

The following document is a guide for the preparation of plan submittals and is intended to aid in consistent plan reviews.
Please note that site-specific conditions may warrant requirements that are not contained within this document.

Engineering Department Water and Sewer Review Check List

Project: _____
 Owner: _____
 Engineer: _____

YES	NO	N/A	GENERAL SUBMITTAL REQUIREMENTS		PAGE
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	This checklist filled out and submitted with plans	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2	Name of Project (w/ Phase #, Section #, or Map #).	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3	PID# of parcel(s) within project boundaries and adjacent to the project.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	Name, address of Developer, and contact person with phone number.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5	Name and address of Engineer.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6	Sheet size to be 24" x 36".	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7	Date of Drawing / Revisions.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8	Clear vicinity sketch (include adjacent streets and North arrow)	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9	Legend	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10	North Arrow (all applicable sheets).	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11	Signature and seal of NC Professional Engineer on every sheet.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12	Lot layout (building layout if multi-family) with dimensions.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13	Lot numbers.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14	A plan view is required for all profile drawings (on the same sheet).	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15	The plan view is to be at the top and the profile is to be at the bottom of the sheet and shown in the same direction.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16	Plan/Profile scale (no less than 1"=40' HORIZ., 1"=4' VERT).	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17	Elevations shall be labeled in 10' intervals on heavy lines (use 1' intermediate grid line intervals).	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18	Plan & profile view data must match.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	19	Match lines (w/station numbers on each sheet).	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20	Include overall utility plan sheet (with summary of w/s lines by size and length, # MH's & F/H's).	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	21	Bench mark location and datum to be described with true elevations (clearly label on overall plan sheet).	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	22	Show existing grade on all profiles.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	23	All dimensions must be legible.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	24	All labels shall be horizontal or vertical (bottom of label to bottom or right side of sheet).	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	25	Show all existing and proposed utility easements with dimensions.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	26	Maintain proper horizontal separation between water, sanitary sewer, and other utilities.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	27	Other utility crossings shown in profile view with proper vertical separation (dimension separation @ crossings).	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	28	Evaluate all water and sewer taps for utility crossing conflicts.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	29	Evaluate future practical maintenance access to utilities.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	30	Show 100 year flood plain data (fringe line, elevation, floodway, and FEMA panel number).	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	31	Show delineated wetlands.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	32	Clearly indicate project phase lines (include gate valve, temporary blow-off, temporary turn-around as required).	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	33	Detailed grading plan utilizing 1' contours for width of W/S easements.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	34	Street layout (w/names and R/W widths).	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	35	Pavement width on plan view (back of curb to back of curb).	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	36	Typical roadway section (on at least 1 utility profile sheet).	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	37	Sidewalk location on plan view.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	38	Show and note both water and sewer taps to be installed by developer, regardless of project scope.	

YES	NO	N/A	WATER LINE INFORMATION			PAGE
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	39	Water line located on the North and East sides of the street.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	40	Water line designed at minimum depth (36" if < 10" diameter, 42" otherwise)		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	41	Water line deeper than 5' requires approval from Two Rivers Utilities on a case-by-case basis		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	42	Provide plan/profile for all waterlines regardless of size.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	43	Size & type of water line in both plan and profile views.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	44	Evaluate the need for vertical and horizontal bends.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	45	Length of main between fittings on plan view.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	46	List all fittings or appurtenances (size and type) on plan view with station number.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	47	Depth of water line (shown on profile).		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	48	Show water meter locations.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	49	Dimension and depict water line in proper location (4.5' boc or 8' when using a 6' planting strip).		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	50	Reduction in waterline sizes to utilize reducer (in lieu of T/2 plug).		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	51	Proper fire hydrant spacing. (500' apart max., 250' from end of street, and at all intersections).		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	52	Private fire hydrants to be painted yellow.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	53	Gate valves @ all intersections.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	54	Evaluate the need for air release valves (10' elevation change).		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	55	Blowoff needed if no fire hydrant within 50' of end of line.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	56	Note if restraining or blocking will be utilized at T's and bends. Show lengths if restraining.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	57	Show DIP encasement pipe and restraint at bore. Ensure blocking at Tee doesn't encroach.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	58	Waterlines to have bends where radiuses are tighter than (PVC 1,200' - DIP<14" 250' - DIP 14"-36" 400' DIP>36 Engineer Reference)		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	59	Provide water main calcs.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	60	Polywrap required if within 10' of metal gas line.		
YES	NO	N/A	SEWER LINE INFORMATION			PAGE
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	61	Size & type of sewer line in both plan and profile views.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	62	Grade of sewer line in profile view (minimum 0.6%, maximum 10.0%).		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	63	Number of sewer connections	Min. Slope PVC	Min. Slope DIP
				10 or less	2%	3%
				20 or less	1.2%	1.8%
				30 or less	1%	1.4%
				40 or less	0.8%	1.2%
				50 or less	0.7%	1%
				60 or less	0.6%	0.9%
				80 or less	0.6%	0.8%
				100 or less	0.6%	0.7%
				If a proposed line has more than 100 connections, both PVC and DIP can be installed at City minimum of 0.6%		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	64	Invert elevations in profile view.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	65	Manholes shown by manhole and station numbers in plan and profile views.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	66	Length of main between manholes in plan and profile views, (Max 350')		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	67	Manhole rim elevations in plan and profile view.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	68	Minimum drop "across" manhole of 0.2'.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	69	Sewer inverts of different diameters shall match crowns.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	70	Minimum ground cover of 36" for all types of sewer line other than ductile iron.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	71	Minimum ground cover of 30" if Ductile Iron and in roadway.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	72	Outside drop manholes required for drops over 2.5'.		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	73	"Shade" DIP on profiles.		

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	74	Manhole depths greater than 14' require 5' diameter manhole sections (label in plan/profile).	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	71	Sewer mainline depth greater than 14' in street requires tees/wyes instead of saddles. Add note!	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	72	Sewer mainline depth greater than 14' in street requires DIP for mainline and also service connections.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	73	Show sanitary sewer tap locations.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	74	If piers are required, city standard detail cited.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	75	Location of piers by stations	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	76	Top of footing to be located a minimum of 1' below the invert of the creek (label elevation).	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	77	"Show" piles in profile view.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	78	Show location, size, length, type, and depth of force main.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	77	Force Main to be designed at 5' depth and 5' inside edge of pavement where applicable	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	78	Label all sealed manholes, show vents in profile view with vent elevation (2' above 100 year elevation).	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	79	All manholes to be 2' above 100 year flood elevation unless sealed.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	80	Minimum 30' GDUE required for SS outside of street R/W.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	81	DIP for sewer in fill sections.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	82	Include sanitary sewer pipe sizing calculations for more than 2,500 bedrooms.	
YES	NO	N/A		FLOOD STUDY INFORMATION	PAGE
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	83	Completed FEMA application form MT1/2.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	84	Narrative on project and submittal explaining any adjustments, revisions, or omissions to any models.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	85	Hydrologic computations along with digital files of computer models.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	86	Hydraulic computations along with digital files of Duplicate Effective, Corrected Effective, and Proposed models used.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	87	Certified topographic map with floodplain, floodway, and cross-section delineations.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	88	Annotated FEMA FIRM and/or FBFM to reflect changes due to project.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	89	Engineers "no-rise" certification.	
YES	NO	N/A		OTHER ITEMS:	PAGE
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	90	Land Development application submitted.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	91	All utility applications submitted (water/sewer/contract, etc.).	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	92	Approved Erosion Control Plan and permit.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	93	Temporary construction and/or off-site easement deeds submitted.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	94	R/W documentations for all off-site street improvements.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	95	NCDOT driveway permit and encroachment applications.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	96	Private utility encroachments as required. (Duke Power, AT&T, PSNC, Bell South, Colonial, etc.)	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	97	Wetlands delineation map and associated permit(s).	
YES	NO	N/A		COVER SHEET NOTES:	PAGE
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	98	THE FIELD INSPECTOR, WITH APPROVAL FROM THE CITY ENGINEER, SHALL HAVE THE AUTHORITY TO REQUIRE ADDITIONAL RIP-RAP ALONG DRAINAGE AREAS WHERE WARRANTED BY POSSIBLE EROSION OR WHERE DRAINAGE AREAS CROSS OTHER UTILITIES.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	99	In case of conflict, City of Gastonia specifications and details shall prevail and the City Engineer or their representative shall be the final arbiter of said conflict.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	100	NOTE: Construction <u>SHALL NOT</u> begin prior to a preliminary construction inspection of the site. Contact the Construction Engineer / Right-of-Way Administrator at (704) 866-6015 at least one (1) working day prior to beginning construction. All construction to conform to a site plan approved by the City Engineer and Planning Director.	
YES	NO	N/A		NOTES:	PAGE
				SEWER	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	101	Contractor to provide video of completed sanitary sewer as required by the COG.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	102	Contractor is to provide compaction testing for the installation of all sanitary sewer lines in fill areas.	
				WATER	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	103	Contractor to coordinate water & sewer taps to minimize conflicts with driveways. (watermeters are not to be located in driveways).	

Reviewed By: _____

Date: _____