

**Brookhaven National Laboratory Electron Ion Collider  
Value Engineering Study Alternatives Summary**

<b>Alt No.</b>	<b>Idea Description</b>	<b>Initial Cost Savings</b>	<b>Performance/Risk</b>
<b>Civil/Site Alternatives</b>			
CS-1	Reduce parking spaces at unoccupied buildings	\$83,000	Improved (M) Reduced (SO)
CS-2	Use non-structural BMPs in lieu of dry wells for stormwater management	\$395,000	Improved (SO, M, FF)
CS-3	Identify onsite source of borrow for fills	\$299,000	Improved (CI, SO)
<b>Architecture / Structural Alternatives</b>			
AS-1	Permanent SOE at 1010C	TBD	No Change
AS-2	Use alternate materials / methods for site retaining walls	\$777,000	Improved (CI, SO)
AS-3	Relocate buildings further from berm/tunnel to reduce retaining walls	\$1,143,000	Improved (CI, SO)
<b>Mechanical Alternatives</b>			
M-1	Replace vertical inline pumps with horizontal split case type and revise orientation/layout	\$96,000	Improved (M)
M-2	Use heat pumps in lieu of cooling-only D/X systems and reduce perimeter unit heaters	\$321,000	Improved (M)
M-3	Reduce return air terminal units and related ductwork	\$998,000	Improved (M, CI)
M-4	Reclassify set points for non-occupied buildings	TBD	Improved (PC, M)
M-5	Utilize cooling towers that allow for dry cooling when atmospheric conditions allow	(\$2,102,000)	Improved (M, PC, FF)
M-6	Phase installation of redundant (N+1) process equipment	\$6,302,000	Improved (M, CI) Reduced (PC, R, Risk)
M-7	Use standard fan type in lieu of specifying whisper-quiet on cooling towers	\$920,000	Improved (M)
<b>Miscellaneous Alternatives</b>			
Misc-1	Demolish IR-10 segment of tunnel and rebuild	TBD	Improved (Risk, M, PC, FF) Reduced (CI)

**Performance Attribute Legend:**

- Resiliency / Redundancy (R)
- Maintainability (M)
- Program Compatibility (PC)
- Site Organization (SO)
- Temporary Construction Impacts (CI)
- Future Expansion/Flexibility (FE)