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

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

☐	☐	☐	74	Manhole depths greater than 14' require 5' diameter manhole sections (label in plan/profile).	
☐	☐	☐	71	Sewer mainline depth greater than 14' in street requires tees/wyes instead of saddles. Add note!	
☐	☐	☐	72	Sewer mainline depth greater than 14' in street requires DIP for mainline and also service connections.	
☐	☐	☐	73	Show sanitary sewer tap locations.	
☐	☐	☐	74	If piers are required, city standard detail cited.	
☐	☐	☐	75	Location of piers by stations	
☐	☐	☐	76	Top of footing to be located a minimum of 1' below the invert of the creek (label elevation).	
☐	☐	☐	77	"Show" piles in profile view.	
☐	☐	☐	78	Show location, size, length, type, and depth of force main.	
☐	☐	☐	77	Force Main to be designed at 5' depth and 5' inside edge of pavement where applicable	
☐	☐	☐	78	Label all sealed manholes, show vents in profile view with vent elevation (2' above 100 year elevation).	
☐	☐	☐	79	All manholes to be 2' above 100 year flood elevation unless sealed.	
☐	☐	☐	80	Minimum 30' GDUE required for SS outside of street R/W.	
☐	☐	☐	81	DIP for sewer in fill sections.	
☐	☐	☐	82	Include sanitary sewer pipe sizing calculations for more than 2,500 bedrooms.	
YES	**NO**	**N/A**		**FLOOD STUDY INFORMATION**	**PAGE**
☐	☐	☐	83	Completed FEMA application form MT1/2.	
☐	☐	☐	84	Narrative on project and submittal explaining any adjustments, revisions, or omissions to any models.	
☐	☐	☐	85	Hydrologic computations along with digital files of computer models.	
☐	☐	☐	86	Hydraulic computations along with digital files of Duplicate Effective, Corrected Effective, and Proposed models used.	
☐	☐	☐	87	Certified topographic map with floodplain, floodway, and cross-section delineations.	
☐	☐	☐	88	Annotated FEMA FIRM and/or FBFM to reflect changes due to project.	
☐	☐	☐	89	Engineers "no-rise" certification.	
YES	**NO**	**N/A**		**OTHER ITEMS:**	**PAGE**
☐	☐	☐	90	Land Development application submitted.	
☐	☐	☐	91	All utility applications submitted (water/sewer/contract, etc.).	
☐	☐	☐	92	Approved Erosion Control Plan and permit.	
☐	☐	☐	93	Temporary contruction and/or off-site easement deeds submitted.	
☐	☐	☐	94	R/W documentations for all off-site street improvements.	
☐	☐	☐	95	NCDOT driveway permit and encroachment applications.	
☐	☐	☐	96	Private utility encroachments as required. (Duke Power, AT&T, PSNC, Bell South, Colonial, etc.)	
☐	☐	☐	97	Wetlands delineation map and associated permit(s).	
☐	☐	☐	98	Submit copy of Private Sewer permitting if applicable.	
YES	**NO**	**N/A**		**COVER SHEET NOTES:**	**PAGE**
☐	☐	☐	99	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.	
☐	☐	☐	100	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.	
☐	☐	☐	101	NOTE: Construction SHALL NOT 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	
☐	☐	☐	102	Contractor to provide video of completed sanitary sewer as required by the COG.	
☐	☐	☐	103	Contractor is to provide compaction testing for the installation of all sanitary sewer lines in fill areas.	
				WATER	
☐	☐	☐	104	Contractor to coordinate water & sewer taps to minimize conflicts with driveways. (watermeters are not to be located in driveways).	

Reviewed By: _____ Date: _____