

## **Town of Lake Santeetlah**

### **Council Meeting Minutes**

**August 13, 2024**

Mayor Simon called the meeting to order at 12:01 PM. Councilmembers Ralph Strunk, Keith Predmore, Kevin Haag, and Jim Hager were present for the meeting. Town Administrator Kim Matheson, Town Clerk Kala Farley, and Attorney Craig Justus were also present.

Kevin Haag led the Pledge of Allegiance and offered an Invocation.

**Approval of the Agenda:** Strunk made a motion to approve the agenda. Haag seconded. All approved. The motion passed unanimously.

**Approval of July 9, 2024 Council Meeting Minutes:** Hager made a motion to approve the July 9, 2024 Council Meeting Minutes. Haag Seconded. All approved. The motion passed unanimously.

**Financial/Tax Report as of July 31, 2024:** Matheson reported the tax collection for July was \$15,046.59.

Mayor Simon read the Ethics Statement Reminder

#### **Request for Public Comment:**

**Jack Gross:** Gross said in November 2023, the agenda was not approved because there was no topic identified for the Closed Session. Gross said today's agenda was approved yet it has no topic for Closed Session, and would like to know what has changed from November until now.

#### **New Business:**

- 1. Update on Broyles septic proposal:** A set of engineered plans was submitted for the Council to review (see attached). Jack Gross brought new information to the discussion regarding an active permit on the property across from the Broyles. Justus requested that Gross submit the permit information to the Town so it can be reviewed. The Council will call a special meeting if needed to make any determinations on the proposal after the additional information is received and reviewed.

2. **Update on Kevin Brown broadband challenge:** Mayor Simon said Brown said he needed two more participants from Town of Lake Santeetlah. Jack Gross said he had two properties with Zito Media and would contact Brown.

### Old Business:

1. **Front Entrance Bricks:** Mayor Simon said the sell of bricks for the front entrance will start back up soon. The 4x8 bricks are \$300, 8x8 bricks are \$500, and additional art/engraving is \$25. The money from the bricks will be donated toward repairs on the Guard House.
2. **Donations for Friends of the Library and the Santeetlah Volunteer Fire Department:** Mayor Simon said the Town has presented a check in the amount of \$3000 to the Friends of the Library and they were very grateful for that contribution. The Town also has a check in the amount of \$6000 to donate to the Santeetlah Fire Department. Additional donations from July 4th, totaling \$1075, were also given to the Fire Department. Mayor Simon said it was reported the previous day at the TPOA meeting that an amount of \$200 from the Green Elephant was donated to the Friends of the Library and \$100 to the Santeetlah Fire Department.
3. **Update on Golden Leaf Grant Application:** Mayor Simon said the application was not accepted for the Golden Leaf Grant but it has not been completely denied. The application status is under review and could be considered if other funds become available for the Grant.
4. **Council Statements:**

**Ralph Strunk:** Strunk said he would like to commend Farley on the work she did on the Town Directory. Strunk asked for an update on a previous inquiry he had about a safety issue and getting security cameras installed. Strunk was told the cameras had arrived and were just awaiting installation.

**Kevin Haag:** Haag said the Town and TPOA has received an award for 30 years of participation in the Adopt A Highway program from 1990-2020. Haag said the TPOA was having a party Saturday, August 31<sup>st</sup> and wanted to extend an invitation to all the townspeople. You have to be a member to attend but you can join at the party. There are 100 members in the TPOA organization.

**Jim Hager:** Hager said in the coming week, Farley would become a full time employee of the Town of Lake Santeetlah.

Bette Lobue said the TPOA would like to invite the Town staff as a courtesy to the TPOA Block Party on Saturday, August 31<sup>st</sup> at 5:00PM.

**Motion for Closed Session:** Motion for Closed Session to discuss matters within the attorney-client privilege. Predmore read the motion to move in to Closed Session. Hager seconded. The motion passed unanimously. The Council moved into closed session.


Any Action from Closed Session: There is no action from Closed Session.

**Announcements:**

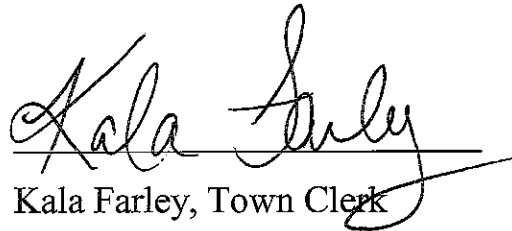
- The next regular scheduled Council Meeting will be held September 10, 2024 at 12:00PM. This meeting will be held at Town Hall and via Zoom. The link to join by Zoom will be sent out by mass email.

**Motion to Adjourn**

Hager made the motion to adjourn the meeting. Strunk seconded. The meeting was adjourned at 1:21 PM.



Diana Simon, Mayor



Kala Farley, Town Clerk

DEVELOPMENT DATA BLOCK

OWNER:  
KEITH BROYLES  
37 NANTAHALA TERRACE  
LAKE SANTEEELAH, NC

ENGINEER:  
TLOP, J. DOCKERY, PE  
DOCKERY ENGINEERING PLLC  
429 HILL STREET  
MURPHY, NC 28906  
828.557.6509  
TLOP@DOCKERYENGINEERING.COM

CONTRACTOR:  
UNKNOWN

SURVEYOR:  
UNKNOWN

SOIL SCIENTIST:  
TREVOR D. PETERSON, LSS #1355  
ALPHA PRECISION SOIL SCIENCE PLLC

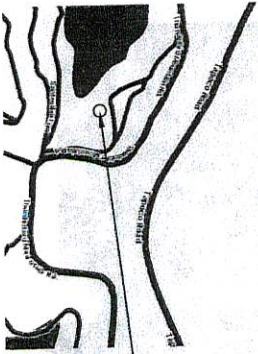
PIN:  
5652038685

*Approved  
to comply  
with State Code  
13 AUG 2024  
S. J. D. [Signature]  
S. J. D. [Signature]*

PROJECT PLANS  
FOR

37 NANTAHALA TERRACE  
WATER LINE RELOCATION

TOWN OF LAKE SANTEEELAH  
GRAHAM COUNTY  
NORTH CAROLINA



APPROX SITE VICINITY

General Notes

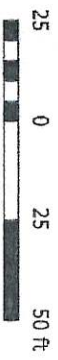
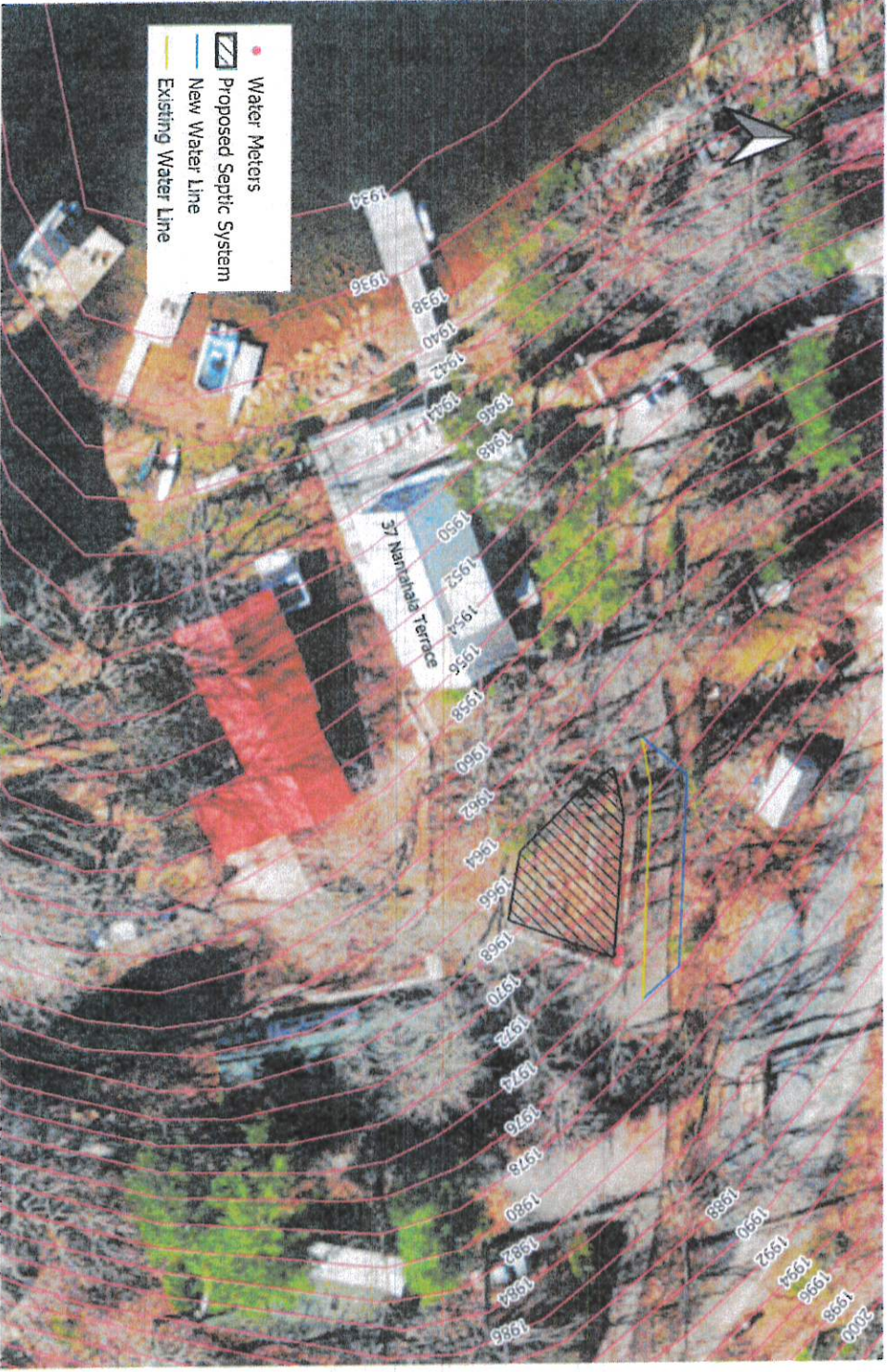
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DOCKERY ENGINEERING PLLC  
429 HILL STREET  
MURPHY, NC 28906  
PIN NO. P-2834

Sheet No.	1
Total Sheets	1



		<p>SEAL 0565385</p> <p>ENGINEER TILOR, J. POKER</p> <p>NORTH CAROLINA PROFESSIONAL</p>
<p>FOR USE BY:</p> <p>BROVLES</p> <p>ON THIS PROJECT ONLY, NOT TO BE TRANSMITTED TO ANY OTHER PROJECT OR ORGANIZATION WITHOUT WRITTEN AUTHORIZATION FROM ENGINEERING FIRM.</p>		<p>DATE: 8/12/24</p>
<p>Project Name and Address</p>	<p>Project No.</p>	<p>Scale</p>
<p>DORRNEY ENGINEERING PLC 4320 N.W. 11TH STREET MIAMI, FL 33154 PHN. NO. 7-2834</p>	<p>NO. _____</p> <p>ENGINEER'S NAME _____</p> <p>DATE _____</p>	<p>2</p>

- COORDINATE CONSTRUCTION WITH TOWN OF LAKE SANTEETLAH ✓
- PROVIDE ADVANCED WARNING AND TRAFFIC CONTROL FOR ROAD CLOSURE ✓
- CALL 811 PRIOR TO ANY EXCAVATION
- COORDINATE WITH SEPTIC PERMIT FOR LOCATIONS
- ALL NEW WATERLINE MUST BE 10FT FROM SEPTIC COMPONENTS

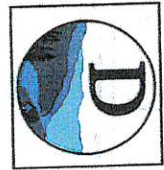
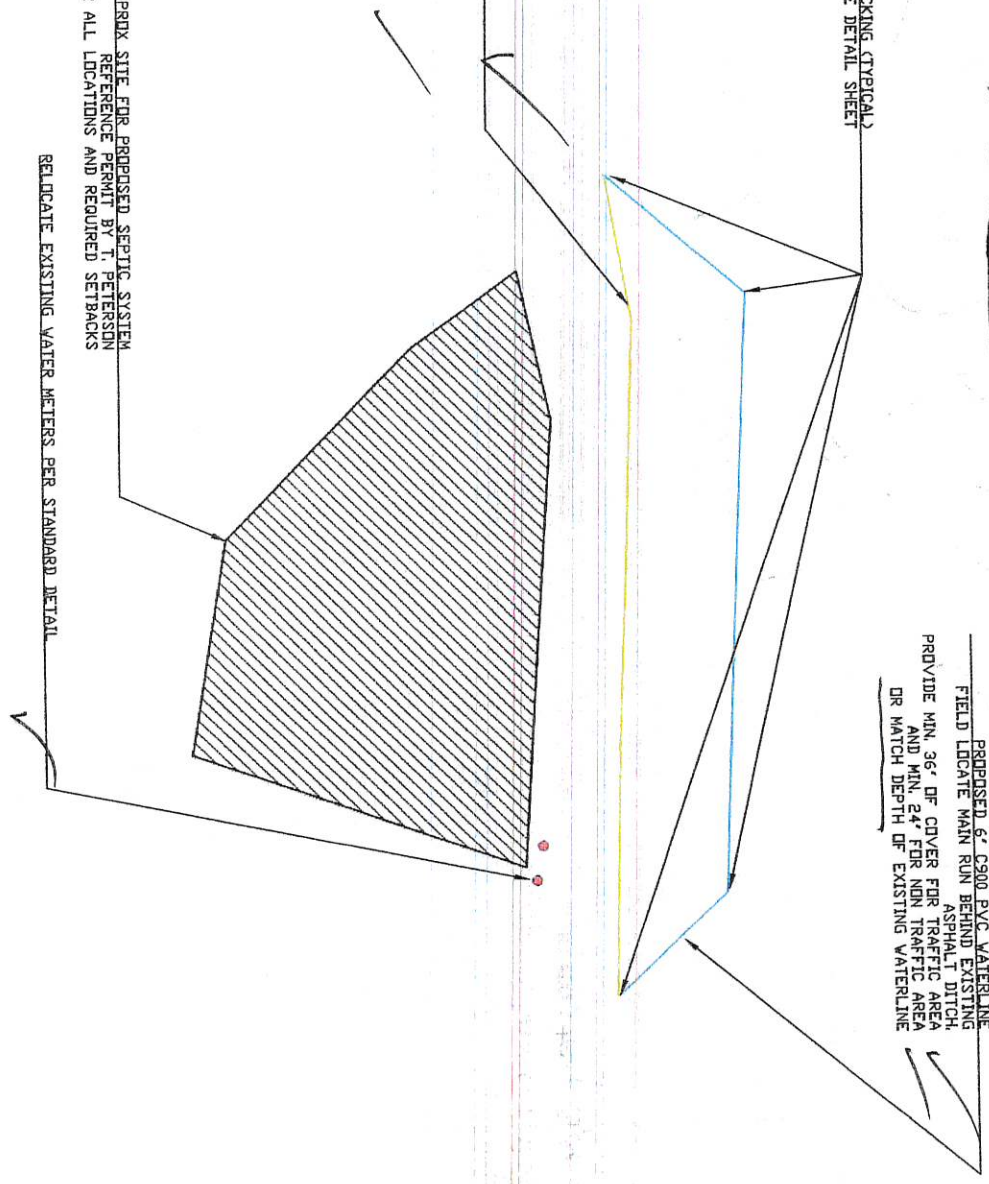
4X 45 DEG. BEND WITH BLOCKING (TYPICAL)  
SEE DETAIL SHEET

PROPOSED 6" C900 PVC WATERLINE  
FIELD LOCATE MAIN RUN BEHIND EXISTING ASPHALT DITCH.  
PROVIDE MIN. 36" DE COVER FOR TRAFFIC AREA AND MIN. 24" FOR NON TRAFFIC AREA OR MATCH DEPTH OF EXISTING WATERLINE

PLUG AND ABANDON EXISTING WATERLINE IN PLACE UNDER ROADWAY  
LOCATION APPROXIMATE PER MARKINGS ON GROUND

APPROX. SITE FOR PROPOSED SEPTIC SYSTEM  
REFERENCE PERMIT BY T. PETERSON  
FOR ALL LOCATIONS AND REQUIRED SETBACKS

RELOCATE EXISTING WATER METERS PER STANDARD DETAIL



SEAL  
0569385

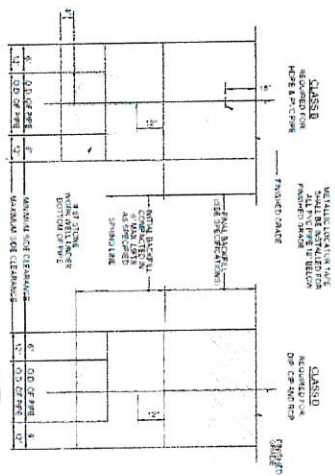
T. J. DOCKERY  
ENGINEER  
8/12/24

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Title	Function/Title	Date

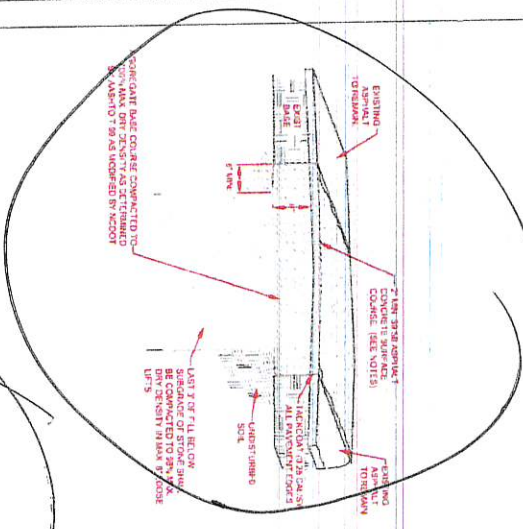
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428 HILL STREET  
ALBANY, NC 28806  
PH. NO. 7-2834

Project No.	
Sheet No.	3
Date	
Scale	
As Noted	



- NOTES**
1. CONTRACTOR SHALL PATCHWORK TO THE SAME PAVEMENT PROFILE AS EXISTING PAVEMENT TO RECONSTRUCT PATCH.
  2. WHEN PATCHING OF SPALLS OCCURS, PATCHES SHALL BE MADE TO MATCH THE EXISTING PAVEMENT PROFILE. PATCHES SHALL BE MADE TO MATCH THE EXISTING PAVEMENT PROFILE.
  3. CONTRACTOR SHALL BE REQUIRED TO PROVIDE PROTECTIVE CURBS AND BENCHES AS REQUIRED TO PROTECT THE TRENCH. CONTRACTOR SHALL BE REQUIRED TO PROVIDE PROTECTIVE CURBS AND BENCHES AS REQUIRED TO PROTECT THE TRENCH.
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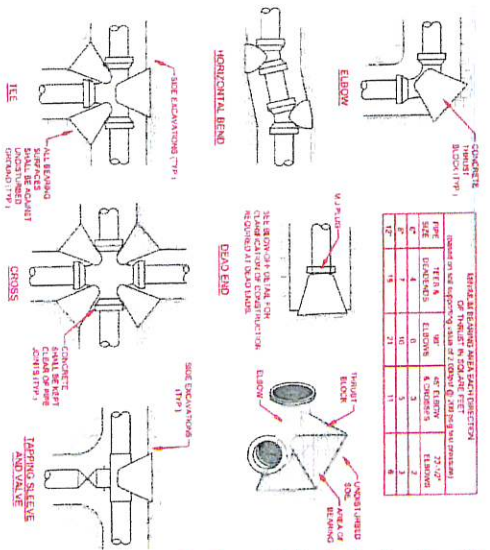
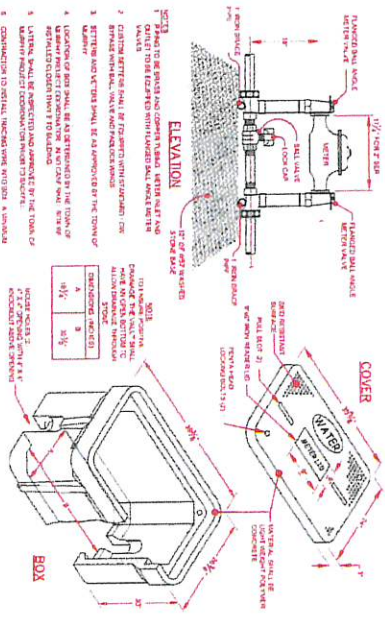
**STANDARD PAVEMENT PATCH**



- NOTES**
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COORDINATE METER SIZE/DETAILS WITH TOWN.  
FOLLOW TOWN STANDARDS FOR BACKFLOW PROTECTION

OR *Standard*  
IM *Industry Spec* *City*



UNIT	DESCRIPTION	QUANTITY
1	CONCRETE	1
2	ELBOW	1
3	BEAD END	1
4	SEAL END	1
5	HORIZONTAL BEND	1
6	CROSS	1
7	TAPPING SLEEVE	1

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General Notes

6/12/24

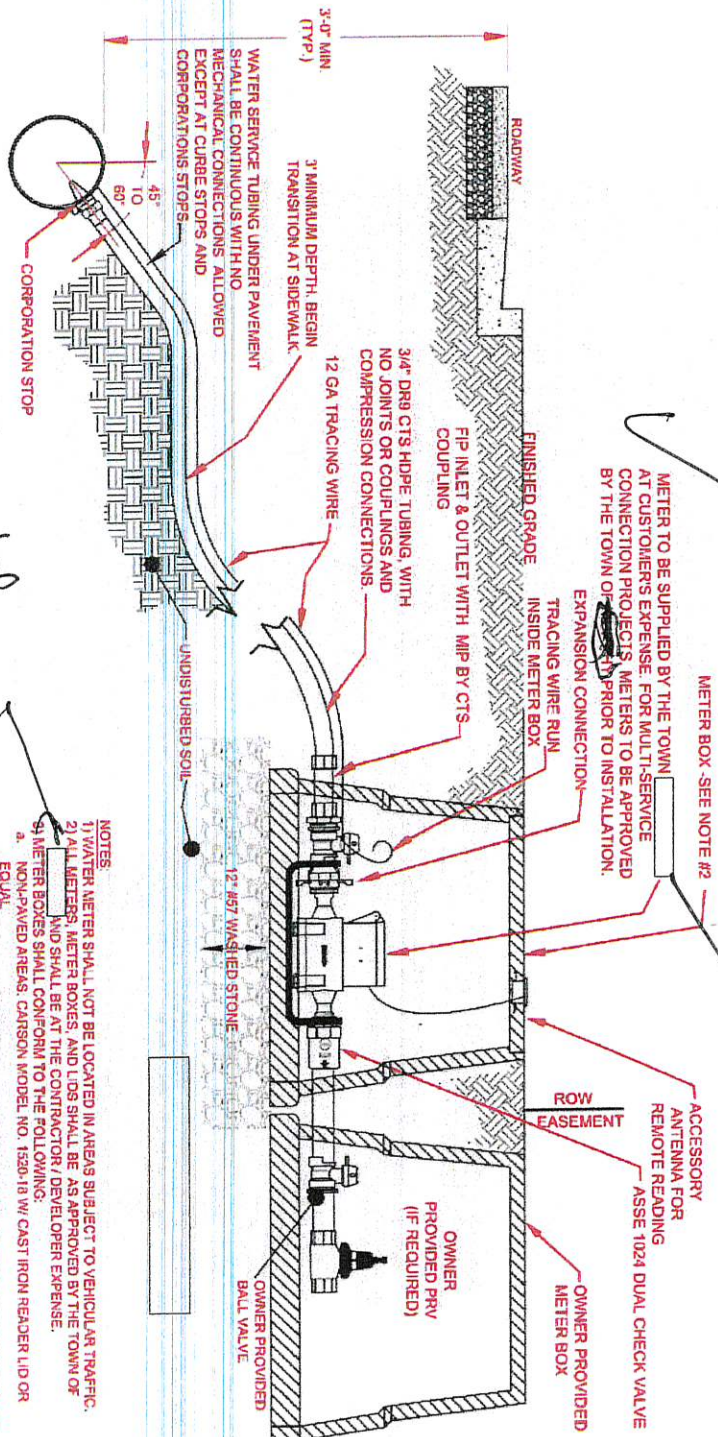
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MURPHY, NC 28506  
PHN NO. 7-2854

Sheet No. \_\_\_\_\_

As Noted

4





METER TO BE SUPPLIED BY THE TOWN AT CUSTOMER'S EXPENSE. FOR MULTI-SERVICE CONNECTION PROJECTS METERS TO BE APPROVED BY THE TOWN OF [redacted] PRIOR TO INSTALLATION.

METER BOX - SEE NOTE #2

ACCESSORY ANTENNA FOR REMOTE READING ASSE 1024 DUAL CHECK VALVE

OWNER PROVIDED METER BOX

OWNER PROVIDED (IF REQUIRED) PRV

OWNER PROVIDED BALL VALVE

*Sanitized*

*Sanitized*

- NOTES:**
- 1) WATER METER SHALL NOT BE LOCATED IN AREAS SUBJECT TO VEHICULAR TRAFFIC.
  - 2) ALL METERS, METER BOXES, AND LOGS SHALL BE AS APPROVED BY THE TOWN OF [redacted] AND SHALL BE AT THE CONTRACTOR / DEVELOPER EXPENSE.
  - 3) METER BOXES SHALL CONFORM TO THE FOLLOWING:
    - a. NON-PANED AREAS: CARSON MODEL NO. 1520-18 W/ CAST IRON READER LID OR PAULI
    - b. PANED AREAS: PRE-APPROVED H-20 TRAFFIC RATED METER BOX, MINIMUM 15"x20" INTERIOR DIMENSION
  - 4) ALL SERVICE LINES, VALVES AND FITTINGS SHALL COMPLY WITH AWWA C900
  - 5) FOR NON-RESIDENTIAL APPLICATIONS THAT REQUIRE AN ABOVE-GROUND BACKFLOW PREVENTER, THE DUAL CHECK ASSEMBLY MAY BE OMITTED.
  - 6) ALL BRASS OF 65-35 RED BRASS, AWWA C900, ASTM B92.
  - 7) ONE 2" OR 8" GRADE ADJUSTER MAY BE USED ON NEW CONSTRUCTION PROJECTS (S). GRADE ADJUSTER AND BOX SHALL BE BY THE SAME MANUFACTURER.
  - 8) 2" BALL VALVE (REQUIRED) AND PRESSURE REDUCING VALVE (IF REQUIRED) SHALL BE INSTALLED BETWEEN METER BOX AND STRUCTURE ENTRY POINT.

General Notes

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SEAL

056585

ENGINEER

PROFESSIONAL

NORTH CAROLINA

8/12/24

PROJECT: ROSSBERG PLD

400 N. STREET

MURPHY, NC 28504

PRJ NO. P-2334

DATE	BY	REVISION



# Dockery Engineering PLLC

NC Firm P-2834 | GA Firm PEF008560

# INVOICE

Invoice #: 24160  
Invoice date: 8/12/2024  
Job:

37 Nantahala  
Terrace

**Physical/Dropoff**  
429 Hill St.  
Murphy, NC 28906  
P: 828-557-6509  
Email: taylor@dockeryengineering.com

**Mailing**  
P.O. Box 507  
Murphy, NC 28906

**Bill to:** Keith Broyles  
**Address:**  
  
**Phone:**

Item #	Description	Qty	Unit price	Adjustment	Price
1	Water Line Design/Plans	1	\$2,500.00		\$2,500.00
				Invoice Subtotal	\$2,500.00
				Tax Rate	0.00%
				Sales Tax	\$0.00
				Deposit Received	\$0.00
				<b>TOTAL</b>	<b>\$2,500.00</b>

Thank you for your business!

Please make all checks payable to Dockery Engineering PLLC  
Mail to P.O. Box 507 Murphy NC 28906  
Total due in 15 days. Overdue accounts subject to a service charge of 1.5% per month.  
taylor@dockeryengineering.com | 828.557.6509

SECTION 02667  
WATER LINES: DISTRIBUTION SYSTEM

Approves to  
Comply  
13 AUG 2024

PART 1: GENERAL

1.01 GENERAL SPECIFICATIONS

A. Scope

The work includes furnishing all material and equipment and performing all labor necessary to construct, test and sterilize the water distribution system, complete with the necessary valves and other accessories, ready for operation.

B. Excavation and Backfilling

Excavation and backfilling shall conform to the requirements of Section 02221—Trenching, Backfilling and Compacting for Utility Systems” of these specifications.

PART 2: PRODUCTS

2.01 GENERAL MATERIAL SPECIFICATIONS

A. General:

1. All pipe and accessories shall be new and unused materials, conforming to the requirements specified hereinafter.
2. All materials/products that contact potable water must be third party certified as meeting the specifications of ANSI/NSF Standard 61, Drinking Water System Components – Health Effects.
3. Natural rubber or other material which will support microbiological growth may not be used for any gaskets, O-rings, and other products used for jointing pipes, setting meters or valves, or other appurtenances which will expose the material to the water.
4. The interior of the pipe and accessories shall be cleaned of all foreign matter before being placed into the trench, and shall be kept clean during laying operations by means of plugs or other approved methods.
5. Lubricants that will support microbiological growth shall not be used for slip-on joints. Vegetable shortening shall not be used to lubricate joints.
6. Shop drawings, catalog cuts and related data (4 copies minimum) for all pipe and appurtenances shall be submitted to The Town for approval.

Not

B. Buried Pipe

1. Ductile Iron Pipe:

- a. Ductile Iron Pipe shall be manufactured in accordance with AWWA C151. All Ductile Iron Pipe shall be Class 350 unless otherwise specified and shall be lined with cement mortar not less than 1/16" thickness conforming to AWWA C104. Pipe wall thickness shall conform to "Thickness Design for Ductile Iron Pipe" AWWA C150. Exterior of Ductile Iron Pipe shall have a protective coating of bituminous seal coat conforming to AWWA C110 and C115.

- b. Joints shall be AWWA C111 push-on or mechanical for general buried service. AWWA C115 Flanged for exposed service unless shown otherwise. Flange material shall match pipe material.
- c. Restrained joint pipe where called for in the plans shall provide a flexible joint which locks in place so that the joint may withstand surges within the line. The pipe shall use "push-on" type joints in accordance with AWWA C111. Restrained joint pipe and fittings shall be U.S. Pipe TR Flex® or approved equivalent.

## 2. Polyvinyl Chloride Pipe (PVC):

- a. For Pressure rated PVC pipe with a nominal diameter of 4 inches and larger the pipe shall be manufactured in accordance with AWWA C900 and shall have a dimension-ratio (DR) of 14. For Pressure rated PVC pipe with a nominal diameter of 3 inches and less the pipe shall be manufactured in accordance with ASTM D-2241 and pressure rated 315 (SDR 13.5). All PVC pipe shall bear the National Sanitation Foundation (NSF) potable water logo and display the appropriate DR/SDR and size.
- b. Joints shall be AWWA C111 push-on

## 3. HDPE (High Density Polyethylene) Tubing:

- a. HDPE Tubing shall be manufactured in accordance with ASTM D2239 and ASTM D3035 and shall be rated for 250 psi (SDR 9) working pressure. Less than 2" diameter tubing shall be Copper Tube Size (CTS) and 2" diameter tubing shall be Iron Pipe Size (IPS).
- b. Joints shall be brass compression couplings or fusion welded suitable for working pressures of 250 psi.

## C. Fittings and Specials

For 4 inches nominal diameter and larger pipe:

1. Fittings and specials shall be Mechanical Joint type Ductile Iron and shall conform to AWWA C110 or AWWA C153 Ductile Iron compact fittings.
2. All fittings shall be internally lined with cement mortar in accordance with AWWA C104 and externally lined with a bituminous seal coat.

For 3 inches nominal diameter and less PVC pipe:

1. Fittings and specials shall be push on gasketed pressure class 250 rated. No solvent welded PVC fittings shall be used.

## D. Valves

1. Valves 2" through 12" shall be resilient-seated, cast iron body, non-rising stem Gate Valve conforming to AWWA C509, latest revision. Sealing mechanism shall provide zero leakage at the water working pressure against the line flow from either direction and be designed such that no exposed metal seams, edged, screws, etc. are within the waterway in the closed position. The gate shall not be wedged into a pocket nor slide across the seating surface to obtain tight closure. All internal and external ferrous surfaces of the valve, including the interior of the gate, shall be coated with a protective coating conforming to AWWA C550, latest revision. Coating shall

- be applied to castings prior to assembly to assure all exposed areas will be covered. Valves 3" through 12" shall be mechanical joint unless otherwise shown on plans. Valves less than 3" shall be N.P.T. threaded. All valves shall be rated at 250 psi working pressure. Unless otherwise noted, underground valves shall have an operating nut and exposed valves shall have a hand wheel operator.
2. Valves greater than 12" shall be Butterfly Valves conforming to AWWA C504, latest revision.

#### E. Valve Boxes

1. Each valve buried in the ground shall be provided with an approved type of valve box and cover. The boxes shall be adjustable slip-joint or screw type.
2. Valve Boxes shall be a cast iron in three pieces comprising the lower or base pieces which shall have a bell at the bottom to fit around the stuffing box gland and rest on the valve bonnet, the upper part of which shall be flared on the lower end to telescope on a socket to receive the cap or cover. Valve box covers shall have the word "Water" cast in the cast iron lid. All castings shall be coated with asphalt or coal-tar varnish.

#### F. Fire hydrants

1. Fire hydrants shall conform to AWWA standard C-502 - 94 and shall be of the three (3) way type. The hydrant valve opening shall not be less than five and one-quarter (5 ¼) inches. Each hydrant shall be equipped with two (2) two and one-half (2 ½) inch hose connections and one (1) steamer connection. The hydrants shall be fitted with bell ends to accommodate the spigot end of six (6) inch ductile iron or PVC pipe and have the standard one and one-half inch pentagon operating nut.
2. The barrel of the hydrant shall be of proper length to permit a three and one half (3 ½) bury. The valve shall be designed to close against the pressure of the distribution system and remain closed in the event of the upper part of the barrel being broken.
3. A flange shall be provided, above ground level, to permit adjusting the facing of the hydrant. The hydrant shall be so designed and constructed as to permit replacement of the upper portion of the barrel without digging.
4. Each nozzle shall have a cast iron cap, suitably attached to the hydrant by means of a chain. Nozzle caps shall be provided with leather gaskets.
5. Hose nipples shall be of the removable type and shall conform to the existing hose nipples in use. On a new system they shall have National Standard Threads on the hose connection side unless otherwise directed by the Engineer. The Contractor shall check existing nipples before ordering.
6. All fire hydrants furnished for this project shall be of the type known as "breakable" in order that the hydrant barrel may be broken without damaging the lower portion of the hydrant in case of an accident.
7. All fire hydrants furnished for this project shall be in accordance with The Town standards.

G. Steel Encasing Pipe

1. Steel Encasing Pipe shall be smooth wall, meeting or exceeding ASTM A - 139 Grade B 35,000 psi minimum yield strength with minimum wall thickness as defined as follows:

CARRIER PIPE	CASING PIPE	THICKNESS
6" DUCTILE IRON	12"	.250"
8" DUCTILE IRON	16"	.250"
10" DUCTILE IRON	24"	.250"
12" DUCTILE IRON	24"	.250"

2. Carrier Pipe Supports Within Steel Casing: shall be steel plate, cold formed structural collar with flanges and a minimum of four support legs welded to the collar. Each support leg shall have a foot or skid welded on the end extending beyond the front and back edge of the collar. The front and rear of each foot shall be angled inwardly towards the collar to serve as a stable, effective skid during installation of the carrier pipe. The carrier support shall be securely fastened to the carrier pipe with heavy duty 1/2" grade 5 bolt and locking nut passing between the flanges, compressing the collar against the carrier pipe.

**PART 3: EXECUTION**

**3.01 INSTALLATION OF PIPE AND ACCESSORIES**

**A. General**

1. Pipe work shall be installed at the location shown on the plans and to the position, alignment and grade shown thereon, or in the event of grade conflict, as directed by the Engineer. All pipe work shall also be installed in accordance with the details shown on the drawings, unless otherwise hereinafter specified or required. All pipe shall have a minimum depth coverage of 36".
2. Handling pipe and Accessories: Pipe and accessories shall be handled in such a manner to insure delivery to the final location of installation in sound, undamaged condition and conforming in all respects to these specifications. All materials shall be maintained in a clean condition.
3. Placing Pipe in Trench: The interior of all pipe shall be thoroughly cleaned of all foreign matter before being lowered into the trench, and shall be kept clean and dry during laying operations by means of plugs or other approved methods. Trenches shall be kept free from water, and no trench water shall be allowed to enter the pipe or fittings. At all times when work is not in progress, all open ends of pipes and fittings shall be securely closed to the satisfaction of The Town.
4. There shall be no connection between the distribution system and any pipes, pumps, hydrants, or tanks whereby unsafe water or other contamination materials may be discharged or drawn into the system.
5. Encasements:
  - a. Encasements shall be installed by boring and jacking unless field conditions require otherwise. It shall be the Contractor's responsibility to notify The Town immediately if conditions do not permit a jack and bore installation.

- b. Installation of encasement pipe shall include all related work and services such as mobilization of equipment, constructing and maintaining working pits, right-of-way maintenance and restoration, traffic maintenance, mining, excavations, dewatering, sheeting, shoring and bracing for embankments, operating pits, and as elsewhere required shall be placed and maintained in order that work may proceed safely and expeditiously.
- c. Installation of the casing pipe shall be carried out without disturbance of the embankment, pavement, tracks, or other railroad or highway facilities and without obstructing the passage of traffic at any time.
- d. The alignment and grade shall be carefully maintained and the encasement pipe installed in a straight line.
- e. The space outside the encasement and the ground shall be filled with grout, sand or pea gravel, as directed by The Town. The Town will direct that this space be filled if the space is large enough to cause any earth settling.
- f. Before the pipe is installed in the casing, carrier pipe supports shall be rigidly fastened to the barrel of the pipe. After completion of the casing, the Contractor shall insert the pipeline in pre-jointed segments. No contact will be permitted between the casing and the carrier pipeline.

**B. Inspection**

1. Inspection of Pipe: Inspection shall be conducted before lowering into trench and while suspended for defects and any defective, damaged or unsound pipe which shall be rejected and removed from the project site.
2. Trench Bottom: Bottom shall be excavated such that the full length of each section of pipe shall rest solidly upon a firm pipe bed with recesses excavated to accommodate the bells and joints. Any pipe that has the grade or joint disturbed after laying shall be taken up and re-laid.
3. Alignment of Pipe: Where pipe lines or runs intended to be straight, shall be so laid. Deflections in straight line and grade, made necessary by vertical curves or horizontal curves or offsets, shall not exceed the maximum deflections recommended by the pipe manufacturer. If the specified or required alignment requires deflection in excess of those stipulated above, the Contractor shall either provide bends as approved by The Town.
4. Laying Pipe: When laying a length of pipe in the trench, the spigot end shall be centered and the pipe pushed fully into position and brought into true and specified alignment.
5. Cutting Pipe: Pipe for closure pieces or for other reasons shall be done in a neat and workmanlike manner by a method which will not damage the pipe. Unless otherwise authorized by The Town, all such cutting of pipe shall be done by means of mechanical cutters of an approved type, or types. Wheel cutters shall be used whenever practicable. The pipe ends shall be shaped as necessary to provide a good joint.

**C. Thrust Blocking:**

All fittings at bends in the pipe line shall be braced with concrete thrust blocks. Size of the thrust blocks will be based upon the bearing capacity of the soil at the bend. Concrete shall have a 28 day compressive strength of not less than 3000 psi. Thrust blocking shall bear directly against a firm undisturbed trench wall.

3,000 PSI Sacrete may be used for material as long as it is properly mixed in clean containers with potable water and so long as the appropriate water to cement ratio is used. If the soil is unsuitable for bearing or wet conditions exist, restrained joint fittings shall be used as directed by the Engineer or the Town. Restrained joint glands shall be of the type Megalug or equal.

D. Existing Subsurface Conditions:

1. Where existing sub-surface structures such as water pipe, gas lines, sewer pipe, conduit, etc., are found which are not shown on the plans or are found to be different in size or location from that indicated by the plans and specifications, the contractor shall notify The Town, the structure shall be uncovered and supported by the Contractor, as directed by the Engineer, and at the Contractor's Expense. The Contractor shall not be entitled to any damages due to the presence of the structure, or the uncovering and supporting of the structure.
2. Any changes in plans and specifications resulting from the presence of the structure shall be determined by the Engineer, and made by the Contractor as directed by the Engineer. Any additional charges for such work shall be as mutually agreed upon by The Town and the Contractor – or if The Town and the Contractor cannot agree upon a price for the work, payment shall be based on the direct cost of materials, labor (including insurance and Workman's Compensation), and equipment, plus a maximum of 15% overhead and profit for all other items of administration, profit, superintendence and other such costs and expenses.

E. Lateral Separation of Sewers and Water Mains

1. Water mains shall be laid at least 10 feet laterally from existing or proposed sewers, unless local conditions or barriers prevent a 10 foot lateral separation – in which case:
  - a. The water main is laid in a separate trench, with the elevation of the bottom of the water main at least 18 inches above the top of the sewer; or
  - b. The water main is laid in the same trench as the sewer with the water main located at one side on a bench of undisturbed earth, and with the elevation of the bottom of the water main at least 18 inches above the top of the sewer.
2. Crossing a Water Main Over a Sewer: Whenever it is necessary for a water main to cross over a sewer, the water main shall be laid at such an elevation that the bottom of the water main is at least 18 inches above the top of the sewer, unless local conditions or barriers prevent an 18 inch vertical separation – in which case both the water main and the sewer shall be constructed of ferrous materials and with joints that are equivalent to water main standards for a distance of 10 feet on each side of the point of crossing.
3. Crossing a Water Main Under a Sewer: Whenever it is necessary for a water main to cross under a sewer, both the water main and the sewer shall be constructed of ferrous materials and with joints equivalent to water main standards for a distance of 10 feet on each side of the point of crossing. A section of water main pipe shall be centered at the point of crossing.

**F. Installation of Valves:**

1. Valves installed in trenches shall be placed where shown on the drawings unless otherwise directed by the Engineer.
2. Valves and valve boxes shall be set plumb, with valve boxes placed directly over the valves. After being correctly positioned, earth fill shall be carefully tamped around the valve box for a distance of 4 feet on all sides of the box.
3. Before installing any valve, care shall be taken to see that all foreign material is removed from the interior of the barrel.
4. After installation, each valve shall be opened and closed to insure that all parts are in proper working condition.
5. The valve box top shall be at finished grade elevation.
6. Each valve shall rest on stone bedding not less than 6 inches thick and 24 inches square.
7. Each valve box shall be provided with a standard concrete valve box protector as shown on the plans.

**G. Installation of Fire Hydrants:**

Fire hydrants shall be placed where shown in the Town Standard Details or otherwise as directed by the Engineer. Hydrants shall be placed with the standpipe plumb. The base of the hydrant shall rest upon a slab of stone or concrete not less than 6 inches thick and 24 inches square. Beneath and around the base of the hydrant and to a point one foot above drip, at least a quarter of a yard of clean, crushed stone shall be placed, and the trench filled with earth. Hydrants shall receive 2 coats of red paint after installation. All other construction requirements shall be according to the Town Standard Details.

**H. Service Installation**

- a. Services shall be installed where shown on the drawings unless otherwise directed by the Engineer or the Town. Service taps shall be made on the upper half of the water main at an angle of 45 degrees from the vertical.
- b. Ductile iron body double strap tapping saddles shall be used for all service connections. HDPE fusion wells are allowed only if done by a current ASTM Certified Technician.
- c. Installation shall conform to the Town Standard Details.

**I. Plugs or Caps:**

Where pipe ends are left for future connections, they shall be valved, plugged or capped as indicated, or as directed by the Engineer or the Town.

**J. Connection to Existing Water Mains:**

- a. Where the Contractor is required to connect the proposed mains with certain existing mains, the approximate location of these existing mains and connections are noted on plans but it will be incumbent upon the Contractor to ascertain the exact locations of these mains if such exact locations are needed by the Contractor for the purpose of ordering pipe fittings or otherwise.
- b. Such taps shall meet the standards of the system being tapped into and the Contractor shall coordinate with municipality or utility companies as necessary for the taps required.

### **3.02 HYDROSTATIC TESTS**

#### **A. Testing**

1. After the pipe is laid and backfilled and the line is cleaned of dirt and foreign material, the pipe shall be subjected to a hydrostatic pressure of  $1\frac{1}{2}$  times of the working pressure.
2. The duration of each pressure test shall be at least two hours in the presence of a Town representative.
3. Each valved section of pipe shall be slowly filled with water and the specified test pressure, based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge. The test shall be applied by means of a test pump connected to the pipe in a manner satisfactory to the Engineer and The Town.
4. The Contractor shall furnish the pump, pipe connection, measuring device, pressure gauges and all other necessary apparatus.
5. Before applying the test pressure, all air shall be expelled from the section of line to be tested. If permanent air vents or other appurtenances are not located at all high points, the Contractor shall install brass corporation stops at such points so the air can be expelled as the line is filled with water.
6. After all the air has been expelled; the corporation stops shall be closed and the test pressure applied. The corporation stops shall be left in the line after completion of the tests.
7. All costs of tapping the line and installing the corporation stops shall be incidental to construction and shall be borne by the Contractor.

#### **B. Leakage Testing**

1. A leakage test shall be conducted on each line, or section of line, in accordance with AWWA C600 - 82, latest revision. Leakage shall be defined as the quantity of water that must be applied into the newly laid pipe, or any valved section thereof, to maintain the specified test pressure after the air in the pipe line has been expelled and the pipe has been initially filled with water. All visible leaks must be repaired regardless of the amount of leakage.
2. No pipe installation will be accepted if the leakage is greater than that determined by the formula:  
$$L = SDVP / 148,000$$
in which L is the allowable leakage in gallons per hours;  
S is the length of line tested in feet;  
P is the average test pressure during the test period in psi gauge; and  
D is the nominal pipe diameter in inches.
3. If any test of pipe laid discloses leakage greater than that specified above, the Contractor shall at his own expense locate and repair, or replace, the defective joint or pipe until the leakage is within the specified allowance.

### **3.03 STERILIZATION**

#### **A. General**

1. Before being placed in service, all new mains and repaired portions of, or existing mains shall be thoroughly flushed then chlorinated according to AWWA Standard C651 Section 5.2, Continuous-Feed Method (latest revision). This method shall be followed as outlined below with the exception that the lines shall be disinfected by the addition and thorough distribution of a chlorine solution in concentration sufficient to produce a chlorine residual of

at least 50 milligrams per liter (or ppm) in accordance to Section .2003 of the "Rules Governing Public Water Supplies".

**B. Preliminary Flushing**

1. Before being chlorinated, the main shall be filled to eliminate air pockets and shall be flushed to remove particulates. The flushing velocity in the main shall not be less than 2.5 ft/s unless the Engineer or job superintendent determines that conditions do not permit the required flow to be discharged to waste. Table 1 shows the rates of flow required to produce a velocity of 2.5 ft/s in pipes of various sizes. Note that flushing is no substitute for preventive measures during construction. Certain contaminants, such as caked deposits, resist flushing at any feasible velocity.

**Table 1:**  
**Required Flow and Openings to Flush Pipelines (40 psi Residual Pressure in Water Main)**

Pipe Diameter (in)	Flow Required to Produce 2.5 ft/s (approx.) Velocity in Main (gpm)
4	100
6	200
8	400
10	600
12	900
16	1600

**C. Disinfection**

1. Water from the existing distribution system or other approved source of supply shall be made to flow at a constant, measured rate into the newly laid water main. In the absence of a meter, the rate may be approximated by methods such as placing a pitot gauge in the discharge or measuring the time to fill a container of known volume.
2. At a point not more than 10 ft downstream from the beginning of the new main, water entering the new main shall receive a dose of chlorine fed at a constant rate such that the water will have not less than 50 mg/L chlorine residual. To assure that this concentration is provided, measure the chlorine concentration at regular intervals using appropriate chlorine test kits.
3. During the application of chlorine, valves shall be positioned so that the strong chlorine solution in the main being treated will not flow into water mains in active service. Chlorine application shall not cease until the entire main is filled with heavily chlorinated water. The chlorinated water shall be retained in the main for at least 24 hours during which time all valves and hydrants in the treated section shall be operated to ensure disinfection of the appurtenances.
4. Direct-feed chlorinators, which operate solely from gas pressure in the chlorine cylinder, shall not be used for application of liquid chlorine. The preferred equipment for applying liquid chlorine is a solution-feed, vacuum-operated chlorinator and a booster pump. The vacuum-operated chlorinator mixes the chlorine gas in solution water; the booster pump injects the chlorine-gas solution into the main to be disinfected. Hypochlorite solutions may be applied to the water main with a gasoline or electrically powered

chemical-feed pump designed for feeding chlorine solutions. Feed lines shall be of such material and strength as to safely withstand the corrosion caused by the concentrated chlorine solutions and the maximum pressures that may be created by the pumps. All connections shall be checked for tightness before the solution is applied to the main.

5. Highly chlorinated water shall not be released into the distribution system nor shall be discharged into any sanitary sewer manhole or other sanitary sewer inlet. The chlorinated water shall remain in the line until the chlorine residual drops below 5 ppm or dissipated by other prior approved methods. After this period, the water will be wasted by pumping into the air to dissipate the remaining chlorine residual. Pumping shall be at a rate not to exceed 25 GPM. Pressure and nozzle size shall be such as to produce an 8 foot (vertical) spray. The system should then be flushed with potable water and the sampling program started. Sampling shall consist of taking at least one per line installation and one representative sample every 5000 feet and at each blow-off. The samples shall then be tested by a state approved laboratory for indication of bacteriologically satisfactory water. Two successive negative samples per line segment will be required for certification. Positive samples will require re-sterilization per specifications. Three (3) copies of this laboratory test shall be submitted to The Town.
6. Contractor shall coordinate all filing, pressure testing, flushing, chlorination, and de-chlorination with the Town and shall pay for water used in the process based on Engineer's calculations.

### **3.04 SAFETY**

A. The Contractor shall comply with all applicable provisions of the Federal Occupation Safety and Health Act.

1. Where work is to be done in state maintained right-of-ways, the Contractor shall contact the Department of Transportation (local and/or district office) to determine the peruse requirements for barricades, signs, etc.

### **3.05 FINAL CLEANUP**

A. Immediately after the completion of the work for any substantial unit or portion of it, the Contractor shall remove all unused materials, refuse, etc., and shall leave the site of the work in a condition satisfactory to The Town.

**END OF SECTION**

**SECTION 02675**  
**DISINFECTION OF WATER DISTRIBUTION SYSTEMS**

**PART 1: GENERAL**

**1.01 SECTION INCLUDES**

- A. Disinfection of potable water distribution system
- B. Testing and reporting results

**1.02 REFERENCES**

- A. ANSI/AWWA B300 – Standard for Hypochlorites.
- B. ANSI/AWWA B301 – Standard for Liquid Chlorine.
- C. ANSI/AWWA C651 – Standard for Disinfecting Water Mains.

**1.03 SUBMITTALS**

- A. Test Reports: Indicate results comparative to specified requirements. *copy of test report*
- B. Certification: Certify that the cleanness of the water distribution system meets or exceeds the North Carolina Department of Environmental Quality (NCDEQ) requirements.

**1.04 PROJECT RECORD DOCUMENTS**

- A. Disinfection report; record:
  - 1. Type and form of disinfectant used.
  - 2. Date and time of disinfectant injection start and time of completion.
  - 3. Test locations.
  - 4. Initial and 24 hour disinfectant residuals (quantity in treated water) in ppm for each outlet tested.
  - 5. Date and time of flushing completion.
  - 6. Disinfectant residual after flushing in ppm for each outlet tested.
- B. Bacteriological report; record:
  - 1. Date issued, project name, and testing laboratory name, address, and telephone number.
  - 2. Time and date of water sample collection.
  - 3. Name of person collecting samples.
  - 4. Test locations.
  - 5. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.
  - 6. Coliform bacteria test results for each outlet tested.
  - 7. Certification that water conforms, or fails to conform; to bacterial standards of the NCDEQ.
  - 8. Bacteriologist's signature and authority.

### **1.05 QUALIFICATIONS**

- A. Testing Firm: Company specializing in testing potable water systems, approved by the State of North Carolina.

### **1.06 REGULATORY REQUIREMENTS**

- A. Conform to the North Carolina Department of Environment Quality (NCDEQ).

## **PART 2: PRODUCTS**

### **2.01 DISINFECTION CHEMICALS**

Chemicals: Hypochlorite, ANSI/AWWA B300; Liquid Chlorine, ANSI/AWWA B301.

## **PART 3: EXECUTION**

### **3.01 PREPARATION**

- A. Verify that piping system has been cleaned, inspected, and pressure tested.
- B. Perform scheduling and disinfection activity with start-up, testing, adjusting and balancing, demonstration procedures, including coordination with related systems.

### **3.02 DISINFECTION**

- A. Provide and attach required equipment to perform the work of this section.
- B. Inject treatment disinfectant into piping system at a dosage of not less than 50 ppm.
- C. Maintain disinfectant in system for at least 24 hours.
- D. At end of retention period residual chlorine shall be no less than 10 ppm.
- E. Flush, circulate and clean until residual chlorine is reduced to less than 1 ppm.
- F. Open and close fire hydrants several times during flushing period.
- G. Disposal of the chlorinated solution during flushing shall comply with all federal, state, and local regulations. In accordance with all applicable regulations, a neutralizing chemical shall be applied to minimize chlorine residual in the flushing water before discharging from the water main, unless an alternate plan is submitted and approved by The Town. Disposal directly to surface waters without removal of chlorine is strictly prohibited.

### **3.03 BACTERIAL TESTING**

- A. Take samples of water from several locations in sterilized containers.
- B. Test samples in accordance with ANSI/AWWA C651 and NCDENR.

- C. There shall be two successive tests taken 48 hours apart having clear bacterial test results.
- D. The system will not be accepted until satisfactory bacteriological results have been obtained.

**END OF SECTION**