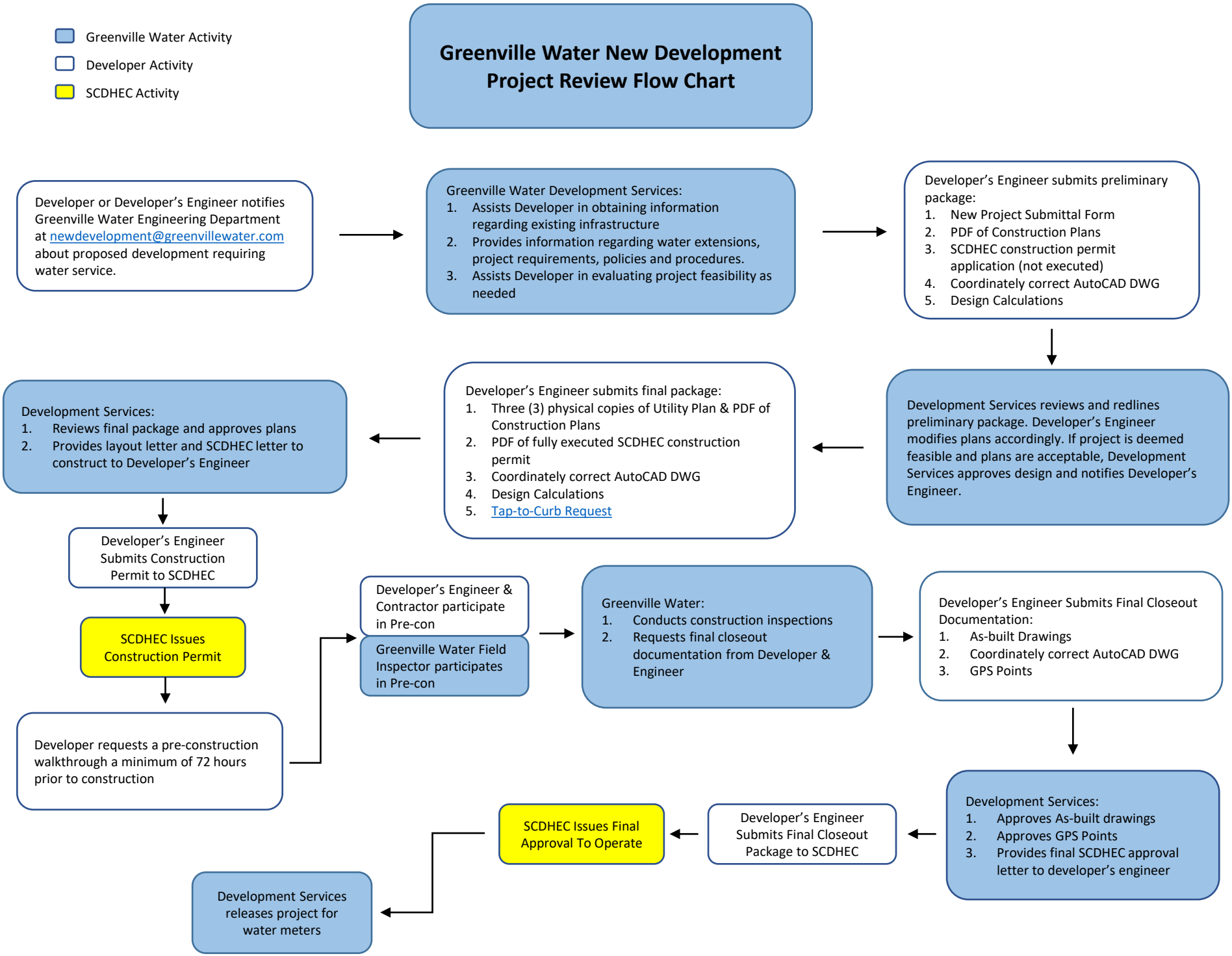
Greenville Water Activity
Developer Activity
SCDHEC Activity
Greenville Water New Development Project Review Flow Chart
Developer or Developer's Engineer notifies Greenville Water Engineering Department at newdevelopment@greenvillewater.com about proposed development requiring water service.
Greenville Water Development Services:
1. Assists Developer in obtaining information regarding existing infrastructure
2. Provides information regarding water extensions, project requirements, policies and procedures.
3. Assists Developer in evaluating project feasibility as needed
Developer's Engineer submits preliminary package:
1. New Project Submittal Form
2. PDF of Construction Plans
3. SCDHEC construction permit application (not executed)
4. Coordinately correct AutoCAD DWG
5. Design Calculations
Development Services reviews and redlines preliminary package. Developer's Engineer modifies plans accordingly. If project is deemed feasible and plans are acceptable, Development Services approves design and notifies Developer's Engineer.
Developer's Engineer submits final package:
1. Three (3) physical copies of Utility Plan & PDF of Construction Plans
2. PDF of fully executed SCDHEC construction permit
3. Coordinately correct AutoCAD DWG
4. Design Calculations
5. Tap-to-Curb Request
Development Services:
1. Reviews final package and approves plans
2. Provides layout letter and SCDHEC letter to construct to Developer's Engineer
Developer's Engineer Submits Construction Permit to SCDHEC
SCDHEC Issues Construction Permit
Developer requests a pre-construction walkthrough a minimum of 72 hours prior to construction
Developer's Engineer & Contractor participate in Pre-con
Greenville Water Field Inspector participates in Pre-con
Greenville Water:
1. Conducts construction inspections
2. Requests final closeout documentation from Developer & Engineer
Developer's Engineer Submits Final Closeout Documentation:
1. As-built Drawings
2. Coordinately correct AutoCAD DWG
3. GPS Points
Development Services:
1. Approves As-built drawings
2. Approves GPS Points
3. Provides final SCDHEC approval letter to developer's engineer
Developer's Engineer Submits Final Closeout Package to SCDHEC
SCDHEC Issues Final Approval To Operate
Development Services releases project for water meters

Water System Design Standards

The following standard shall be required for water line designs that are submitted to Greenville Water:

Design of water mains shall be in accordance with the requirements of the South Carolina, Department of Health and Environmental Control Primary Drinking Water Regulation R.61-58 and the requirements of these standards. Additional specifications can be found here Complete Specifications for Water Mains

Location for new water mains and valves shall be within the paved roadway. Do not locate water mains, valves, meters or hydrants under parking spaces or in any other areas that can hinder access for operation and maintenance.

Meters shall be placed in a 3' x 3' green space in the ROW or Easement in front of the property it serves, not in driveways, sidewalks or private property.

Double Check Valves for fire services shall be within 50' of the water main, located in a vault or mechanical room.

TR Flex or Equivalent to be used for all cased bores.

Minimize dead-ends by looping of all water mains, interconnected at intersections without using crosses.

Fire hydrants to be spaced no more than 800' apart and placed in the ROW at each entrance, on property lines or radius of intersections of development.

Where there are dead ends on mains of 6-in size or larger, a fire hydrant shall be provided where feasible.

Minimum size distribution main shall be 8 inches in diameter. Exceptions include dead-end water mains and internal looping within development less than 500 feet in length, which can be 6 inches in diameter, unless otherwise specified by Greenville Water. Only one hydrant will be permitted on a 6-in dead-end main.

Standard distribution pipe diameters include 6", 8", 12" and 16". Main sizes of 10" and 14" are not permissible.

Developments or areas of developments greater than 50 units shall provide for redundant water service, where feasible. This may require providing an easement between lots to gain access to adjacent water mains.

Valves in subdivisions should be installed such that no more than 50 homes are without water if repairs are required.

Greenville Water reserves the right to specify the maximum water main size for any extension.

Connections 2” and above made to cast iron mains shall be tees.

All size-on-size connections shall be tees.

Calculation Requirements:

1. Mains shall be sized based on either 1/5 the maximum instantaneous demand plus fire flow or maximum instantaneous demand, whichever is greater. The minimum pressure under conditions of maximum instantaneous demand shall be 25 psi at every service tap. 20 psi will be acceptable at any service tap when fire flows or flushing flows are provided in excess of maximum peak hourly flow.

2. Minimum design fire flow shall be 1000 gpm in single family residential and 1500 gpm in multi-family or commercial developments. A fire flow less than 1000 gpm may be accepted with written approval submitted to Greenville Water from the jurisdictional authority for fire protection in the project area. Minimum fire flow shall never be less than 500 gpm.

3. Maximum Velocity of 10 feet per second shall govern for sizing mains to meet fire flow and minimum service requirements.

4. Hydraulic calculations shall include elevation changes and be based on the available static and residual from a hydrant flow test performed within the last 12 months and the losses in the main from it to the proposed development.

5. Calculation shall use Hazen Williams equation with a design roughness coefficient of C = 120.

6. The maximum instantaneous demand shall be calculated using the tables provided below as published in the Community Water System Source Book by Joseph S. Ameen.

Table XXI - Maximum Instantaneous Flows for Residential Areas

Number of Residences Served	Flow per Residence in GPM
1 (First)	15.0
2 - 10*	5.0
11 - 20**	4.0
21 - 30	3.8
31 - 40	3.4
41 - 50	3.2
51 - 60	2.7
61 - 70	2.5
71 - 80	2.2
81 - 90	2.1
91 - 100	2.0
101 - 125	1.8
126 - 150	1.6
151 - 175	1.4
176 - 200	1.3
201 - 300	1.2
301 - 400	1.0
401 - 500	0.8
501 - 750	0.7
751 - 1,000	0.5

*Second, third, etc., through tenth residence served.
**Eleventh, twelfth, etc., through twentieth residence served.

Table XXII - Maximum Instantaneous Flows for Commercial Areas

Type of Business	GPM on Basis Shown
Barber Shop	3.0 gpm per chair
Beauty Shop	3.0 gpm per chair
Dentist Office	4.0 gpm per chair
Department Store*	1.0 - 2.0 - 3.0 gpm per employee
Drug Store	5.0 gpm
With Fountain Service	add 6.0 gpm per fountain area
Serving Meals	add 2.0 gpm per seat
Industrial Plants**	4.0 gpm plus 1.0 gpm per employee
Laundry	30.0 gpm per 1,000 pounds clothes
Launderette	8.0 gpm per unit
Meat Market, Super Market	6.0 gpm per 2,500 sq. ft. floor area
Motel, Hotel	4.0 gpm per unit
Office Building	0.5 gpm per 100 sq. ft. floor area or 2.0 gpm per employee
Physicians' Office	3.0 gpm per examining room
Restaurant	2.0 gpm per seat
Single Service	6.0 to 20.0 gpm total
Drive-In	2.0 to 7.0 gpm total
Service Station	10.0 gpm per wash rack
Theater	0.2 gpm per seat
Drive-In	0.2 gpm per car space
Other Establishments***	Estimate at 4.0 gpm each

*Including customer service.
**Not including process water.
***Non-water using establishments.

Table XXIII - Maximum Instantaneous Flows for Institutions

Type of Institution	Basis of Flow, GPM
Boarding Schools, Colleges	2.0 gpm per student
Churches	0.4 gpm per member
Clubs: Country, Civic	0.6 gpm per member
Hospitals	4.0 gpm per bed
Nursing Homes	2.0 gpm per bed
Prisons	3.0 gpm per inmate
Rooming House	Same as Residential*
Schools: Day, Elementary, Junior, Senior High	
Number of Students	GPM Per Student
0 –50	2.00
100	1.90
200	1.88
300	1.80
400	1.72
500	1.64
600	1.56
700	1.44
800	1.38
900	1.32
1,000	1.20
1,200	1.04
1,400	0.86
1,600	0.70
1,800	0.54
2,000	0.40

*Each unit of an apartment building should be considered as an individual residence.

Minimum Water Plan Requirements

The following standard shall be required for water line construction drawings that are submitted to Greenville Water:

Plan not greater than 1"=100' scale, showing the entire water system

Site Map – Minimum size 3"x3"

Show match lines as appropriate and project phasing

North Arrow, Legend, General Notes and Standard Detail sheets as required

Stationing and callouts of tees, hydrants, valves, bends, plugs and reducers etc.

Meter and Fireline locations

Title block

- Names, mailing addresses and telephone numbers of the owner of the property, the land developer, engineer or consultant
- Name of the development
- Scale
- Date (also include revision dates)

Road Right of Way and street names

Road Cross Section in 8-1/2" x 11" or 11" x 17" format

Subdivision Boundary, edge of pavement, face & back of curb

Driveways, sidewalks and house/building outlines

Parking islands and islands in the roadway if applicable

Lot lines and numbers

Easements labeled and dimensioned if applicable

Pipe layout, material and size (diameter) e.g., Exis. 8" D.I., Prop. 8" D.I.

Show sewer and storm drainage layout, if applicable

Show limits of wetlands, floodplains and steep slopes

Aerial and stream crossings identified and detailed if needed

Minimum Record Drawing Requirements

Record Drawings shall reflect all As-Constructed conditions for mains, water services, and curbstop/meters. Record Drawings shall be sealed, signed, and dated by an Engineer registered in the state of South Carolina and include the following items at a minimum:

1. Mains, line valves, and bends shall be referenced to sewer manholes, catch basins, fire hydrants, or permanent structures. Each valve cluster (at tees and bends) and each mainline valve (along runs) shall be shown on plan. A minimum of two (2) tie-down dimensions are required for each fitting.

2. Detailed diagrams shall be shown for tees, valves and fittings at road intersections and areas where valves/fittings are clustered. Detailed diagrams shall indicate type of valve/fitting, size, how its restrained (e.g., mega-lugged, thrust block) and at least two (2) tie-down dimensions to the nearest permanent visible objects. All dimensions shall be shown to the nearest foot.

3. Meters/Curbstops to be tied down by catch basins, manholes or property pins.

4. Length of service lines from tap to meter/curbstop to be dimensioned

5. Callouts updated if material has changed from design

6. Record Drawings must be clearly legible, accurate, and of good quality. If the drawings indicate inaccuracies, they will be returned to the Developer's Engineer for revision. Project commissioning will not occur until the Record Drawings are approved by Greenville Water Development Services. The Developer's Engineer is responsible for the accuracy of all Record Drawings.

GreenvilleWater

New Project Submittal

Date: _____

PROJECT NAME _____

CONTACT INFORMATION

Engineering Firm: _____

CONTACT NAME

_____

ADDRESS

_____

CITY, STATE ZIP

_____

PHONE

_____

EMAIL

_____

Name of Developer: _____

CONTACT NAME

_____

ADDRESS

_____

CITY, STATE ZIP

_____

PHONE

_____

EMAIL

_____

PROPERTY INFORMATION

TAX MAP NUMBER _____

☐ PUBLIC ROADS ☐ PRIVATE ROADS

☐ SHOWN ON PLANS (REQUIRED)

NUMBER OF LOTS OR UNITS _____

☐ METER SERVES INDIVIDUAL UNIT (EX: SINGLE FAMILY UNIT)

☐ METER SERVES MULTIPLE UNITS (EX: APARTMENT BLDG)

☐ TAP SIZES AND METER SIZES SHOWN ON PLANS (REQUIRED)

Owner's Name: _____

CONTACT NAME

_____

ADDRESS

_____

PHONE

_____

EMAIL

_____

CITY, STATE ZIP

_____

CROSS CONNECTION

Fire line Size (if applicable) _____

Backflow Preventer required? ☐ YES ☐ NO ☐ NOT SURE

Fire Pump required? ☐ YES ☐ NO ☐ NOT SURE