

# Water Management for Dam Construction

*Update of Bulletin 48a (1986)*

ICOLD Workshop 28 May 2022  
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## **Coffer Dam Types**

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1. Introduction
2. River with low flows cofferdam types
3. River with high flows cofferdam types
4. Some design criteria issues



## ***1.0 Introduction***

## *ICOLD Bulletins 48 and 48A include the following cofferdam types:*

- Concrete, Rollcrete, Masonry Gravity, and Arch Dams
- Embankment Dam Types:
  - With wide clay core, sometimes placed in water
  - With central diaphragms constructed in dry or under water
  - With sheet pile curtains as seals or cut-offs
  - Reinforced rockfill

## ***2.0 River with low flow cofferdam types***



## Polihali Crump Gauging Weir (Lesotho)



## Polihali Crump Gauging Weir Cofferdam



## *Sheet piles used to form cofferdam structures*



# Spring Grove Dam Cofferdam SA



## Spring Grove Dam Cofferdam SA



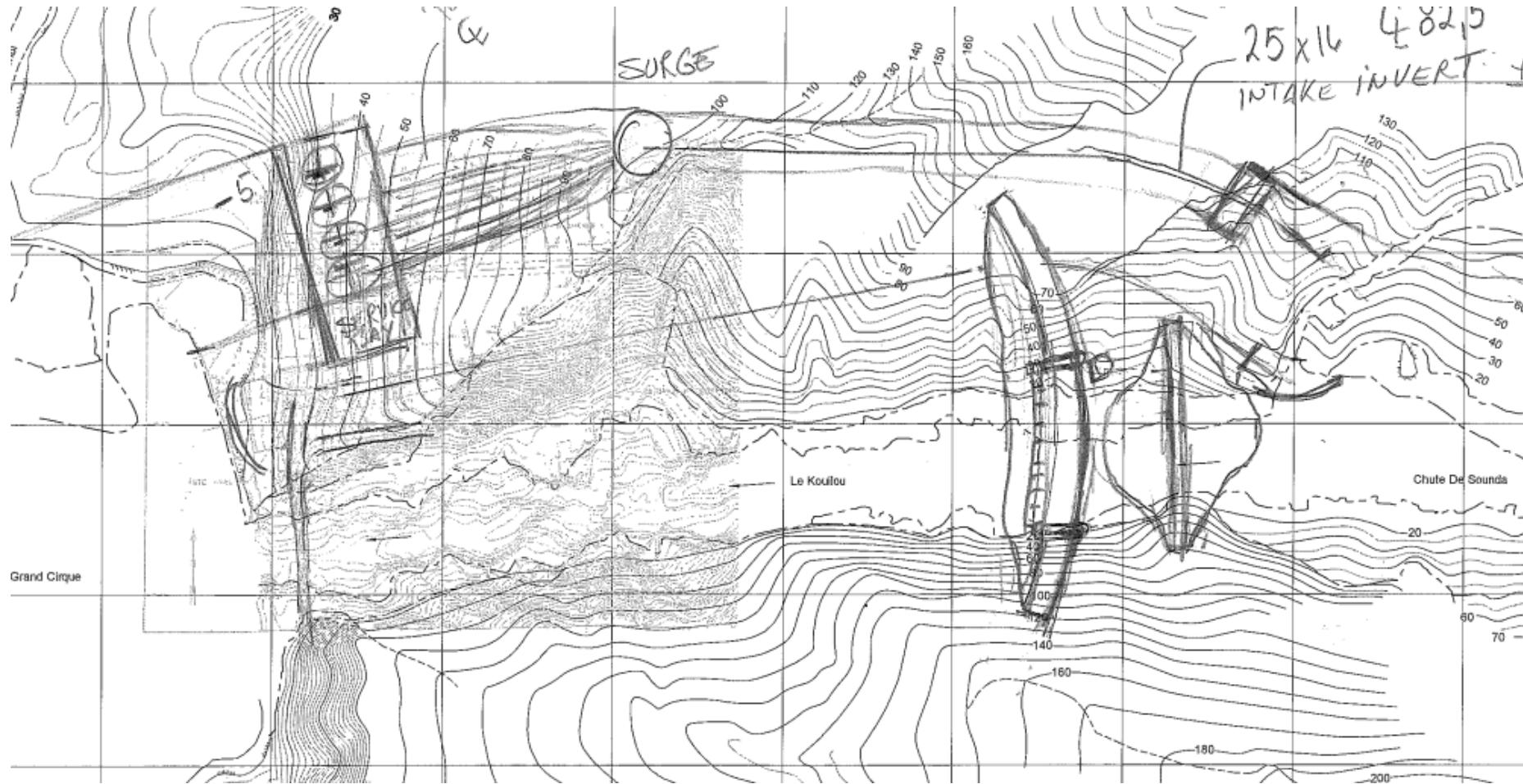
## CFR Mohale Dam Cofferdam



### ***3.0 River with high flows cofferdam types***



# Sounda Gorge Cofferdam Arrangement: DRC



# Sounda George



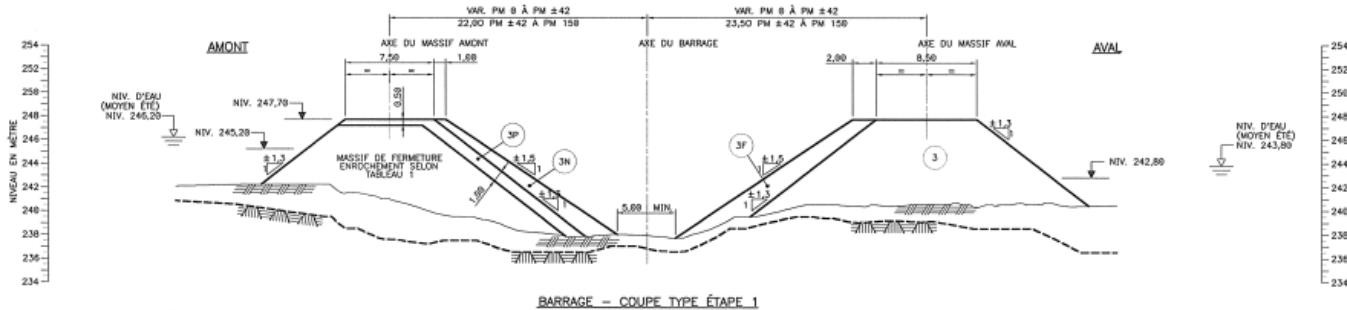
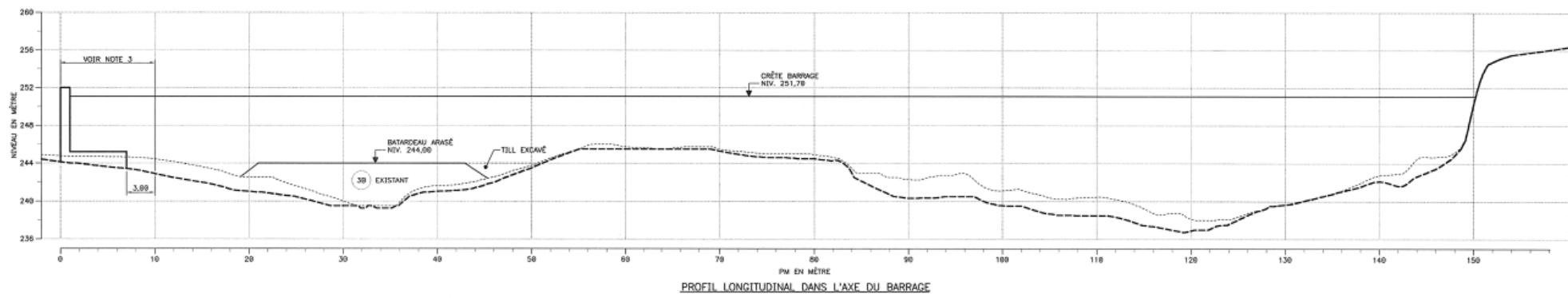
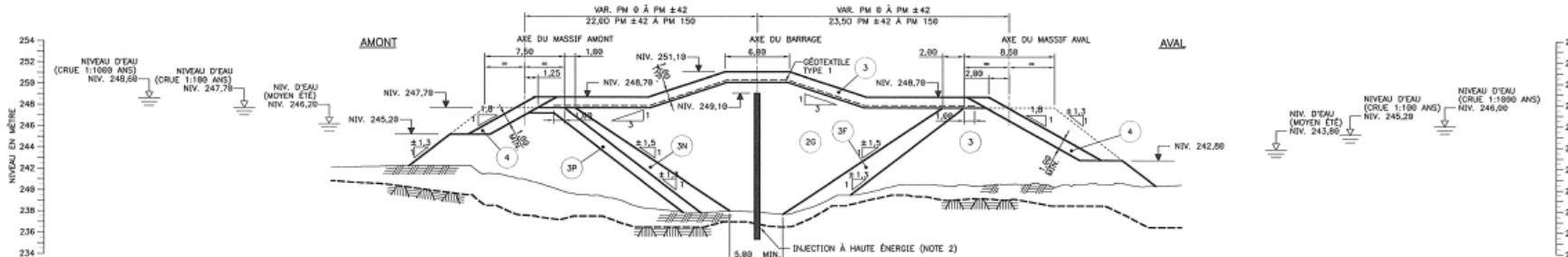
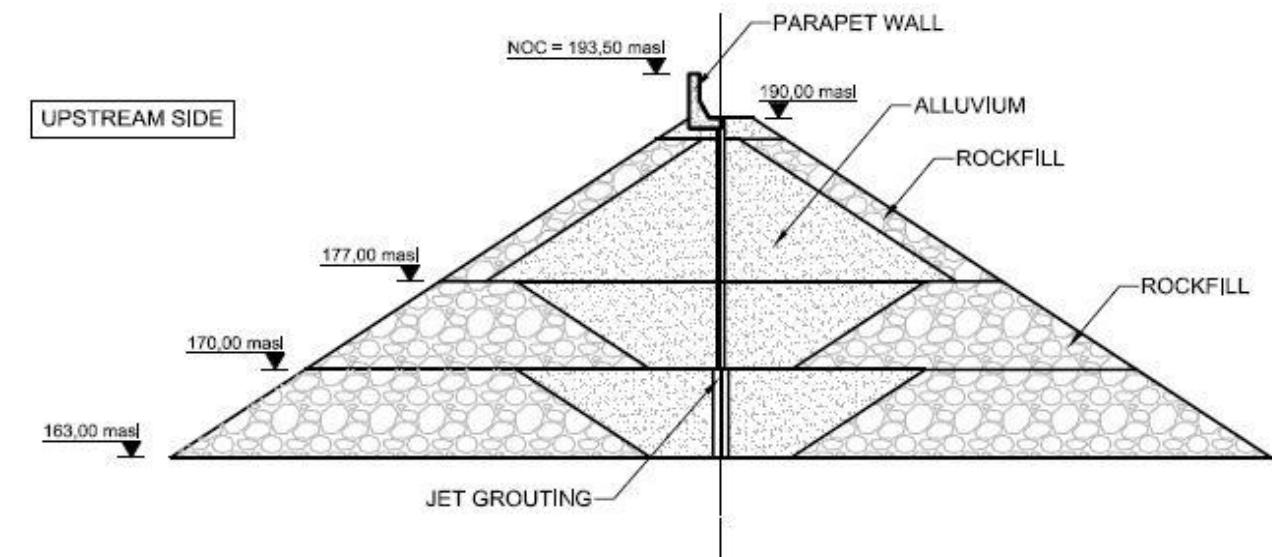
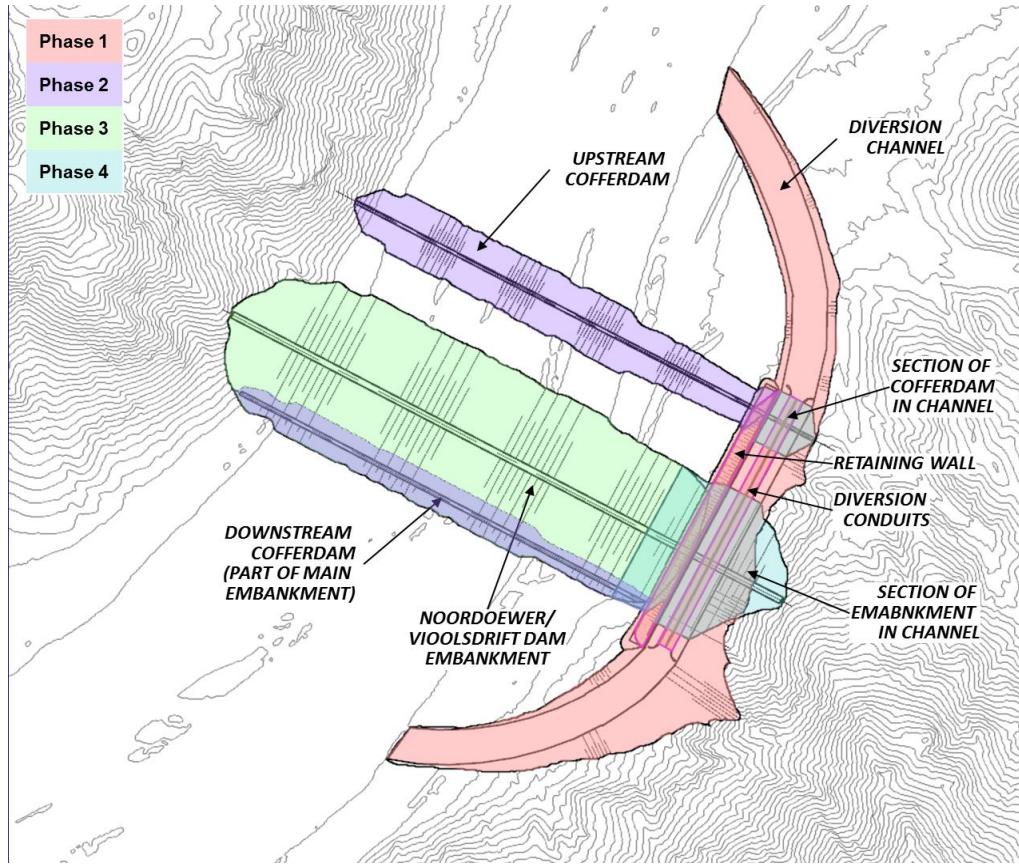


TABLEAU 1	
PM	MATÉRIAUX
0 à 90	ZONE 3
90 à 125	D <sub>min</sub> = 100mm, D <sub>max</sub> = 120mm
125 à 150	D <sub>min</sub> = 120mm, D <sub>max</sub> = 150mm

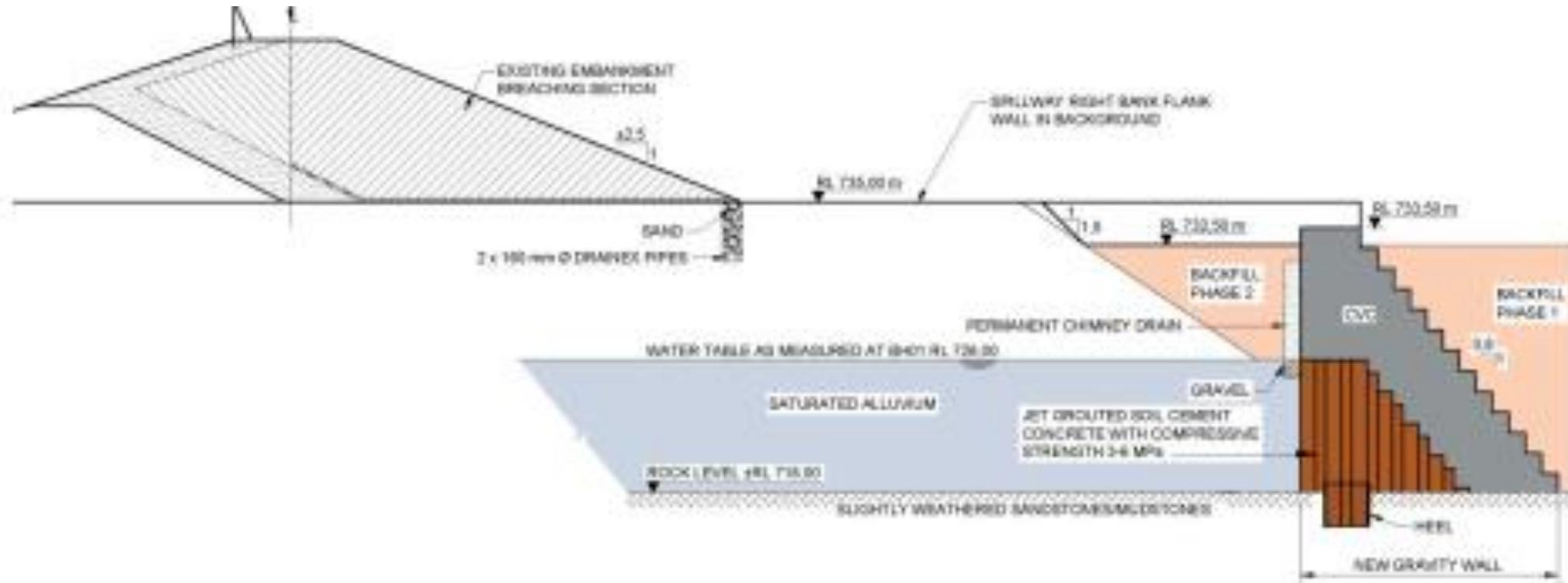
LÉGENDE	
PM	POINT MÉTRIQUE
20	GRANULAIRES GROSSEUR, SÉLECTIONNÉ OU TRAITÉ, DÉVERSE JUSQU'À 1m AU DESSUS DE L'EAU ET COMPACTÉ PAR LA SUITE, MAXIMUM 150mm
3	ENROCHEMENT DÉVERSE, MAXIMUM 90mm
3F	PIERRE CONCASSEÉ, DÉVERSE, MAXIMUM 150mm
3N	PIERRE CONCASSEÉ, DÉVERSE, MAXIMUM 225mm
3P	ENROCHEMENT SÉLECTIONNÉ, DÉVERSE, MAXIMUM 450mm
4	BLOCS SÉLECTIONNÉS, PLACÉS, MINIMUM 400, MAXIMUM 600mm
---	TERRAIN NATUREL
---	ROC PRÉSUMÉ



# Noordoewer/Vioolsdrift Cofferdam



## Eldansdrift Barrage Cofferdam Arrangement



## Elandsdrift Barrage SA: Jet-Grouted Columns



## Elandsdrift Barrage SA: Jet-Grouted Columns



## ***4.0 Design Criteria Aspects***



- Classification
- Overtopping
- Freeboard
- Design flood (Attenuation, Climate change?)
- Design for not clogging of inlet of diversion channel
- Dam axis and conduit alignments
- Flood peaks and hydrographs (hurricanes, global warming, cyclones, seasonal affects)
- Flood recurrence interval for Cofferdam and Main Dam
- Flood routing in cofferdam reservoir
- Overtopping failure and risk
- Level of protection selected



- Consequences of partial/total failure
- Freeboard
- Cofferdam reservoir backwater effects
- Accommodating practical aspects like tree trunks blocking the conveyance structure inlet. (Unexpected condition – may add more)
- Merging the Coffer Dam with the Main Dam
- Foundation/construction material borrow area evaluation
- Stability of dam
- Design for filling the area below the cofferdam and the main dam like a CFRD using a fuse plug spillway, before the Main Dam is overtopped



- Interfaces of coffer dams to permanent dam infrastructure
- Erosion of earthfill against flowing water of the river
- Specifications and typical language for assigning responsibility
- Drawings, specifications and design memoranda
- Environmental requirements
- Water quality requirements



*Thank You*

