









Alhere Community & Learning Connect



















































Value Engineering Study for the **New Woodland High School**

May 28, 2013









Specialists in School Buildings

May 28, 2013

Board of Directors Woodland School District 800 3rd Street Woodland, WA 98674

RE: New High School Value Engineering Study - Final Report

Dear Board Members:

Value Engineering studies have been required by the Office of Superintendent of Public Instruction's (OSPI) School Construction Assistance Program for 25 years on projects such as the upcoming New Woodland High School. Value Engineering has been defined as:

"In its purest form, value engineering (VE) refers to detailed, systematic procedures intended to seek out optimum value for both the initial and long-term investments of a construction project. The goal is to eliminate or modify features that add cost to a facility but do not add to its quality, useful life, utility, or appearance. Using a non-adversarial, problem-solving approach, value engineers look at trade-offs between design concepts, construction techniques, materials, building types and up-front versus life cycles to arrive at the best overall value."

"What Every Owner Needs to Know about Value Engineering"

-Boston Society of Architects

CSG has developed the capability to combine the knowledge gained in years of experience in managing, reviewing and commissioning K-12 school construction into value engineering studies that will deliver a better facility to the district. Our Value Engineering team leader, Jim Coleman, has lead over 70 VE studies of K-12 schools, and our co-leader, Carter Bagg, has over 15 years experience in the OSPI Value Engineering process. Both are qualified as Associate Value Specialists by the Society of American Value Engineering (SAVE) as required by state regulations. All members of the VE team are specialists experienced in various aspects of school facilities such as Constructability, Building Commissioning, Energy Usage, Technology, Maintenance and Operations. The study was conducted in a manner exceeding the state requirements of a minimum 5 person, 40 hour workshop (see attached staffing plan).

We thank you for the opportunity to conduct this study and participate in providing the highest value learning environment for new Woodland High School students.

Carter Davis Bagg, AIA, AICP, AVS, LEED AP

ESD 112 CSG Value Engineering Team Co-Leader



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New High School Value Engineering Report

EXECUTIVE SUMMARY:

Findings:

The Value Engineering study was conducted the week of January 7 -12, 2013 at ESD 112 in Vancouver, with the team visiting the site on the afternoon of January 7, 2013.

The attached VE Implementation Plan contains 60 proposals with nearly \$5.6 Million in potential cost reduction, but also \$26,000 in recommended additional costs to add value to the project. Therefore net amount of the savings of all recommendations is slightly less than \$5.6 Million.

The design team/district recommends approving 25 of these suggestions, saving about \$3.3 Million. The remaining items were not recommended for approval by the design and/or district staff due to other cost considerations such as maintenance, impact to the site or instructional programs, and other factors.

The attached VE Implementation Plan is required to be submitted to the Office of Superintendent of Public Instruction (OSPI) demonstrating the school board's acceptance or rejection of the suggestions of the Value Engineering Study. The Implementation Plan contains a column of the design team/ district recommendations. Should the board agree with all these recommendations, then this document will suffice as presented, and the board action would be to "approve as recommended". Where the board rejects a suggestion, the reason for the rejection needs to be stated for the record. If the board elects to not to agree with a recommendation, the Implementation Plan should be changed to reflect the change and the board's record should reflect this for submittal to OSPI.





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New High School Value Engineering Report

Major Issues: Many of the recommendations address the following major issues:

Site Development: The difficult soil and drainage conditions at the site limited the VE team's feasible recommendations to surface improvements, but still accepted recommendations achieved \$1.35 Million in savings. (Items C-1, C-2, C-4, C-7, C-8, C-9, C-10, C-11, and L-2).

Auditorium Seating: The VE team recommended using stackable chairs instead of telescoping seating in commons (Items 3A & B): A telescoping assembly seating costs twelve times the cost of a stackable chair, though it does offer better sightlines of the stage. Item 3B attempted to ameliorate the sightlines by lowering the floor in tiers. However, the district and the design team find the telescoping seating as the best combination of performance seating and flexibility for other uses of the space.

Classroom Technology: The VE noted that various design documents called for ceiling mounted projectors while others indicated "Smart Boards" on the front wall of the classrooms. The VE questioned whether this was redundant (Item A-6). After further study the district and the design team arrived at a compromise of installing short throw projectors at the smart boards.

Mechanical Systems: The VE team made recommendations in two areas of the mechanical system's Schematic design: the preliminary design of the system and the proposed alternative Ground Source Heat Pump (GSHP) system. The resulting accepted recommendations reduced the estimated cost of the project by over \$1.9 million.

In regard to the preliminary design of the mechanical system, the VE team felt the initial design was oversized and overpriced. The design team accepted several of these recommendations (M-2, M-3), some of which may have evolved as the design progressed.

After meeting with the Geo-technical engineer, the VE recommended the ground source piping for the GSHP system be run horizontally instead of vertically drilled into the earth (Item M-8). This would significantly reduce the cost of the GSHP system.





Item #	Doc	Description	Advantages	Comment	Design Team/District Recommendation	
C-1			Reduced capital and operating cost for the project	It was understood that these rain garden islands have already been eliminated from the projects. Eliminates 1,600 LF of curb, 9600 SF of paving and 800 SF of mulch/rain garden.	ACCEPT:	(306,000)
C-2		Eliminate parking lot wheel stops.	Not required	Most of the wheel stops could be eliminated with head to head parking. Eliminates an estimated 300 wheel stops.	ACCEPT:	(23,000)
C-3			Not required per 2012 Storm water Management Manual for Western Washington	It is our opinion that the liner is not desirable for wet ponds as it may be damaged by high groundwater and eliminates any potential infiltration that could occur. With high groundwater wet ponds will maintain the required wet depth.	REJECT; The geotechnical report indicates that there is a high groundwater table at the site, the bottom of the proposed ponds is below the groundwater table. Based on the report it is our opinion that it is more likely that groundwater will enter the unlined pond than stormwater runoff will infiltrate into the existing soils. If groundwater enters the ponds the stormwater detention volume will be reduced, thus diminishing the capacity of the facilities. For infiltration, there is a "minimum distance" requirement between the water quality facility and the groundwater. This is to prevent groundwater contamination. The bottoms of the ponds are below the groundwater therefore infiltration is not a feasible option.	(76,000)
C-4		Reduce Sidewalk along west side of entrance road to 5 feet wide.	Reduced cost.	Reduce approximately 1000 SF of concrete sidewalk.	ACCEPT:	(216,000)
C-5		Eliminate 2.5 foot wide strip along south parking lot perimeter.	Reduced capital cost.	Shows only on Landscape Plan.	REJECT: The area in question is not a concrete strip. It is a planting area that provides planting for parking lot screening. The screening will be required by the City of Woodland.	(7,000)



Item #	Doc	Description	Advantages	Comment	Design Team/District Recommendation	
C-6		Reconfigure the parking and parent drop drives to eliminate the potential conflicts at intersection.	Reduced congestion and increased safety.	Provides more room for stadium/track. See sketch. Reduces approximately 4,800 SF of asphalt paving, adds 4,800 SF of lawn.	REJECT; The VE team is proposing the elimination of a drive lane at the north end of the west student parking area. Eliminating that lane will force more vehicles through the parent drop off zone creating much more congestion in that area. It is unclear how the exit lane would be moved further from the track without reducing parking. We do not agree with the VE team that this proposal reduces congestion or increases safety. In fact we believe it creates a less safe and more congested condition.	(15,000)
C-7		Eliminate mow strip under fences	Reduce costs.	We understand the District has agreed to eliminate this item. Use soil treatment under fence line.	ACCEPT:	(30,000)
C-8		Reduce the scope of landscape and irrigation, perhaps to minimum code requirements	Reduce capital cost	The current estimate is \$1.6 million in plantings and irrigation.	ACCEPT:	(608,000)
C-9		Eliminate sidewalk along north side of the north parking lot.	Not needed for access.	Reduces concrete sidewalk by approximately 4,300 SF	ACCEPT:	(26,000)
C-10		Install sewer line after surcharge soil is placed on site	Grade control on sewer line.	Consider extending the Phase 1 surcharge over the sewer line route.	ACCEPT:	0
C-11		Reduce sidewalk and concrete hardscape around school.	Reduced capital cost.	The concrete sidewalk on the east side including the kidney shaped patio could be reduced in size or eliminated completely. It is estimated that 15,000 SF of concrete hardscape could be reduced without impact to ingress/egress to the building.	ACCEPT:	120,000



Item #	Doc	Description	Advantages	Comment	Design Team/District Recommendation	
C-12		Explore options to surcharge soils such as deep dynamic compaction, Deep soil mixing or others, including asking ACOE to expedite permit process to April, 2013 Delete herring bone drainage system for football	Potentially reduced schedule or reduced cost or both. Reduce costs.	Could eliminate need to import soil in 2 phases Per Geo-tech report, sand fill under field will provide	REJECT: The VE team suggests a savings for exploring a different approach to surcharging the soils however they provided no specifics as to which different approach would provide the proposed savings. Their brief narrative mentions "deep dynamic compaction". In this approach a very heavy weight is repeatedly dropped on the site to compress the soil by impact. The impact does compact the soil but in doing so it also shakes the ground for a relatively large surrounding area. The weight itself is large but would still only cover a relatively small footprint when compared to the entire site. It would have to be moved several times and it takes several impacts for each area on which it is employed. It is conceivable that this approach could be done faster than the surcharge but it is much more labor intensive so we do not believe it would be less expensive. No suitable alternatives could be found	(120,000)
C-13	C1.09 A6.11	field and footing drains @ building	Reduce costs.	adequate drainage.	maintaining a grass sports field in our environment, particular with the amount of use the new field is anticipated to get and the time of year when high school sports are played.	(326,000)
C-14		Need to add guard rails/railings at S/W entering campus per L1.12 & L.1.13	Adds cost to civil estimate		ACCEPT:	16,000
C-15	C1.06	Reconfigure the staff parking West of building to allow service access.	Avoids safety & scheduling conflicts with buses		REJECT;	0
C-16	A6.11	Delete footing drains @ building	Reduced cost.	Per Geo-tech report, sand fill will provide adequate drainage.	ACCEPT:	(163,000)
L-1	L1.03	Eliminate portable bleachers for practice fields	Reduce cost	What is need/value of bleachers @ practice fields?	REJECT: The practice fields are anticipated to serve as JV game fields and spectators are anticipated. The fields are also anticipated to serve community baseball and softball leagues, which will also have spectators.	(23,000)
L-2	L1.05	Use arch pipe for bridge over channel ILO precast concrete	Reduced cost - see civil cost estimate for savings		ACCEPT:	(24,000)



Item #	Doc	Description	Advantages	Comment	Design Team/District Recommendation	
L-3	L1.04 L1.07	Delete access road to detention pond	Reduce cost	Is all weather vehicular access needed to detention area?	REJECT: Maintenance access for service vehicles is a requirement of the City.	(15,000)
A-1	A2.01	Reconfigure service area per attached sketch	Simplifies delivery routes for kitchen & custodial supplies. Avoids conflict of service yard gate, door and chillers	Per Narrative statement "Deliveries will be brought directly into the kitchen from the adjacent receiving dock A cart/can wash with hot/cold hose bibb will be located outside at the service area."	REJECT: With the proposed reconfiguration the hallway that serves the kitchen will move to the east and exit into the service yard. That hallway also serves as a required exit for the gymnasium and as such cannot exit into a controlled area. Having the hallway end inside the service yard will also require any deliveries to the building to come through the service yard. Such an arrangement would require the kitchen staff to open the service yard to accept deliveries. It would also require the kitchen staff to enter the building through the service yard which presents a safety concern when the staff arrives long before school opens. In the current design the service yard has been reconfigured to allow access to that hallway from outside the fence.	0
A-2			No storage provide for storing dining furniture during performances		REJECT: Although we agree that having storage area for tables and chairs would be desirable, this idea was evaluated by the District during Schematic Design and discarded.	(24,000)



Item #	Doc	Description	Advantages	Comment	Design Team/District Recommendation	
A-3A	A2 (11		Use portable seating on main floor for assembly seating		REJECT: The theater seating has been a project goal since prior to the bond. The idea of eliminating it was discussed as part of budget reconciliation during Schematic Design but it was discarded by the District. Any portable seating would also be in addition to lunch room seating so additional storage would be necessary. That added area would offset a portion of the proposed savings. This telescoping seating is an element that lends itself to being an alternate bid. If the District is comfortable with the potential to not have the seating we would recommend it be considered as a potential alternate. Design Team Recommendation: We recommend considering this proposal as an alternate bid item this idea was evaluated by the District during Schematic Design and discarded.	(291,000)
A-3B	A2.01	Depress commons floor in tiers ILO telescoping seating & drop Drama/Choir to main floor level per attached sketch	Allows better sight lines sight lines, dining tables and or seating on each tier.		REJECT: One of the primary goals of this project is to create flexible space. The Commons is a prime example of that intent in that it will serve a variety of uses. Creating a tiered floor system however would significantly impair its ability to function in modes other than performance. It would also create vertical breaks in the floor that, although not large, would present a tripping/falling hazard. We believe that the cost to create the tiered floor would be much higher than the VE team is suggesting so the savings would be significantly less than proposed.	(277,000)



Item #	Doc	Description	Advantages	Comment	Design Team/District Recommendation	
A-4	A2.01	Eliminate IDF room 1210	End of South wing can be served from MDF 1114		REJECT: The exact location and number of IDF rooms will be confirmed with District IT staff during Design Development. We would presume that the number of racks and switches required to serve the building would be dependent on the amount of equipment that is being served, not which room it is being served from so we do not believe the proposed savings would be realized. Also IDF 1210 would serve future expansion	(4,000)
A-5	A2.03	Use single ply roofing on Science #2208 & Business Marketing #2408 roofs	These roofs will not be seen	Retain metal roofing if all other single ply eliminated from project	PARTIALLY ACCEPT: Building has been redesigned so these areas no longer project out from main building, therefore will have same roof as main building & savings will be achieved.	(6,000)
A-6	A3.02 1/A8.00	If smart boards are to be installed, eliminate ceiling mounted projectors and pull down screens in classrooms.	Use smart boards to project video from teacher's computer & use voice enhancement speakers for audio.	1/A8.00 shows smart boards for teaching wall, 10/A8.01 does not show smart board, narrative says "future interactive boards" This recommendation looks at net cost of smart boards versus ceiling mounted projectors & screens. Note that the VE recommendation would have to be custom designed versus off-the-shelf as designed	PARTIALLY ACCEPT: District has decided to proceed with smart boards with "short throw" wall mounted projectors. Short throw projectors cost about the same as ceiling mounted ones, but the savings is achieved by eliminating power and data wiring to middle of ceiling, about 1/2 of cost	(92,000)
A-7	1/2/3/4 A8.01	Reduce ceramic tile height to 7'-0"	Per Narrative	In estimate, but full height C.T. shown on interior elevations	ACCEPT:	0
A-8	A3.01	Delete ACT ceiling in Storage #1409C & Tool Room # 1409D	Reduces costs, avoids damage due to use of spaces		ACCEPT;	(1,000)
A-9	A4.00	Reduce higher roof pitches from 4/12 to 3/12 or 3.5/12 if required for shingle roofing	Reduces costs of gable end walls, may allow better integration of increasing height of roof connecting classroom wings for mechanical attic.		REJECT: The currently proposed roof slopes are as low as can be achieved and still comply with the roofing manufacturer's warranty requirements. The roofs could be lowered as proposed but to secure the warranty we would be required to add two layers of ice and water shield to the entire roof surface at a cost of \$2 per square foot. The added cost would exceed the proposed savings	(27,000)
A-10	5/A5.01	Delete sunscreens from West elevation	Reduce cost	Effectiveness/value in screening sun from West doubtful.	REJECT: Solar studies showed sunscreens effective on West side	(13,000)
A-11	A4.00	Add small roof cover @ service area to protect loading & unloading	Adds cost but protects people & items being unloaded		ACCEPT;	8,000
A-12	A9.01 A9.02	Use sealed concrete floors in rooms 1209A,1303, 1602E, 2208A,2210A, 230A, 240A	Better durability, lower maintenance		ACCEPT:	(11,000)

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Item #	Doc	Description	Advantages	Comment	Design Team/District Recommendation	
A-13	Δ') ()1	Reconfigure Central Public Spaces per attached sketch	Reduces cost & area (100S.F.). Consolidates entries into one for better identity & larger area. Allows Commons to be used as break out area for events in the Gym. Provides direct service access to kitchen. I mechanical attict for both main & auxiliary gyms. Provides access to locker rooms from Auxiliary Gym, Wrestling & Weight rooms with out having to go through Main Gym.		PARTIALLY ACCEPT: has been redesigned significantly, but does not reduce area by combing gym entry with commons/main entry, so no savings are achieved	(27,000)
S-1	S2.01	Locker Room Area- Use CMU walls as load bearing shear walls and eliminate the steel column line	Eliminates the braced frame shown along grid 10.5 at the culinary arts lab	This area is proposed as CMU load bearing. Utilize the CMU for gravity and lateral loads.	ACCEPT:	(9,000)
S-2	S2.01	Wrestling and weight room area- Use the CMU as load bearing shear walls and eliminate the steel column and beam line	Eliminates the braced frames shown in this area.	This area is proposed as CMU load bearing. Utilize the CMU for gravity and lateral loads.	REJECT: Both spaces have limited opportunity for natural light. It is being provided via clerestory windows, high on the exterior walls. Changing the wall framing to CMU would require those windows to be significantly reduced or a more complicated connection would be required to tie the CMU below the windows to the roof diaphragm above. We believe the proposed steel framing is the most cost effective for the intended design.	(11,000)

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Item #	Doc	Description	Advantages	Comment	Design Team/District Recommendation	
S-3		Recommend that all area west from gridline N be of load bearing CMU system.	Majority of the area is proposed as CMU except for the small areas shown out of steel. Reduce coordination time between the two trades		PARTIALLY ACCEPT: The current design has CMU bearing walls for the high volume gyms and the associated locker rooms. These are spaces that are unlikely to change in any significant way in the future. They are also areas that programmatically require the durable wall finish on the interior that CMU offers so the structural wall can be left exposed. The rest of the spaces between the commons and the gym (Culinary Arts and Food Service) are not as fixed in their configuration. Although they are less likely to change in any significant way than other areas of the building their organization and function may nonetheless change during the life of this building. CMU bearing walls will restrict that future reconfiguration more than steel structure. In these spaces the CMU bearing walls will also need to be furred to provide an interior face of GWB, which is more appropriate to those spaces. However, the idea does have the potential of simplifying the structural system which may have overall benefit to the project.	TBD
S-4		Spread out the high windows to allow for CMU piers to extend to the bottom of roof for load transfer	Eliminates all the strong back steel shown		ACCEPT:	(1,000)
S-5	S1.01	Slab reinforcing is a bit excessive	For 5" slab #4@18"oc might be a more cost effective option.		ACCEPT:	(9,000)
S-6		The plans suggest the ridge trusses to be a deferred submittal. Recommends the trusses be design by the EOR as part of the bid package	Minimize coordination especially that these trusses are most likely to be welded HSS with W section for top and bottom chords and will be field fabricated due to their size	The trusses are major part of the building system and most likely are needed long before the process of steel trusses shops and design.	REJECT: The roof trusses as proposed will be designed by the roof truss manufacturer. The manufacturer is able to design the most efficient member, in terms of material use, to meet the structural criteria of our design. We believe it will be less costly than a custom designed, site fabricated truss. This is a common practice in school design and we believe it will provide the most cost effective solution for the District.	TBD



Item #	Doc	Description	Advantages	Comment	Design Team/District Recommendation	
S-7	A11.01	Recommends CMU pilaster under columns instead of formed concrete columns	Less coordination between CMU and concrete		REJECT: We do not believe that CMU columns will be able to develop the necessary lateral resistance for the seating structure above.	TBD
	estimate-	The unit price of \$8.00 for the Plumbing, piping and devices seems high. We are finding a unit price of \$6.00 to be more in line.	Reduce base bid estimated costs		REJECT: The unit cost proposed by the VE team is more consistent in our experience with elementary school construction. High schools have much more sophisticated plumbing, particularly for areas such as science, art and culinary arts. Our unit price includes those unique systems, such as air and gas at science, acid resistant piping, clay traps, and etc. The actual unit cost may come down as the design is further refined but we would not recommend reducing it at this stage.	(440,000)
M-2	estimate- 11/12/12	The unit price of \$3.50 for the Fire Sprinkler system seems high. We are finding a unit price of \$3.00 to be more in line.	Reduce base bid estimated costs		ACCEPT:	(132,000)
M-3	estimate- 11/12/12	Reduce cooling capacity from 400 tons to 200 tons. (or 250 tons to allow for expansion). We are able to cool a 150,000 sq ft high school in the area with 150 tons of cooling and a greater diversity than is being proposed at Woodland HS.	Reducing size of chillers and capacity saves		ACCEPT:	(359,000)
	nd Cost estimate-	The unit price of \$18.00 for the Grandstand Plumbing Piping and Devices is high and possibly a typographical error. The unit price of \$6.00 would be more in line with actual costs.	Reduce grandstand cost estimate		REJECT: The unit price proposed for the grandstand is correct and reflects the very concentrated nature of grandstand toilet facilities. The unit price proposed by the VE team is in our experience more appropriate to an elementary school facility, where the cost is amortized over a much larger floor area. We do not believe it would be prudent to reduce the cost assumption until further design has been completed.	(4,000)



Item #	Doc	Description	Advantages	Comment	Design Team/District Recommendation	
M-5	Grandsta nd Cost estimate- 11/12/16	Eliminate EMCS controls from entire stadium.	Reduce grandstand cost estimate		REJECT: EMCS controls are not required by code. However, from a long term energy management standpoint, the ability to remotely monitor and control the mechanical systems in the grandstand will be beneficial to the District. We do not believe the limited cost savings warrants the loss of that capability.	(9,000)
M-6	Bid-	The unit price of \$8,000 for each ground loop bore seems rather high. We think it may be possible to lower this unit price closer to \$5,000 per bore.	Reduce the alternate bid cost estimate by - \$660,000 assuming there will be 220 bores drilled.		ACCEPT:	(915,000)
M-7	Bid-	There is additional savings by the reduction of piping by at least half by eliminating the proposed 4-pipe system.	Reduce cost estimate of ground loop heat pump system by between -\$200,00-\$250,000.		REJECT: Too costly and complicated to have a second system designed in the event the alternate ground source heat pump system is accepted	(275,000)
M-8	Bid- Ground Loop cost estimate	After speaking with the Geotech engineer, it is clear the water table is just below the surface. Together with having sufficient land available, a horizontal ground loop systems may be a viable option and traditionally costs less than a vertical bore type system. Also, to minimize excavation, a pump and dump system would be an even more economical choice than the proposed vertical bore system. One pump and dump option could be to tap into the proposed trench/ drain that will be running across the property, pull water from it (essentially becoming the well), run it through a heat exchanger and dump it back into the ditch where it is already being proposed to be dumped as part of the Civil design.	By eliminating the bores, you reduce the cost estimate for the ground loop system. The estimated costs for constructing a pump and dump system would be a net savings.	This alternative is mutually exclusive with Item M-6 above which adjusted costs of vertical bores, while this would eliminate the bores all together.	ACCEPT:	(1,220,000)



Item #	Doc	Description	Advantages	Comment	Design Team/District Recommendation	
M-9	ELCCA	The ELCCA should include an electric resistance heat/Chiller cooled system in the modeling comparison. There is a possibility of receiving a BPA/ Cowlitz Co.PUD new construction rebate of \$0.27 per kilowatt-hour saved in the first year of operation. The kWh savings are proposed based on the modeled savings per year between the chosen mechanical system and any other system that meets code. In order to maximize potential savings, an all electric resistance heat/chiller cooled system should be modeled in the ELCCA	When a ground-source heat-pump system is modeled against an electric resistance heating / chiller cooling system, it is estimated the rebate would be +/- \$200,000. back to the district after 1 year of verification. Typical paybacks can be between 5-10 years. Also, the Geothermal heat pump system can be 30-50% more efficient than the more traditional types of systems which translates to a 30-50% reduction in energy consumption for the life of the building. Maintenance costs are also lower. Geothermal HP systems can cost between \$.1125/Sq. Ft. Traditional 4-pipe fan coil systems can cost between \$.4050/ Sq. Ft.		ACCEPT:	(200,000)
E-1	Narrative p22	NREC 1513.3 States that daylighted zones shall be provided with individual controls or automatic controls. Use individual controls (i.e. switches) instead of automatic controls.	Reduce cost.	If allowed by AHJ	REJECT: The automated dimmers are required by code.	(28,000)
E-2		Allow the use of aluminum feeder conductors.	Reduce cost of project.	Cost determined by previous like projects.	REJECT: The use of aluminum feeder conductors will reduce first costs. However, they will also require an increase in conduit size, tighter tolerance on the termination torque, and the use of antioxidant compound at all terminations. Aluminum conductors also have a higher thermal expansion and contraction rate than copper increasing the need to maintain the proper termination torque over time in order to minimize loose connections (connections need to be checked more often). Loose connections can cause heat and increase the chances of arcing or in the worst case fires.	(37,000)
E-3		Arrange the main distribution switchboard using the 6 main rule thus eliminating the need for ground fault circuit breaker on the main.	Reduce cost of project.	Cost determined by previous like projects.	REJECT: The use of (6) disconnects will reduce first costs. However that reduced cost will severely limit the ease of future revisions or expansions. Given the intended life span of this facility we do not believe the change would be prudent.	(12,000)



Item #	Doc	Description	Advantages	Comment	Design Team/District Recommendation	
E-4		Allow the use of riser cable for systems cabling in lieu of plenum cable	Reduce cost of project.	Cost determined by previous like projects.	ACCEPT: No plenum cable is planned for this project, so no savings	0
E-5		Allow aluminum conductors to be terminated in the lugs supplied with the switchgear if rated for aluminum conductors. Contractor to provide data sheet showing torque requirements and verify.	Reduce cost of project.	Cost determined by previous like projects.	REJECT: Our concerns with this proposal are the same as those noted for item E2 above.	(6,000)
E-6		Allow the use of series rated distribution equipment.	Reduce cost of project.	Cost determined by previous like projects.	REJECT: The use of series rated distribution equipment would reduce first cost. However it would lock the District into specific circuit breaker and gear manufacturers for all future revisions or additions. Any future change that is not properly coordinated with the original equipment could result in unsafe conditions or even catastrophic failure of the equipment.	(12,000)
E-7		In areas that are carpet and not hard surface allow the use of floor box cavers that are not scrub rated.	Reduce cost of project.	Cost determined by previous like projects where 50 boxes were in carpet areas.	REJECT: This proposal assumes that only floor boxes located in exposed concrete floors will be susceptible to potential damage from floor cleaning equipment. We do not agree with that assumption. Even carpeted areas will occasionally be cleaned with powered equipment. The savings proposed is minimal and not worth the potential problems with future maintenance.	(2,000)
E-8		Install only a specified number of head end equipment for the pole vault system. Delete 10 rooms at \$4.000. per room.	Reduce cost of project.	To not supply the head end equipment for the pole vault system. Install the raceways only. Do not pull any cable as the pole vault equipment is supplied with cable and the cable ends attached to match equipment.	ACCEPT:	(49,000)
E-9		To delete auto dimming as allowed by NREC and use switches as the control for daylight zones. Use troffers with indirect lighting. See E-1	Base line for E-10 and E-11 comparisons.	Base cost \$2,600.00 per room of 15 fixtures.	REJECT: The auto dimming is a code requirement	(140,000)
E-10		To use pendant mount indirect T-5 fixtures		60 lineal feet. Per room cost	REJECT: This would be a cost increase	1,000
E-11		To use LED troffer with indirect lighting. Fixture has same appearance as base fixture.		15 fixtures per room. Per room cost.	REJECT; This would be a cost increase	1,000



Item #	Doc	Description	Advantages	Comment	Design Team/District Recommendation	
	ecommended ditional Costs \$26,000		Total Recommended Savings	(\$5,586,000)	Net Recommended Savings	(\$5,560,000)
	epted nal Costs	\$24,000	Total Accepted Savings	(\$3,313,000)	Net Accepted Savings	(\$3,289,000)



COST ESTIMATE FORM COMPONENT:	Elimina	te I	sland Ra	ain Garde	ns				C1
CURRENT DESIGN					va proposal				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Eliminate gardens, planting & irrigation	66,872	sf	3.75	250,769					
				050.740					
Subtotal General Contractor Markup	22.00	%		55,169	Subtotal General Contractor Markup	22.00	%		-
Total to nearest \$1000				306,000	Total				
					Difference				306,000



COST ESTIMATE FORM COMPONENT:	Eliminate Parking wheel stops									
CURRENT DESIGN					VA PROPOSAL					
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	
Eliminate wheel stops	347	ea	55.00	19,085						
Subtotal				19,085	Subtotal					
General Contractor Markup	22.00	%			General Contractor Markup	22.00	%		-	
Total to nearest \$1000				23,000	lotal					
					Difference				23,000	



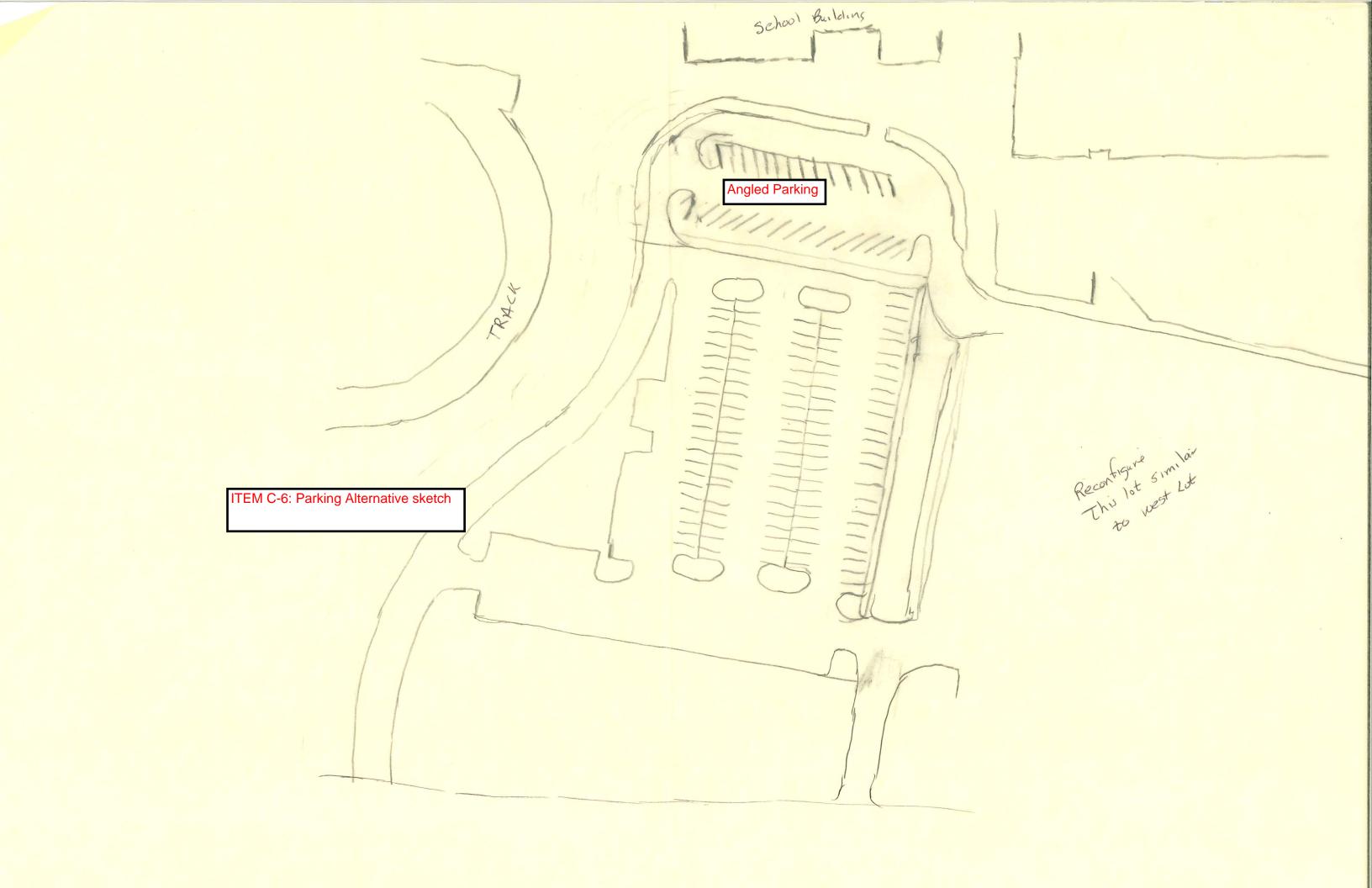
COST ESTIMATE FORM COMPONENT:	Eliminate Impermeable Liner in Ponds								
CURRENT DESIGN					va proposal				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	INI	UNIT COST	TOTAL COST
Impermeable pond liner per HDJ	9,997	SY	6.25	62,481					
							_		
Subtotal				62,481	Subtotal				
General Contractor Markup	22.00	%			General Contractor Markup	22.00	%		-
Total to nearest \$1000				76,000	Total				
					Difference				76,000



COST ESTIMATE FORM COMPONENT:	Reduc	e Si	dewalk	along We	st Side to 5 feet				C4
CURRENT DESIGN					va proposal				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Sidewalks per HDJ	11,300	SY	45.00	508,500	Sidewalks adjusted	10,300	SY	35.00	360,500
							_		
Subtotal					Subtotal				360,500
General Contractor Markup	22.00	%			General Contractor Markup	12.00	%		43,260
Total to nearest \$1000				620,000	Total				404,000
					Difference				216,000



COST ESTIMATE FORM COMPONENT:	Elimina	te 2	2.5 foot (Strip around South Parking			_	C5
CURRENT DESIGN					va proposal				
ITEM	QUAN	UNIT		TOTAL COST	ITEM	QUAN	IN	UNIT COST	TOTAL COST
Eliminate conc walkway	156	SY	35.00	5,475					
Subtotal				5,475	Subtotal				
General Contractor Markup	22.00	%			General Contractor Markup	22.00	%		-
Total to nearest \$1000				7,000	Total				
					Difference				7,000





COST ESTIMATE FORM COMPONENT:	OMPONENT: Reconfigure Parking and Parent Drop									
CURRENT DESIGN					VA PROPOSAL					
ITEM	QUAN	INN	UNIT COST	TOTAL COST	ITEM	QUAN	IINN	UNIT COST	TOTAL COST	
Asphalt paving	4,800	sf	2.65	12,720	Additional lawn	4,800	sf	0.15	720	
Subtotal				12 720	Subtotal				720	
General Contractor Markup	22.00	%			General Contractor Markup	12.00	%		86	
Total to nearest \$1000				16,000		12.00			1,000	
				·						
					Difference				15,000	



COST ESTIMATE FORM COMPONENT:	Elimina	te l	Mow Stri	p Under F	ence				C7
CURRENT DESIGN					va proposal			•	
ITEM	QUAN	INN	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Mow strip	1	LS	24,700.00	24,700					
Subtotal				24,700	Subtotal				
General Contractor Markup	22.00	%			General Contractor Markup	22.00	%		-
Total to nearest \$1000				30,000	Total				
					Difference				30,000



COST ESTIMATE FORM COMPONENT:	Reduc	e So	cope of L	andscape	e and Irrigation				C8
CURRENT DESIGN					va proposal				
ITEM	QUAN	INN	UNIT COST	TOTAL COST	ITEM	QUAN	INN	UNIT COST	TOTAL COST
Landscape & irrigation	1	ls	1,600,000.00	1,600,000	Landscape & irrigation - reduced 25%	1	ls	1,200,000.00	1,200,000
Subtotal				1,600,000	Subtotal				1,200,000
General Contractor Markup	22.00	%			General Contractor Markup	12.00	%		1,200,000
Total to nearest \$1000	22.00			1,952,000		.2.00			1,344,000
					Difference				608,000



COST ESTIMATE FORM COMPONENT:	Elimina	te S	Sidewalk	along No	orth Parking				C9
CURRENT DESIGN					VA PROPOSAL				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Concrete sidewalk	4,300	sf	5.00	21,500					
Colletetel				04 500	Culabatal				
Subtotal General Contractor Markup	22.00	%			Subtotal General Contractor Markup	22.00	%		_
Total to nearest \$1000	22.00	/0		26,000		22.00	/0		-
Total to ficarest \$1000				20,000	Total				
					Difference				26,000



VALUE ANALYSIS STUDY

COST ESTIMATE FORM COMPONENT:	Reduc	e Si	dewalk	and Cond	crete Hardscape around Sch	nool			C11
CURRENT DESIGN					VA PROPOSAL				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Concrete sidewalk and landscape	101,700	sf	5.00	508,500	Concrete sidewalk and landscape	86,700	sf	4.00	346,800
						+			
Subtotal				508,500	Subtotal				346,800
General Contractor Markup	22.00	%			General Contractor Markup	12.00	%		41,616
Total to nearest \$1000				620,000	Total				388,000
									000.055
					Difference				232,000

Proposal #



VALUE ANALYSIS STUDY

COST ESTIMATE FORM COMPONENT:	Alterna	ite :	to Surch	arge					C12
CURRENT DESIGN					VA PROPOSAL				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Cost not assessable					Save 2 months general conditions	2	МО	60,000.00	120,000
							_		
							-		
							 		
							<u> </u>		
							_		
Subtotal					Subtotal		-		120,000
General Contractor Markup	22.00	%		-	General Contractor Markup		%		120,000
Total to nearest \$1000	22.30	.0			Total		,,		120,000
7									1_2,300
					Difference				(120,000)

Proposal #



COST ESTIMATE FORM COMPONENT:	Delete	Her	ring Bor	ne Draina	ge System R1				C13
CURRENT DESIGN					VA PROPOSAL				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST

CONNEINT DESIGN	VATROLOGAL								
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Storm Pipe	2,500	lf	37.15	92,875					
Catch Basis	15	ea	1,600.00	24,000					
Area Drains	4	ea	965.00						
Manholes	5	ea	2,500.00	12,500					
	+								
Subtotal				133 235	Subtotal				
General Contractor Markup	22.00	%			General Contractor Markup	22.00	%		-
Total to nearest \$1000				163,000			<u> </u>		
	+			100,000					
					Difference				163,000



VALUE ANALYSIS STUDY

COST ESTIMATE FORM COMPONENT:	Add Rails along SW Access								
CURRENT DESIGN					VA PROPOSAL				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	INI	UNIT COST	TOTAL COST
					Railings	560	lf	25.00	14,000
Subtotal					Subtotal				14,000
General Contractor Markup	22.00	%		-	General Contractor Markup	12.00	%		1,680
Total to nearest \$1000					Total				16,000
					Difference				(16,000)

Proposal #





VALUE ANALYSIS STUDY

COST ESTIMATE FORM COMPONENT:	T ESTIMATE FORM MPONENT: Eliminate Foundation Drain (Not Required)								
CURRENT DESIGN				VA PROPOSAL					
ITEM	QUAN	- UNIT		TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
12" underdran system Rock for underdrains	1,660 6,143	lf Cy	25.00 15.00	41,500 92,145					
Nock for undergrains	0,143	Су	13.00	72,143					
Subtotal				122 / 45	Subtotal				
General Contractor Markup	22.00	%		29,402	General Contractor Markup	12.00	%		_
Total to nearest \$1000	22.00	,,		163,000		12.00	,,,		
				, , , , ,					
					Difference				163,000

Proposal #



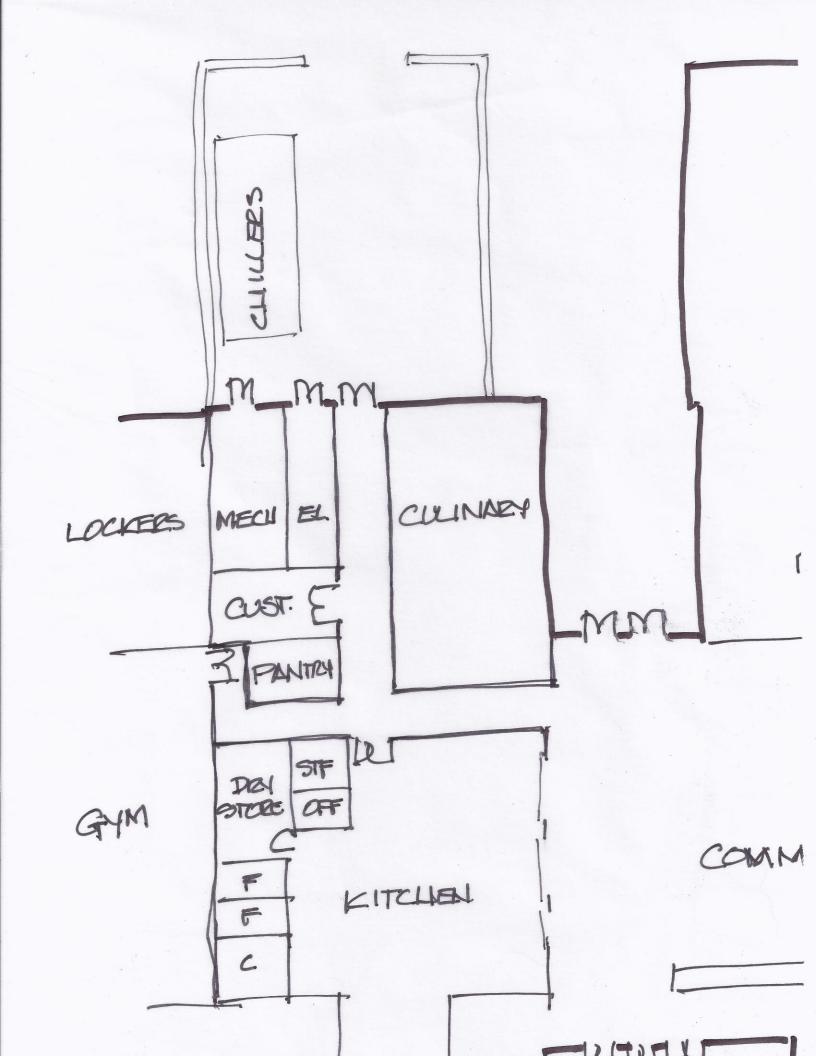
COST ESTIMATE FORM COMPONENT:	Eliminate Portable Bleachers for Practice Field								
CURRENT DESIGN	va proposal								
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Players bench	4	EA	2,200.00						
5 row bleacher	1	EA	7,500.00	7,500					
3 row bleacher	1	EA	2,200.00	2,200					
							_		
						+			
						+			
College				10.500	Calabatat	+			
Subtotal	22.00	0/			Subtotal General Contractor Markup	22.00	%		
General Contractor Markup	22.00	%				22.00	%		-
Total to nearest \$1000				23,000	10tai	+	_		
					Difference	-	-		22.000
					Difference				23,000

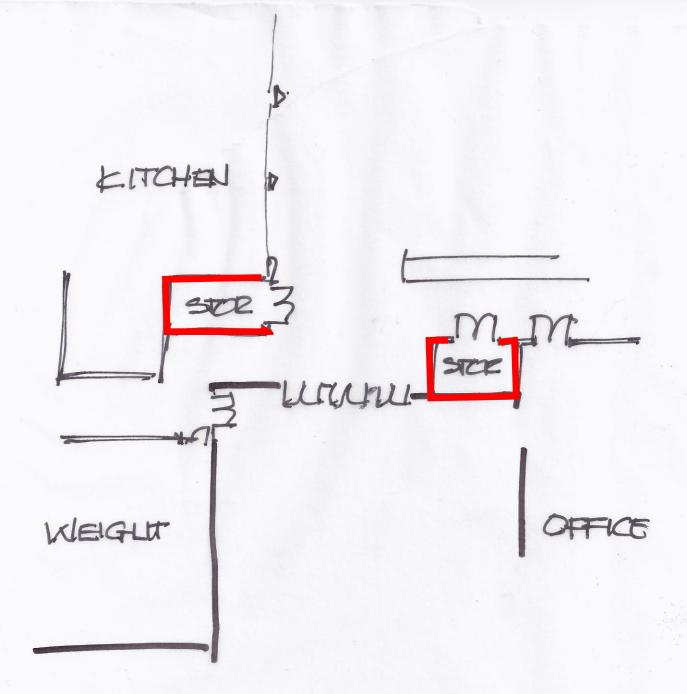


COST ESTIMATE FORM COMPONENT:	Use Ard	ch F	Pipe for I	Bridge ILC	Precast Concrete				L2
CURRENT DESIGN		VA PROPOSAL							
ITEM	QUAN	UNIT		TOTAL COST	ITEM	QUAN	UNIT		TOTAL COST
Precast Concrete Bridge	1	EA	26,000.00	26,000	Arch Pipe bridge system	1	EA	7,500.00	7,500
				0/.000					7.500
Subtotal Contractor Markup	22.00	%			Subtotal General Contractor Markup	12.00	%		7,500 900
General Contractor Markup Total to nearest \$1000	22.00	70		32,000		12.00	70		8,000
Total to fledlest \$1000				32,000	IOtal				0,000
					Difference				24,000



COST ESTIMATE FORM COMPONENT:	Delete Access Road to Detention Pond								
CURRENT DESIGN		VA PROPOSAL							
ITEM	QUAN	INI	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Access road to detewntion pond	1	LS	12,000.00	12,000					
							\vdash		
Subtotal				12,000	Subtotal				
General Contractor Markup	22.00	%			General Contractor Markup	22.00	%		-
Total to nearest \$1000				15,000	Total				
					Difference				15,000

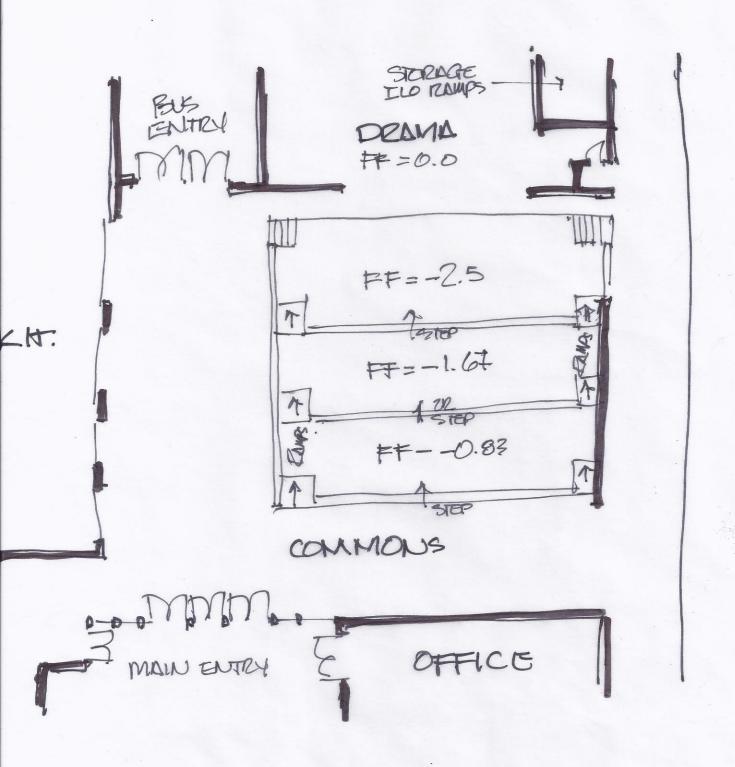




ITEM A-2: Add Storage Rooms off Commons



COST ESTIMATE FORM COMPONENT:	Elimina	te 1	Telescop	oing Seatt	ing to Commons				A3A
CURRENT DESIGN					VA PROPOSAL				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	INI	UNIT COST	TOTAL COST
Telescoping Seating	514	ea	485.00	249,290	Standard Chairs	514	ea	20.00	10,280
					Chair Dolleys	5	ea	320.00	1,600
Subtotal				249,290	Subtotal				11,880
General Contractor Markup	22.00	%			General Contractor Markup	12.00	%		1,426
Total to nearest \$1000				304,000					13,000
					Difference				291,000



ITEM-3B: Depress Commons Floor in Tiers ILO Telescoping Seating - Plan

=1 BOWN XX = CA TIER OF SEATS = 114

3 TIERS SEATING = 940, SEAR.

ITEM 3B: Depress Commons Floor in Tiers ILO Telescoping Seating - Section



COST ESTIMATE FORM COMPONENT:	Depress Commons Floor ILO Telescoping Seats	A:
CUDDENT DECICN	VA DDODOSAL	

CURRENT DESIGN					VA PROPOSAL				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Stage floor	1,884	sf	8.00	15,072	Terraced floor to commons	6,685	sf	2.30	15,376
Storage Floor	496	sf	8.00		Allowance for ramps, steps etc.	1	ls	20,000.00	20,000
Stairs	1	ls	2,500.00		Standard Chairs	514	ea	20.00	10,280
Commons telescoping seating	514	ea	485.00	249,290	Chair Dolleys	5	ea	320.00	1,600
Subtotal					Subtotal				47,256
General Contractor Markup	22.00	%			General Contractor Markup	12.00	%		5,671
Total to nearest \$1000				330,000	Total				53,000
					Difference				277,000



VALUE ANALYSIS STUDY

COST ESTIMATE FORM COMPONENT:	Elimina	te I	DF Roor	n 1210					A 4
CURRENT DESIGN					va proposal				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Racks and switches	1	ls	3,000.00	3,000					
Subtotal					Subtotal				
General Contractor Markup	22.00	%			General Contractor Markup	22.00	%		-
Total to nearest \$1000				4,000	Total				
					Difference				4,000

Proposal #



VALUE ANALYSIS STUDY

COST ESTIMATE FORM COMPONENT:	Use Sin	gle	Ply Roo	fing on Bu	uttress Roofs				A 5
CURRENT DESIGN					VA PROPOSAL				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Standing seam metal roof system	1,891	sf	11.75	22,225	Single ply roofing system	1,891	sf	9.10	17,213
Subtotal				22,225	Subtotal				17,213
General Contractor Markup	22.00	%			General Contractor Markup	22.00	%		3,787
Total to nearest \$1000				27,000	Total				21,000
					Difference				6,000

Proposal #



COST ESTIMATE FORM COMPONENT:	Smart I	3oa	rds ILO I	Projectors	and Screens				A 6
CURRENT DESIGN					va proposal				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Projectors and screens - per classroom	38	ea	4,000.00	152,000	Smart boards	38	ea	2,000.00	76,000
Subtotal Control Control of Markup	22.00	%			Subtotal Contractor Markup	22.00	%		76,000
General Contractor Markup Total to nearest \$1000	22.00	70		185,000	General Contractor Markup Total	22.00	70		16,720 93,000
					Difference				92,000



COST ESTIMATE FORM COMPONENT:	Delete	Ce	ling in St	torage 14	09C and Tool Room 1409D)			A 8
CURRENT DESIGN					VA PROPOSAL				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Ceiling 1409C & 1409D	264	sf	3.50	924					
Subtotal				024	Subtotal				
General Contractor Markup	22.00	%			General Contractor Markup	22.00	%		_
Total to nearest \$1000	22.00	70		1,000		22.00	/0		-
Total to Healest \$1000				1,000	Total				
					Difference				1,000



VALUE ANALYSIS STUDY

COST ESTIMATE FORM COMPONENT:	Reduc	e R	oof Pitch	n from 4.5	to 3.5				A 9
CURRENT DESIGN					VA PROPOSAL				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Roofing at high level - 4.5% pitch	89,500	sf	24.00	2,148,000	Roofing at high level - 3.5% pitch	88,604	sf	24.00	2,126,496
Subtotal				2,148,000					2,126,496
General Contractor Markup	22.00	%			General Contractor Markup	22.00	%		467,829
Total to nearest \$1000				2,621,000	।ଠୀଣା				2,594,000
					Difference				27,000

Proposal #





COST ESTIMATE FORM COMPONENT:	Delete	Sur	nscreens	from Wes	st Elevation				A10
CURRENT DESIGN					VA PROPOSAL				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Sunscreens to west elevation	105	lf	105.00	11,025					
Subtotal				11,025	Subtotal				
General Contractor Markup	22.00	%			General Contractor Markup	22.00	%		-
Total to nearest \$1000				13,000	lotal				
					Difference				13,000



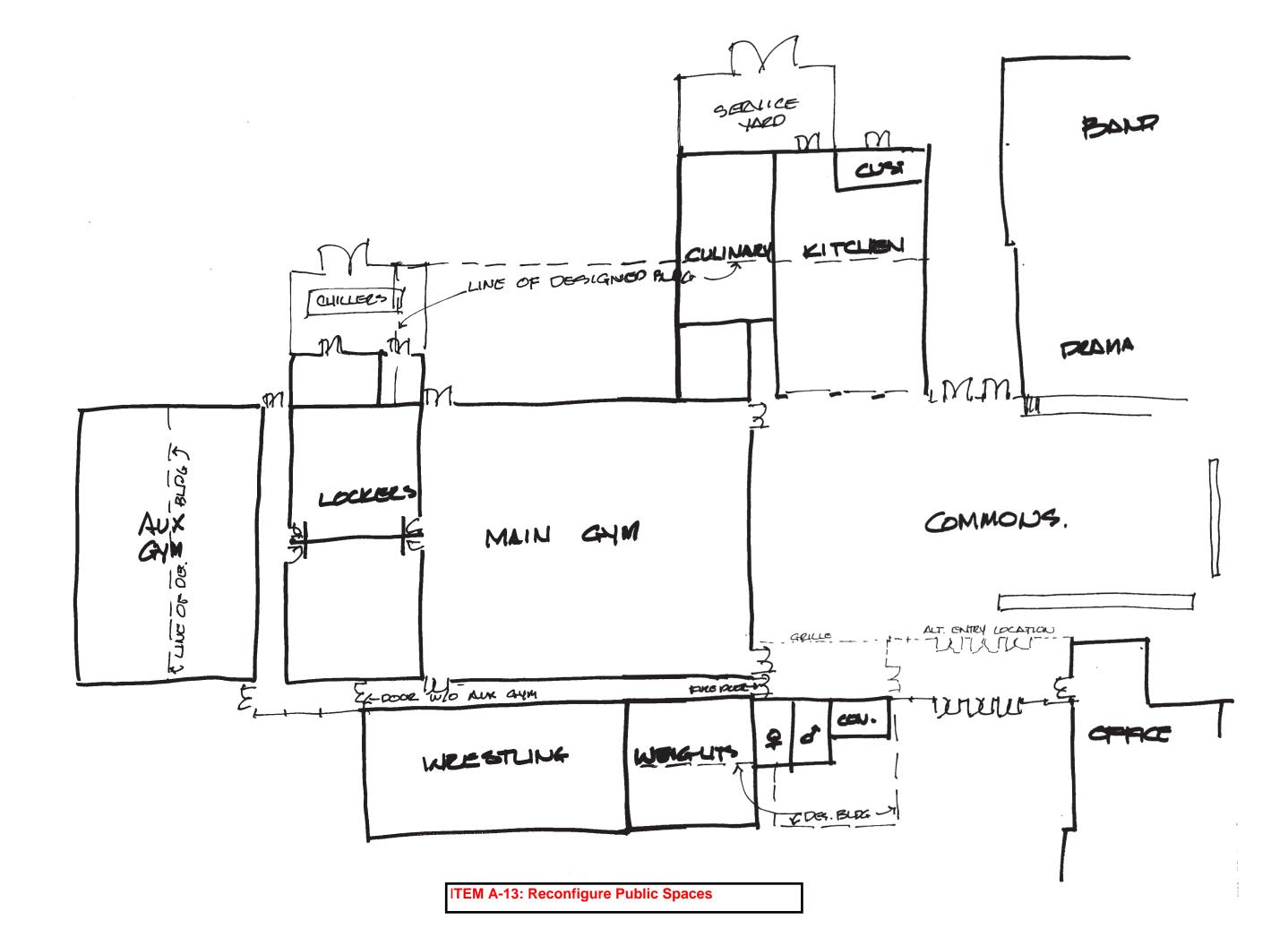
COST ESTIMATE FORM COMPONENT:	Roof o	ver	Service	Area					A 11
CURRENT DESIGN					VA PROPOSAL				
ITEM	QUAN	INN	UNIT COST	TOTAL COST	ITEM	QUAN	INN	UNIT COST	TOTAL COST
					Roof over Service Area	300	sf	22.00	6,600
Subtotal					Subtotal				6,600
General Contractor Markup	22.00	%		-	General Contractor Markup	22.00	%		1,452
Total to nearest \$1000	22.00				Total				8,000
									2,300
					Difference				(8,000)
-		•			-		•		



COST ESTIMATE FORM		Λ1
COMPONENT:	Sealed Concrete in Rooms	AI

CURRENT DESIGN					VA PROPOSAL				
ITEM Floor Finish in 1209A, 1303, 1602E,	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
2208A, 2210A, 230A, 230A & 240A	2,410	sf	4.50	10,845	Conc Floor finish	2,410	sf	0.75	1,808
						+			
Subtotal				10.845	Subtotal				1,808
General Contractor Markup	22.00	%		2,386	General Contractor Markup	12.00	%		217
Total to nearest \$1000				13,000	Total				2,000
					Difference				11,000







COST ESTIMATE FORM COMPONENT:	Reorga	aniz	e Area F	Plan Loca	tions per Sketch				A13
CURRENT DESIGN	-				VA PROPOSAL				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Existing Area of specific areas	53,276	sf	220.00	11,720,720	New area per plan	53,175	sf	220.00	11,698,500
						+			
Subtotal				11,720,720	Subtotal				11,698,500
General Contractor Markup	22.00	%		2,578,558	General Contractor Markup	22.00	%		2,573,670
Total to nearest \$1000				14,299,000	Total				14,272,000
					Difference				27,000



COST ESTIMATE FORM COMPONENT:	Locker	Ro	om Area	a - Use CN	1U For Load Bearing and Sh	ear			S 1
CURRENT DESIGN					VA PROPOSAL				
ITEM	QUAN	UNIT		TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Columns for structure (9 Off)	216	LF	35.00	7,560					
						+	_		
Subtotal				7,560	Subtotal				
General Contractor Markup	22.00	%			General Contractor Markup	12.00	%		-
Total to nearest \$1000				9,000	Total				
					Difference				9,000



COST ESTIMATE FORM COMPONENT:	Wrestlir	ng a	and Wei	ght - Struc	ctural CMU ILO Steel Colur	nns			S2
CURRENT DESIGN					VA PROPOSAL				
ITEM	QUAN	UNIT		TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Columns for structure (9 Off)	260	LF	35.00	9,100					
						-			
Subtotal				9,100	Subtotal				
General Contractor Markup	22.00	%		2,002	General Contractor Markup	12.00	%		-
Total to nearest \$1000				11,000	Total				
					Difference				11,000



COST ESTIMATE FORM COMPONENT:	Spa	ice Wi	ndows to	o allow fo	r CMU ILO Strong Backs				S4	
CURRENT DESIGN		VA PROPOSAL								

CURREINI DESIGN					VA PROPOSAL				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Structural steel strong backs between windows (14 off)	56	lf	25.00	1,400	CMU between windows	1	LS	800.00	800
							_		
Subtotal					Subtotal				800
General Contractor Markup	22.00	%			General Contractor Markup	12.00	%		96
Total to nearest \$1000				2,000	Total				1,000
					Difference				1,000



COST ESTIMATE FORM COMPONENT:	Slab Re	eba	r Excess	ive					S 5
CURRENT DESIGN					VA PROPOSAL				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Slab Rebar Allowance	104,198	SF	0.35	36,469	Reduced slab rebar	104,198	SF	0.30	31,259
Subtotal					Subtotal				31,259
General Contractor Markup	22.00	%			General Contractor Markup	12.00	%		3,751
Total to nearest \$1000				44,000	lotal				35,000
					Difference				9,000



COST ESTIMATE FORM COMPONENT:	Grandstand Columns CMU ILO Concrete - R1	S7
CUDDENT DESIGN	VA DODOSAL	K.

CURRENT DESIGN				VA PROPOSAL					
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	INI	UNIT COST	TOTAL COST
Concrete columns to support sub root under grandstand (7 off)	70	lf	130.00	9,100	CMU Pilaster ILO of concrete	70	lf	95.00	6,650
						-			
Subtotal				9,100	Subtotal				6,650
General Contractor Markup	22.00	%		2,002	General Contractor Markup	12.00	%		798
Total to nearest \$1000				11,000	Total				7,000
					Difference		_		4.000
					Difference				4,000



COST ESTIMATE FORM COMPONENT:	Reduc	e SF	Rate fo	or Plumbin	g from \$8/SF to \$6/SF				M1
CURRENT DESIGN					VA PROPOSAL				
ITEM Allowance in Mechanical estimate for	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
plumbing	144,644	sf	8.00	1,157,152	Revised allowance for plumbing	144,644	sf	6.00	867,864
Subtotal				1,157,152					867,864
General Contractor Markup Total to nearest \$1000	22.00	%		254,573 1,412,000	General Contractor Markup Total	12.00	%		104,144 972,000
					Difference				440,000





r Koozon Woodiana riigir oonidar							• •		
COST ESTIMATE FORM COMPONENT:	Reduc	e SF	Rate fo	or Sprinklei	rs from \$3.50/SF to \$3.00/SF				M2
CURRENT DESIGN					va proposal				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Allowance in Mechanical estimate for			0.50	50/.05/				0.00	400.000

ITEM	QUAN	INN	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Allowance in Mechanical estimate for plumbing	144,644	sf	3.50	506,254	Revised allowance for plumbing	144,644	sf	3.00	433,932
					·				
Subtotal				506,254	Subtotal				433,932
General Contractor Markup	22.00	%			General Contractor Markup	12.00	%		52,072
Total to nearest \$1000				618,000	Total				486,000
					Disc				400.000
					Difference				132,000



COST ESTIMATE FORM COMPONENT:	Reduc	e C	ooling (Capacity 1	from 400 tons to 250 tons			_	M3
CURRENT DESIGN					va proposal				
ITEM	QUAN	UNIT		TOTAL COST	ITEM	QUAN	INI	UNIT COST	TOTAL COST
Additional cost of 400 ton cooling	1	LS	######	294,000					
							-		
							_		
Culatotal				204.000	Subtotal		-		
Subtotal General Contractor Markup	22.00	%			General Contractor Markup	22.00	%		-
Total to nearest \$1000	22.00	70		359,000	·	22.00	/0		
				337,300	10.01				
					Difference				359,000



VALUE ANALYSIS STUDY

COST ESTIMATE FORM COMPONENT:	Reduce Cost of Grandstand Plumbing from \$18.00/sf to \$6.00/sf									
CURRENT DESIGN					va proposal					
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	INI	UNIT COST	TOTAL COST	
Grandstand plumbing in scope	5,000	sf	18.00	90,000	Grandscaping plumbing revised	5,000	sf	6.00	30,000	
						+				
Subtotal					Subtotal				30,000	
General Contractor Markup	22.00	%			General Contractor Markup	22.00	%		6,600	
Total to nearest \$1000				110,000	Total				37,000	
					Diff				70.000	
					Difference				73,000	

Proposal #



COST ESTIMATE FORM COMPONENT:	Elimina	te E	EMCS Co	ontrols fro	m Stadium			_	M5
CURRENT DESIGN					va proposal				
ITEM	QUAN	UNIT		TOTAL COST	ITEM	QUAN	IN	UNIT COST	TOTAL COST
EMCS controls at stadium	1	LS	7,500.00	7,500					
Subtotal				7,500	Subtotal				
General Contractor Markup	22.00	%			General Contractor Markup	22.00	%		-
Total to nearest \$1000				9,000					
					Difference				9,000



COST ESTIMATE FORM COMPONENT:	Alterna	ate ·	- Ground	d Loop Sy	stem - Bores					
CURRENT DESIGN					VA PROPOSAL					
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	IN	UNIT COST	TOTAL COST	
Ground loop field (bores)	220	EA	8,000.00	1,760,000	Ground loop field (bores)	220	EA	5,000.00	1,100,000	
Subtotal				1,760,000					1,100,000	
General Contractor Markup	22.00	%			General Contractor Markup	12.00	%		132,000	
Total to nearest \$1000				2,147,000	Total				1,232,000	
					Difference				915,000	



COST ESTIMATE FORM COMPONENT:	Alterna	ate -	- Ground	d Loop Sys	stem - Piping Reduction				M7
CURRENT DESIGN					VA PROPOSAL				
ITEM Over allowance of piping by 50% by	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
eliminating 4-pipe system	1	LS	######	225,000					
Subtotal	00.55	0.4			Subtotal	00.55	0,		
General Contractor Markup Total to nearest \$1000	22.00	%		49,500 275,000	General Contractor Markup Total	22.00	%		-
					Difference				275,000





COST ESTIMATE FORM COMPONENT:	Alterna	ate	- Pump ar	nd Dump	System				M8
CURRENT DESIGN					va proposal				
ITEM	QUAN	INI	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COS
Eliminate afternate ground loop system and relace with pump and dump system.	1	LS	1,000,000.00	1,000,000					
Subtatal				1,000,000	Cubtatal				
Subtotal General Contractor Markup	22.00	%			General Contractor Markup	22.00	%		-
Total to nearest \$1000				1,220,000	Total				
					Difference				1,220,00



VALUE ANALYSIS STUDY

COST ESTIMATE FORM

COMPONENT: ELCCA Rebate for Alternate System

M9

CURRENT DESIGN				VA PROPOSAL					
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	Possible ELCCA Rebate for using	QUAN	UNIT	UNIT COST	TOTAL COST
					alternate ILO electric resistance heating/cooling system - saving after 12 months	1	1.0	200 000 00	202.202
					12 months	1	LS	-200,000.00	-200,000
	+								
									1
Culatatal					Culatatal				200.000
Subtotal General Contractor Markup	22.00	%		_	Subtotal General Contractor Markup	22.00	%		-200,000 (44,000)
Total to nearest \$1000	22.00	/0		-	Total	22.00	/0		-244,000
Total to Healest \$1000	+				IOlai				-244,000
	+				Difference				244,000
L			<u>I</u>		Direction				274,000



COST ESTIMATE FORM COMPONENT:	Use Inc	divic	dual Cor	ntrols ILO	Auto Controls				E1
CURRENT DESIGN					va proposal				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Lighting controls - Auto	144,644	sf	0.50	72,322	Lighting controls - Individual	144,644	sf	0.37	53,518
Subtotal				70 000	Subtotal				F0 F10
General Contractor Markup	22.00	%			General Contractor Markup	12.00	%		53,518 6,422
Total to nearest \$1000	22.00	70		88,000		12.00	70		60,000
				22,000					22,000
					Difference				28,000



COST ESTIMATE FORM COMPONENT:	Alumin	um	feeder	Conducto	ors				E2
CURRENT DESIGN					VA PROPOSAL				
ITEM	QUAN	UNIT		TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Conductors other than aluminum	1	ls	30,000.00	30,000					
Subtotal				30,000	Subtotal				
General Contractor Markup	22.00	%		6,600	General Contractor Markup	22.00	%		-
Total to nearest \$1000				37,000	Total				
									07.55
					Difference				37,000



COST ESTIMATE FORM				o.					E3
COMPONENT:	<u>Elimina</u>	te (Ground	Fault Circ	uit Breaker			ı	LJ
CURRENT DESIGN					VA PROPOSAL				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COS
Ground fault circuit breaker	1	ls	10,000.00	10,000					
				10.055					
Subtotal	22.00	0/			Subtotal Control to Markup	22.00	0/		
General Contractor Markup	22.00	%			General Contractor Markup	22.00	%		-
otal to nearest \$1000				12,000	।ଠାଣା				
					Difference				12,00
					DILICIGILOE	1			12,00



COST ESTIMATE FORM COMPONENT:	Riser C	abl	e for Sys	tems ILO	Plenum Cable				E4
CURRENT DESIGN					VA PROPOSAL				
ITEM	QUAN	INI	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Riser cable for systems	1	ls	15,000.00	15,000					
				45.55					
Subtotal General Contractor Markup	22.00	%			Subtotal General Contractor Markup	22.00	%		
Total to nearest \$1000	22.00	7/0		18,000		22.00	7/0		-
iotal to licalest \$1000				10,000	Total				
					Difference				18,000



COST ESTIMATE FORM COMPONENT:	Alumin	ıum	Condu	ctors Term	inated in Lugs				E 5
CURRENT DESIGN					va proposal			-	
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	INI	UNIT COST	TOTAL COST
Aluminum Conductors Terminated in Luas	1	LS	5,000.00	5,000					
Subtotal					Subtotal				
General Contractor Markup Total to nearest \$1000	22.00	%		1,100 6,000	General Contractor Markup Total	22.00	%		-
					Difference				6,000



COST ESTIMATE FORM COMPONENT:	Series F	Rate	ed Distrik	oution Equ	uipment		E6		
CURRENT DESIGN					va proposal				
ITEM Non Series Rated Distribution	QUAN	IN	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Equipment	1	ls	10,000.00	10,000					
Culatatal				10.000	Culetatal				
Subtotal General Contractor Markup	22.00	%			Subtotal General Contractor Markup	22.00	%		-
Total to nearest \$1000	22.00	.0		12,000		22.00	70		
					Difference				12,000



COST ESTIMATE FORM COMPONENT:	Non-Scrub Rated Cavers in Carpet Areas							E7	
CURRENT DESIGN	<u>'</u>	VA PROPOSAL							
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Scrub Rated Cavers in Carpet Areas	1	ls	1,500.00	1,500					
Subtotal				1 500	Subtotal				
General Contractor Markup	22.00	%			General Contractor Markup	22.00	%		_
Total to nearest \$1000	22.00			2,000					
				_,=00					
					Difference				2,000



COST ESTIMATE FORM COMPONENT:	Install Head-End Equipment at Pole Vault Only								E8
CURRENT DESIGN					VA PROPOSAL				
ITEM	QUAN	UNIT	UNIT COST	TOTAL COST	ITEM	QUAN	UNIT	UNIT COST	TOTAL COST
Head-End Equipment	10	ea	4,000.00	40,000					
							\vdash		
Subtotal				40,000	Subtotal				
General Contractor Markup	22.00	%		8,800	General Contractor Markup	22.00	%		-
Total to nearest \$1000				49,000	Total				
					Difference				49,000