**6. ENGINEERING SYSTEMS REQUIREMENTS**

**G30 SITE CIVIL/MECHANICAL UTILITIES**

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SYSTEMS REQUIREMENTS  
SITE CIVIL/MECHANICAL UTILITIES TEMPLATE 09/22  
  
Instructions for using this template: There are template files for each UNIFORMAT Level 2 Group Elements. This template is for Group Element G30-SITE CIVIL/MECHANICAL UTILITIES. Text such as this is hidden text that will not print when the hidden text box in "Print/Options" is un-checked.  
  
The Civil and Mechanical Member must edit this template for the requirements of the project. The SYSTEMS REQUIREMENTS are intended to define items that are required for these utility systems. Editing is required where brackets [ ] appear. Delete all utility elements that are not required for the project. If additional elements or sub-elements are required for the project that do not appear in the template, refer to the NIST UNIFORMAT II publication for additional site element numbers and descriptions. The Uniformat II Work Breakdown Structure can be found at** [**www.wbdg.org/ndbm/**](http://www.wbdg.org/ndbm/) **. Coordinate with the PERFORMANCE TECHNICAL SPECIFICATION SECTION G30 to ensure that performance requirements are provided for all of the Utility Elements listed here and that paragraph numbering matches.  
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NOTE: Edit the following paragraphs to suit the project, or create your own, to describe the SITE CIVIL/MECHANICAL UTILITIES for the project. Coordinate this section carefully with other portions of the RFP.  
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NOTE: Consider site improvement activities and components relative to Part 2 UFGS Section 01 33 29, *Sustainability Requirements and Reporting*, and UFC 1-200-02, *High Performance and Sustainable Building Requirements*.  
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**SYSTEM DESCRIPTION**  
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NOTE: This specification assumes a project will utilize installation-owned utility systems. Should any utilities be owned by a non-installation entity, RFP Editor will need to coordinate with the utility owner for system requirements and make necessary modifications to this ESR and corresponding PTS G30.  
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The site civil/mechanical utility systems include water supply systems, sanitary sewer systems, storm drainage systems, heating distribution systems, cooling distribution systems, fuel distribution systems and associated appurtenances which are more than 5 feet (1.5 meters) outside the building.

The site mechanical utility system consists of piping and appurtenances for [steam] [and] [condensate,] [steam manholes,] [chilled water,] [hot water] [liquid fuel,] [natural gas,] and [propane] [ ] including accessories and devices as required for a complete and usable system up to 5 feet (1.5 meters) outside buildings.

**GENERAL SYSTEM REQUIREMENTS**  
**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: A blank Permits Record of Decision (PROD) form is included in Part 6 of the Standard Template Complete Set zip file on the WBDG Design-Build Request for Proposal page.  
 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

Develop the site to provide water, fire protection, sanitary sewer, storm drainage, heating, cooling and fuel distribution services that meet the requirements of each regulatory agency that governs and issues permits for the construction and operation of these systems. Site design is required to comply with UFC 3-210-10, *Low Impact Development*, as well as state or local stormwater management regulations and project sustainability goals.

Provide each system complete and ready for operation.

Physically verify the location of existing above and below ground utilities prior to starting work.

Identify and obtain permits to comply with all federal, state, and local regulatory requirements associated with this work. Complete the Permits Record of Decision (PROD) form with the first design submittal package. Determine correct permit fees and pay said fees. Forward copies of permits, permit applications, and the completed PROD form to the Government's Civil/Mechanical Reviewer. Perform work in accordance with the obtained permits.

Minimize the impact of construction activity on facility operations and neighboring facilities.

Utility connection points are indicated on the drawings in Part 6. Obtain final approvals from the Government's Civil/Mechanical Reviewer and the Contracting Officer for utility connection points associated with this work.

Coordinate with the local utility providers and pay fees or charges required to connect to their utility.

Disciplines involved in site work design must coordinate utility locations with the Civil Engineer and the Landscape Architect.

Refer to Site Analysis and Building Requirements Sections for additional site civil/mechanical utilities information.

Provide fittings, connections and accessories required for a complete and usable system. Install equipment in accordance with PTS Section G30 and the manufacturer's recommendations. Where the word "should" is used in the manufacturer's recommendations, substitute the word "must".

See UFGS 01 78 23 OPERATION AND MAINTENANCE DATA for additional requirements.

Provide site civil/mechanical utility systems and components that support project sustainability goals of Part 2 UFGS Section 01 33 29, *Sustainability Requirements and Reporting*.

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NOTE: Use BMS B-5.2.19 to determine installation requirements for connecting to existing sanitary sewer lines and incorporate into this paragraph.  
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Verify the sanitary sewer connection to the sanitary sewer system by visual testing. [Perform post-installation TV inspection of new sanitary sewer mains.] Complete a visual inspection[, dye test][ and smoke test].

Leakage test is [not] required.

[Perform post-installation TV inspection of new storm sewer mains.]

**G3010 WATER SUPPLY**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: For most projects the new water system is an extension of an existing water system. Where a new water supply system is proposed, revise wording in the paragraph below. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

The new water system is an extension of the existing water system. The existing water system serving the project site is [owned by the Federal Government][operated and maintained by [\_\_\_\_\_(utility provider)] at [\_\_\_\_\_(utility address)] and [\_\_\_\_\_(utility phone number)]]. Provide the new water system and connections to the existing water system in accordance with [state sewerage regulations,][the utility provider's requirements,] and UFC 3-230-01 *Water Storage, Distribution, and Transmission*; whichever is more stringent.

Notify the utility provider of the additional demand generated by the proposed facility. Provide a copy of all correspondence with the utility provider to the Government’s Civil/Mechanical Reviewer.

Provide connection to the existing water distribution system at the point indicated on the drawings in Part 6.

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NOTE: At a minimum include a water meter for each facility in accordance with UFC 1-200-02. Also include specific requirements below for installation of sufficient potable and non-potable water meters to identify system losses and individual facility use for all water-intensive facilities (swimming pools, gyms, golf courses, piers, dry docks, vehicle wash stations, industrial facilities, water intensive laboratories, and landscaping systems). Enable meter data to be collected and automatically transferred to a Meter Data Management (MDM) module in CIRCUITS (Centralized and Integrated Reporting for Comprehensive Utilities Information and Tracking System) for utility and energy management within an environment protected from cyber attack.  
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Design the new water system so that water consumption is measured at a minimum, by one meter for each facility. Ensure the meter is easily accessible, but not obvious.

[Install sufficient potable and non-potable water meters to identify system losses and individual facilities use. Enable meter data to be collected and automatically transferred to a Meter Data Management (MDM) module in CIRCUITS for utility and energy management within an environment protected from cyber attack.]

**G301001 WELL SYSTEMS**

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NOTE: Well systems are rarely required. Delete this section if not required.  
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Provide a potable water well system [capable of producing a guaranteed capacity of [\_\_\_\_\_]gallons per minute (cubic meters per second)]. The system is required to produce the average day demand[ of [\_\_\_\_\_] gallons per minute (cubic meters per second)] with the largest well out of service. Provide a minimum of two wells.

**G301002 POTABLE WATER DISTRIBUTION**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Indicate any preferences of the utility provider in this section. Include information such as pipe materials, pipe linings, thrust restraint, valve types, corrosion protection, meters, and backflow preventers. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

Connect the new potable water distribution system to the distribution system at the point indicated on the drawings in Part 6.

[Provide exterior corrosion protection on metallic pipe lines.]

A water meter on each proposed service line is required. Provide type of meter and remote reading as required by the utility provider. [Water meter must be compatible with and functionally match the existing Advanced Metering Infrastructure (AMI) water metering system and be capable of recording water usage data for download to existing AMI system.] [Water meter must be compatible with and monitored by the Direct Digital Controls (DDC) system.]

Provide [precast concrete vault] [meter box].

Backflow preventers are required on service entrance lines. If not specified in ESR D20 and D40, provide reduced pressure backflow preventers [aboveground] [in a belowground vault] outside the building. [Provide [a heated] enclosure.]

**G301003 POTABLE WATER STORAGE**

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NOTE: Coordinate with the PTS Section G301003, "Potable Water Storage". \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

Provide a potable water storage facility [with a minimum capacity of [\_\_\_\_\_] gallons (liters)]. Provide [an elevated] [a ground] water storage tank. [Provide freeze protection.]

Provide automatic level control to fill and prevent overflow of the tank.

Provide automatic level control by [altitude valve][floats][pressure transducer] in accordance with the preferences of the system owner to fill and prevent overflow of the tank.

Provide a telemetering system and recording equipment to a location manned 24 hours a day for the transmission and recording of storage levels in the distribution system. Transmit overflow, low level and pump malfunction alarms to a location manned 24 hours a day.

Obtain approval from the Contracting Officer for shape of tank, the color and pattern of exterior coating.

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NOTE: Coordinate with the Fire Protection Engineer. Coordinate with the ESR for Section D40, Fire Protection, the PTS Section D40 and PTS Section G301002, "Potable Water Distribution". \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

**G301005 FIRE PROTECTION WATER STORAGE**

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NOTE: Coordinate with the Fire Protection Engineer. Coordinate with the PTS Section G301003, "Potable Water Storage".  
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Provide a fire protection water storage facility [with a minimum capacity of [\_\_\_\_\_] gallons (liters)]. Provide [an elevated] [a ground] water storage tank. [Provide freeze protection.]

Provide automatic level control to fill and prevent overflow of the tank. Provide automatic level control by [altitude valve][floats][pressure transducer] in accordance with the preferences of the system owner to fill and prevent overflow of the tank.

Provide a telemetering system and recording equipment to a location manned 24 hours a day for the transmission and recording of storage levels in the distribution system. Transmit overflow, low level and pump malfunction alarms to a location manned 24 hours a day.

Obtain approval from the Contracting Officer for shape of tank, the color and pattern of exterior coating.

**G301007 PUMPING STATIONS**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: If a hydraulic analysis has been conducted recently for the water system or for this project, indicate the recommendations below. If the Contractor will conduct this analysis to determine if a pump station is required for the project, delete sentence below. The PTS Section G301007 indicates that the Contractor must provide a packaged booster pump station if required for water system pressure. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

A package booster pump station is [not] required.

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NOTE: If a booster pump station is not required, delete the remaining paragraphs in this section. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

Provide automatic control to start and stop the pump system.

Provide a telemetering system and recording equipment to a location manned 24 hours a day for the transmission and recording of pump operation. Transmit alarms to a location manned 24 hours a day.

Provide [electrical connections for a portable emergency generator hook-up][an emergency generator]sized to start up and maintain the total rated running capacity of the station, including the pumps, controls, lighting, ventilation and other auxiliary equipment.

**G301008 PACKAGED WATER TREATMENT PLANTS**

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NOTE: Where packaged water treatment plants are required, indicate type of treatment, performance parameters, and special features. Usually the Government has conducted a preliminary study to determine best option.   
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Provide a packaged water treatment plant [with a capacity of [\_\_\_\_\_] gallons per day (cubic meters per day)] [in accordance with the recommendations of the study attached in Part 6 of this RFP].

**G3020 SANITARY SEWER**

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NOTE: For most projects the new sanitary sewer system is an extension of an existing sanitary sewer collection system. Where a new sanitary sewer collection system is proposed, revise wording in the paragraph below.  
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The new sanitary sewer system is an extension of the existing sanitary sewer collection system. The existing sanitary sewer collection system serving the project site is [owned by the Federal Government] [operated and maintained by [\_\_\_\_\_(utility provider)] at [\_\_\_\_\_(utility address)] and [\_\_\_\_\_(utility phone number)]]. Provide the new sanitary sewer system and connections to the existing sanitary sewer collection system in accordance with [state sewerage regulations,][the utility provider's requirements,] and UFC 3-240-01 *Wastewater Collection*; whichever is more stringent.

Notify the utility provider of the additional wastewater flow generated by the proposed facility. Provide a copy of all correspondence with the utility provider to the Government Civil Reviewer.

Provide connection to the existing sanitary sewer collection system at the point indicated on the drawings in another part of this RFP. In identifying a suitable point of connection, evaluate the capacity of the existing collection system.

**G302001 SANITARY SEWER PIPING**

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NOTE: Indicate any preferences of the utility provider in this section. Include information such as pipe materials, pipe linings, valve types, and corrosion protection.  
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[Provide exterior corrosion protection on metallic pipelines.]

**G302002 SANITARY SEWER MANHOLES & CLEANOUTS**

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NOTE: Indicate any preferences of the utility provider in this section. Include information on types of manholes, manhole linings, corrosion protection, etc.   
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[Provide precast concrete manholes only.] [Provide lockable manhole covers.]

**G302003 LIFT STATIONS AND PUMPING STATIONS**

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NOTE: If a study has been conducted recently for the wastewater collection system or for this project, indicate the recommendations below. If the Contractor will conduct this analysis to determine if a pump station is required for the project, delete paragraphs below. The PTS Section G3020 indicates that pump stations and force mains will only be used when absolutely necessary.  
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A wastewater pump station is [not] required. [Provide exterior corrosion protection on metallic force mains.]

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NOTE: If a wastewater pump station is not required, delete the remaining paragraphs in this section.  
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NOTE: Indicate any preferences of the utility provider in this section. Include information such as pipe materials, pump, wet well materials, linings, valve types, and controls/alarms.  
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Provide a [simplex][duplex][triplex] [submersible pump][grinder pump][suction lift pump] station in accordance with the utility provider's requirements. Provide pump station wet well of [precast concrete][fiberglass][\_\_\_\_\_\_\_\_\_\_] construction. Provide adjacent valve vault of [precast concrete][\_\_\_\_\_\_\_\_\_\_] construction.

Provide automatic control to start and stop the pump system. Provide automatic level control by [floats][pressure transducer][\_\_\_\_\_] in accordance with the preferences of the system owner to fill and prevent overflow of the wet well. Provide an emergency pump connection.

Provide a telemetering system and recording equipment to a location manned 24 hours a day for the transmission and recording of pump operation. Transmit alarms to a location manned 24 hours a day.

Provide [electrical connections for a portable emergency generator hook-up][an emergency generator] sized to start up and maintain the total rated running capacity of the station, including the pumps, controls, lighting, ventilation and other auxiliary equipment.

**G302004 PACKAGED SANITARY SEWER TREATMENT PLANTS**

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NOTE: Where packaged wastewater treatment plants are required, indicate type of treatment, performance parameters, and special features. Usually the Government has conducted a preliminary study to determine best option.   
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Provide a packaged sanitary sewer treatment plant [with a capacity of [\_\_\_\_\_] gallons per day (cubic meters per day)] [in accordance with the recommendations of the study attached in Part 6 of this RFP].

**G3030 STORM SEWER**

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NOTE: For most projects the new storm sewer system is an extension of an existing storm sewer system. Where a new storm sewer system is proposed, revise wording in the paragraph below.**

**Background information on Low Impact Development policy was introduced in Part 3 Project Objectives. Storm sewer combines Navy LID policy and reporting requirements in FC 1-300-09N *Navy and Marine Corps Design Procedures*, storm sewer criteria in UFC 3-201-01 *Civil Engineering* and LID criteria in UFC 3-210-10 *Low Impact Development.*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

The new storm sewer system is an extension of the existing storm sewer system. The existing storm sewer system serving the project site is [owned by the Federal Government] [operated and maintained by [\_\_\_\_\_ (utility provider)] at [\_\_\_\_\_ (utility address)] and [\_\_\_\_\_ (utility phone number)]]. Provide the new storm sewer system and connections to the existing storm sewer system in accordance with [the utility provider's requirements,] UFC 3-201-01 *Civil Engineering*; UFC 3-210-10 *Low Impact Development* and *FC 1-300-09N Navy and Marine Corps Design Procedures*, state stormwater management laws and regulations, local stormwater management laws and regulations and project sustainability goals; whichever is more stringent.

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NOTE: If outfall for existing storm sewer system is located off the Activity, require Contractor to determine that existing outfall has adequate capacity to handle additional flow generated by project. Also require Contractor to obtain approval from system owner and provide a copy of all correspondence to the Government Civil Reviewer.  
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Provide connection to the existing storm sewer collection system at the point indicated on the drawings in another part of this RFP. Confirm that the existing outfall has adequate capacity to receive the additional stormwater flow generated by the project.

[Provide vehicle wash areas.]

**G303001 STORM SEWER PIPING**

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NOTE: Indicate any preferences of the utility provider in this section. Include information such as pipe materials, pipe linings, and corrosion protection.   
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The following materials for storm sewer piping are not allowed: [PVC] [ductile iron] [reinforced concrete pipe] [corrugated steel] [corrugated aluminum] [polyethylene (PE)] [ polypropylene (PP)] [\_\_\_\_\_].

[Due to corrosive soil conditions, storm sewer piping materials are required to be [polyvinyl chloride (PVC)] [,] [reinforced concrete] [,] [polyethylene (PE)] [or] [polypropylene (PP)].]

**G303004 CULVERTS**

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NOTE: Indicate any preferences of the utility provider in this section. Include information such as pipe materials, pipe linings, and corrosion protection.   
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The following materials for culvert piping are not allowed: [PVC] [ductile iron] [reinforced concrete pipe] [corrugated steel] [corrugated aluminum] [polyethylene (PE)] [polypropylene (PP)] [\_\_\_\_\_].

[Due to corrosive soil conditions, storm sewer piping materials are required to be [polyvinyl chloride (PVC)] [,] [reinforced concrete] [,] [polyethylene (PE)] [or] [polypropylene (PP)].]

**G303007 STORM WATER MANAGEMENT**

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NOTE: For projects that require storm water management delete the last bracketed sentence. If storm water management is not required choose the last bracketed sentence below and delete all preceding bracketed paragraphs.  
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NOTE: LID data is required to comply with DoD policy on implementation of storm water requirements under EISA Section 438 and to prepare annual reports to the Assistant Secretary of Navy. The NAVFAC Low Impact Development (LID) Data Card and eProjects "LID Information" tab are used as the NAVFAC tool for documenting LID data and annual reporting for both EISA Section 438 and Navy LID Policy. The Government's PM, DM or Civil Engineer will review the NAVFAC Low Impact Development (LID) Data Card submitted by the Designer of Record (DOR) and document on the eProjects LID Information tab. The Government's Civil Engineer is responsible for storing the DOR's calculations in the project file.  
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NOTE: For projects near airfields, storm water management facilities such as retention/detention ponds may not be allowed due to bird hazards.  
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NOTE: Each LID feature has unique requirements that may (or may not) be suitable for your location and should be individually selected below.  
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[Provide stormwater management that complies with [state stormwater regulations, ][the utility provider's requirements, ]UFC 3-201-01 *Civil Engineering*, UFC 3-210-10 *Low Impact Development*, FC 1-300-09N *Navy and Marine Corps Design Procedures*; whichever is more stringent. [Provide Low Impact Development (LID) features in accordance with UFC 3-210-10 *Low Impact Development*. The following LID features may be used: [bioretention, ][dry wells, ][filter/buffer strips, ][grassed swales, ][bioretention swales, ][wet swales, ][rain barrels, ][cisterns, ][infiltration trenches, ][rain gardens, ][permeable pavement or pavers, ][\_\_\_, ]and [tree box filters].[ The use of [bioretention, ][dry wells, ][filter/buffer strips, ][grassed swales, ][bioretention swales, ][wet swales, ][rain barrels, ][cisterns, ][infiltration trenches, ][rain gardens, ][permeable pavement/pavers, ] [\_\_\_, ]and [tree box filters] are not allowed for this project.

For Navy and Marine Corps projects, use FC 1-300-09N *Navy and Marine Corps Design Procedures* to comply with Navy LID Policy (commonly referred to as the Penn Memo). Navy LID policy sets a goal of no net increase in stormwater and sediment or nutrient loading from major renovation projects and construction projects. Major renovation projects are defined as having a storm water component and exceeding $5 million and major construction projects are defined as exceeding $750,000. If LID is not implemented to the Maximum Extent Technically Feasible (METF), as defined in UFC 3-210-10, a waiver request must be approved by the Regional Engineer. Coordinate waiver review and approval with the Civil Technical Discipline Coordinator (TDC).

Projects with a footprint exceeding 5,000 SF or exceeding the dollar values above must be documented on the NAVFAC Low Impact Development (LID) Data Card and submitted to the Government's Civil Engineer for review and approval.

The NAVFAC Low Impact Development (LID) Waiver Form and Low Impact Development (LID) Data Card can be found at: <https://www.wbdg.org/ffc/dod/tri-services-sustainability-program/tracking-reporting> .

The Contractor must obtain [State Stormwater Management] [and \_\_\_\_] regulatory permits required for the proposed work from the [EPA][State] [Installation Environmental Stormwater Program Manager]. Coordinate reports, submittals, and permit applications through the Contracting Officer.]

[Storm water management is not required for this project.]

**G303090 OTHER STORM SEWER**

[An oil/water interceptor is not required.]

[Provide an oil/water interceptor designed [for a maximum flow of [\_\_\_\_\_] gallons per minute ([\_\_\_\_\_]liters per second).] [to receive the first flush of stormwater runoff. Provide a bypass into the storm sewer system upstream of the oil/water interceptor designed to divert flows above the capacity of the oil/water interceptor.]

The [grease and oil][petroleum hydrocarbon] concentration in the effluent from the oil/water interceptor must not exceed [10][\_\_\_\_\_] mg/L. Remove all free oil droplets equal to or greater than [20][\_\_\_\_\_] microns. Discharge the effluent of the oil/water interceptor to the [sanitary sewer] [storm sewer] system.]

**G3040 HEATING DISTRIBUTION**

Use the following design parameters for buried piping systems:

1. Minimum depth of burial must be 36 inches (914 mm) from center of carrier pipe to final ground surface.

2. Earth thermal conductivity of 2.16 [\_\_\_] W/m-K

3. Earth temperature of 50 degrees F (10 degrees C) [\_\_\_].

**G304001 OVERHEAD HOT WATER SYSTEMS**

[Provide insulated steel piping system including supports.]

Provide [ ] insulation for hot water piping systems.

Provide [concrete] [steel] support poles.

**G304003 UNDERGROUND HOT WATER SYSTEMS**

[Provide direct buried, factory pre-fabricated, pre-insulated piping systems with [steel] [polyethylene] [PVC[ carrier pipe.] Provide [drainable/dryable/testable (DDT)] [water spread limiting (WSL)] type system.

**G304005 REINFORCED CONCRETE MANHOLES & VALVE BOXES**

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NOTE: Use manholes for steam systems and valve boxes for hot water systems.  
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[Provide concrete manholes for valves [, expansion joints,] and building supply taps.] Provide [open grate cover] [solid plate cover] with access and ventilation openings]. Provide [electric] [stream] operated sump pump in each manhole.

[Provide valve boxes for building supply taps and system isolation.]

**G304090 OTHER HEATING DISTRIBUTION**

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NOTE: Check with the Activity for cathodic protection requirements. Coordinate with section G40, Site Electrical Utilities.  
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Provide a [sacrificial anode] [impressed current] cathodic protection system for the underground metallic piping systems.

**G3050 COOLING DISTRIBUTION**

Provide cooling distribution.

**G305090 OTHER COOLING DISTRIBUTION**

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NOTE: Check with the Activity for cathodic protection requirements. Coordinate with section G40, Site Electrical Utilities.  
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Provide a [sacrificial anode] [impressed current] cathodic protection system for the underground metallic piping systems.

**G3060 FUEL DISTRIBUTION**

**G306006 GAS DISTRIBUTION PIPING [NATURAL GAS] [PROPANE])**

Provide [steel] [polyethylene (PE)] [natural gas] [propane] piping system. [See ESR D30 for gas meter requirements associated with [direct digital control (DDC) system][and existing AMI meter].

**G306090 OTHER FUEL DISTRIBUTION**

Provide warning and identification tape for underground utilities.

--End of Section--