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Underground Piping System Design
(PROJECT STANDARDS AND SPECIFICATIONS)

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1 PURPOSE

The objective of this document is to describe the design process that needs to be adopted for drainage systems pertinent to projects associated with the Oil and Gas Industry.

2 SCOPE

This document discusses design considerations for Drainage Systems. A well designed Drainage System shall:

- Contain and quickly remove storm water, contaminated storm water, fire water, equipment drains, spills and leaks from process and non-process areas.
- Carry oil spills, rainwater, and fire water to a safe location where the spill can be retained and recovered.
- Minimizes the spread and area of exposure from spills and fires in process plants, tank fields, marketing terminals, chemical plants, production facilities, etc.

3 GUIDELINE

3.1 Process Unit Drain Systems

A Process Unit Drain System may consist of several parts.

- Surface drains for Storm water (SW)
- Potentially Contaminated Surface Water (PCSW)
- Oily Water drain system (OW)
- Sanitary Sewer system (SS)
- Chemical process system (CS)

3.2 Surface Drainage (SW)

Surface water is described as rain water falling outside any process area, on roads, around buildings and roofs or any non-developed area within the plant. Final grading and paving around plant buildings shall direct the runoff away from the building to catch basins, filter drains or open channels/ditches. The runoff collected by SW system shall discharge into a water course or detention pond to a designated outfall.

3.3 Potentially Contaminated Surface Water (PCSW)

Potentially contaminated surface water is described as rain water or fire water falling within the process areas, inside tank berms, and any potential area that is subject to spillage of chemically tainted water.

3.4 Oily Water Drain System (OW)

The Oily Water system shall collect potentially oil contaminated effluent from process area paving, Process Unit Equipment, Compressor House, Workshops etc via a buried pipe system. The effluent shall be discharged into a Oily Water sump. From the sump the effluent will be pumped to a Treatment Plant before discharge into a water course or to the Surface Water System (SW). Sealed Manholes shall be provided at strategic locations to prevent the build up and transfer of the Hydrocarbon vapours through the system.

3.5 Sanitary Sewer System (SS)

The Sanitary Sewer shall collect effluent from toilet facilities, kitchens and floor drainage. The effluent shall be treated by a Sewage Treatment Plant or Septic Tank or discharged into an existing foul sewer system wherever appropriate.

3.6 Chemical System – Process Area (CS)

Chemical sewers shall be designed to collect heavily contaminated chemical wastes from laboratories, spills and leaks. The sewers shall discharge to the neutralization plant for treatment. Closed system with secondary containment will be a sand filled concrete trench with concrete cover.

4 DRAINAGE SYSTEM DESIGN

4.1 Plant Area Division

Divide the Plant Area into categories by function, such as equipment areas, pipeways, and walkways so that drainage from one area does not pass through another area on the way to a catch basin. Note special areas such as acid, caustic, and Amine shall require curbing.

4.2 Segregation of Waste Streams

Determine to the extent to which waste streams should be segregated for environmental, disposal, cross-contamination or reactivity reasons.