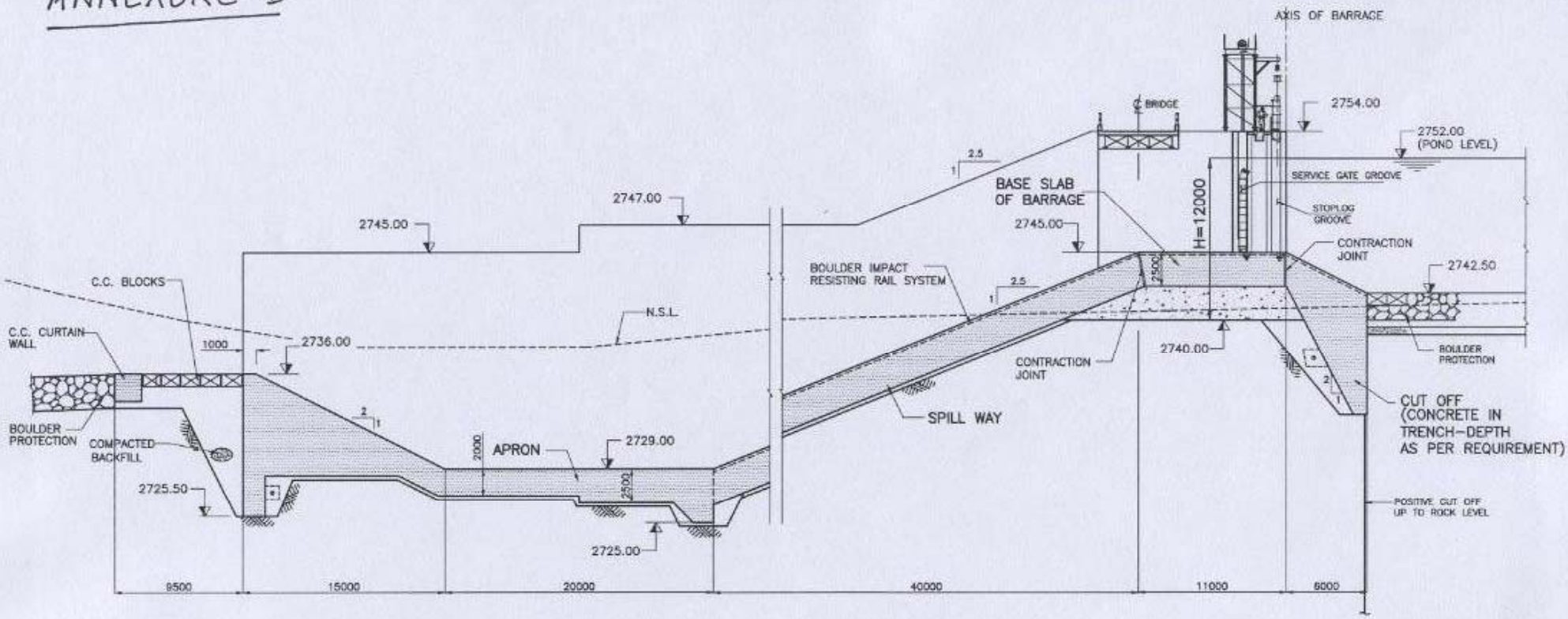
ANNEXURE-I



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RAJASTHAN SPINNING AND WEAVING MILLS LTD.

INDO CANADIAN CONSULTANCY SERVICES LTD. ICS

Project: ALLAIN DUHANGAN H.E. PROJECT, HIMACHAL PRADESH

Title: ALLAIN BARRAGE
TYPICAL SECTION THROUGH SPILLWAY

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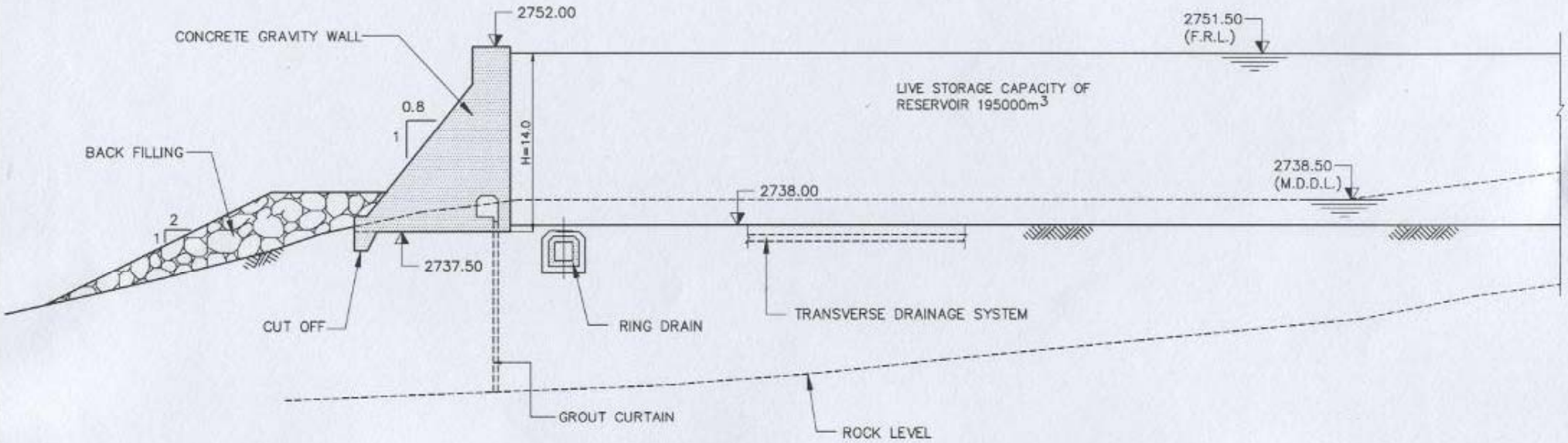
ANNEXURE-II



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RAJASTHAN SPINNING AND WEAVING MILLS LTD.

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Project: ALLAIN DUHANGAN H.E. PROJECT, HIMACHAL PRADESH

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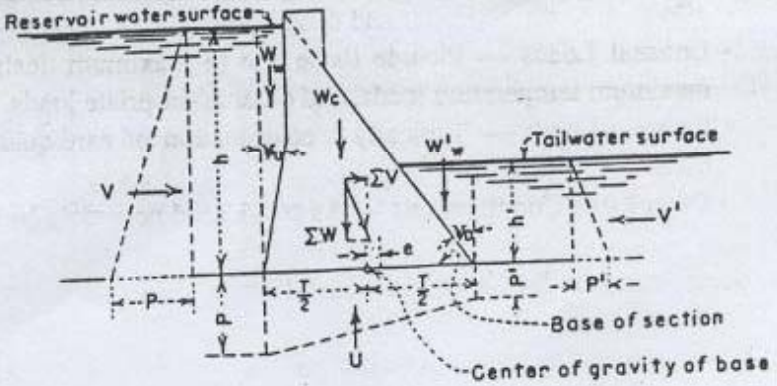
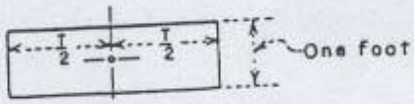
ANNEXURE-III



(A) VERTICAL CROSS-SECTION



(B) HORIZONTAL CROSS-SECTION

ψ=angle between face of element and the vertical.

T=horizontal distance from upstream edge to downstream edge of section.

I=moment of inertia of base of section 1-foot wide about its center of gravity, equal to $\frac{T^3}{12}$.

w_c=unit weight of concrete.

w=unit weight of water.

h or h'=vertical distance from reservoir water or tailwater, respectively, to base of section.

p or p'=reservoir water or tailwater pressure, respectively, at base of section. It is equal to wh or wh'.

W_c=dead load weight above base of section under consideration including the weight of the concrete, W_r, plus such appurtenances as gates and bridges.

W_w or W_w'=vertical component of reservoir water or tailwater load, respectively, on face above base of section.

M_c=moment of W_c about center of gravity of base of section.

M_w or M_w'=moment of W_w or W_w' about center of gravity of base of section.

V or V'=horizontal component of reservoir water or tailwater load, respectively, on face above base of section. This is equal to $\frac{wh^2}{2}$ for V and $\frac{w(h')^2}{2}$ for V' for normal conditions.

M_p or M_p'=moment of V or V' about center of gravity of base of section, equal to $\frac{wh^3}{6}$ for M_p and $\frac{w(h')^3}{6}$ for M_p'.

ΣW=resultant vertical force above base of section.

ΣV=resultant horizontal force above base of section.

ΣM=resultant moment of forces above base of section about center of gravity of base of section.

e=distance from center of gravity of base of section to point where resultant of ΣW and ΣV intersects base of section. It is equal to $\Sigma M/\Sigma W$.

U=total uplift force on horizontal section, equal to $T\left(\frac{p+p'}{2}\right)$.

Figure 1–4. — Loads acting on a dam. Shown for a concrete gravity dam. [USBR, 1987b].

c) For the loading conditions F and G (*see* **4.1**) the uplift shall be taken as varying linearly from the appropriate reservoir water pressure at the upstream face to the appropriate tailwater pressure at the downstream face. The uplift is assumed to act over 100 percent of the area (Fig. 2).

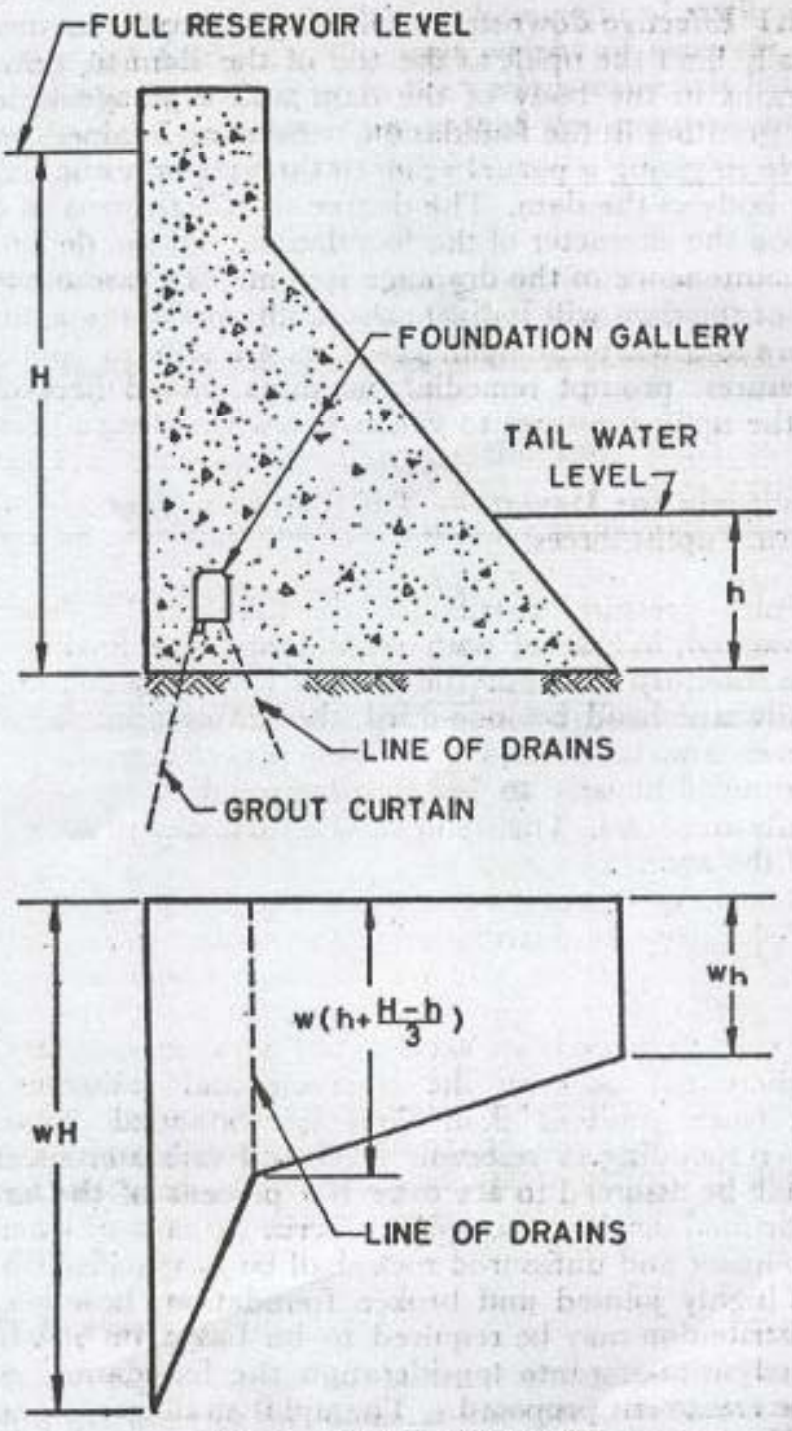


FIG. 1 UPLIFT DIAGRAM