and storage location, pond spillways, pilot channels, and at upstream side of pond discharge locations
  - Note stating:
    PER TPDES REQUIREMENTS, DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITIES HAVE CEASED (TEMPORARILY OR PERMANENTLY) SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITY RESUMES WITHIN 21 DAYS. SEEDING DOES NOT CONSTITUTE AS STABILIZATION.
- Erosion Control Standards
  - Maintenance specifications and schedule

3 Reports

The following information is intended to assist in the preparation, review and approval of reports required for public infrastructure permitting in the City of New Braunfels. The information listed under each report is required and should be provided within the report. Additional information may be required by the engineer of record.

3.1 Drainage Report

Requirements for Drainage and Water Quality Reports are identified in the New Braunfels Drainage and Erosion Control Design Manual and supported by City Code of Ordinances.

All drainage and water quality reports are required to include the following:

- Engineer's seal with signature and date
- Name of project and location

3.1.1 Description of methodology and assumptions

- Project summary
- Hydrology methodology description

3.1.2 Hydrology

- Pre-Development Drainage Area Map
    - Existing contours
    - Existing drainage infrastructure (pipes, channels, ponds, inlets, etc.)
    - Drainage easements on and adjacent to site
    - Watershed delineations
    - Off-site areas contributing to the site
    - Time of concentration paths
    - Flow arrows
    - Drainage area calculations summary
    - Runoff Coefficient "C" Value/Curve Number computations and breakdown
    - Points of discharge (points where flow exits property)
    - Flow summary table (2-yr, 10-yr, 25-yr, 100-yr) at each point of discharge
- Post-Development Drainage Area Map
    - Existing contours
    - Proposed contours
    - Existing drainage infrastructure (pipes, channels, ponds, inlets, etc.)
    - Proposed drainage infrastructure (pipes, channels, ponds, inlets, etc.)
    - Drainage easements on and adjacent to site
    - Watershed delineations
    - Off-site areas contributing to the site
    - Flow arrows
    - Time of Concentration paths

- Drainage area calculations summary
- Runoff Coefficient "C" Value/Curve Number computations and breakdown
- Points of discharge consistent with predevelopment to ensure impact assessment
- Flow summary table (2-yr, 10-yr, 25-yr, 100-yr) at each point of discharge
- Comparison of flows to Pre-Development conditions

3.1.3 Hydraulics

- Street design
  - Capacity calculations
    - 100-yr within the right-of-way and maximum depth
    - 10-yr water spread limit
  - Intersection inundation (if applicable)
  - 10-yr water spread width
  - 100-yr water surface elevation
- Inlet design
  - Capacity and sizing calculations
  - Carryover flow
  - Intercepted flow
  - Inlet Length
  - Ponded width
- Storm sewer design
  - Velocity (25-yr, 100-yr check)
  - Capacity calculations (25-yr design, 100-yr check)
  - Hydraulic grade line for 25-yr and 100-yr event
- Channel design
  - Channel geometry
  - Channel cross-sections
  - 25-yr event water surface elevation
  - 100-yr event water surface elevation
  - Required freeboard (per Sec. 2.3 Table 2-2 of the NB DECDM)
  - Velocities (2-yr, 25-yr, 100-yr)
- Culverts and Bridges
  - Velocity (2-yr, 25-yr and 50-yr design,100-yr check)
  - Headwater depth (25-yr, 50-yr, 100-yr)

3.1.4 Mitigation

- Description of mitigation
- Description of water quality requirements
- Detention design
  - Stage-storage-discharge table (2-yr, 10-yr, 25-yr, 100-yr)
  - Water surface elevations (2-yr, 10-yr, 25-yr, 100-yr)
  - Freeboard

    - Hydrographs
    - Outlet, weir, and spillway sizing and velocity
    - Emergency spillway calculations for 25-yr storm with clogged outfall
- Water quality design
    - Water Quality Site Plan with impervious cover assumptions
    - Required water quality volume
    - Provided water quality volume

3.2 Geotechnical Report

Geotechnical reports are required for structural pavement design for all streets, public and private, and include the following:

- Engineer's seal with signature and date
- Name of project and location

3.2.1 Exploration Procedures

- Subsurface exploration procedures
- Laboratory testing

3.2.2 Exploration Results

- Site conditions
- Regional geology
- Soil conditions
- Groundwater observations

3.2.3 Analysis and recommendation

- Pavement design criteria
- Pavement design recommendations
- Limitations
- CBR results
- Boring logs

3.3 Stormwater Maintenance Report

Maintenance of stormwater improvements in the City of New Braunfels are governed City Code of Ordinances. Additionally, the Drainage and Erosion Control Manual requires a maintenance schedule submitted with construction plans for all stormwater public improvements. The schedule shall be in report format and include the following:

- Engineer's certification that the maintenance schedule accounts for design limitations and constraints.
    - If deviations from standard code criteria are requested, additional maintenance may be deemed necessary.
- Vegetation management to prevent obstruction of stormwater flows
    - Routine inspection to maintain vegetation height below 18"

    - Standard mowing schedule to maintain appropriate vegetation height
    - Routine inspection and removal of woody vegetation
    - Ensure vegetation remains stable to prevent erosion, seeding and watering may be required
- Sedimentation accumulation management to maintain positive drainage and design flow
    - Routine inspection after storms and periodically to ensure flow lines, outlets, and areas downstream are free from drainage obstruction
    - Removal of accumulations when capacity and/or flow is restricted
- Obstruction removal to maintain positive drainage and design flow
    - Routine inspection after storms and periodically to ensure flow lines, outlets, and areas downstream are free from drainage obstruction
    - Removal of accumulations when capacity and/or flow is restricted
- Debris removal
    - Routine inspection schedule
    - Removal and disposal of debris
- Erosion control
    - Routine inspection schedule