



WASTEWATER COLLECTION SYSTEM EXTENSION OR MODIFICATION APPLICATION

INSTRUCTIONS FOR FORM: WWEMA 09/03

The City of Concord will not accept this application unless all of the following instructions are adhered to: Prior to the submittal of an application package for wastewater collection system extension/modification, the engineering plans and specifications shall be approved through the appropriate technical review process as required by the Director of Engineering and defined by the City of Concord Unified Development Ordinance Article 3 and 6. Plans and specifications must be prepared in accordance with 15A NCAC 2H .0200, the State of North Carolina's *Gravity Sewer Minimum Design Criteria*, the Water and Sewer Authority of Cabarrus County's *Standard Specifications for Wastewater Collection and Water Distribution Construction for Cabarrus County*, the City of Concord Code of Ordinances, the Concord Regional Water Resources' *Water and Sewer Policy and standard specifications*, and good engineering practices.

A. Cover Letter (All Application Packages):

- Submit a cover letter, which lists all items and attachments included in the application package as well as a brief project description.
- If necessary for clarity, include attachments to the application form. Such attachments will be considered part of the application package and should be numbered to correspond to the section to which they refer.

B. Application Form (All Application Packages):

- Submit one original and one copy of the completed and appropriately executed application form. Any changes made to this form will result in the application being returned. The City of Concord will only accept application packages that have been fully completed and executed.
- The project name should be consistent with the project name on the plans, specifications, flow acceptance letters, etc.
- If this project involves a modification of an existing permit, submit one copy of the existing permit.

C. Application Fee (All Application Packages):

- Submit a check made payable to the "City of Concord" in the amount as required by the current "City of Concord Fees and Charges Schedule."

D. Detailed Plans and Specifications (All Application Packages):

- Submit four (4) sets of detailed engineering plans and specifications signed, sealed, and dated by a N.C. Professional Engineer. Specifications may only be omitted if the following information or the equivalent is noted on each sheet of the plans: "All materials, equipment, labor, and workmanship is to be in accordance with and subject to the Water and Sewer Authority of Cabarrus County's standard specifications; the City of Concord's ordinances, policies, and standard specifications, and the North Carolina Administrative Code for wastewater collection and water distribution systems. In the event of conflict between the Water and Sewer Authority of Cabarrus County's standard specifications; the City of Concord's ordinances, policies, and standard specifications, or the North Carolina Administrative Code, the more restrictive requirements shall apply."
- Plans must include but shall not be limited to the following minimum items:
 - Wastewater collection system extensions and/or modifications shall be designed in accordance with all applicable federal, state, and local regulations and standards.
 - Engineering plans shall be submitted on 24-inch by 36-inch sheets with the approved City of Concord border and logo.
 - The horizontal scale shall be one inch equals 40 feet and the vertical scale shall be one inch equals 4 feet.
 - A general location map, a North arrow, plan and profile views of the sewer extension as well as the proximity of the sewer extension to other utilities and natural features, and detail drawings of all items pertinent to the sewer extension.

- Depict minimum separations on the plans, in accordance with 15A NCAC 2H .0219(i)(2)(G) and the City of Concord's ordinance, policies, and specifications. Clearly indicate on the plans, the sections where the minimum separations cannot be maintained and the ferrous pipe material is required.
 - Minimum cover over sewer extensions must also be shown clearly on the plans, in accordance with 15A NCAC 2H .0219(i)(2)(H) and the City of Concord's ordinance, policies, and specifications.
- The plans and specifications shall be labeled with the phrase: FINAL DESIGN. Plans and specifications must not be labeled with preliminary phrases (e.g., FOR REVIEW ONLY, NOT FOR CONSTRUCTION, etc.) that indicate that they are anything other than final plans and specifications.

E. **Map** (All Application Packages):

- Submit an 8.5-inch by 11-inch **color** copy of the portion of a 7.5-minute USGS Topographic Map along with this form. The map should clearly identify the entire project area location as well as the closest down slope surface waters. Each map portion must be labeled with the map name and number, the identified location of the sewer line and pump station, and be of clear and reproducible quality. Projects that traverse over or near several different waterbodies (or counties, basins, etc.), shall submit topographic maps for each different waterbody.
- Stream Classifications. Provide the stream classification for the closest down slope surface waters. Include all points that traverse over or are near different waterbodies (or counties, basins, etc.) For further assistance with determining watershed classification, contact the NCDENR Mooresville Regional at 704-663-1699 or the City of Concord Engineering Department for the guidance document entitled, "Determining Watershed Classifications for Form FTA 02/03 (Fast-Track Sewer Systems)." This document is also available on the NCDENR-Division of Water Quality's web site at <http://h2o.enr.state.nc.us/ndpu>. If approved by the Director or Engineering or his/her designee, a properly executed Water Classification Attachment Form, WSCA 10/99 may be accepted in place of this section.

F. **Engineering Calculations** (All Application Packages):

- Submit two copies of all design calculations that have been signed, sealed, and dated by a NC Professional Engineer.
- Calculations must include the minimum items required by 15A NCAC 2H .0200, the State of North Carolina's *Gravity Sewer Minimum Design Criteria* and the City of Concord's ordinance and policies:

Wastewater Collection Systems (All Application Packages):

- The design capacity and available capacity of each of the City's sanitary sewer lines and pump stations downstream of the proposed connection point shall be evaluated. This evaluation shall include a map of the City's wastewater collection system from the proposed project location to the point where the City's system connects to the Water and Sewer Authority of Cabarrus County's wastewater collection system. Using good engineering judgement, the design engineer shall estimate existing and potential (build out) flows using the acreage of the drainage area served and zoning information (type of allowable development) in conjunction with the daily design flows provided in the North Carolina Administrative Code.
- The diameters of downstream sanitary sewers and the capacities of downstream pump stations shall be verified. Downstream sanitary sewer lines shall have diameters equal to or greater than those upstream. If downstream sanitary sewer lines and pump stations do not have adequate capacity to accommodate the peak flow of the existing wastewater (along with the potential build out) and the estimated peak flow of the project served by the extension, then all necessary downstream sewer lines, pump stations, and appurtenances shall be upsized at the developer's expense. For connection to a gravity sewer, submit an evaluation of the gravity sewer based on peak flow from proposed project and peak flows already tributary to the existing gravity sewer. Provide calculations and detail how existing peak flows were determined.
- The hydraulics of the proposed manhole with the greatest slope differential (i.e., steep line entering the manhole and a flat line exiting the manhole) and the tie-in point of the existing system shall be evaluated to determine whether or not the wastewater will surcharge during peak flow conditions.

Wastewater Pump Station (All Pump Station Application Packages):

- Total dynamic head/friction calculations for all applicable pumping conditions shall be provided.
- The pump curve of each proposed pump shall be provided. A pump curve/system curve analysis, plotting total dynamic head versus capacity, shall be used to determine the pump selection and the operating range. System curves for the following conditions shall also be provided: system at the point of initial service (new), system at the end of service (aged), at the pump-on condition, at the pump-off condition, one pump operating, and multiple pumps operating. The efficiency of the pump(s) shall be at least 40% throughout the operating range. Provide manufacturer's information, and recommended installation guidelines.
- The number of times that the pump is activated during average daily flow and peak flow conditions shall be evaluated. The pump run time shall also be evaluated.
- Buoyancy protection calculations shall be provided for wastewater pump stations. Flotation calculations shall assume that the elevation of the groundwater is equivalent to the ground elevation and shall not include the weight of the pumps, internal piping and appurtenances, or wastewater.
- The available storage capacity of the wet well shall be calculated for the area between the pump-off elevation and the elevation of the lowest invert into the wet well.
- For connection to a pump station, submit an evaluation of the existing pump station to pump peak flow from proposed project and peak flows already tributary to the existing pump station. Provide calculations and detail how existing peak flows were determined.
- For connection to a force main, provide an evaluation of the existing force main based on peak flows from proposed project and peak flows already tributary to the existing force main. In addition, evaluate the ability of each pump station tributary to the existing force main to pump against additional head created by greater flows through the force

main. Evaluation may include alternate designs such as telemetry to coordinate pumping between pump stations (provided sufficient storage is available). Also, include an evaluation of the discharge point of the existing force main as described above.

Pump Station Reliability (All Pump Station Application Packages):

- If the pump station is to be supplied by a dual electrical source/feed, submit the following minimum information: a letter from the power supplier acknowledging that the pump station site will be supplied by two electrical sources.
- If an on-site (stand-by) generator is proposed for installation at the pump station, ensure that the plans and specifications detail the generator, the automatic transfer switch, and how these items interact with the pump station instrumentation/controls.
- If a portable (emergency) generator is proposed to fulfill power reliability requirements at the pump station, ensure that the plans and specifications detail the generator quick-connect receptacle, the manual transfer switch, and the telemetry provided as well as how this telemetry interacts with the pump station instrumentation and controls. In addition, submit a contingency plan which details the number of portable generators that the applicant has available for use at the proposed pump station, the number of other items these portable generators are expected to serve, and verification that the portable generators may be moved between items in a way that prevents any sanitary sewer overflows. The plan must also detail procedures for contacting personnel, the number of personnel available to respond to a power outage, and the predicted response time.
- If 15A NCAC 2H .0219(h)(3)(D) is intended to fulfill the power reliability requirement, ensure that the plans and specifications detail the storage time available above the high-water alarm as well as how a telemetry device will interact with the pump station instrumentation and control, and submit at least three years of power outage data from the power supplier for the electrical source from which the pump station will be supplied.

Maximum Depth of Cover (May be Required):

- Maximum depth cover for PVC pipe shall be limited to eighteen (18) feet. All PVC pipe with a proposed depth of cover exceeding twelve (12) feet shall require the submission of bearing capacity documentation and the supporting design calculations from the engineer. The documentation and design calculations shall adequately address the bearing capacity of the proposed PVC pipe and the pipe's ability to withstand the dead and live loads. The design shall include adequate documentation and the proposed standard detail, which adequately satisfies the bedding requirements for the pipe.
- Ferrous material shall be provided for all proposed water and sewer system extensions that have a depth of cover exceeding eighteen (18) feet. All ferrous pipe with a proposed depth of cover exceeding eighteen (18) feet shall require the submission of bearing capacity documentation and the supporting design calculations from the engineer. The documentation and design calculations shall adequately address the bearing capacity of the proposed ferrous pipe and the pipe's ability to withstand the dead and live loads. The design shall include adequate documentation and the proposed standard detail, which adequately satisfies the bedding requirements for the pipe.

G. Environmental Assessments (May be Required – See 15A NCAC 1C .0100):

Submit one copy of the Findings of No Significant Impact (FONSI) or Environmental Impact Statement (EIS). Also, include information on any mitigating factor(s) from the Environmental Assessment (EA) that impact the construction of the subject sewers. An EA may also be required for private systems if any public funds are used for the construction of the subject sewer.

THE COMPLETED APPLICATION PACKAGE, INCLUDING ALL SUPPORTING INFORMATION AND MATERIALS, SHOULD BE MAILED TO THE FOLLOWING ADDRESS: City of Concord - Engineering Department

By U. S. Postal Se
P.O. Box 308
Concord, NC 280368

By Courier/ceial Deliv
850 Warren C. Coleman Blvd.
Concord, NC 28026

TELEPHONE NUMBER: (704)920-2120 FACSIMILE NUMBER: (704)278-2186



PUMP STATIONS, FORCE MAINS, AND GRAVITY SEWERS

(THIS FORM MAY BE PHOTOCOPIED FOR USE AS AN ORIGINAL)

To be completed by the City of Concord			
Permit Application No:		Date Approved	
Project Number:		Date Received:	
Project Title:			

I. PROJECT INFORMATION:

1. Project name: _____
2. Brief project description defining the scope of the project: _____

3. Brief description of project location: _____
4. Fee submitted: \$ _____ (See Instruction C.)
5. Name and affiliation of contact person who can answer questions about application: _____

II. APPLICANT INFORMATION:

1. Applicant's name: City of Concord
2. Applicant's address: 850 Warren C. Coleman Blvd; Post Office Box 308
3. City: Concord State: North Carolina Zip: 28026-0308
4. Telephone number: (704) 920-5425 Facsimile number: (704) 786-4521
5. Owner's or signing official's name and title (15A NCAC 2H .0206(b)): _____
M. Sue Hyde, Director of Engineering

III. DEVELOPER INFORMATION:

1. Developer's name (corporation, individual, partnership, etc.): _____
2. Owner's or signing official's name and title (15A NCAC 2H .0206(b)): _____
3. Developer's address: _____
4. City: _____ State: _____ Zip: _____
5. Telephone number: (_____) _____ Facsimile number: (_____) _____

IV. PROFESSIONAL ENGINEER INFORMATION:

1. Professional Engineer name (firm, corporation, individual, partnership, etc.): _____
2. Professional Engineer of seal's name and title (15A NCAC 2H .0206(b)): _____
3. Address of engineering firm: _____
4. City: _____ State: _____ Zip: _____
5. Telephone number: (_____) _____ Facsimile number: (_____) _____

V. PERMIT INFORMATION:

1. Project is: _____ new; _____ modification
2. If this application is being submitted as a result of a modification to an existing permit, provide:
existing permit number _____ the issuance date _____
and a copy of the most current permit, the flow acceptance letter, and any corresponding certifications.
3. If project disturbs one acre or more, provide date when an erosion and sedimentation control plan was submitted to the Division of Land Resources for approval: _____
4. If project includes any stream or wetland crossings, provide date when Nationwide 12 or 404 permit was submitted for approval: _____
5. Provide buffers used to maintain compliance with any applicable river basin rules in 15A NCAC 2B .0200 (e.g., Neuse River basin buffer rules): _____

VI. STREAM CLASSIFICATION: (See Instruction E)

Use the NCDENR Division of Water Quality guidance document entitled, **“DETERMINING STREAM CLASSIFICATION FOR FORM FTA 02/03 (FAST-TRACK SEWER SYSTEMS)”** to collect and record the stream classification data below (attach additional sheets as necessary). This document is available from the NCDENR or City of Concord Engineering web site or by contacting the NCDENR – Division of Water Quality, Mooresville Regional Office, 919 N Main Street, Mooresville, NC 28115, Phone (704) 663-1699 or the City of Concord Engineering Department.

Table 1 Stream Classification

Location ID on Map (self-chosen – as shown on map for cross-reference)	Name of Waterbody	County	River Basin	Waterbody Stream Index	Waterbody Classification

VII. INFORMATION ON WASTEWATER:

1. Please provide a brief description specifying the origin of the wastewater (school, subdivision, hospital, commercial facility, industry, apartments, condominiums, etc.): _____

2. Volume of wastewater generated by this project: _____gallons per day.
3. If the permitted flow is zero, indicate why: _____

4. Explanation of how wastewater flow was determined (15A NCAC 2H .0219(l)): _____

5. Nature of wastewater: _____ % Domestic/Commercial; _____ % Industrial;
 _____ % Other waste - specify: _____
6. If wastewater is industrial in nature:
- a. Level of pretreatment that has been provided to ensure protection of the receiving collection system and wastewater treatment facility: _____
- b. If a pretreatment permit is required, has one been issued? _____ Yes; _____ No. If yes, please attach a copy of the pretreatment permit. If no, provide date application was submitted: _____

VIII. DESIGN INFORMATION:

1. Owner and name of wastewater treatment facility (WWTF) receiving wastewater:
 Rocky River Wastewater Treatment Facility – Permit No: **NC0036269**
 Muddy Creek Wastewater Treatment Facility – Permit No: **NC0081621**
2. List the owner(s) of any intermediate sewers if different from applicant or owner of WWTF: _____

3. Permit number(s) for sewers immediately downstream (If known): _____
4. Pipe diameter of sewers immediately downstream: _____
5. Engineering evaluation of downstream sewers' ability to accept the wastewater from this project (**See Instruction F.**) is provided on page _____ of the calculations.
6. **Summary of GRAVITY SEWER to be permitted:**

Table 2 Gravity Sewer Summary

Diameter (Inches)	Length (Linear feet)	Material (Primary material type)

7. Does the subject gravity sewer collection system comply with the Water and Sewer Authority of Cabarrus County's standard specifications; the City of Concord's ordinances, policies, and standard specifications, and the North Carolina Administrative Code Title15A NCAC 2H .0200? Yes; No. **If no, please identify pertinent minimum design criteria or regulation and indicate why a variance is requested:** _____

(Submit two additional copies of the plans, specifications or calculations pertinent to the variance with this application.)

IX. PUMP STATION INFORMATION (Complete for each pump station included in this project.)

1. Pump station number or name: _____
2. In accordance with 15A NCAC 2H .0219(h)(3), describe the measures that are being implemented to prevent impacts on downslope surface waters should a power failure occur at this pump station: _____

3. Design flow of the pump station: _____ million gallons per day
4. Operational point(s) of the pump(s): _____ gallons per minute at _____ feet total dynamic head (TDH)
5. Number of pumps provided (15A NCAC 2H .0219(h)(2)): _____
6. Number of pumping cycles at average daily flow (15A NCAC 2H .0219(h)(2)): _____ cycles per hour
7. If extended detention times are necessary due to phase development, describe odor and corrosion control measures taken: _____

8. Provide the location of each design element in the specifications and/or engineering plans:

Table 3 Pump Station Summary

Design Element	Sheet Number of the Plans	Page Number in the Specifications
Alternate Power Source:		
Portable Generator (telemetry and receptacle required)		
On-Site Generator (automatic transfer switch required)		
Wet Well Vented with Screen		
Fillets in Wet Well		
Check Valves and Gate Valves		
Security Fencing or Approved Alternate		
Lockable Wet Well Cover and Dead Front Control Panel		
Area Light		
Electrical Convenience Outlet		
High Water Alarms:		
Audible Alarm		
Visual Alarm		
Auto-Dialer/Telemetry		
Non-Corrosive Guide Rails/Lift Chains		
All-Weather Access Road		
Flowmeter		
Remote Telemetric Monitoring System		

9. List any equipment (note sheet number of the plans or page number in the specifications) not specifically mentioned above (hoist, odor control equipment, etc.): _____

10. a. 100-year flood elevation: _____ feet.
 b. Finish grade elevation of the pump station: _____ feet.
 c. Measures taken to protect the pump station against flooding (15A NCAC 2H .0219(h)(6)): _____

11. Summary of FORCE MAIN to be permitted, by diameter and length:

Table 4 Force Mains

Diameter (inches)	Length (linear feet)	High Elevation (feet)	Discharge Elevation (feet)	Pump-Off Elevation (feet)

12. Station location of air-release valves (15A NCAC 2H .0219(i)(2)(L)): _____

Note: Air-release valves must be provided at all high points along the force main where the elevation difference exceeds 10 feet.

13. Does the subject pump station and force mains and wastewater collection system comply with the Water and Sewer Authority of Cabarrus County's standard specifications; the City of Concord's ordinances, policies, and standard specifications, and the North Carolina Administrative Code Title 15A NCAC 2H .0200?

Yes; No. **If no, please identify pertinent minimum design criteria or regulation and explain why a variance is requested:** _____

(Submit two additional copies of the plans, specifications or calculations pertinent to the variance with this application.)

City of Concord Certification:

I, M. Sue Hyde, Director of Engineering, _____ attest that this application for _____

has been reviewed by me and contains sufficient information to ascertain reasonable grounds to believe the application package and its contents meet all applicable standards of 15A NCAC 2H .0200, the State of North Carolina's Gravity Sewer Minimum Design Criteria, the Water and Sewer Authority of Cabarrus County Standard Specifications and the City of Concord's ordinance, policies and specifications as presented. The denial of the issuance of a permit, subject to the provisions in Article V, Chapter 62 of the City of Concord Code of Ordinances shall be made in writing and shall contain the reasons for the denial and the City's estimate of the general changes in the applicant's proposed activities or plan which will be required in order that the applicant may obtain a permit. Nothing in such estimate shall preclude or otherwise bar the City from denying a permit, which incorporates such changes, based upon changed circumstances or information not previously known by the Director of Engineering or the applicant. THE CITY AND ITS STAFF ARE NOT RESPONSIBLE FOR ERRORS IN DESIGNS, CALCULATIONS, DRAWINGS OR STATEMENTS SUBMITTED BY APPLICANTS, THEIR TECHNICAL CONSULTANTS, SURVEYORS OR ENGINEERS. THE CITY AND ITS STAFF ARE NOT RESPONSIBLE FOR FINDING OR CORRECTING ANY ERRORS OR DEFICIENCIES IN PLANS SUBMITTED TO THE CITY FOR REVIEW AND APPROVAL. THE CITY OF CONCORD DISCLAIMS ANY LIABILITY FOR ERRORS CONTAINED IN PLANS SUBMITTED TO THE CITY. THE SIGNATURE OF THE CITY ENGINEER MAY NOT BE RELIED UPON TO ESTABLISH ANY DUTY OR RELATIONSHIP (SUCH AS A THIRD PARTY BENEFICIARY) WITH ANY PARTY USING THIS PLAN OR DRAWING. PARTIES USING THIS DOCUMENT SHOULD CONDUCT THEIR OWN REVIEW AND ANALYSIS FOR MAKING A DECISIONS IN RELIANCE ON THIS DOCUMENT. Note: In accordance with N.C. General Statute 130A-26.2, any person who knowingly makes any false statement, representation, or certification in any application shall be guilty of a Class 2 misdemeanor, which may include a fine not to exceed \$10,000 per violation.

Signature: _____ Date: _____

Professional Engineer's Certification:

I, _____, attest that this application for _____

has been reviewed by me and is accurate, complete and consistent with the information supplied in the engineering plans, calculations, and all other supporting documentation to the best of my knowledge. I further attest that to the best of my knowledge the proposed design has been prepared in accordance with and subject to the Water and Sewer Authority of Cabarrus County's standard specifications; the City of Concord's ordinances, policies, and standard specifications, and the North Carolina Administrative Code for wastewater collection. In the event of conflict between the Water and Sewer Authority of Cabarrus County's standard specifications; the City of Concord's ordinances, policies, and standard specifications, or the North Carolina Administrative Code, the more restrictive requirements shall apply. Although other professionals may have developed certain portions of this submittal package, inclusion of these materials under my signature and seal signifies that I have reviewed this material and have judged it to be consistent with the proposed design. Note: In accordance with NC General Statutes 143-215.6A and 143-215.6B, any person who knowingly makes any false statement, representation, or certification in any application shall be guilty of a Class 2 misdemeanor, which may include a fine not to exceed \$10,000 as well as civil penalties up to \$25,000 per violation.

North Carolina Professional Engineer's seal, signature, and date:

Developer's Certification

I, _____, attest that this application for _____

has been reviewed by me and is accurate and complete to the best of my knowledge. I understand that if all required parts of this application are not completed and that if all required supporting information and attachments are not included, this application package will be returned to me as incomplete. Any application package determined incomplete by the Director of Engineering shall be returned to the applicant. Revised engineering plans and specifications shall constitute a re-submittal, shall be accompanied by a new fee, and shall require additional time for review. Note: In accordance with NC General Statutes 143-215.6A and 143-215.6B, any person who knowingly makes any false statement, representation, or certification in any application shall be guilty of a Class 2 misdemeanor, which may include a fine not to exceed \$10,000 as well as civil penalties up to \$25,000 per violation.

Signature: _____

Date: _____