

**CASE HISTORY**

TENAX GNT high flow triplanar geonets to replace gravel drain in gypsum stacking lining system, Louisiana



PRODUCT	TENAX GNT high flow triplanar geonets
LOCATION	Louisiana, July 2001
ENGINEER	Ardaman & Associates

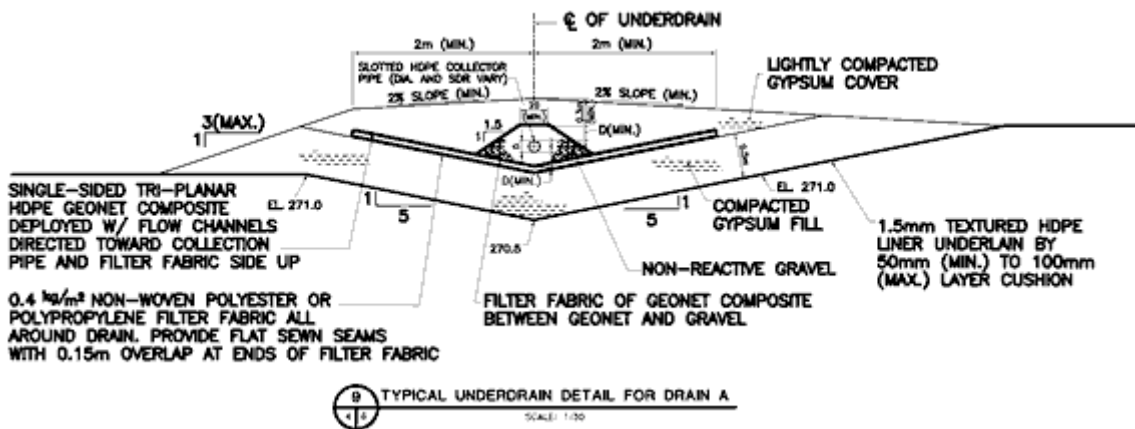
**PROBLEM**

The current state of practice for lateral drainage layer in gypsum stacking lining systems is 0.45 m of gravel wrapped within a 340g/m<sup>2</sup> geotextile. Gravel drainage layer is expensive considering material cost, transportation, and installation. Geonet drain alternative can save cost, air space, especially when conforming gravel material is not readily available. To evaluate the feasibility of replacing 0.45 m of gravel with triplanar geonet as drainage medium in gypsum stacking lining systems, a testing section is proposed in a nitrogen fertilizer company located in Louisiana.

**SOLUTION**

Due to high normal stresses and high flow rate requirement, triplanar geonet is used in this test section in the area of 4x150 m. This geonet drain alternative is compared, in terms of measured flow rate, side by side, with a standard design section. The high flow geonet is deployed atop the geotextile with its primary flow direction perpendicular to the centerline of the slotted pipe. Silica gravel is then placed in the drain to form the bedding on which the slotted HDPE pipe invert rests. Care is exercised during placement so as not to damage or displace the geonet.

The slotted HDPE pipe is then installed atop the gravel bedding; silica gravel is then placed on both sides of the pipe. Placement of the silica gravel is controlled such that the gravel completely surrounds the pipe. After placing the triplanar geonet, gravel, and the geotextile is wrapped all around the sides and top of the geonet, gravel. Gypsum backfill above the drain is then placed over the geotextile in one lift and compacted lightly.



Typical underdrain detail

**CONCLUSIONS**

This test section will be monitored for seven years. Further investigation with field pore pressure measurement over the liner system will be conducted to verify the reduction in seepage pressure due to the presence of the geonet drain system and the effectiveness of the alternative design. Initial flow monitoring indicates favorably with the geonet alternative.