

**PRINCIPALS**

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# Memorandum

DRMP Job #: 20-0252.000

Date: May 5, 2020

To: Sterling Carroll, Florida Rural Water Association

From: Patrick Day, DRMP

**Subject: Mobile Manor MHP Water Main Upgrades – Preliminary Design Report****GENERAL**

The water distribution system at Mobile Manor Mobile Home Park (MHP) was installed in the 1960's. There have been frequent water main breaks which indicates that the water main is at the end of its useful life. There have also been issues with the water meters. The water system is owned by the Mobile Manor Water Company (Water Co.) and the Water Co. reached out to the Florida Rural Water Association (FRWA) to provide a retrofit for the water system. FRWA hired DRMP to perform an initial examination of the system and prepare a Preliminary Design Report with a Concept Plan.

**SUPPORTING DOCUMENTS**

This Preliminary Design Memorandum is based in part on the information contained in the following documents:

- Supplied Utility Plan provided by the Water Co.
- Offer Letter for Assistance from FWRA
- Deed of Property

**EXISTING SYSTEM**

The existing water main system encompasses approximately 13,700-feet of predominantly 2" PVC piping within the Mobile Manor MHP. The system connects to a 12-inch water main that is part of the Lee County Water Distribution System in the Bayshore Road ROW near Lamplighter Lane. There is an existing 4-inch Backflow Preventer Assembly at the connection point that is owned by the Water Co. This connection point is located in close proximity to Lee County's North Reservoir Water Treatment Facility where the pressure is typically in the 60 – 80 psi range. Due to this high pressure and the age of the Mobile Manor water system, a 3-inch Pressure Reducing Valve was installed near the Backflow Preventer. Attached is an exhibit depicting the existing system which was derived from the Utility Plan provided to us by the Water Co.



Other utilities in the Mobile Manor MHP include the septic sewer system, the power system, and the cable system. These are located behind the homes in an easement. The power and cable distribution systems are aerial on power poles. There are drops at each home and the service for the power and the cable are underground from the drop off the pole into the home. We were unable to determine the location of the septic tanks and drainfields.

**OFFICES**

Atlanta, Georgia  
Boca Raton, Florida  
Charlotte, North Carolina  
Chipley, Florida  
Fort Myers, Florida  
Gainesville, Florida  
Jacksonville, Florida  
Lakeland, Florida  
Melbourne, Florida  
 Mooresville, North Carolina  
Orlando, Florida  
Panama City, Florida  
Pensacola, Florida  
Raleigh, North Carolina  
Tallahassee, Florida  
Tampa, Florida



The existing water system is comprised of 2-inch water mains and is very well looped throughout the community. There is roughly 13,700 linear feet of 2-inch main. We could not determine the pressure rating of the pipe, but we believe it an ASTM thin walled pipe which was used extensively when the MHP was constructed. There are working valves strategically placed that enable the system to be isolated in times of a water main break. The location of the water mains varies with some homes having the water main in the front of the house and many having the water main in the back. Here is a list of where the water mains are located:

Watermains in the front of the homes are on the following streets:

Lantern Lane  
Flame Lane  
Torch Terrace  
Torch Lane  
Lantern Place  
Fireball Lane  
Fireball Circle

Watermains installed behind the homes are as follows:

Between Amber Avenue and Candle Court  
Between Coachlight Lane and Amber Avenue  
Between Gaslight Avenue and Coachlight Lane  
Between Lantern Lane and Gaslight Avenue  
All the homes on Lamplighter Lane

In areas with the water mains in the back of the home, the utility easement over the years has been encroached upon with fences, plants and landscaping fixtures. The following pictures depict these conditions.



We researched the deed for the MHP to determine if there is a written description of the easement. The deed (attached at the end of this report) states that the “Grantor reserves an exclusive franchise to furnish butane, or other fuel gas to the lots of the subdivision together with an easement to lay and maintain pipes along the utility easements.” We could not find a legal description or survey of the of the easements. And while the deed mentions gas mains, we are not aware of any gas mains.

There is also a water main that is attached to the condemned pedestrian bridge crossing Indian Canal. Since the bridge will have to be demolished, the Water Co. would prefer this water main replaced with a subaqueous directional drill prior to the demolition.

The Water Co. also requested that the water meters be replaced as there are many maintenance issues with them.

### **PROPOSED IMPROVEMENTS**

The proposed improvements include replacing all existing water mains, valves, blow offs, meters and service lines up to the meter. Attached is an exhibit depicting these proposed changes. .

When a new water main is constructed, and prior to be putting into operation, the water main must be bacteriologically tested and cleared by the Health Department. This process typically takes three or four days. Thus, in order to maintain a supply of water to each resident, the proposed water main system will need to be constructed parallel to the existing system,



bacteriologically cleared, and then put into operation. This can occur on a phased basis by constructing sections of new water main between the valves of the existing system. When the Health Department issues the clearance to put the main into service, the existing services will be transferred to the new main, and the new main put into operation.

A Preliminary Concept of the water main is attached to this report. The initial construction of the replacement water main can start after the pressure reducing valve. The following are the recommended water main sizes for the replacement main:

- 4-inch Sch 80 PVC main from the pressure reducing valve to the crossing of Indian Canal
- 4-inch HDPE DR 9 directionally drilled under the Indian Canal to Lantern Lane.
- 3-inch Sch 80 PVC on Lantern Lane from Torch Lane to Flame Lane
- 2-inch Sch 80 PVC for everywhere else

The ultimate decision for phasing and the method of installation will be at the discretion of the selected contractor. The construction could start with the 4-inch main and then progress back through the development. There is an existing water main attached to a condemned walking bridge over the Indian Canal. The 4-inch directionally drilled main under the Indian Canal referenced above will allow for the main attached to the bridge to be removed and the bridge to be replaced.

The construction of the water main in the easement behind the homes will be very difficult due to the congestion of the utilities, services, fences, and fixtures. The contractor will have to locate the existing power and communication service lines that are running underground to each home prior to digging. The sewer laterals and septic system will also have to be located as well as the existing water services. The landscaping and fixtures in the easement that are in the line of construction will also have to be temporarily removed. A detailed survey of the utility replacement alignment will be necessary.

As part of the design plans, notes must be added to the design documents stating that:

- All fencing and fixtures that are removed must be replace
- Any altered surfaces shall be restored to their original condition or better, generally to match existing adjacent surfaces. Unpaved areas shall be restored with sod.

**DESIGN CRITERIA**

**All material will have to be NSF certified for FDEP approval.**

- Design Conditions
  - Working Pressure – 60 - 80 psi
- Pipe Materials

<i>Open Cut and Trench Installation</i>						
Nominal Pipe Diameter	Pipe Material	Pressure Rating (PSI)	Average Outside Pipe Diameter	Min. Wall Thickness	Average Inside Pipe Diameter	Length
2"	PVC SCH80	400	2.375"	.218"	1.913"	12,115'
3"	PVC SCH80	370	3.5"	.300"	2.864"	1,150'
4"	PVC SCH80	320	4.5"	0.337"	3.786"	320'

<i>Directional Drill Installation</i>						
Nominal Pipe Diameter	Pipe Material	Pressure Rating (PSI)	Average Outside Pipe Diameter	Min. Wall Thickness	Average Inside Pipe Diameter	Length
4"	HDPE DR 9	200	4.5"	0.50"	3.440"	115'

- Pipe Fittings
  - All fittings for the water distribution system shall be installed via solvent cement welded joints which should follow a two-step process with a primer meeting ASTM F656 and a medium or heavy bodied solvent cement conforming to ASTM D 2564.



- Valves
  - The system is currently set up with isolation valves at key locations and the proposed system must match this so individual streets and pipe runs can be isolated. Typically gate valves are used for water mains. Since the mains are small, ball valves can also be used for isolation.
  - Hydrants – No hydrants are proposed on this water system
  - Meters – Water meters should meet the AWWA C700 Standard. Typically for this application a 5/8' residential water meter should be used such as the T-10 from Neptune. These meters can be equipped with encoders that can be read electronically saving time. This could be a bid option so the Water Co. can determine the value. If the existing meter boxes are in good shape they can be reused. But given the age of the system, new meter boxes should be considered.
  - Water service lines – New service lines should be connected to the new water main and installed up to the meter. One service line typically provides service to two homes. These laterals will include a corporation stop at the connection to the main, polyethylene tubing to the meter, a "Y" connect to split the service to the two homes, and a curb stop in the meter box. The service line from the meter to the home can be reused unless.

#### **PERMITTING**

The following permits will be required to install the water main.

- General Permit for Construction of Water Main Extensions for Public Water Systems from the Florida Department of Health.
- Lee County Limited Review Development Order Type D.

#### **NEXT STEPS**

The following is a typical task list for a water main replacement:

1. Survey
2. Initial Design (60%)
3. Final Design (90%)
4. Permitting
5. Bidding (providing 100% Documents updated from permitting comments)
6. Construction.

#### **PRIMARY CONCERNS**

The primary concerns for this project will be constructing the new water main in the congested easement. Locating existing utilities prior to construction will be critical. Notifying Florida Power and Light and the communications company would be a necessity. The project will also be much easier to construct if the residents were involved in moving as much of their personal property out of the easement prior to construction. The residents will need to be made aware of the complexity of the project and how their cooperation will make the construction time shorter.

We thank you for the opportunity to provide this report. If you have any questions or comments, feel free to contact me.

Sincerely,

A handwritten signature in blue ink that reads "Patrick Day".

Patrick Day, PE  
Utilities Manager