EXPAND MORE ON THE CONTROL UNIT SIGNALS

IF/ID

IR[31:26]

R[25:0]

Control Unit (contains alu control)

ID/EX

Control Word
WB
M
EX
ALU control signals
PC
Read Data1
Read Data 2

Imm

ALU OP

EX/MEM

Control Word
WB
M
EX
ALU control signals
PC

PC_offset

Read Data 2

ALUout

MEM/WB

Control Word
WB
M
EX
ALU control signals
PC

Read Data 2

DataOut

Add

4

Mux

PC

Instruction memory

PC

IR

load
dest
Register File
src_a
src_b in

Imm

Mux

Mux

Add

ALU

mem_read
mem_write

Data Memory

Mux

Hazard Detection Unit

stall

Rs
Rt

Forwarding Unit

Rs1_select

WriteData_select
To
ALU
mux

Rs2_select

alu_muxsel1   alu_muxsel2

signals from control unit(w/ ALU control)

TO ALU MUX
+ To the Regfile Write Data

Control Word

Alu op
mem_read
mem_write
regfile_mux_sel
load_regfile
PC_src
alu_muxsel1
alu_muxsel2

Could we add Forwarding unit at the IF/ID stage? , like decide forwarding only with the instruction(? not sure)

We are going to need more signals for both Forwarding and Hazards

I-cache

Arbiter

D-cache

Control signal

L2 cache

Control signal