Stormwater Compliance for Air Force Bases

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Achieving compliance with recent and future regulations for stormwater compliance will require a holistic, base-wide strategy at Air Force Installations.

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Collecting stormwater runoff and diverting it as quickly as possible to avoid hindrances with the base mission is the typical design strategy for new construction at U.S. Air Force bases. Section 438 of the Energy Independence and Security Act of 2007 (EISA) raised the bar for stormwater management compliance for all federal facilities. The new compliance standards promote “slowing down stormwater runoff” and “infiltrating runoff into the ground” as the two main principles for stormwater management for new construction to comply with EISA. At face value, the new stormwater requirements are in contrast with the existing principles of stormwater management at Air Force bases. This change in approach not only affects current construction planning, but also impacts longer-term regulatory drivers and environmental remedies.

Section 438

Section 438 of EISA, which Congress passed December 2007, stipulates that:

> …the sponsor of any development or redevelopment project involving a Federal Facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.

In January 2010, the Office of the Under Secretary of Defense issued a memorandum requiring Department of Defense (DOD) facilities to comply with Section 438. The DOD memorandum references technical guidance issued by the Environmental Protection Agency (EPA) in December 2009 and prescribes EPA’s technical approach as the basis for DOD facilities to comply with Section 438. Specifically, the DOD memorandum includes a four-step flowchart taken directly from the EPA guidance as the “road map” for Section 438 compliance for DOD facilities. In addition to the four steps, the DOD memorandum includes an additional step requiring DOD facilities to develop itemized cost estimates that specifically include the added cost of compliance with Section 438.

The EPA flowchart provides engineers a “design water volume,” which is to be captured using a combination of options such as bio-retention areas,

permeable pavements, cisterns, green roofs and others. Designers should attempt to achieve on-site compliance for a given project to the “maximum extent technically feasible.” When on-site compliance is not fully achievable, due to a variety of technical reasons cited in the EPA guidance, off-site compliance methods may be utilized as indicated. Off-site compliance implies that stormwater is conveyed to a location off the limits of the project area and the technical criteria for compliance are met at the off-site location.

Off-Site Compliance

The EPA guidance envisions technical constraints such as shallow bedrock, high groundwater, contaminated soils, underground utilities, low permeability soils and other similar obstacles for on-site compliance and will, therefore, necessitate off-site compliance. However, at Air Force bases, facility managers may run into other technical contradictions or conflicts for on-site infiltration due to a variety of reasons that may not be apparent. A large number of Air Force bases include extensive environmental remediation programs that may include multiple remediation or restoration sites within the same facility. These typically include groundwater treatment systems, capped and uncapped old landfills, natural attenuation sites, constructed wetlands systems, soil remedies and so forth.

One example of a compliance conflict is the proposed development of a new building complex on or adjacent to a parcel of land with an existing Record of Decision (ROD) for a groundwater remedy that requires diversion of stormwater from the site. Implementing groundwater infiltration stormwater best management practices would have a significant impact on compliance with the ROD, and could result in violation of regulatory requirements. Another conflict example is the construction of a new runway wherein infiltration best management practices and slowing of stormwater runoff would pose serious threats to aircraft operations. What types of infiltration strategies can be implemented that are compatible with operational needs and able to meet Section 438 requirements? Another factor that poses an obstacle for on-site compliance is the lack of available space within the project area due to anti-terrorism and force protection and security setbacks.

At certain Air Force bases, other local or state regulatory drivers for stormwater management require consideration in conjunction with the Section 438. One such example is at Robins Air Force Base (AFB), Ga., which covers approximately 11-mi2 and is located in close proximity to jurisdictional wetlands, creeks and a major state waterway. A number of military construction (MILCON) projects planned at the base will result in a significant increase in impervious area over the next five years. The Georgia Environmental Protection Division recently issued Robins AFB a Municipal Separate Storm Sewer System (MS4) permit that stipulates new stormwater management requirements as specified in the Georgia Stormwater Management Manual for future construction projects and adds a new layer of complexity for base-wide stormwater compliance. In such cases, compliance with Section 438 of EISA in conjunction with the MS4 permit will require careful consideration, and may require multiple off-site regionalized management systems.

Stormwater Master Planning

Air Force bases would be better served by addressing the changing face of the stormwater regulations through a stormwater master planning approach. In the context of this article, stormwater master planning refers to a comprehensive game plan that may be developed on a base-wide scale. When implemented, such a plan will help achieve compliance with Section 438 of EISA and other applicable stormwater compliance regulations in a proactive manner. The plan should be developed in a collaborative manner among multiple departments within the base that represent future construction projects to include functions such as planning, construction, maintenance and environmental considerations.

One of the main outcomes of base-wide master planning is that the base develops an early understanding of the types of stormwater best management

practices that will help achieve future stormwater compliance. For example, the plan will be able to identify projects where on-site compliance is achievable, off-site compliance may be required and regionalized best management practices may be necessary. In addition to the challenges associated with proper citing of regionalized best management practices within an already crowded base, regional systems also require larger amounts of funding for design and construction, which may trigger MILCON-level funding. Planners and programmers will greatly benefit from recommended best management practices well ahead of developing requirements documents and request for proposals for new construction that may be required to meet the new environmental and stormwater compliance needs.

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