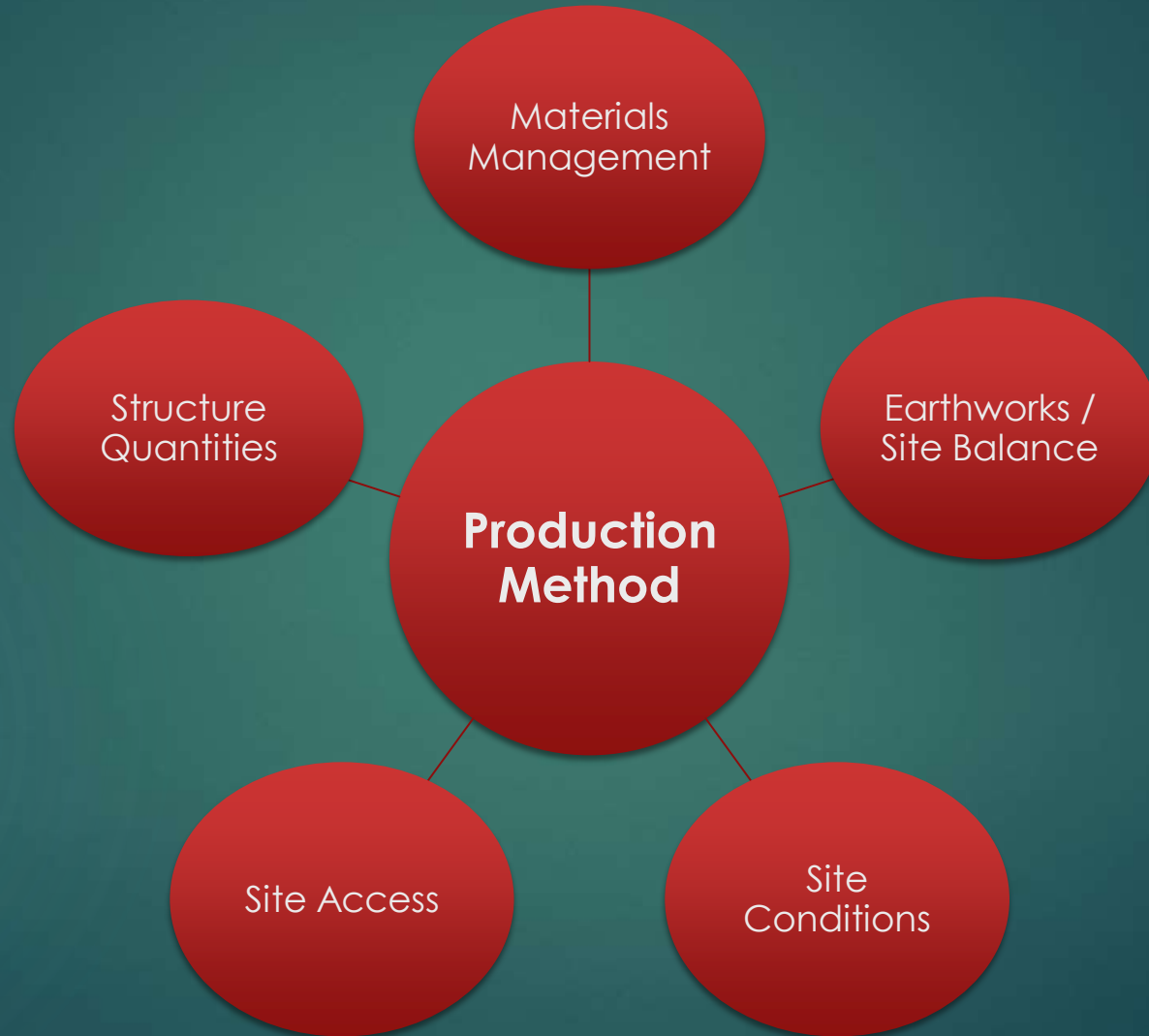


Cost Effective Stream Restoration in Urban Watershed – Contractor Recommendations for Successful Implementation

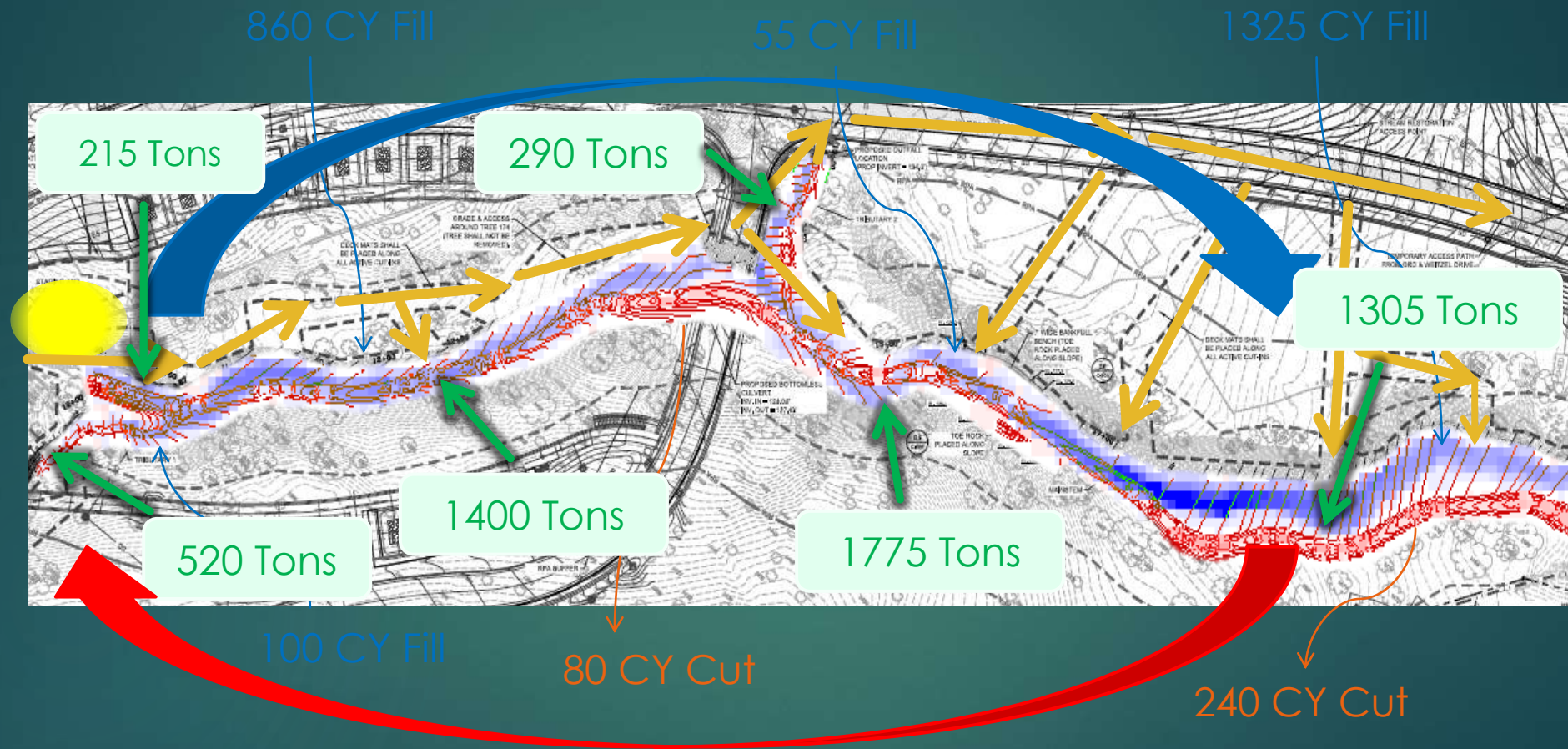


ADAM NABORS, ANABORS@EQRLLC.COM
ENVIRONMENTAL QUALITY RESOURCES, LLC

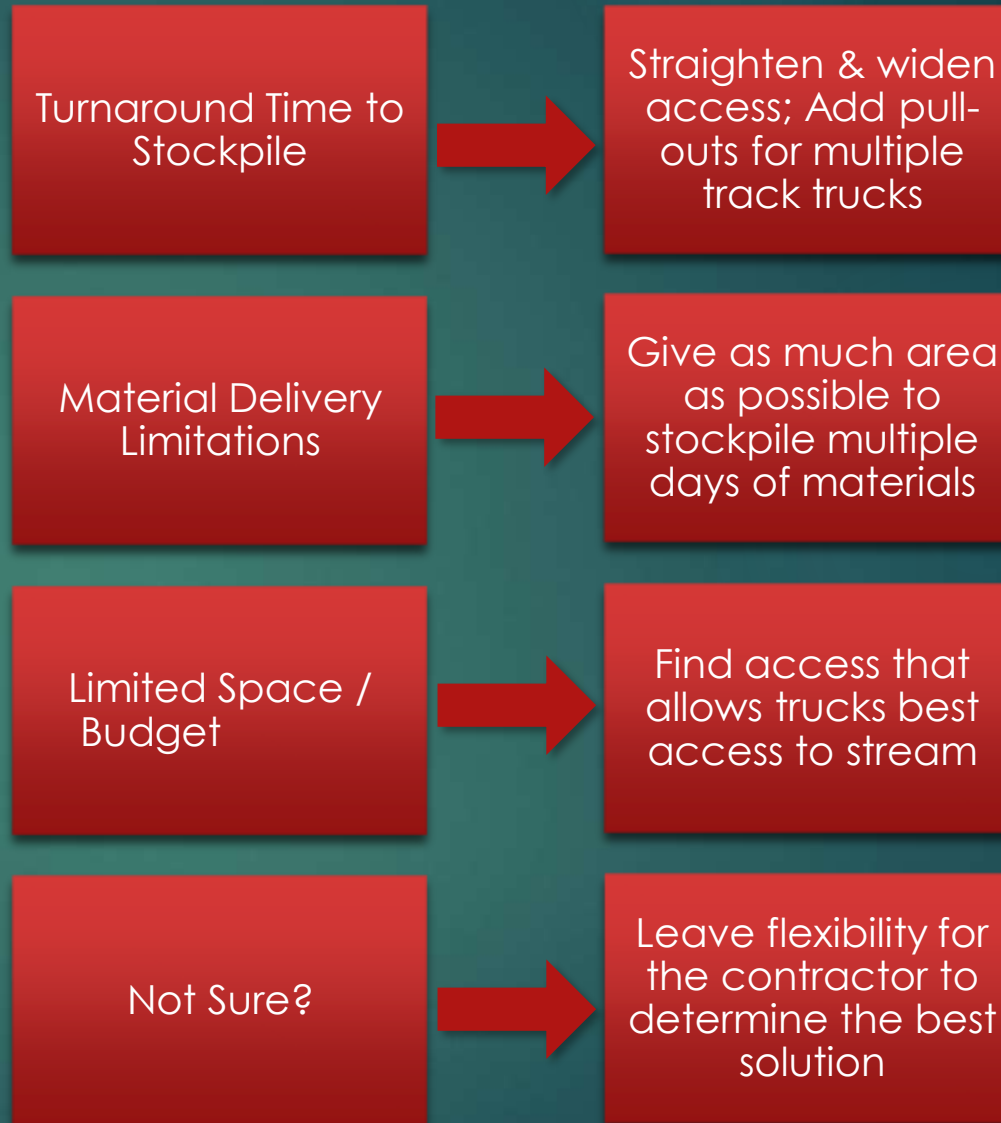
Driving our Production Method



Project Sequencing



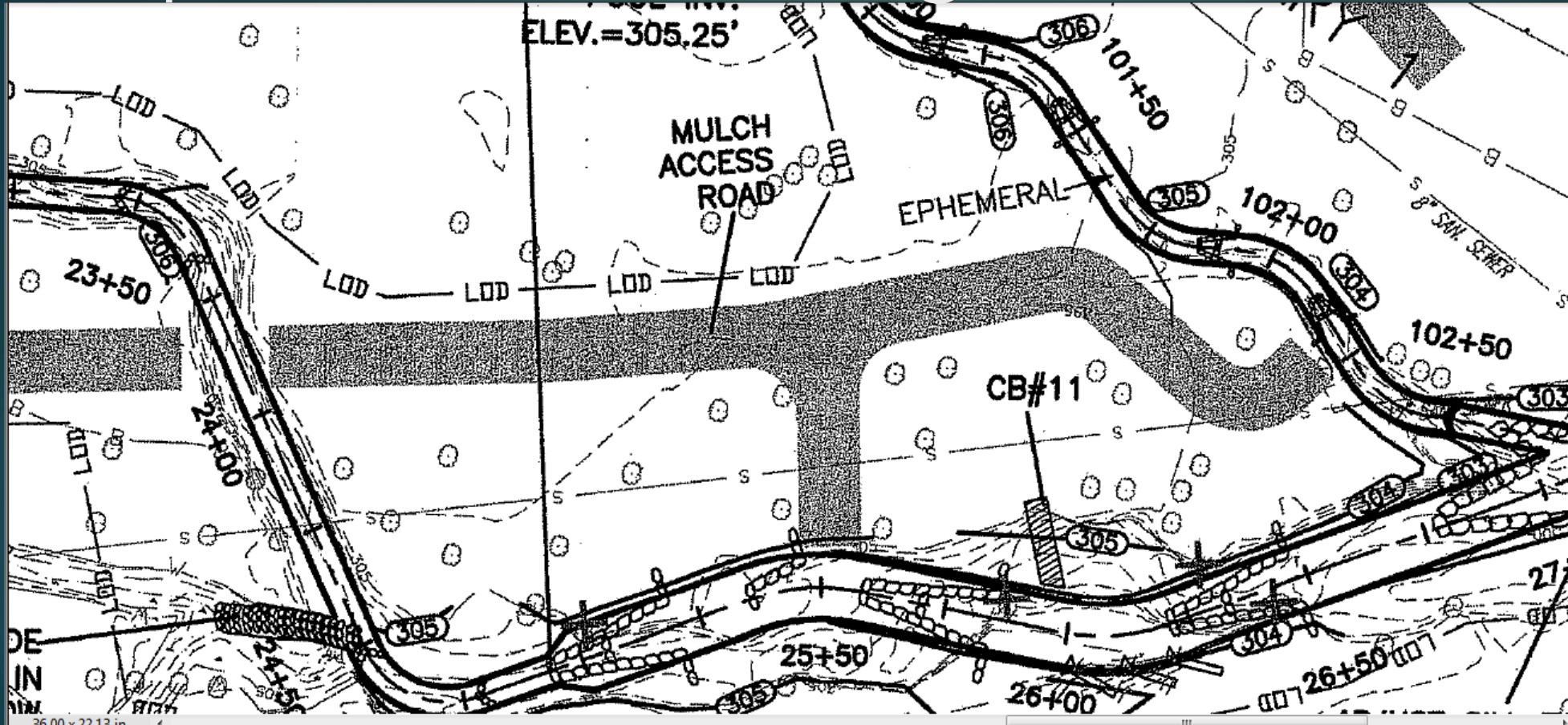
What are some limiting factors to Production?



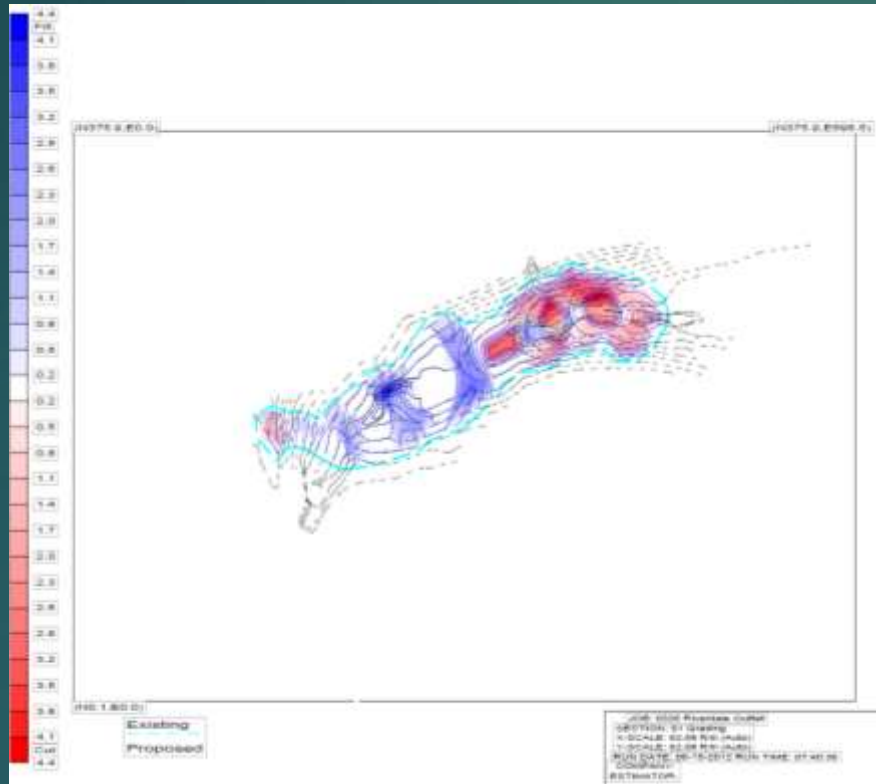
Cost Savings
achievable before
project implementation



Proposed and Existing Contours



Cut / Fill Patterns



- ▶ If site is balanced, make sure that you have adequate area to store material for Fill.
- ▶ Don't forget structure over-excavation or expansion & compaction

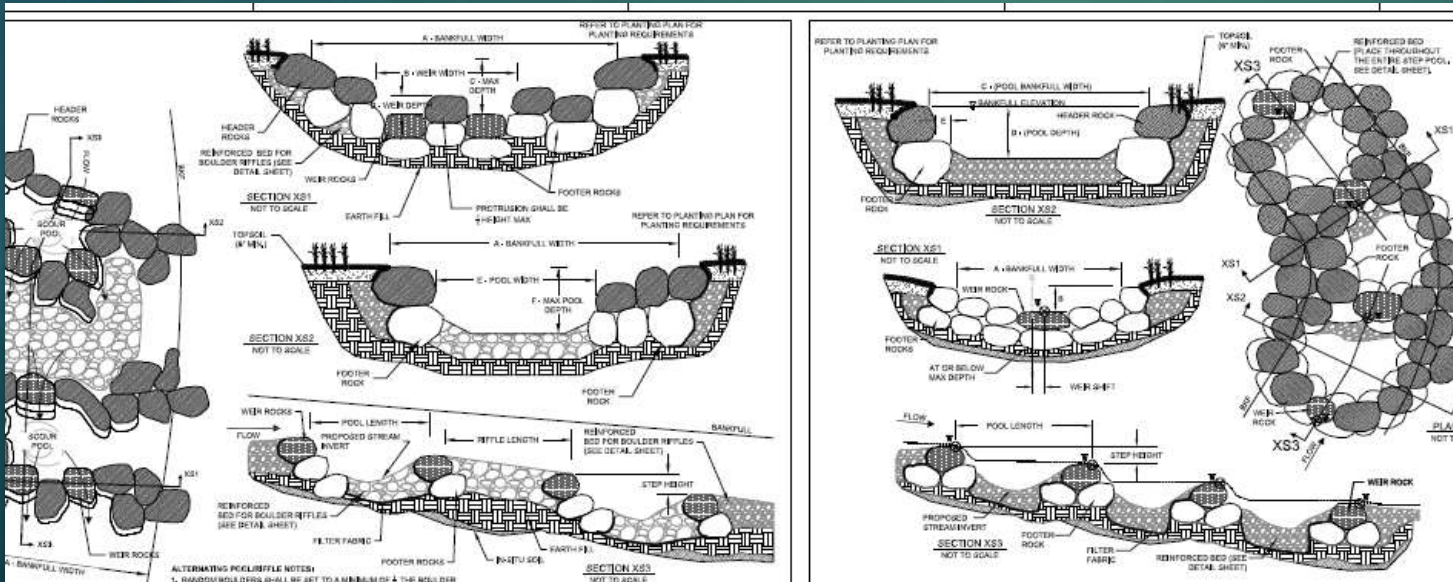


Utility Conflicts

- IDENTIFYING LOCATION AND ELEVATION OF UNDERGROUND UTILITIES REDUCES A CONTRACTOR'S RISK AND INFORMS OF POTENTIAL DESIGN CONFLICTS.
- GPR UTILITY INVESTIGATION AND TEST PITTING DURING DESIGN COST CONSIDERABLY LESS THAN CONSTRUCTION DELAYS AND CHANGE ORDERS.

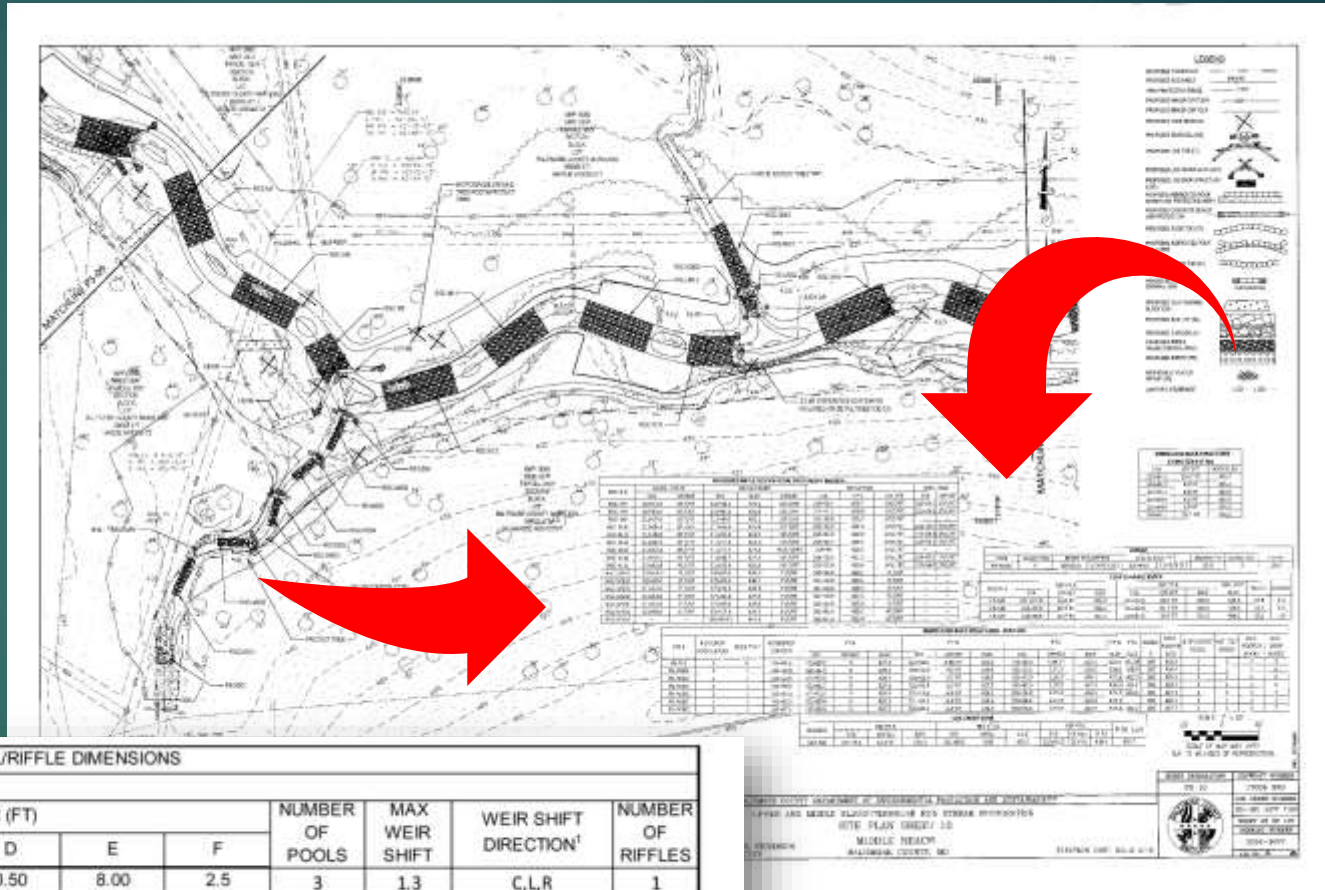


Soil Borings



Stream Structures

Structure Tables



FEATURE LOCATION		ALTERNATING POOL/RIFPLE DIMENSIONS										
REACH ID	PER BASELINE STATION		PARAMETER (FT)						NUMBER OF POOLS	MAX WEIR SHIFT	WEIR SHIFT DIRECTION ¹	NUMBER OF RIFPLES
	FROM	TO	A	B	C	D	E	F				
MAINSTEM	11+12.50	11+67.00	10.0	3.00	0.20	0.50	8.00	2.5	3	1.3	C,L,R	1
MAINSTEM	13+70.50	14+03.50	10.0	3.00	0.20	0.50	8.00	2.5	1	1.3	R	1
MAINSTEM	15+10.00	15+52.50	11.0	3.00	0.20	0.50	8.50	3.0	1	1.2	C,L,R	1
MAINSTEM	17+52.50	19+54.00	11.0	3.00	0.20	0.50	8.50	3.0	10	1.2	R,L,R,L,C,R,L,R,C,L	3
MAINSTEM	20+64.00	21+49.00	11.0	3.00	0.20	0.50	8.50	3.0	5	1.2	L,C,R,L,R	2
TRIBUTARY 1	11+49.17	12+52.00	5.5	2.50	0.10	0.50	4.50	1.3	7	0.5	R,L,R,C,L,L,R	2
TRIBUTARY 2	10+00.00	10+97.39	5.5	2.50	0.10	0.50	4.50	2.0	6	0.5	C,L,R,C,R,R	1

¹INDICATES LOCATION OF WEIR IN RELATION TO CHANNEL CENTER LINE, ORIENTED WHEN LOOKING DOWN STREAM (C=CENTER, L=LEFT, R=RIGHT)



Maintenance of Streamflow



Site Access



Material stockpile sizes and locations

Coir Matting and Staking Methods





Density
and Type
of
Fasteners?

Materials

- ▶ Available on-site?
- ▶ Availability and pricing of natural materials fluctuate widely.
- ▶ Communicate with material vendors during the design phase to confirm material availability.



Have we heard the term Supply Chain enough yet?

- ▶ Reduce your design's reliance on imported materials.
- ▶ Trucking is expensive! Source natural materials reflecting your project's geology and landscape.



Shop Local



Questions?

ADAM NABORS, ANABORS@EQRLLC.COM
ENVIRONMENTAL QUALITY RESOURCES, LLC

