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FABRIC DAM LINING IN POROUS SOIL AREAS

SCOPE OF APPLICATION

This proposal concentrates on farm type applications for the purpose of crop irrigation and stock watering, although applications involving the storage of potable water are similar in principle.

SUITABILITY OF MATERIALS

It is recommended that high quality double coated poly fabric be used in this application with joins heat sealed.

Life expectancy of poly fabric can be infinitely increased when not exposed to direct sunlight, it is therefore essential that the installed membrane be protected by an earth cover of 100 to 200mm. the actual depth of the cover being dependant on the quality and availability of soil, which should be free of rocks, shale slabs, tree roots or other matter which may cause damage to the membrane.

Consideration should be given to the presence of any contamination in the soil cover or from jointing compounds, as this may adversely affect the quality of the stored water

SELECTION OF FABRIC

Canvacon 5000E and 7000E or equivalent polyethylene

Preference for Canvacon is based on these characteristics

1. Economical in supply & installation
2. Mechanical resistance to puncturing during the spreading of soil cover
3. Tensile strength of welded seams
4. Tear strength for easier manhandling, where large areas are to be covered
5. Excellent water head resistance

SUPPLY OF LINER

The prefabricated membrane can be supplied to the property owner by one of two commonly available options

1. Supply of membrane only
2. Supply & installation of the membrane by the contractor responsible for the dam earthworks

In the case of a new dam construction, the cost of the membrane maybe a component in the overall contractors price to the property owner & the membrane could be supplied & laid by the fabric converter, on the sub-contract basis.

In circumstances where an existing dam has been unsuccessful in holding water, the supply of the membrane could be as for a new installation or the property owner may have access to equipment to clean out the dam & lay the membrane without outside assistance.

Dimensions of the dam & the degree of difficulty anticipated are factors that usually determine how the installation is to be undertaken

INSTALLING MEMBRANE

Ideally the prefabricated membrane will cover the entire area of the dam in one section, however, this is dependent on the manpower available & the dam size. Where the dam is too large for one section it will necessitate on site joining of two or more sections that should not exceed 3000 square metres per section for a four-man team.

Where on site jointing is necessary, overlap 150 to 200mm using a double-sided adhesive sealant strip. It is recommended that fabric edges are rolled back on themselves or other steps taken to ensure a dust free surface to which the adhesive strip is placed.

The membrane should ride well over the shoulders of the dam & back filling of the shoulders should not take place until the soil cover extends over the base & well up the sides. Failure to work from the centre out could place the membrane under tension, causing seam failure or tearing of the fabric.

Folds in the fabric taken up in corners or rounded areas of the dam should be buried in the normal process of earth covering. Avoid strong wind conditions during installation or supplement with additional manpower.

PREPARATION AND EQUIPMENT

New dam excavations are usually done by a drott or bulldozer with no reasonable limitations to the size of equipment.

Dam sides should not exceed a rise of one in four (refer figure 1) to ensure a non dispensable soil cover to protect the membrane from sunlight. Where it is not practicable to obtain dam sides that are within these limitations, advice should be obtained from qualified sources, as to the procedure for setting the membrane under covered shoulders of the dam sides. (refer figure 2)

Prior to laying the membrane in position the site should be inspected to ensure the floor & sides of the dam are free of any sharp or irregular obstructions. The surface should be smooth & well compacted utilizing track driven earthmoving equipment, or spread with a blanket cover of sandy loam. Where natural material is not readily available a geotextile is another option.

It is recommended that a track driven swamp drott or half dozer be used to spread the soil cover over the membrane. With the possibility of rubber tyre machines causing damage by 'gathering up' the fabric, greater care should be taken with the use of this type of equipment.

Placing soil on the cover can be done with a front end loader or a scraper, as tests on Canvacon subjected to machine loads of 16 tonne have shown no significant damage to the fabric.

PERMEABILITY

Indicative head pressure results from Poly fabrics to AS2001-2017

Canvacon 5000E	>250kPa
Canvacon 7000E	>250kPa

Head pressure results of hot air fabric welded seams should produce no less than 80% of parent fabric results.

Within Australia, there are a number of areas where porous soils are found. Dams constructed in porous soils usually leak. Dams built in these areas have been successfully repaired by installation of Canvacon liners.

CONCLUSION

In the total cost of dam construction a Canvacon dam membrane represents only a small addition component & is a positive solution to problems that can be very expensive & inconvenient to rectify.

Information provided in this data sheet is offered as a guide only. For additional advice on lining your dam contact Polytex office on P: 02 6953 6953 / F: 02 6953 7141 / E: info@polytex.net.au

Figure 1

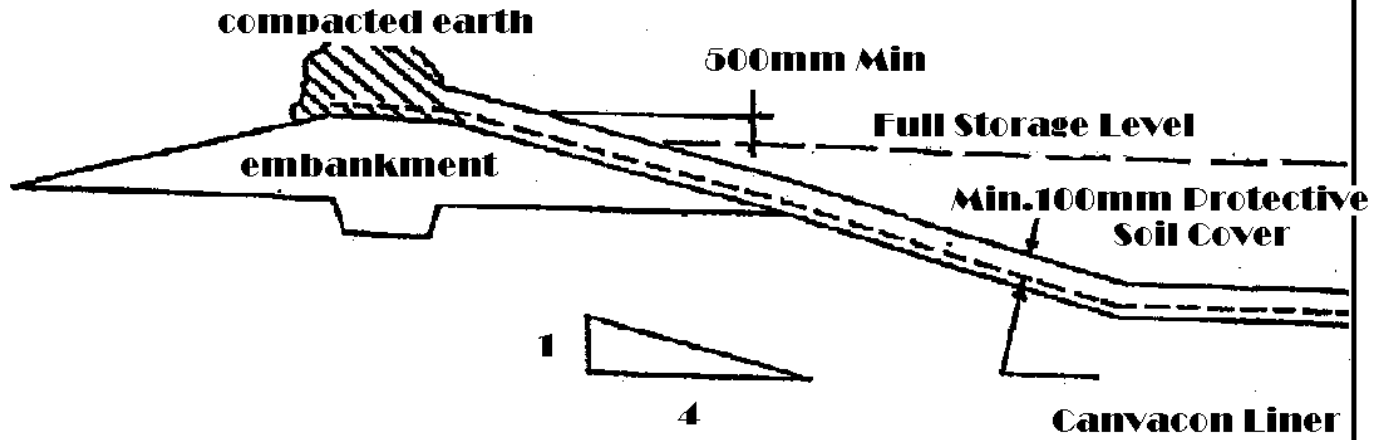
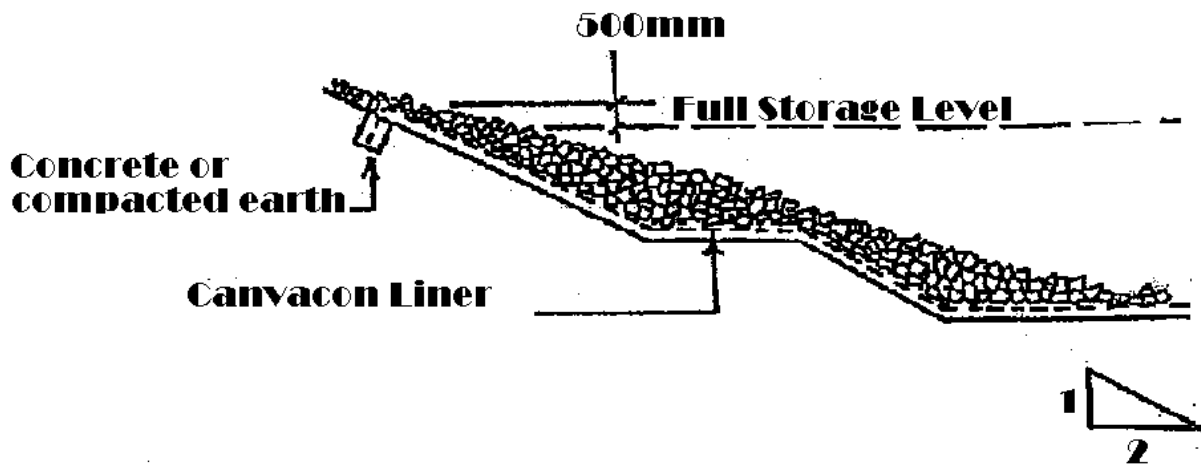
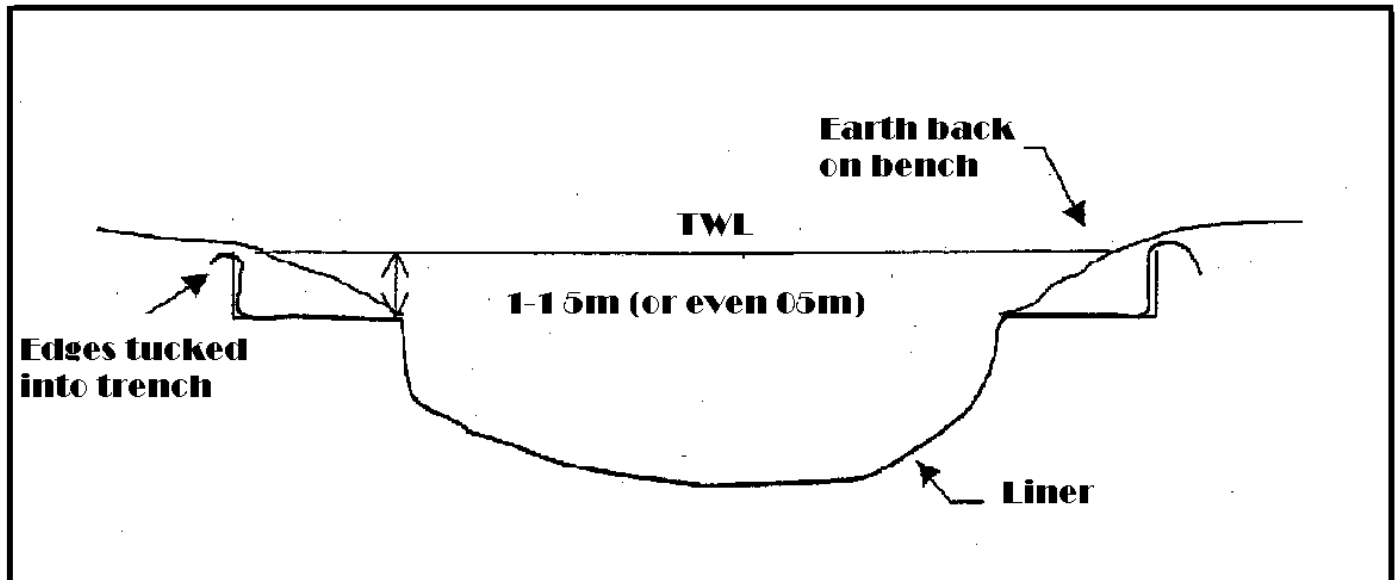


Figure 2



**Embankments in excess of 1 in 2
To prevent protective cover from slipping on synthetic liner,
step sides to retain aggregate or coarse rock fill**

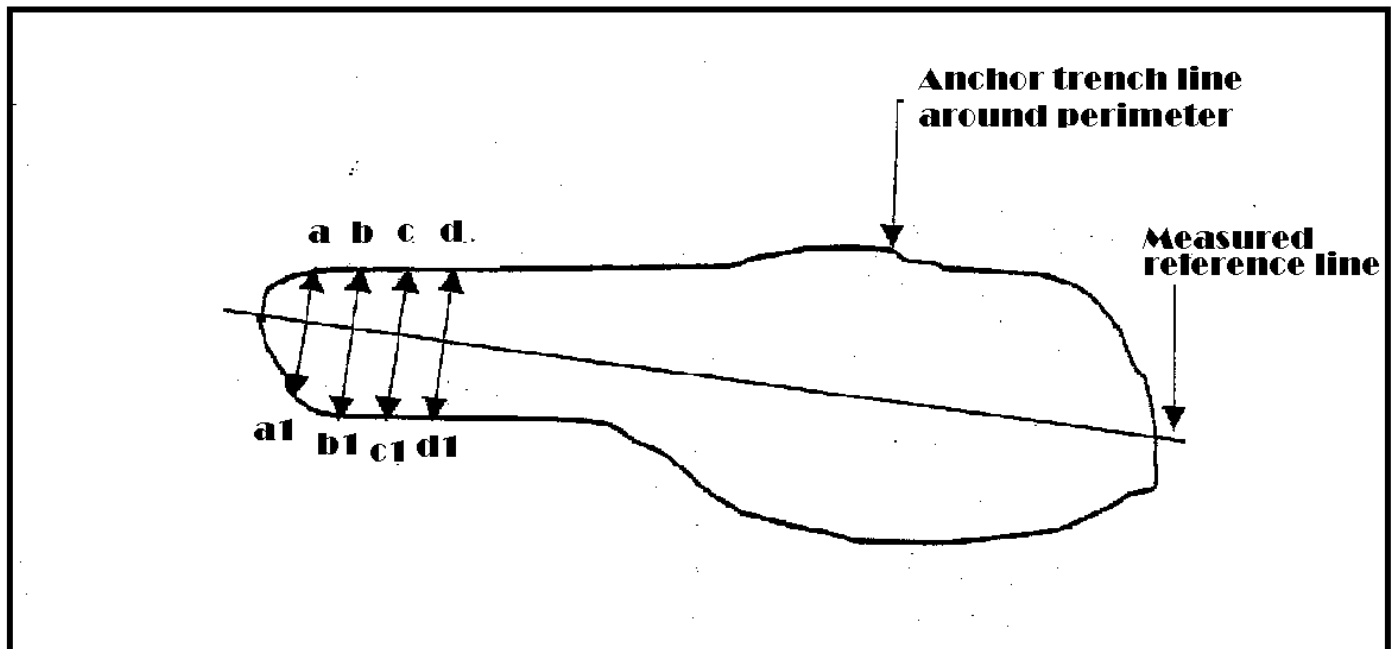
HOW TO KEEP U.V. OFF DAM LINER



Section of dam showing liner in place, having laid across the 'bench' & up the back (vertical) wall of the bench, & secured above T.W.L (top water level)

Earth removed to create bench is placed back in position, on top of liner. This keeps UV off the most vulnerable part of liner.

MEASURING FOR LINER SIZE



Measurements are taken at regular spacing's (such as 2m – a,a1; b,b1; c,c1; d,d1;) along the reference line, and perpendicular to it. we are then able to draw up the liner plan to scale. (NB: all dimensions taken with tape lying where the liner will sit – I down slope, across floor etc on the ground surface).