US Army Corps of Engineers ®

Chicago District

SEDIMENT REMEDIATION east chicago DEMONSTRATION PROJECT

SE @ EAST BANK (Taken in spring)

SOUTH from NE CORNER of CHANNEL (taken in spring)

View looking NW from NE corner of channel (taken in summer)

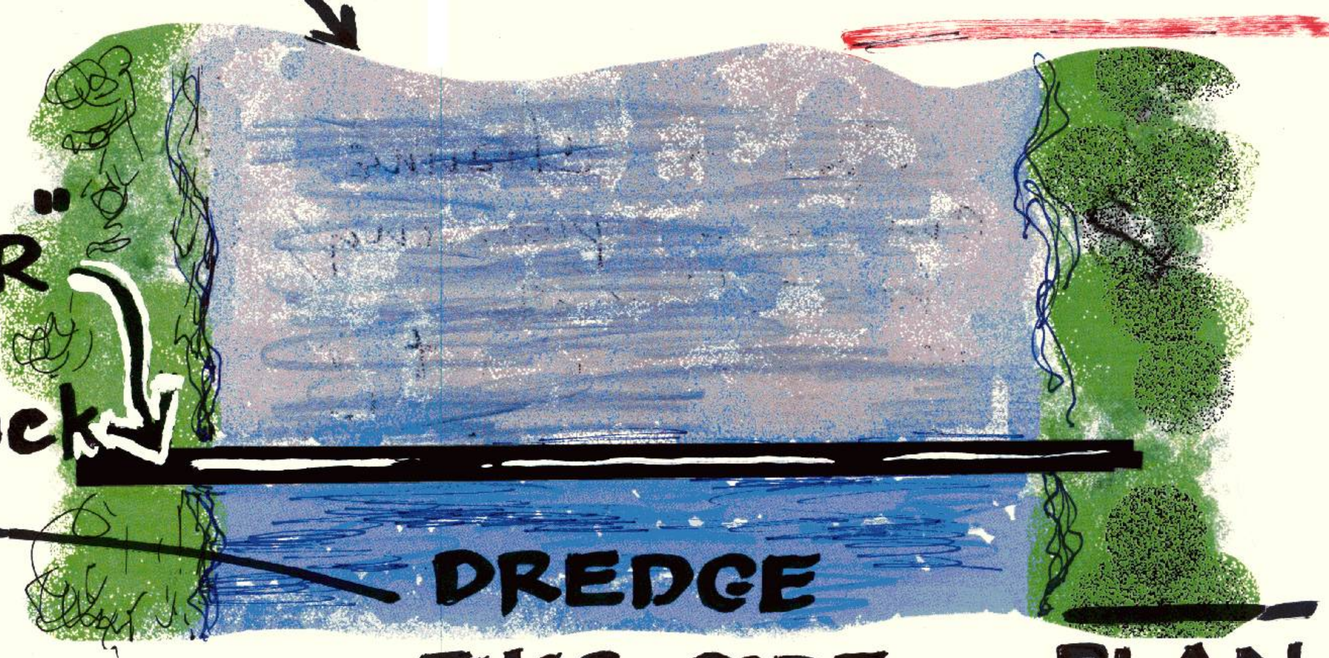
Phase 1.

EFFLUENT CHANNEL

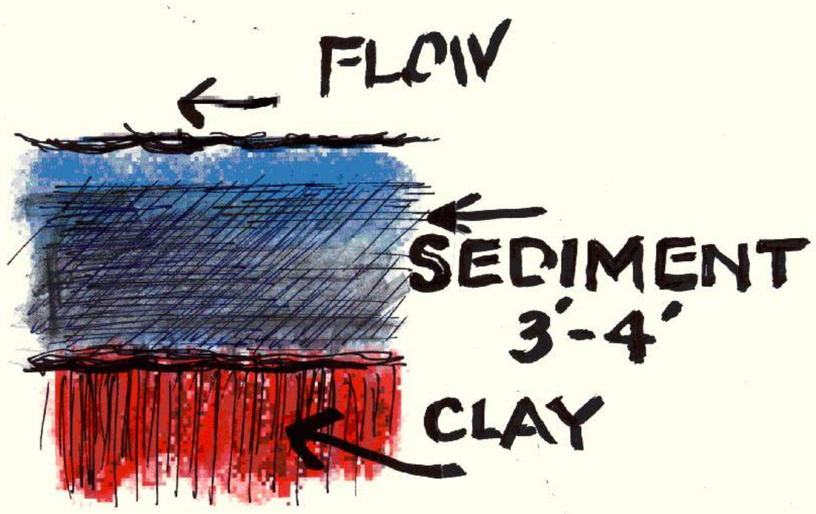
CONTAINS "PUDDING" LIKE SEDIMENT

1. install "BARRIER" to stop sediment from coming back

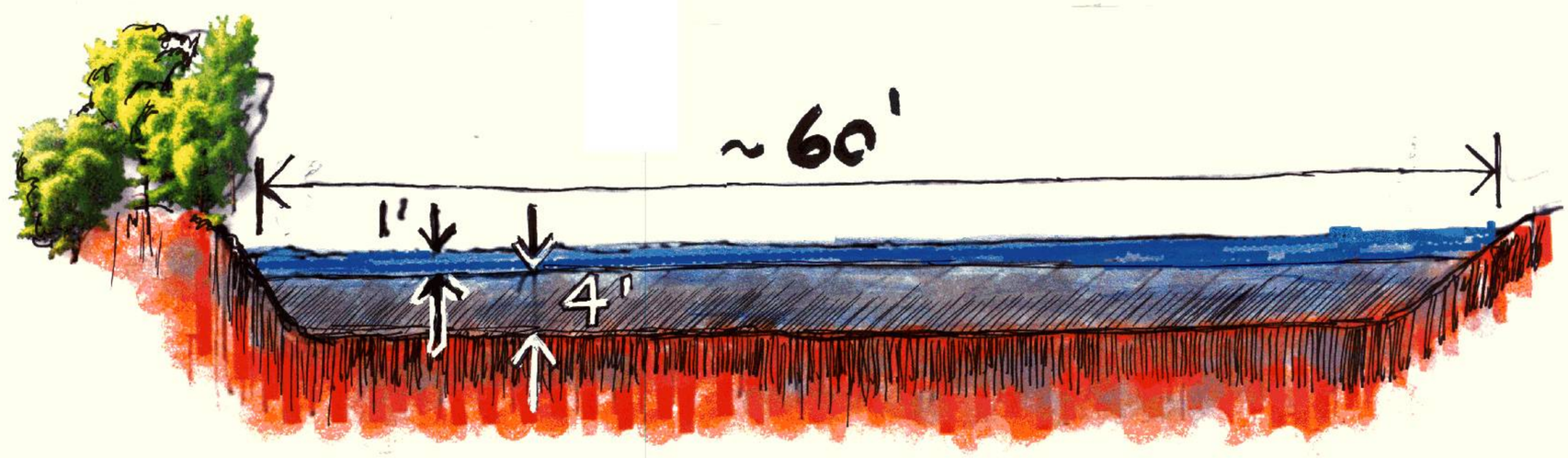
2. WHEN DREDGE THIS SIDE



PLAN

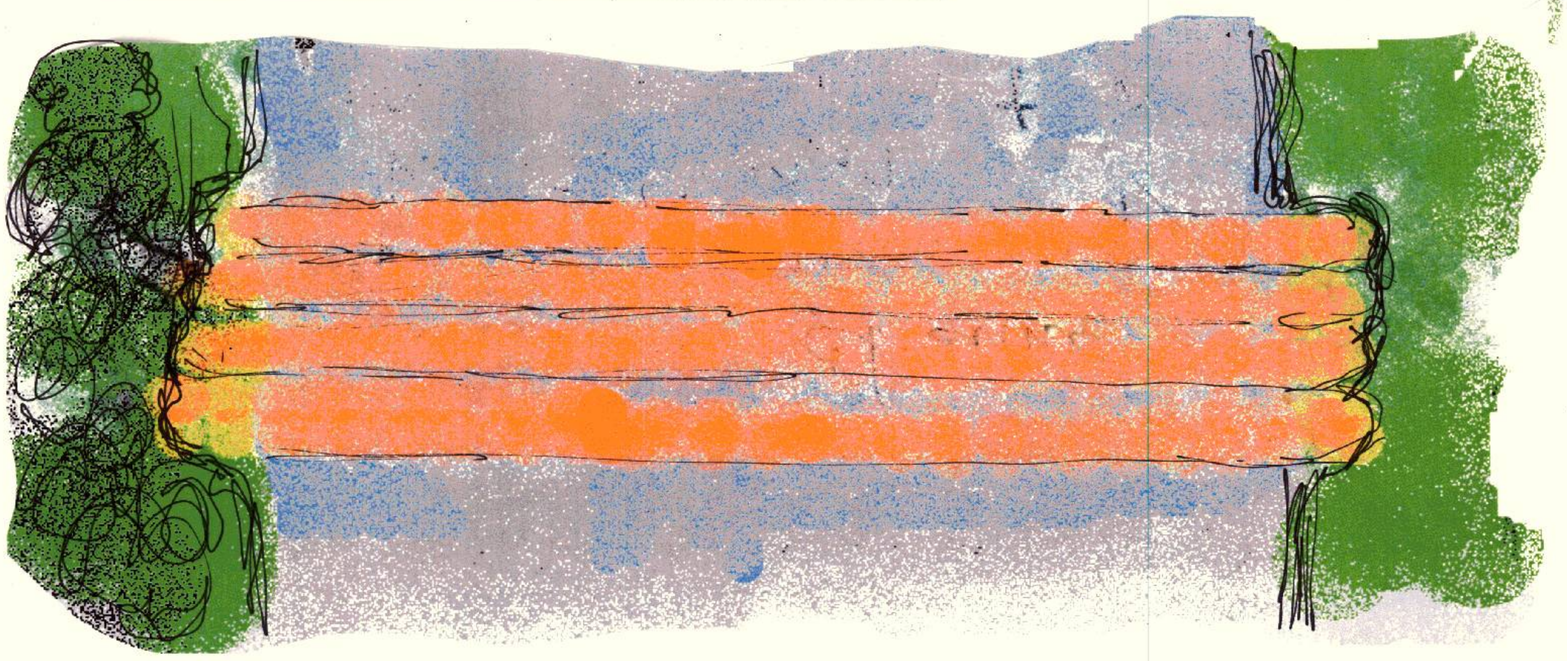


LONGITUDINAL SECTION



CHANNEL CROSS SECTION

CONSTRUCTION PLAN

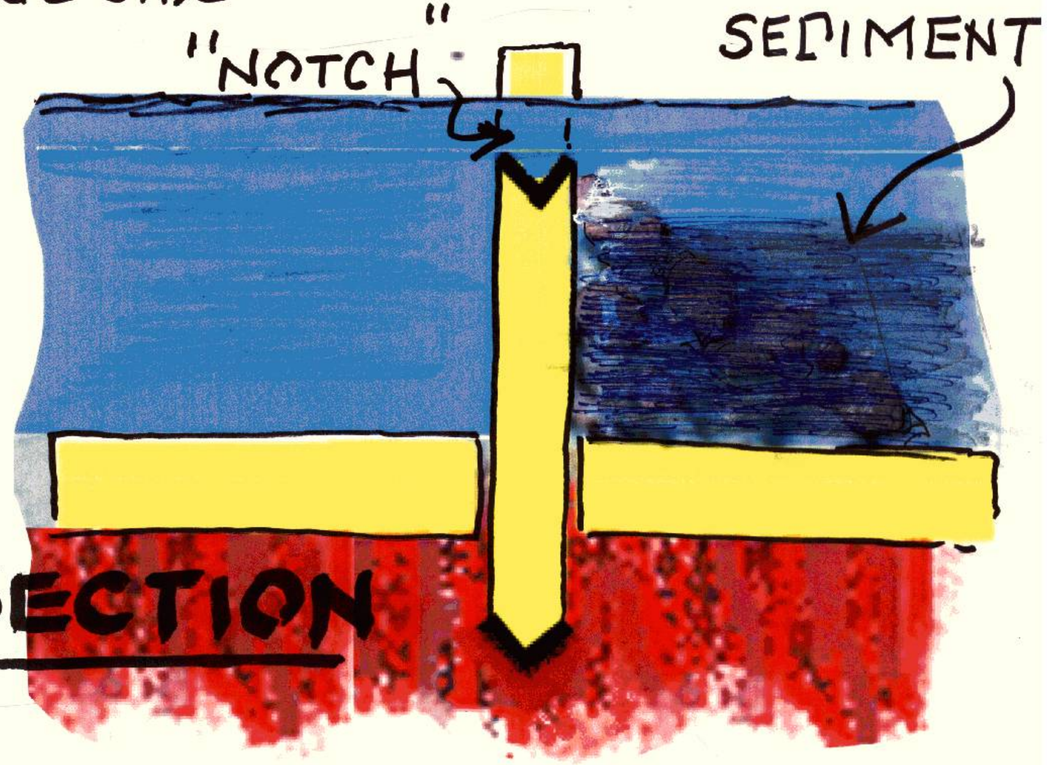


CRANE ON SITE FOR DREDGING
SKIMS TOP OF CLAY

PLAN

CRANE MAKES 3 or 4 PASSES
SETTING SEDIMENT "TO DREDGE SIDE"

FINAL

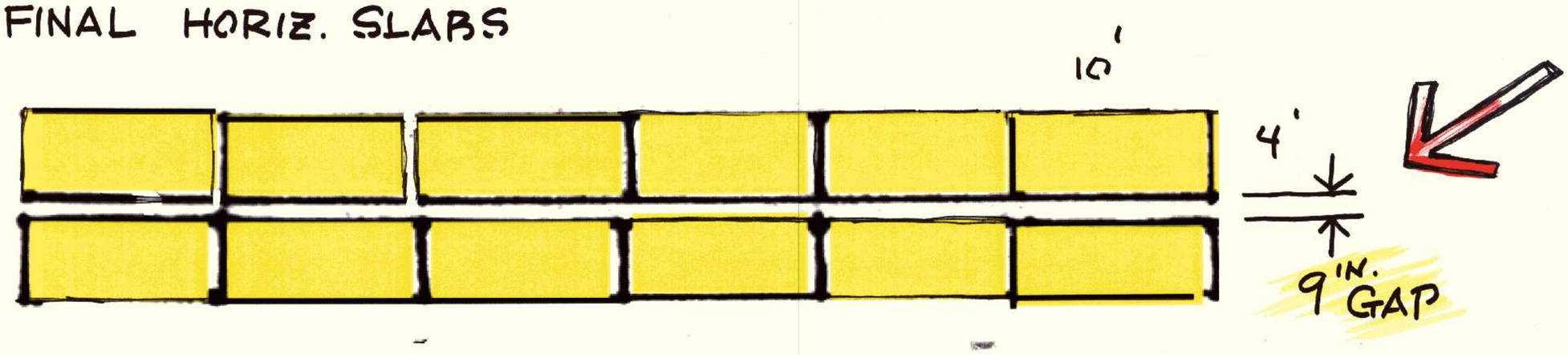


SECTION

FIRST

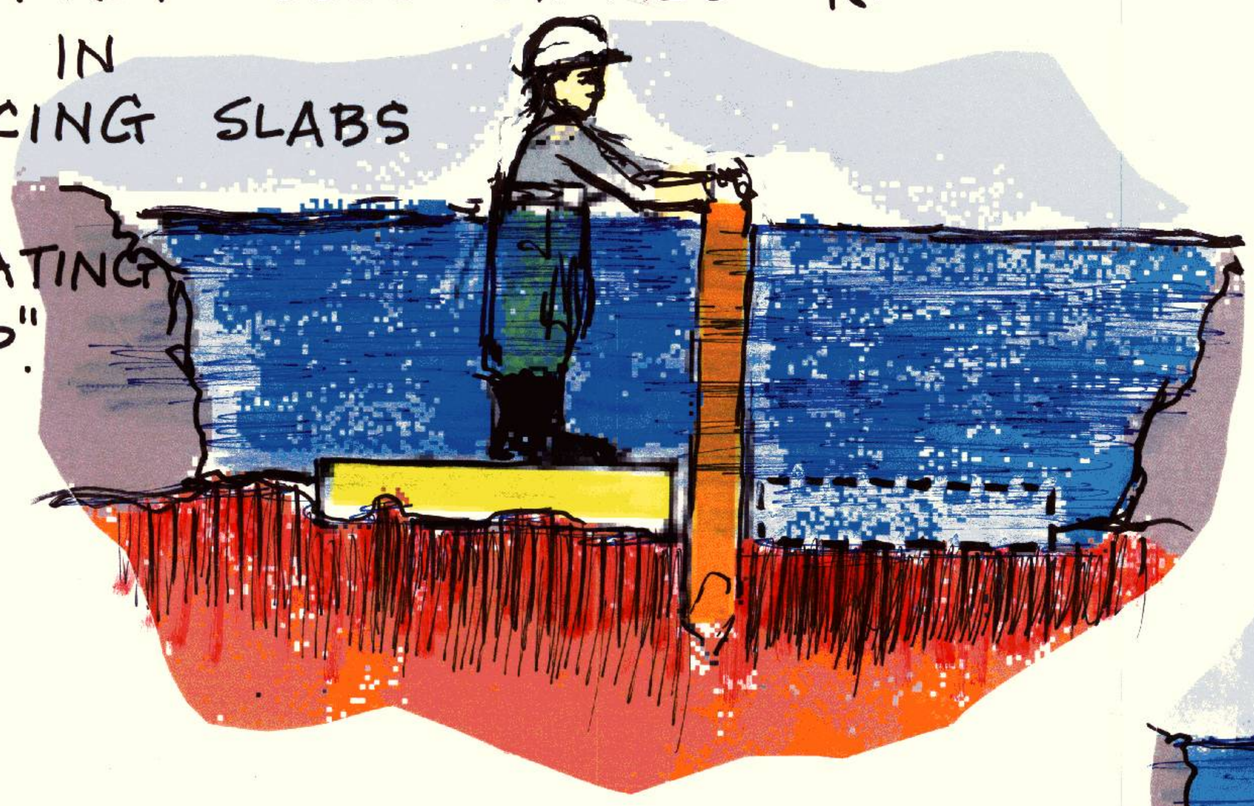
CRANE PLACES
FLAT HORIZ. SLABS

FINAL HORIZ. SLABS



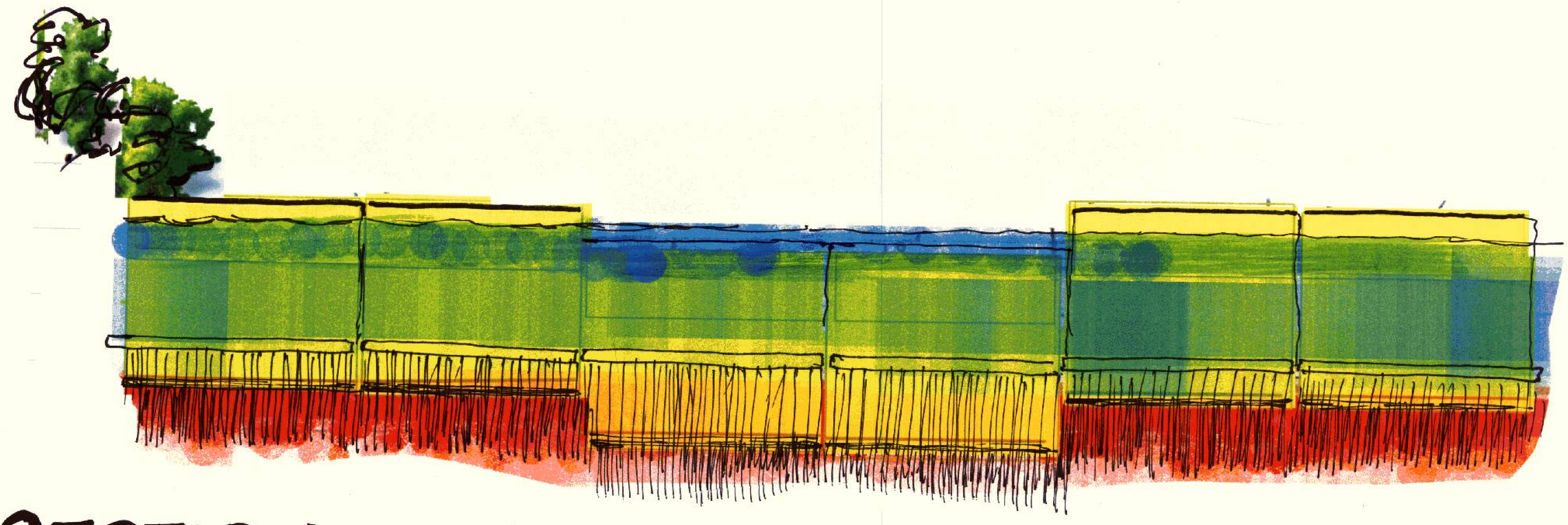
PLAN

WORKER USES STAKES TO AID IN PLACING SLABS AND CREATING "GAP".



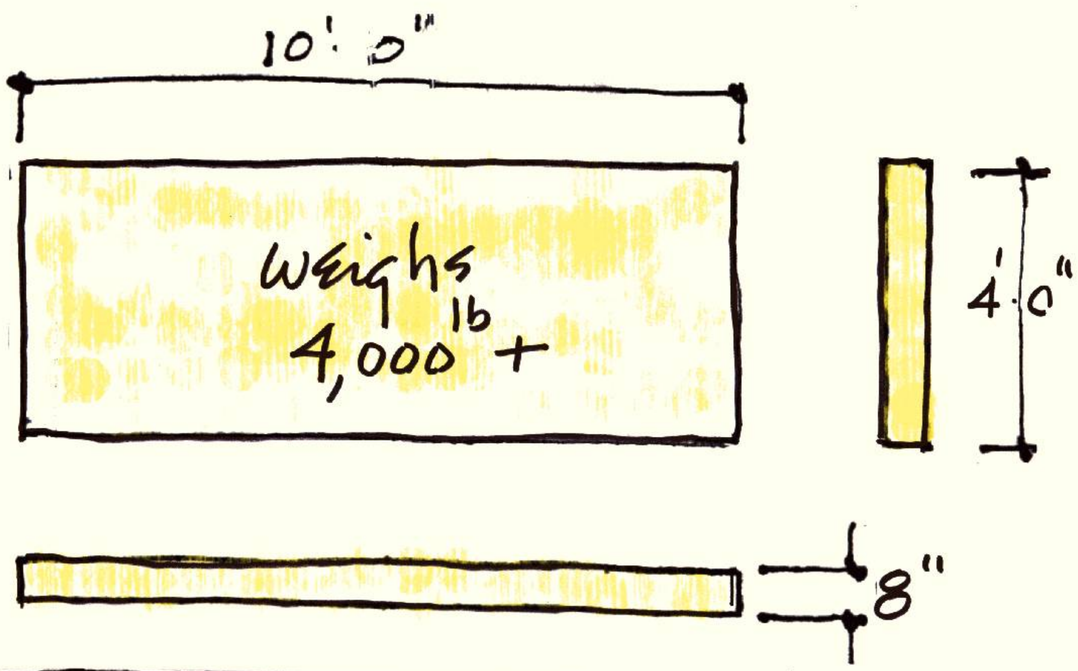
WORKER "GUIDES" VERTICAL SLABS

SLAB SINKS INTO CLAY



SECTION VIEW FROM PLANT (UPSTREAM SIDE)

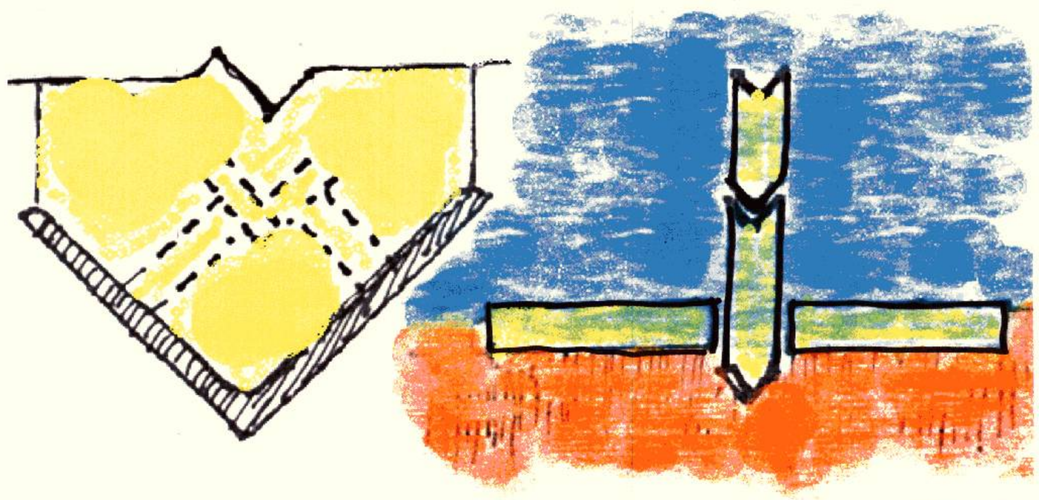
PRECAST details



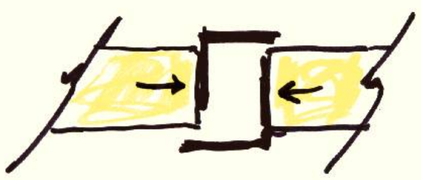
VERTICAL PANELS		
TOTAL	7	10' x 4' x 8"
	7	10' x 2' x 8"

4' x 10' x 8"
HORIZONTAL PANELS
TOTAL REQUIRED 14

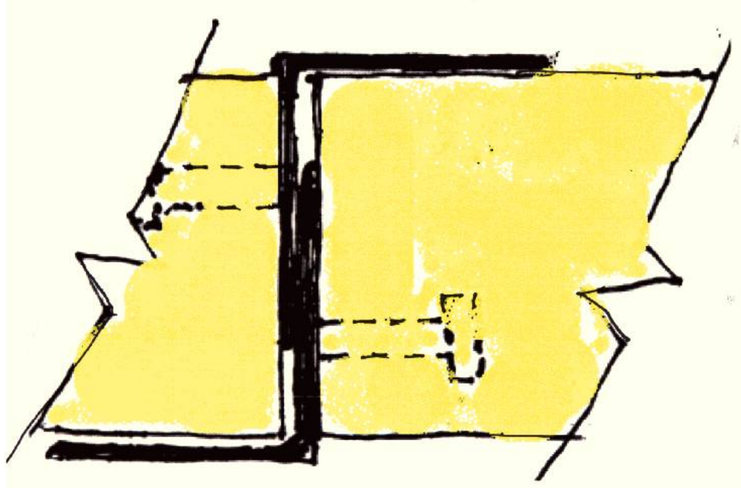
SLABS have W.W.F. not shown



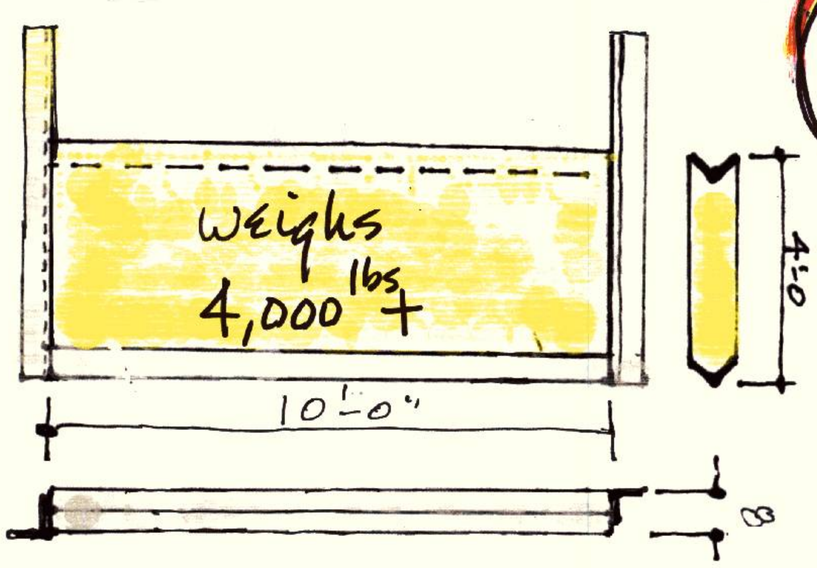
UNSURE AMOUNT VERTICAL WILL SINK.
400 lbs PER FOOT OVER 8" WIDTH IS EQUAL TO 600 lbs PER 1 FOOT.



ANGLES @ ENDS



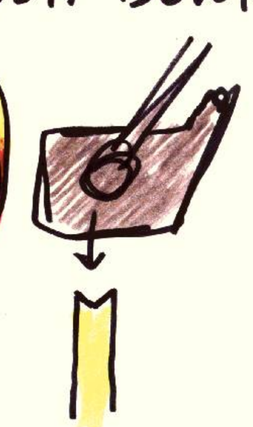
CROSS SECTION



OPTIONS

USE CRANE BUCKET TO PUSH DOWN

TO GET REQUIRED ELEVATIONS



OR ADD 2 FT SLABS

Proposed Channel

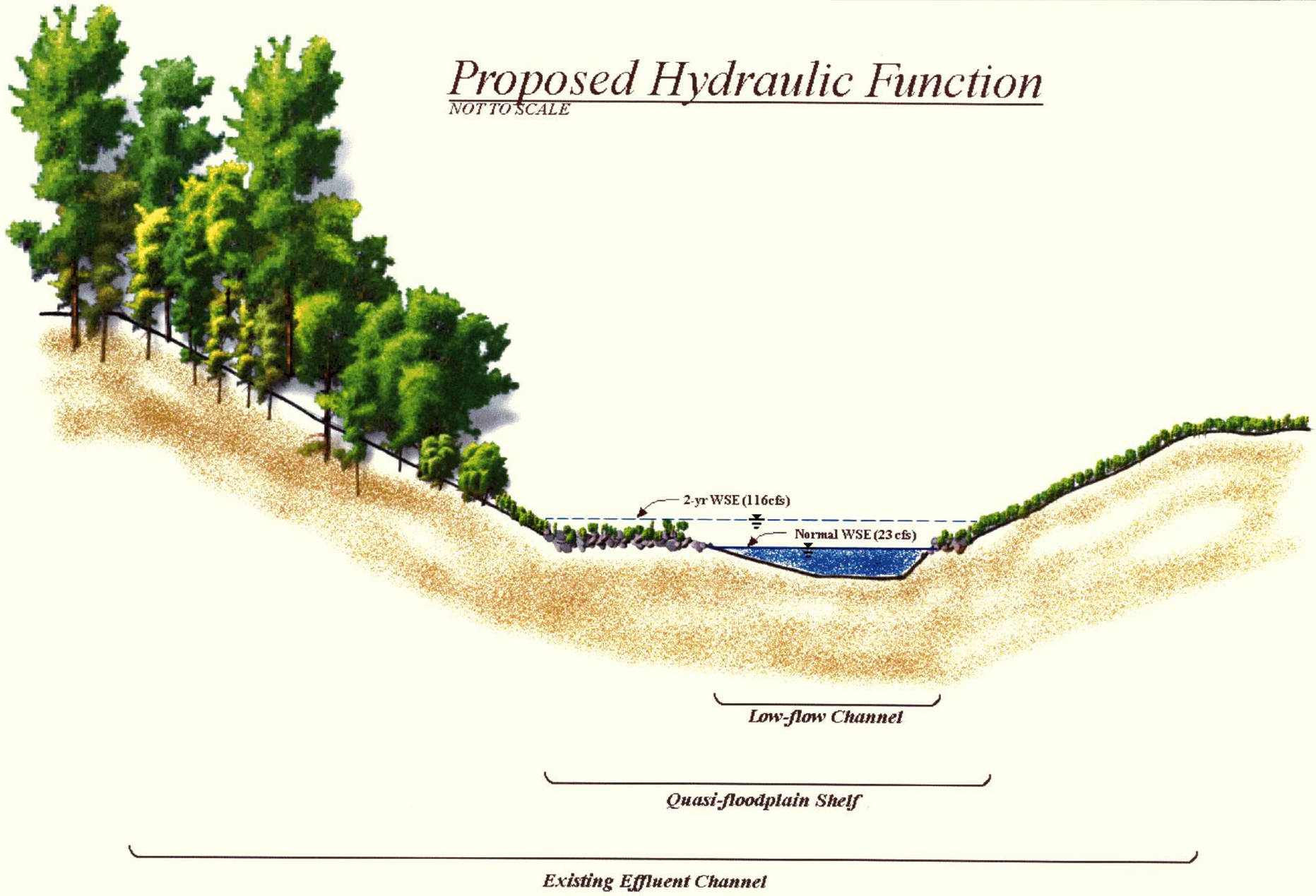
Phase 2.

PROPOSED CHANNEL VS. NATURAL RIVERINE SYSTEM

- ***"Low-flow Channel"*** **will contain treatment plant flow and normal rainfall runoff events. This channel is synonymous with a natural river under normal flow conditions**
- ***"Quasi-Floodplain Shelf"*** **will be inundated under flows generated from larger rainfall runoff events (>2-yr recurrence interval) and CSO overflows. This area will function similar to a natural floodplain that conveys flows that go overbank**
- ***"Existing Effluent Channel"*** **will contain the entire system under all flow conditions. This oversized channel will function as a river valley by containing all conveyance within the carved section.**

Proposed Hydraulic Function

NOT TO SCALE



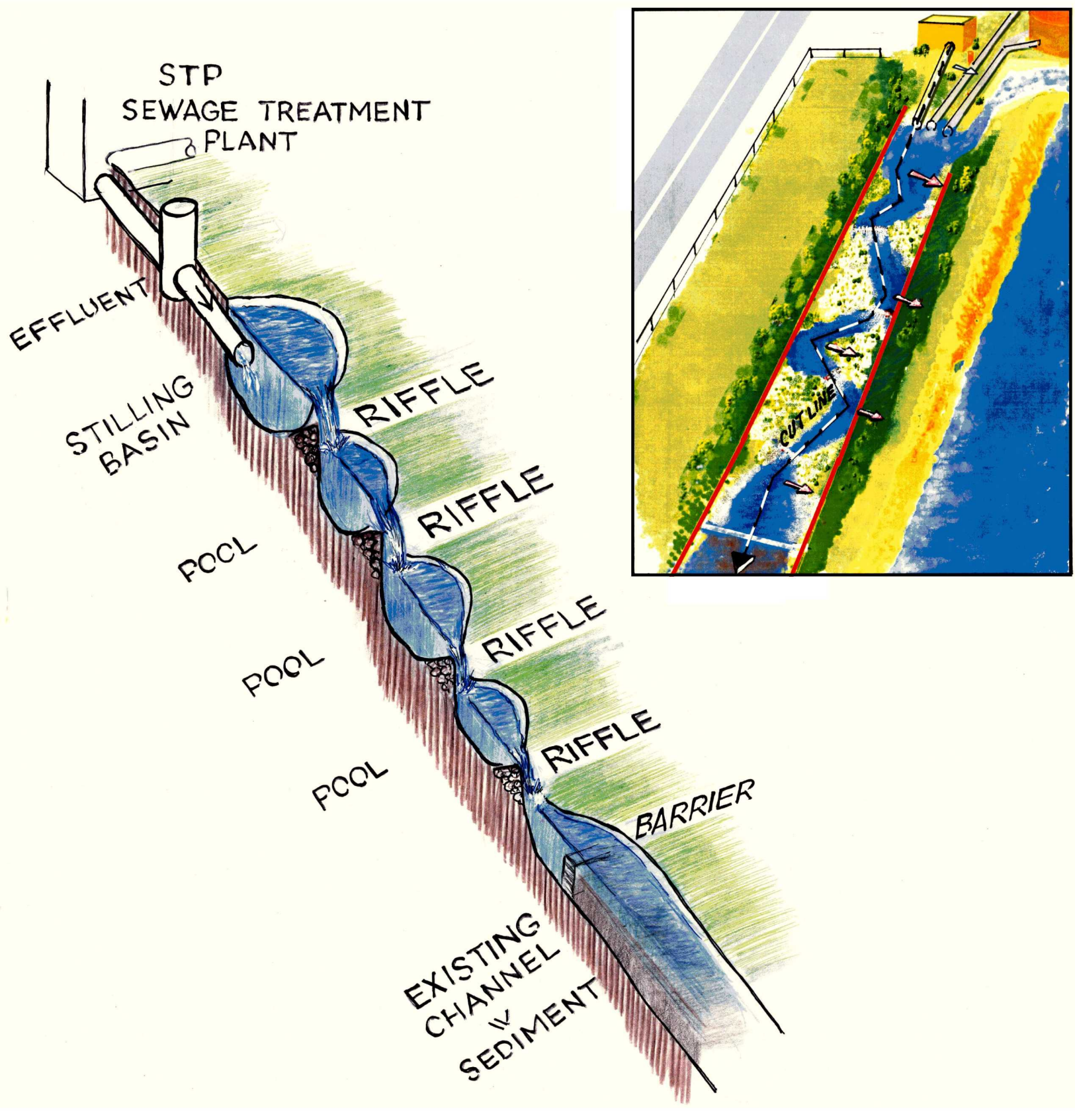
DESIGN FLOWS

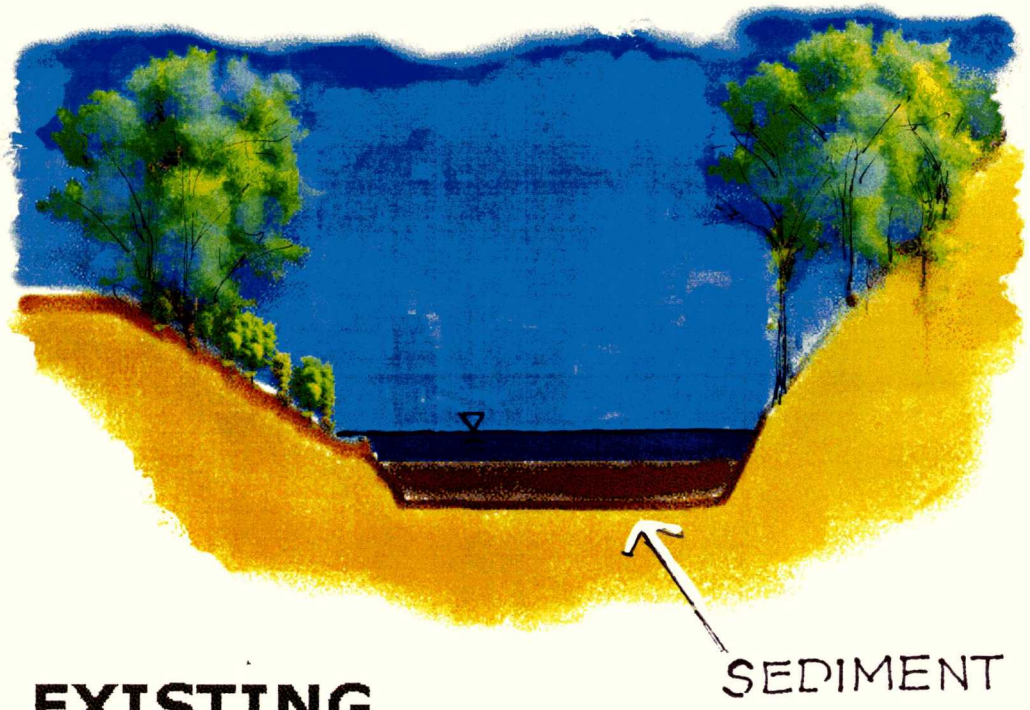
	million gallons per day (MGD)	cubic feet per second (cfs)
ECSD dry weather flow	7	11
ECSD daily average flow	15	23
ECSD peak hourly flow	27	42
ECSD instantaneous peak*	36	56
CSO peak daily flow	6.4	10
CSO peak hourly flow	12.8	20
CSO instantaneous peak*	16	25
ECSD 2-yr peak runoff*	19.4	30
Indianapolis Boulevard 2-yr peak runoff*	3.2	5
Total 2-yr Design Flow*	74.6	116

*Note: These flows were used in calculating the 2-yr design flow

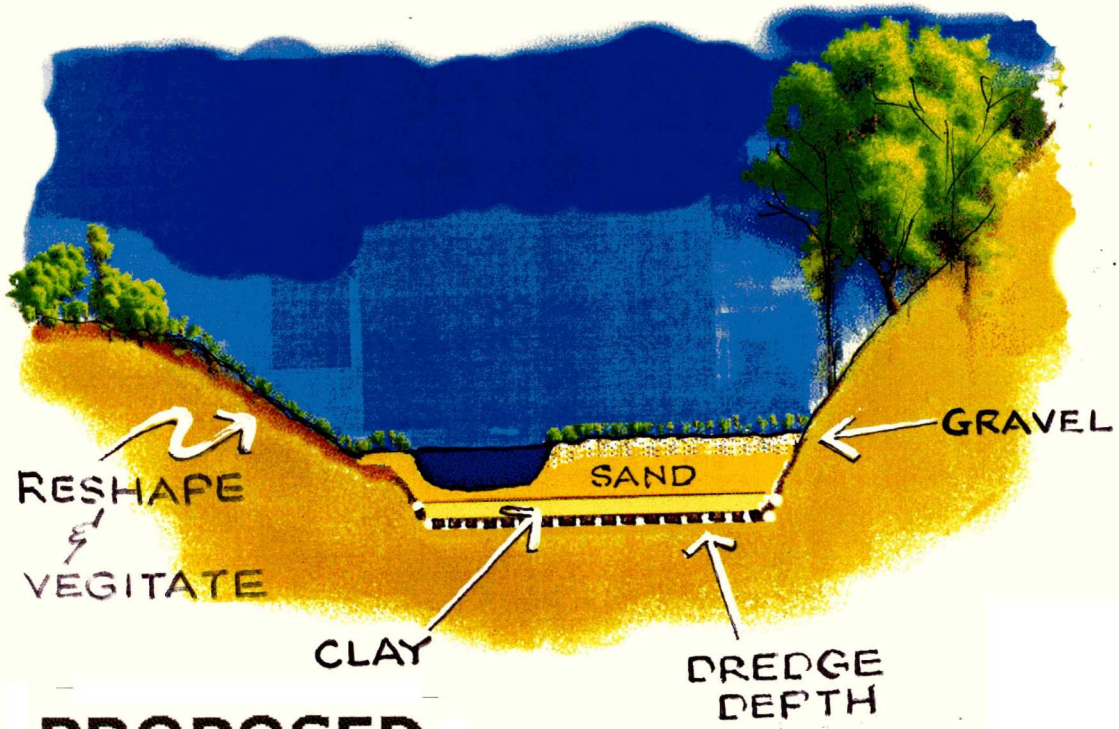
DESIGN GOALS BASED ON HABITAT OUTPUTS

Design Parameter	Riffle Section	Pool Section
Depth	Shallow	Deep
Velocities	Fast	Slow
Flow Condition	Critical	Subcritical
Substrates	Cobble	Sand/Gravel
General Habitat	Spawning / Food Production	Resting / Forage


STP
SEWAGE TREATMENT
PLANT
EFFLUENT
STILLING
BASIN
RIFFLE
RIFFLE
POOL
RIFFLE
POOL
RIFFLE
POOL
BARRIER
EXISTING
CHANNEL
SEDIMENT
CUT LINE



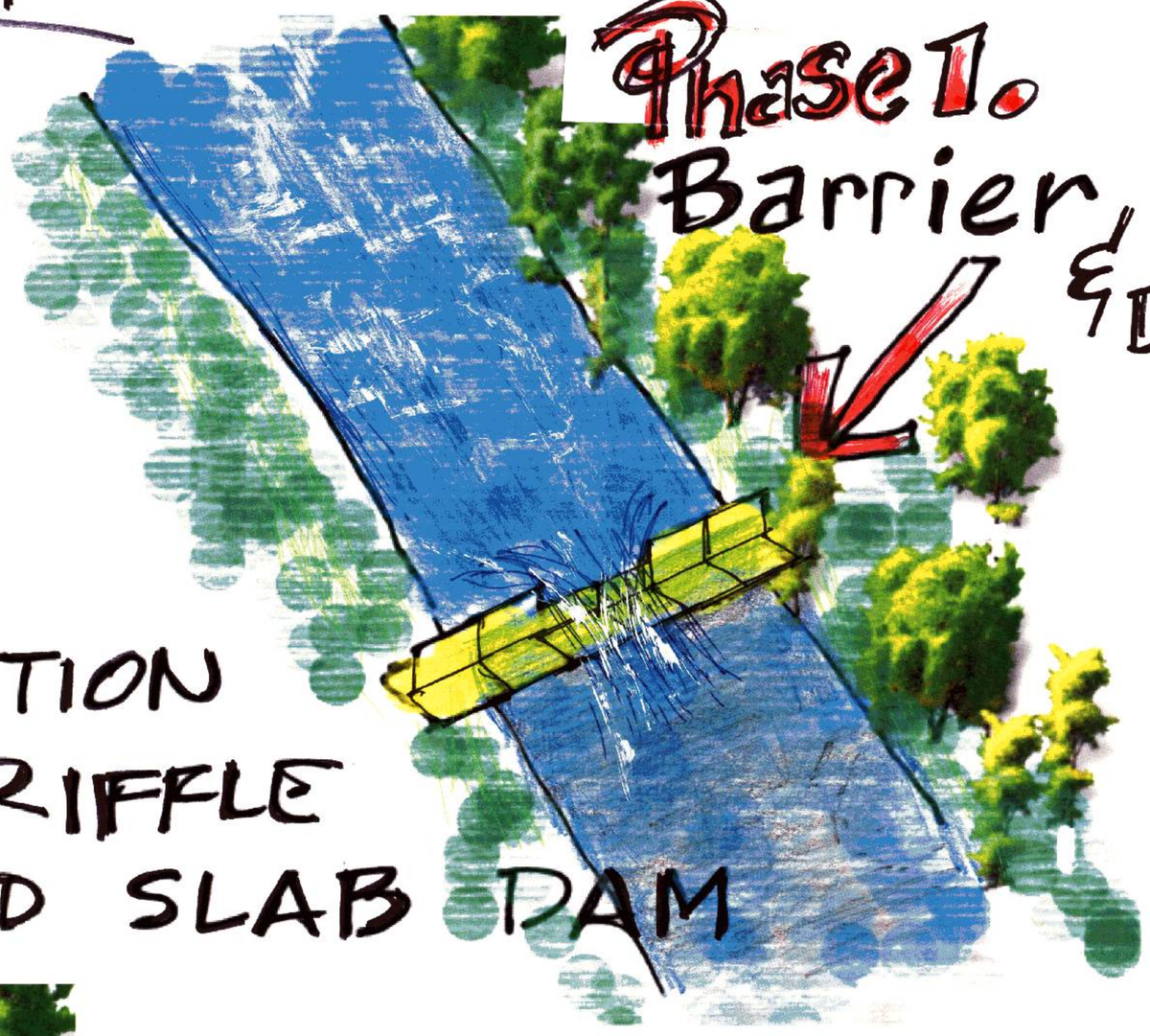
EXISTING



PROPOSED

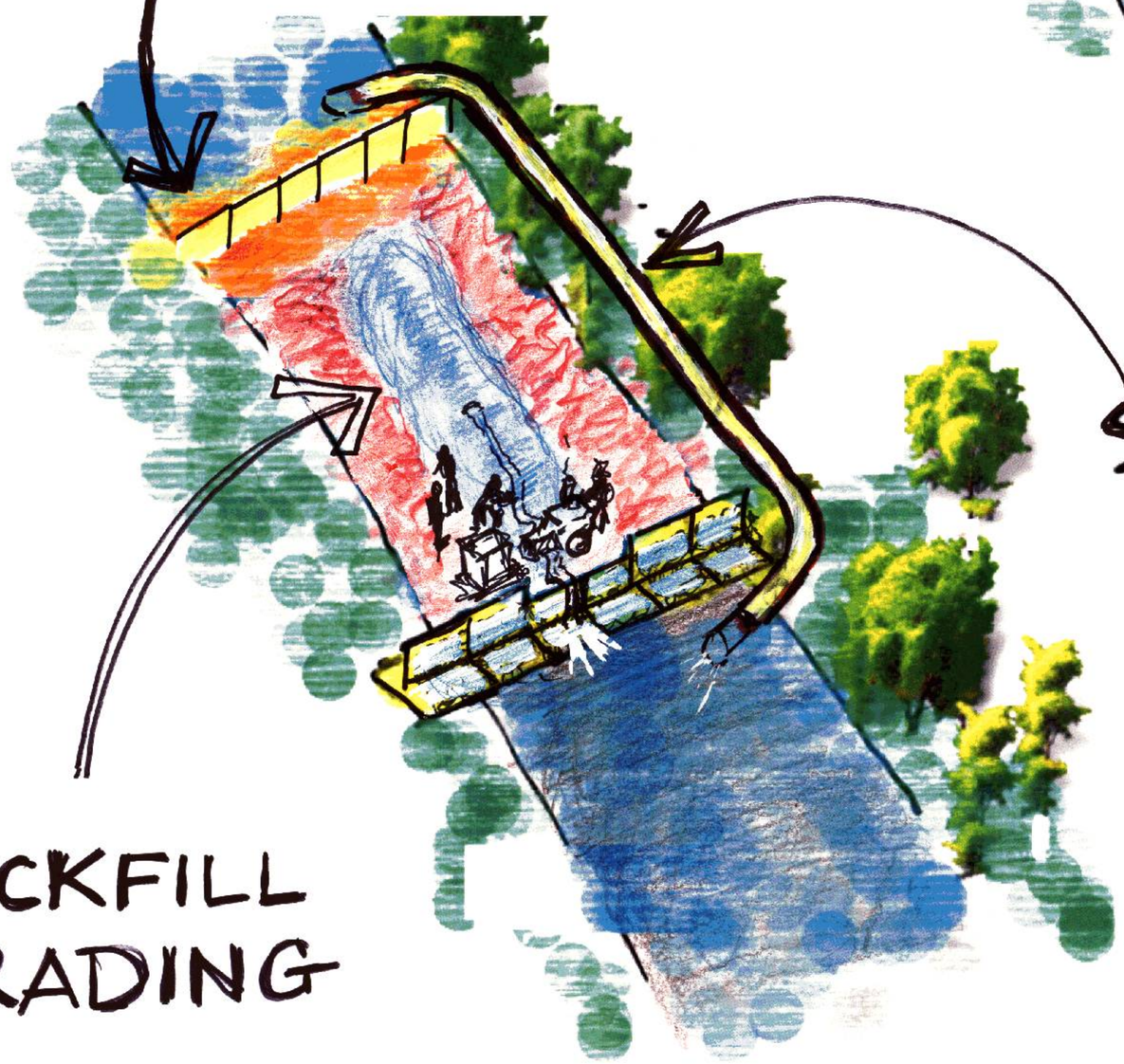
construction plan

WORK FROM DOWNSTREAM "FAR" END



Phase 1.
Barrier & Dredge

STEP 1.
LAY FOUNDATION FOR LAST RIFFLE
ADD SLAB DAM

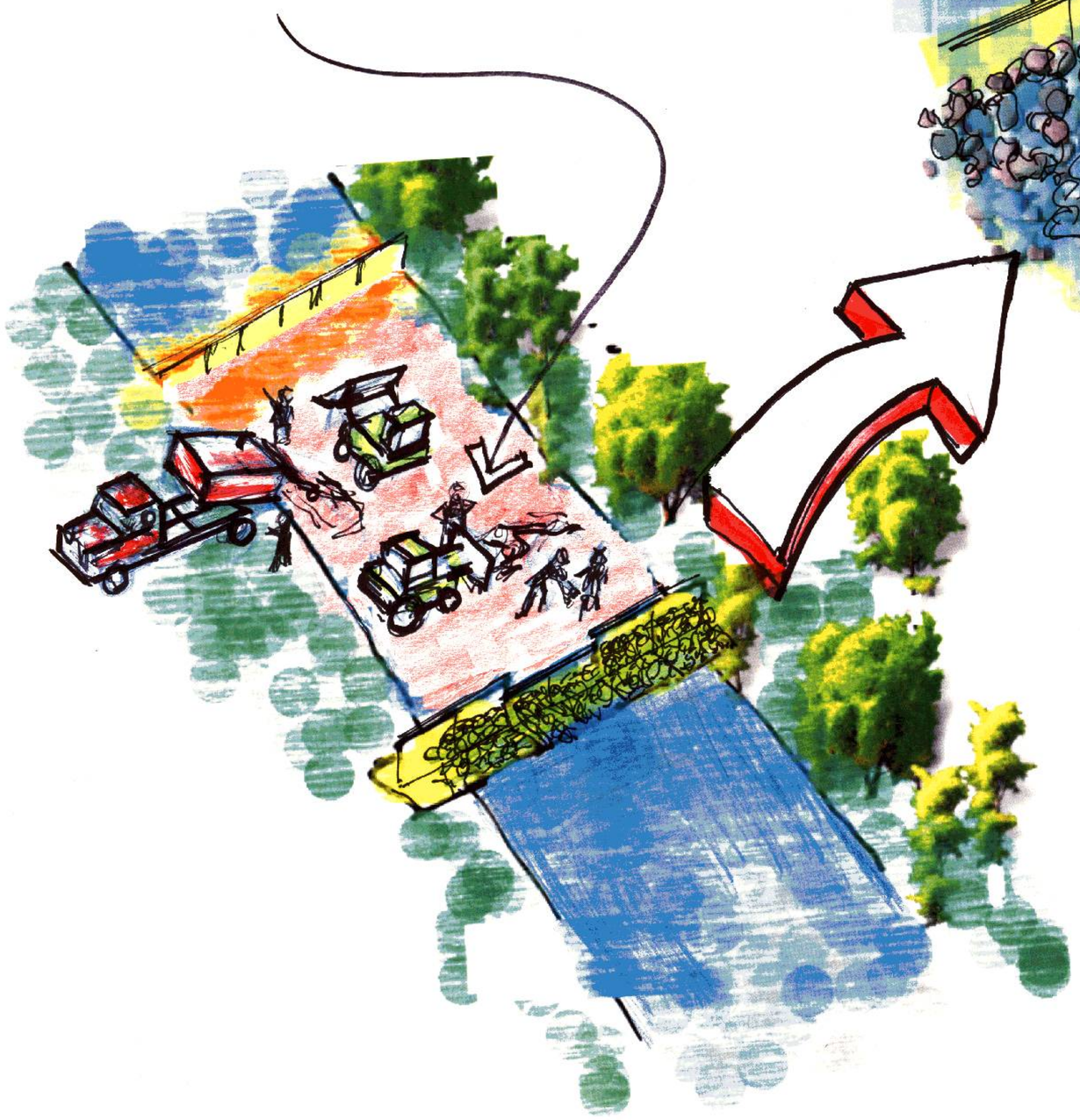


STEP 2.
INSTALL "BYPASS" PIPES
and
PUMP DRY FOR SEGMENT CONSTRUCTION

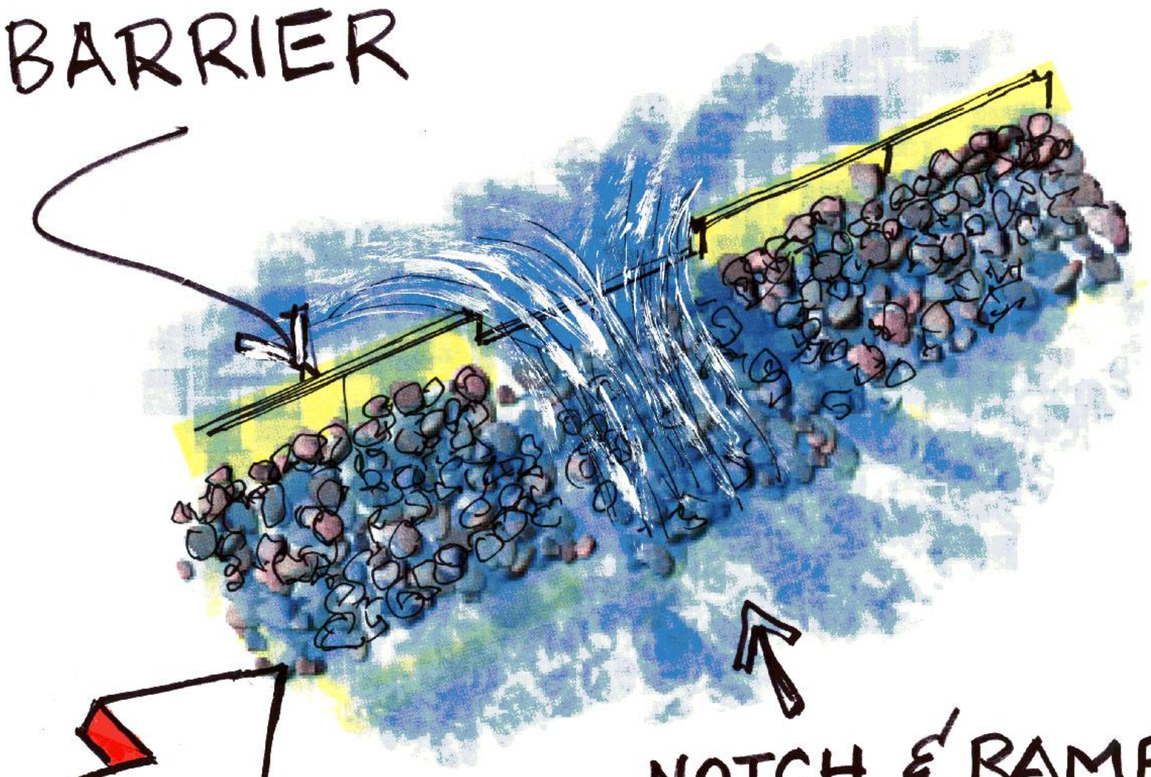
BACKFILL & GRADING

STEP 3.

SEGMENT
FILLING, GRADING
CONTOURS

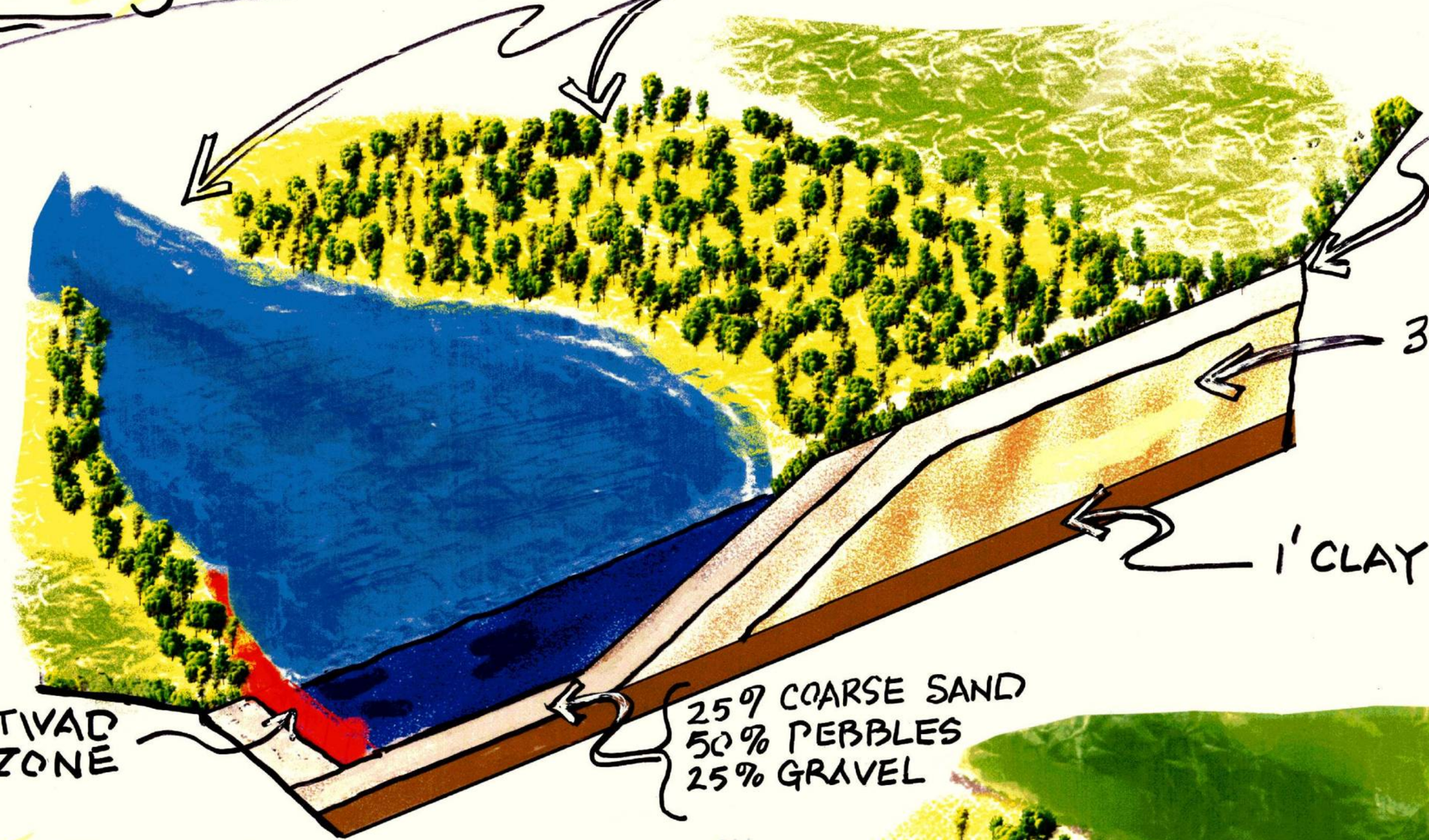


BARRIER

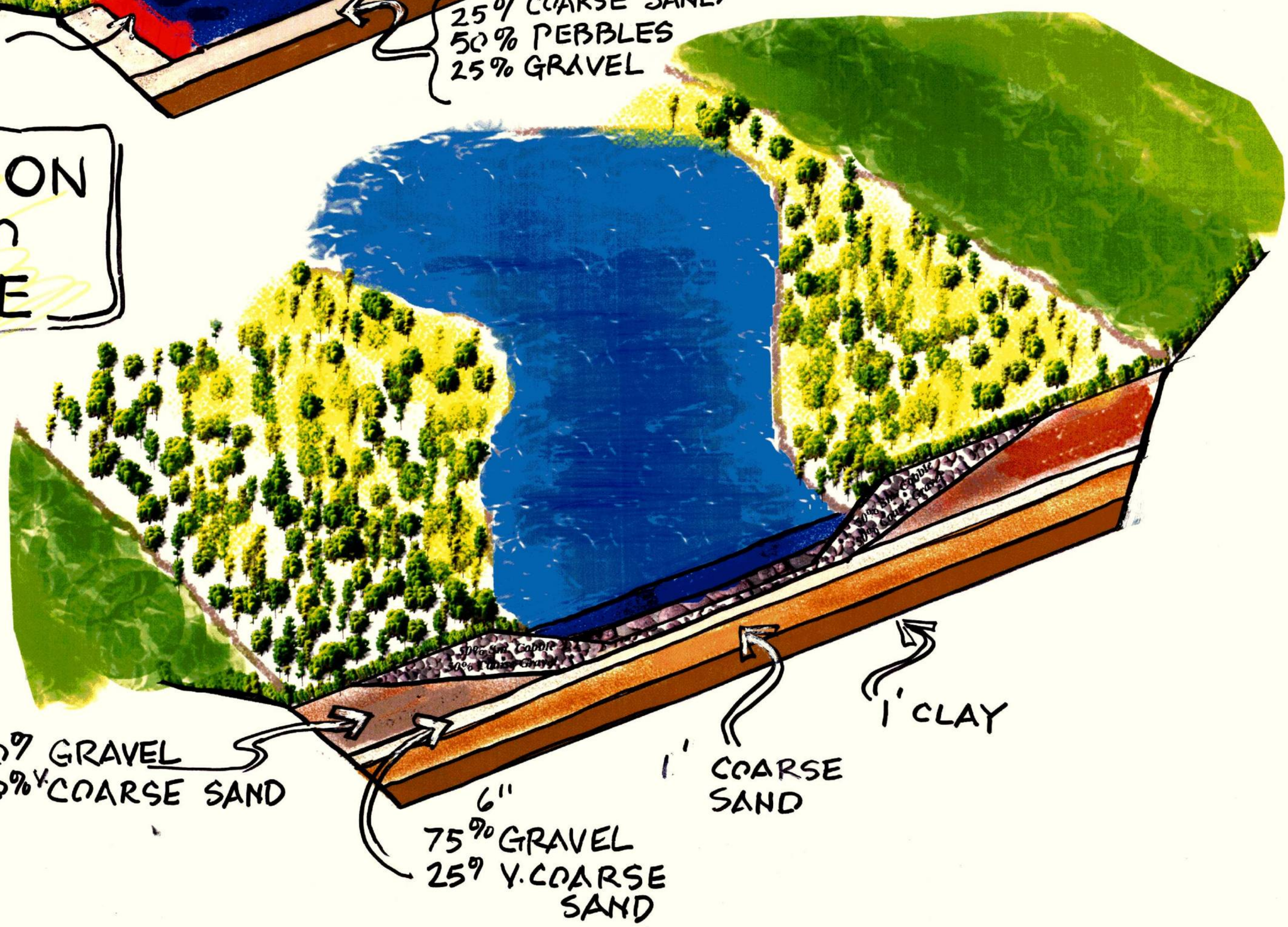


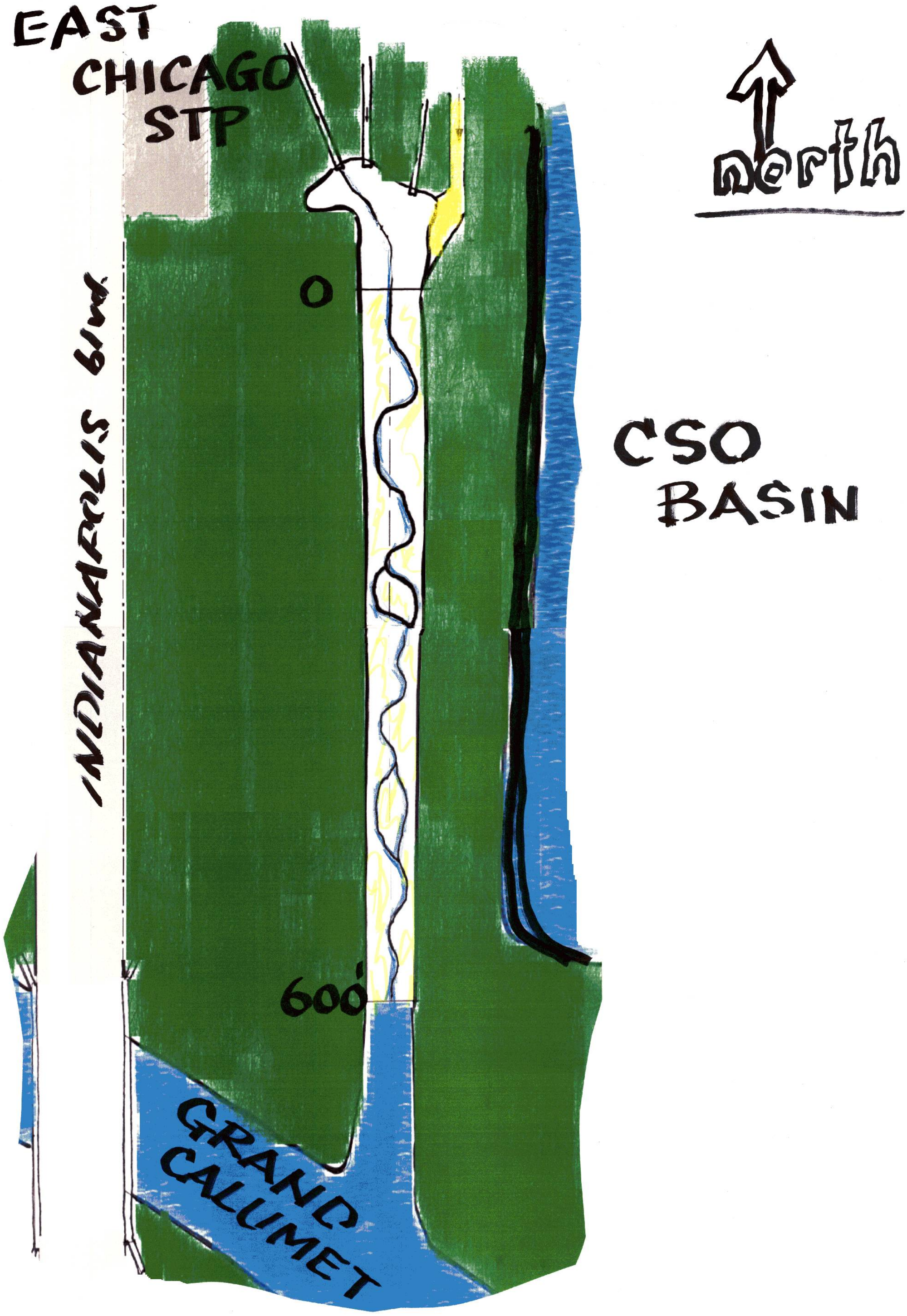
NOTCH & RAMP
FOR FISH

SECTION through POOL

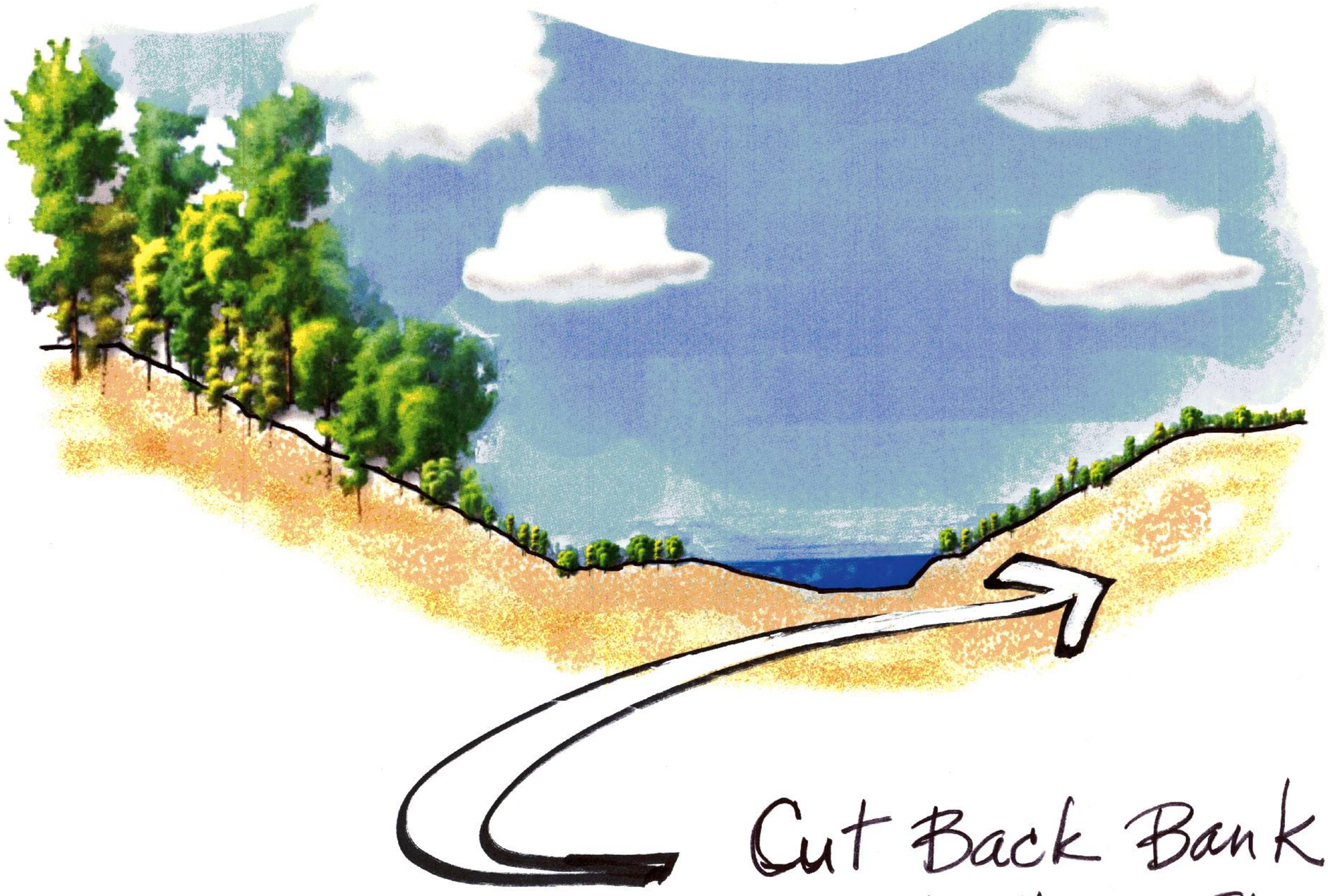


SECTION through RIFFLE




EAST
CHICAGO
STP
INDIANAPOLIS BLVD.
0
600'
GRAND
CALUMET
North
CSO
BASIN

Phase 3. REGRADE & PLANT WEST BANK



Cut Back Bank
To Shallow Slope
Revegitate with
Native Species

Phase 4. MONITORING

- TRACK AQUATIC & TERRESTRIAL HABITATS
- 3 YR. PLAN, ANNUAL SAMPLING
- DECISION FOR FUTURE AFTER FIRST 3 YEARS

Value Ranges of Metrics at East Chicago, Indiana

	FQI	IBI	MBI
	Floristic Quality Index	Index of Biotic Integrity	Macroinvertebrate Biological Index
Unique	> 50	51 – 60	< 5.0
Highly Valued	45 – 49	41 – 50	5.0 – 5.9
Moderate	35 – 44	31 – 40	6.0 – 7.5
Limited	21 – 34	21 – 30	7.6 – 8.9
Restricted	≤ 20	≤ 20	> 8.9

Current	8.1	26	t.b.d.
Expected	25 – 44	35 – 40	6 – 8

Sampling Time	June - Sept	June – Sept	Jun 15 – Sept 15