Attachment J-1

Fort Riley Potable Water System

Table of Contents

List of Tables

J-1 Fort Riley Potable Water System

J-1.1 Fort Riley Overview

Established on 5 May 1855, Fort Riley consisted of 24,000 acres of land. Presently, there are over 100,000 acres owned or leased by Fort Riley with a military and civilian population of approximately 18,000. The present cantonment area is the same as the cantonment from the original Fort. Many of the buildings still housing operations and headquarters were built during the first few years of the Installation's existence. Fort Riley's primary mission is the training, housing, and support of the 24th Infantry Division. In addition, it supports various non-divisional and tenant organizations such as the Reserve, the National Guard, and ROTC.

Located in Geary and Riley Counties of northeastern Kansas, the Installation is approximately 135 miles west of Kansas City and 130 miles northeast of Wichita. The Installation was established where the Smoky Hill River and Republican River join to form part of the Kansas River. These rivers separate the Installation from Junction City, which is the closest city to the Installation. Fort Riley extends to the north and northwest approximately 18 miles with an approximate width of 10 miles. The general character of the area surrounding the Installation is rural with small farm communities. Two flood control reservoirs, Tuttle Creek and Milford Reservoirs, flank the Installation.

J-1.2 Potable Water System Description

There are two independent potable water systems at Fort Riley, each with its own independent source, treatment system, pumps, reservoirs, and distribution lines. The two systems are Fort Riley and the Multi-Purpose Range Complex (MPRC). Fort Riley potable water system supplies potable water to the following areas: (1) Main Post, (2) Camp Forsyth, (3) Custer Hill, (4) Camp Funston, (5) Camp Whitside, (6) Forsyth Family Housing, and (7) Marshall Army Air Field. The MPRC potable water system is a small system serving seven buildings in the Range complex.

Figures 1 and 2 shows the potable water systems at Fort Riley. Figure 1 shows the locations of water tanks, pump stations, wells and the treatment plant at Fort Riley. Figure 2 is the schematic diagram of the potable water system at Fort Riley and MPRC.

J-1.2.1 Water Source

Fort Riley

The water source for Fort Riley is groundwater from wells. The raw water at Fort Riley is relatively clean with low turbidity and has a wide range of hardness from 200 mg/L (milligrams per Liter) to over 400 mg/L. Eight wells are located in the Forsyth Family Housing area southeast of the Potable Water Treatment Plant (PWTP), and one well is located in the Marshall Airfield area. The wells at Forsyth Family Housing area are 80 to 90 feet deep and the well at Marshall Airfield is 60 to 70 feet deep. All wells have vertical turbine pumps and local alarms and are connected to the Fort Riley Water Distribution

and Monitoring Control System. The well water from Forsyth Family Housing is conveyed to the PWTP through a 24-inch concrete pipeline. Marshall Airfield well is used only on a limited basis. The water from Marshall Airfield well is chlorinated and fed to the distribution system directly. The following table shows the details of the wells:

S. No	Well Number	Capacity GPM	Installed/Upgrade	Notes
Forsyth Family Housing area				
1	3200	900	1958	
2	3201	900	1958	Connected to emergency power generator.
3	3202	1,000	2001	125 HP motor. New variable speed control not operational yet
4	3203	1,000	1993	Connected to emergency power generator.
5	3204	1,100	1943	125 HP motor.
6	3205	500	2001	Upgraded pump, 60 HP motor and piping.
7	3272	1,000	1993	
8	3198	1,000	1993	.
Marshall Airfield				
9	801	1,000	1987	Limited use; chlorinated and fed to the distribution system directly.

Figure 1.2.1.a - Fort Riley, Well 3202

Figure 1.2.1.b - Fort Riley, Well 3202, Variable Speed Control

Figure 1.2.1.c - Fort Riley, Well 3204

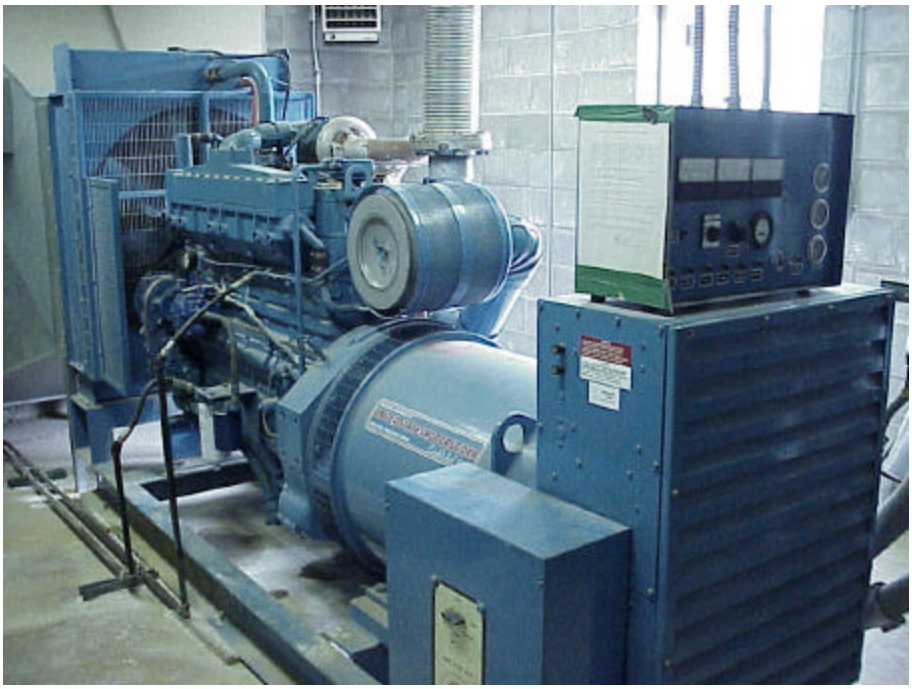


Figure 1.2.1.d - Fort Riley, Backup Generator 3206

There is a 350 kW emergency generator located in building 3206 to supply emergency power to wells 3201 and 3203.

MPRC

The water source for MPRC is groundwater also. There are two wells located within the complex.

S. No	Well Number	Capacity GPM	Installed/Upgrade	Notes
1	9305	80	1994	
2	9306	80	1994	

J-1.2.2 Potable Water Treatment Plant

Fort Riley

The PWTP at Fort Riley was placed in operation in December 1992. The maximum production capacity of the plant is 10 million gallons per day (MGD), which is made up of two 5 MGD treatment trains. The average water demand at Fort Riley is less than 5 MGD that requires only one treatment train to be operational at any one time. Fort Riley potable water system is controlled by a Water Distribution Monitoring and Control System (WDMCS) supplemented with two Super Data Acquisition Systems. The main components of the PWTP are:

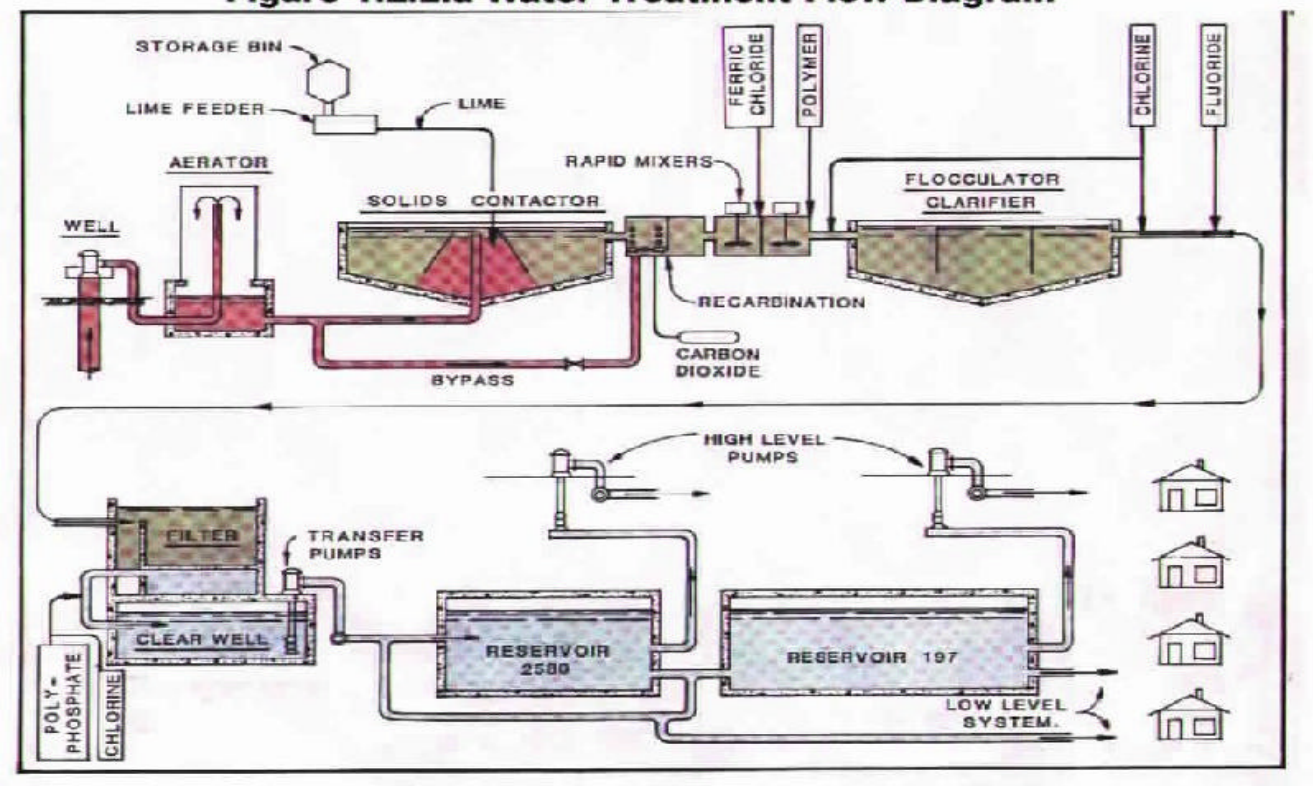
- Two (2) Induced-Draft Aerators

- Two (2) Flocculators/Clarifiers
- Four (4) Dual-Media Gravity Filters
- Two (2) Solids Contact Units
- Two (2) Lime Slakers
- Laboratory
- Clearwell w/ High-Lift Pump Station – 1MG
- Four (4) Waste Residual Lagoons
- Chlorinators/chlorine Building
- Lime Silos
- Water Plant Control Room

The vast range of hardness of the well water poses some operational challenges in the treatment process.

Figure 1.2.2.a shows the schematic of the treatment plant and the treatment process is briefly described below.

Figure 1.2.2.a Water Treatment Flow Diagram



Aeration

The raw water from the well is aerated to remove excess carbon dioxide, volatile organic compounds, and a fraction of iron and manganese through oxidation. The aerated water is split to two streams. The first stream that has 80 percent aerated water goes to the Solids Contact Basin and the other stream with 20 percent water bypasses the Solids Contact Basin.

Softening

After aeration the water entering the Solids Contact Basin is blended with slaked lime slurry. The softened water leaving the Solids Contact Basin has a high pH in the range of 11.0 to 11.3. The settled sludge from the Solids Contact Basin is pumped to the lime sludge lagoons.

Recarbonation

There are two recarbonation basins one in each treatment train. The total detention time in the recarbonation basin is 8.5 minutes at 5 MGD flow rate. The bypass stream with the 20 percent water from the aerator, stabilizes the softened water to avoid corrosion or scale deposit in the potable water pipes. The recarbonation basin can also use gaseous carbon dioxide, but currently it is not used.

Rapid Mixing

Rapid mixing is done in two stages in a primary and secondary basin with a total detention time of one minute at 5 MGD flow rate. Ferric chloride is added as the coagulant in the primary basin and polymer is added to aid coagulation in the secondary basin.

Flocculation/Clarification

Water from the rapid mixing basins enter the Flocculator/Clarifier and is detained for a total time of 150 minutes at 5 MGD flow rate. The center portion of the basin has rotating paddles to facilitate flocculation. The clarified water leaves the basin through V-notch weirs. Sludge arms at the bottom of the basin collect the flock and the settled sludge is pumped to the sludge lagoons.

Chlorination and Fluorination

Chlorine and Fluorine are added to the clarified water at the chemical vaults.

Filtration

There are four dual media filters using anthracite coal and sand. Each filter has 2.78 MGD capacity. There are two backwash pumps each with a capacity of 9,660 GPM at 45 feet of total head. There are two surface wash pumps each with a capacity of 552 GPM at 288 feet of total head.

Treated water storage

The filtered water flows to a one MG clear well at the plant. Transfer pumps supply to the distribution system from the clear well. There are four transfer pumps each with a capacity of 2,350 GPM at 70 feet of total head.

MPRC

MPRC treats the water by wellhead chlorination.

J-1.2.3 Potable Water Distribution System

The potable water distribution system has three pressure zones, and is schematically shown in Figure 2. Each zone is discussed below. The average distribution pressure at Fort Riley is 60 pounds per square inch (psi). The depth of water pipe varies from 2.5 feet to 10 feet. For this privatization action, all water pipelines except the service lines to Family Housing are included. The Family Housing potable water service lines would continue to be owned and operated by the Army. The distribution system includes a network of potable water mains, service lines, valves, altitude air release valves, post indicator valves, meters, fire hydrants, tanks, control valves, pumps and control system. There are 12 water storage facilities at Fort Riley and one overhead water tank at MPRC.

Camp Funston water usage is very low compared to its original design load due to loss of many services. This increases the detention time of water in the mains and causes problems with low residual chlorine level.

Fort Riley

Lower Pressure Zone

The lower pressure system includes distribution systems of the Main Post, Camp Forsyth, Forsyth Family Housing, and Marshall Field. The transfer pumps at the PWTP supply water to the Lower Pressure Zone. The pump station details are shown in the table below:

S. No	Pump Station	Pumps	Capacity GPM	Total Head	Motor HP	Installed	Comments
1	2654	4	2,350	70’	60	1993	Pump operation controlled by Tank 197 water level.

Figure 1.2.3.a - Fort Riley, Pump Station 2654

The water storage tanks in this zone are:

S. No	Tank No.	Capacity GPM	Installed	Type, location
1	197	1,000,000	1991	Ground Storage, northwest of Main Post, water level controls pump operation.
2	2580	500,000	1940	Ground Storage, at PWTP
3	2581	500,000	1976	Ground Storage, at PWTP
4	834	500,000	1984	Overhead Storage Tank, Marshall Field
5	734	250,000	1957	Overhead Storage Tank, Marshall Field

Middle Pressure Zone

The middle pressure zone includes distribution systems of Custer Hill Family Housing, Camp Whitside and Camp Funston. Two pump stations from the lower pressure zone supply water to the middle pressure zone. Pump station 198 is located near the ground storage tank 197. The other pump station supplying the middle pressure zone is 2582.

S. No	Pump Station	Pumps	Capacity GPM	Motor HP	Installed	Comments
1	198	2	1,200	100	1956	Pump operation controlled by tank 197 water level. Has an emergency generator.
		1	1,200	100	1970	
2	2582	3	1,875	125	1976	Has an emergency generator.
		1	1,200	75		

Figure 1.2.3.b - Fort Riley, Pump Station 198

The water storage tanks in this zone are:

S. No	Tank No.	Capacity GPM	Installed	Type, location
6	989*	500,000	1941	Ground Storage, west of Camp Funston.
7	999*	500,000	1941	Ground Storage, west of Camp Funston.
8	5200	500,000	1960	Overhead Storage Tank, south of the golf course.
9	7515	500,000	1955	Overhead Storage Tank, west of Custer Hill Troop Housing and Support.
10	6995	500,000	1976	Overhead Storage Tank, west of McClellan Heights.

*****Tanks not currently in service due to low water demand in Camp Funston.

Figure 1.2.3.c - Fort Riley, Water Tank 7515

Upper Pressure Zone

The Upper pressure zone includes distribution systems of Custer Hill Troop Housing and Support area. Two pump stations from the middle pressure zone supply water to the upper pressure zone. Pump station 7514 is located north of the storage tank 7515. The other pump station supplying the upper pressure zone is 8129 located northeast of the golf course.

S. No	Pump Station	Pumps	Capacity GPM	Total Head	Motor HP	Installed	Comments
3	7514	2	1,200	45	20	1969	Pump operation controlled by Tank 775 water level.
4	8129	2	1,200	70	40	1973	Pump operation controlled by Tank 775 water level

Figure 1.2.3.d - Fort Riley, Pump Station 7514

Figure 1.2.3.e - Fort Riley, Pump Station 8129

The water storage tanks in this zone are:

S. No	Tank No.	Capacity GPM	Installed	Type, location
11	7775	500,000	1968	Overhead Storage Tank, north part of Custer Hill Troop Housing and Support.
12	7919*	500,000	1985	Overhead Storage Tank, north part of Custer Hill Troop Housing and Support

*Used only during summer to meet peak demand.

The detail inventory of pipes, valves, fire hydrants and others are given in the later sections.

MPRC

MPRC has a small distribution system that serves seven buildings in the range complex. There is one water storage facility at MPRC. Figure 2 includes the schematic of MPRC potable water system.

S. No	Tank No.	Capacity GPM	Installed	Type, location
1	9307	50,000	1985	Overhead Storage Tank

J-1.2.5 Fixed Inventory

Table 1 provides a general listing of the major Potable water system fixed assets for the Fort Riley Potable water system included in the purchase. The system will be sold in a "as is, where is" condition without any warranty, representation, or obligation on the part of Government to make any alterations, repairs, or improvements. Ancillary equipment attached to, and necessary for, operating the system, though not specifically mentioned herein, is considered part of the purchased utility**.**

TABLE 1
Fixed Inventory
Potable Water Distribution System – Fort Riley

Description	Quantity	Unit	Age (yrs)
DI Pipe			
12"	26,730	LF	37
16"	19,945	LF	38
20"	2,235	LF	40
CI Pipe			
2"	21,320	LF	37
2.5"	955	LF	40
3"	6,510	LF	28
4"	30,873	LF	35
6"	109,615	LF	37
8"	111,030	LF	32
10"	47,660	LF	34
12"	30,015	LF	34
14"	15,695	LF	40
16"	11,740	LF	40
18"	7,525	LF	40
20"	17,610	LF	40
24"	5,111	LF	40
30"	2,080	LF	40
PVC Pipe			
1"	885	LF	18
2"	4,835	LF	8
3"	4,435	LF	6

Description	Quantity	Unit	Age (yrs)
4”	6,775	LF	16
6”	11,720	LF	12
8”	25,415	LF	12
10”	12,395	LF	19
12”	4,000	LF	13
PE Pipe			
6”	460	LF	16
8”	635	LF	3
10”	225	LF	19
12”	2,260	LF	19
Asbestos-Cement Pipe			
12”	660	LF	24
16”	9,445	LF	23
18”	2,000	LF	24
T Pipe			
2”	400	LF	24
6”	22,505	LF	24
8”	28,390	LF	24
10”	6,700	LF	24
C Pipe			
20”	1,615	LF	24
24”	2,240	LF	24
30”	680	LF	24
Valve			
1”	24	EA	20
2”	80	EA	19
2.5”	1	EA	20
3”	71	EA	18
4”	83	EA	19
6”	293	EA	19
8”	234	EA	19
10”	82	EA	20
12”	80	EA	18
14”	19	EA	20
16”	36	EA	20
20”	25	EA	20
24”	4	EA	20
30”	2	EA	20
Post Indicator Valves	140	EA	18
Fire Hydrants	836	EA	19
Meters	60	EA	19
Air release Valves	11	EA	20
Valve Vaults	4	EA	40

J-1.3 Potable Water Distribution System Non-Fixed Equipment and Specialized Tools Inventory

Table 2 lists other ancillary equipment (spare parts) and Table 3 lists specialized vehicles and tools included in the purchase. Offerors shall field verify all equipment and tools prior to submitting a bid. Offerors shall make their own determination of the adequacy of all equipment and tools. The successful Contractor shall provide any and all equipment, vehicles, and tools, whether included in the purchase or not, to maintain a fully operating system under the terms of this contract.

TABLE 2
Spare Parts
Potable Water Distribution System – Fort Riley

Quantity	Item	Make/Model	Description	Remarks
None identified.				

TABLE 3
Specialized Equipment and Vehicles
Potable Water Distribution System – Fort Riley

Description	Quantity	Location	Maker
None identified.			

J-1.3.1 Potable Water System Manuals, Drawings, and Records Inventory

Table 4 lists the manuals, drawings, and records that will be transferred with the system.

TABLE 4
Manuals, Drawings, and Records
Potable Water Distribution System – Fort Riley

Quantity	Item	Description	Remarks
Fort Riley maintains a limited Distribution of technical manuals, drawings, and records on the installed components of the Potable water Distribution system. This information will be transferred to the new owner during the transition period. System maps will be available in the bidders' library.			

J-1.4 Current Service Arrangement

Presently, Fort Riley serves all the potable water requirements at the base utilizing wells, treatment plant and the distribution system.

J-1.5 Secondary Metering

The Installation may require secondary meters for internal billings of their reimbursable customers, utility usage management, and energy conservation monitoring. The Contractor shall assume full ownership and responsibility for existing and future secondary meters IAW Clause C.3.

J-1.5.1 Existing Secondary Meters

TABLE 5
Existing Secondary Meters
Potable Water Distribution System – Fort Riley

Meter Location	Meter Description
None identified	

J-1.5.2 Required New Secondary Meters

This section applies only to the Volumetric Price Schedule option IAW B.4. If the Contractor offers a bid based on any of the optional Volumetric Price Schedule options, the Contractor shall install and calibrate new secondary meters as listed in **Table 6.**

There are approximately 1,004 residential type buildings and 711 nonresidential buildings. New secondary meters shall be installed within two years from the start of contract. After installation, the Contractor shall maintain and read these meters IAW Clauses C.3, H.5, and J01.6.

TABLE 5
New Secondary Meters Location
Potable Water Distribution System – Fort Riley

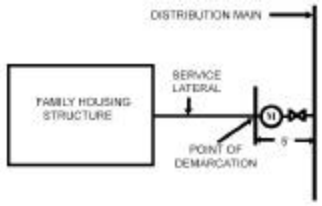
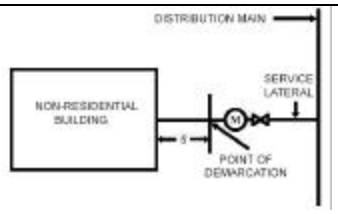
Description	Sketch
Install new meters close to the main on the service line supplying potable water to 1,004 residential buildings.	
Install new meters close to the non-residential buildings on the service line supplying potable water to 711 non-residential buildings.	

Table 6 lists the approximate size and quantity of the water meters. After contract award the contractor shall coordinate with Fort Riley regarding actual location, size, quantity and installation schedule for each meter.

TABLE 6
New Secondary Meters
Potable Water Distribution System – Fort Riley

Meter size	Meter Quantities	
	Nonresidential	Residential
¾ Inch	204	70
1 Inch		145
2 Inch	650	320
4 Inch	150	140
6 Inch		36

The above list is an estimate for bidding purposes. Both the Government's and offeror's proposal shall be based on these estimates. The actual future metering requirement would be corrected or modified with Government approval during a due diligence period IAW C.11.1 and L.4.4.3. Also note that a few future non-residential meters may be for non-building use, and these include the parade grounds, ball fields, etc. Restated the numbers in the above table are for comparing the offerors bid price for comparison with similar values estimated by the Government and are expected to change during actual installation based on actual size and meter quantity requirements.

J-1.6 Monthly Submittals

The Contractor shall provide the Government monthly submittals for the following: Invoice (IAW G.2). The Contractor's monthly invoice shall be presented in a format proposed by the Contractor and accepted by the Contracting Officer. Invoices shall be submitted by the 25th of each month for the previous month. Invoices shall be submitted to the Contracting Officer's designee. (This information will be provided upon award.)

Outage Report. The Contractor's monthly outage report will be prepared in the format proposed by the Contractor and accepted by the Contracting Officer. Outage reports shall include the following information for Scheduled and Unscheduled outages:

Scheduled: Requestor, date, time, duration, facilities affected, feedback provided during outage, outage notification form number, and digging clearance number.

Unscheduled: Include date, time and duration, facilities affected, response time after notification, completion times, feedback provided at time of outage, specific item failure, probability of future failure, long term fix, and emergency digging clearance number.

Outage reports shall be submitted by the 25th of each month for the previous month. Outage reports shall be submitted to the Contracting Officer's designee. (This information will be provided upon award.)

System Efficiency Report. If required by Paragraph C.3, the Contractor shall submit a system efficiency report in a format proposed by the Contractor and accepted by the Contracting Officer. System efficiency reports shall be submitted by the 25th of each month for the previous month. System efficiency reports shall be submitted to the Contracting Officer's designee. (This information will be provided upon award.)

J-1.7 Energy Savings and Conservation Projects

IAW C.3, Utility Service Requirement, the following projects have been implemented by the Government for energy conservation purposes:

None.

J-1.8 Service Area

IAW Clause C.4, Service Area, the service area is defined as all areas within the Fort Riley boundaries and the MPRC area.

J-1.9 Off-Installation Sites

There are no off-Installation sites.

J-1.10 Specific Transition Requirements

IAW Clause C.17, Transition Plan, Table 7 lists service connections and disconnections required upon transfer, and Table 8 lists the improvement projects required upon transfer of the Fort Riley potable water system.

TABLE 7
Service Connections and Disconnections
Potable Water Distribution System – Fort Riley

Location	Description
Fort Riley will negotiate directly with successful bidder regarding any future service need, when such need arises.	

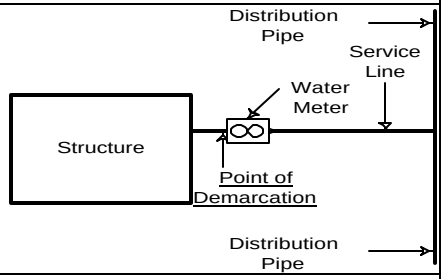
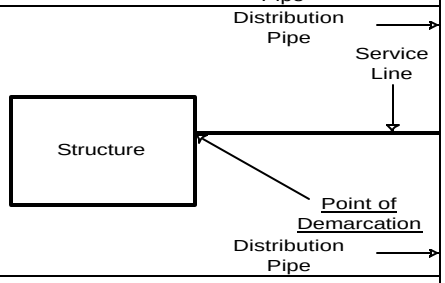
TABLE 8
System Improvement Projects
Potable Water Distribution System – Fort Riley

Project Location	Project Description
None identified	

J-1.11 Potable water Distribution System Points of Demarcation

The point of demarcation is defined as the point on the piping system where ownership changes from the Grantee to the building owner. The table below identifies the general locations of these points with respect to the building served.

TABLE 9
Points of Demarcation
Potable Water Distribution System – Fort Riley

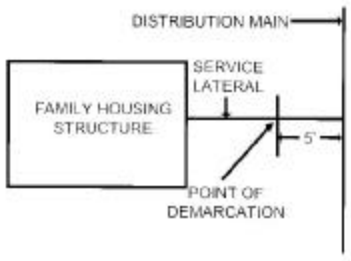
Point of Demarcation	Applicable Scenario	Sketch
Water meter, backflow device, or valve is located on the service line entering the structure within 5 feet of the exterior of the structure.	Water Meter or Backflow Device, or Valve (closest apparatus to the exterior of the structure).	
No water meter, backflow device, or valve exists on the service line entering the structure. Service valve may be within 5 feet of the structure at any time. Down stream side of the service valve will become the new point of demarcation.	Point where the service line enters the structure.	
If the fire suppression system has a storage tank, then the point of demarcation (POD) is located on the inlet side of the isolation valve or backflow prevention device closest to the storage tank. If no storage tank is present, the POD is located on the inlet side of the PIV or isolation valve closest to the fire suppression pumps.	**Fire suppression system** is provided flow and/or pressure by the potable water distribution system. These systems typically dedicated to serving one facility or a small cluster of facilities.	None
The point of demarcation (POD) is located on the inlet side of the PIV, isolation valve, or backflow prevention device closest to the fire suppression system.	**Fire suppression system** is connected to the potable water distribution system.	None

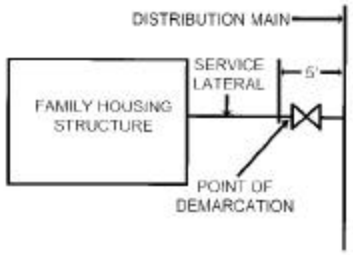
Point of Demarcation	Applicable Scenario	Sketch
The POD for irrigation systems is inlet side of the backflow prevention device or isolation valve closest to the irrigation system.	**Irrigation system** fed directly from potable water distribution system.	None
The POD will be the inlet side of the hose bib or water fountain assembly's connection to the service lateral. Note: Service valve may be installed within 25 feet of the hose bib or water fountain at any time. Inlet side of the service valve will become the new point of demarcation.	**Drinking Fountains and Hose Bibs** connected to the water distribution system (typically found at ball fields and outdoor recreation areas.) No valve is located on the lateral providing water service to the drinking fountain or hose bib within 25 feet of these connections.	None
The POD will be the inlet side of the service valve.	**Drinking Fountains and Hose Bibs** connected to the water distribution system (typically found at ball fields and outdoor recreation areas.) Service valve is located on the lateral providing water service to the drinking fountain or hose bib within 25 feet of these water use devices.	None

J-1.11.1 Unique Points of Demarcation

The following table lists anomalous points of demarcation that do not fit any of the above categories.

TABLE 10
Unique Points of Demarcation
Potable Water Distribution System – Fort Riley

Point of Demarcation	Applicable Scenario	Sketch
The POD will be the point on service lateral five feet from the distribution main.	Family Housing Area where there is no valve on the service line within 5 feet of distribution main.	

Point of Demarcation	Applicable Scenario	Sketch
The POD will be the downstream point of the water valve.	Family Housing Area where there is a valve within 5 feet of distribution main.	

At Facility 7958, the upstream boundary point is 5-feet outside the outmost security fence. The service line from this point to the building will remain under the operation and maintenance of Fort Riley.

J-1.12 Unique Service Requirement

Union Pacific Railroad tracks runs through Fort Riley. The potable water system pipes crosses the railway tracks at various locations. The Contractor shall coordinate with Union Pacific Railroad for all work that is within the railroad right of way and the work shall be performed in accordance with Union Pacific Railroad standards.