



Specialists in School Buildings



WOODLAND Public Schools

Where 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.

Sincerely,

A handwritten signature in blue ink that reads "Carter Davis Bagg".

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.



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Item #	Doc	Description	Advantages	Comment	Design Team/District Recommendation	
C-1		Eliminate the island rain gardens in the parking lots and keep the parking row end islands for landscaping only.	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		Eliminate the impermeable liner in the storm water wet pond construction.	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)



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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



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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	Potentially reduced schedule or reduced cost or both.	Could eliminate need to import soil in 2 phases	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	Delete herring bone drainage system for football field and footing drains @ building	Reduce costs.	Per Geo-tech report, sand fill under field will provide adequate drainage.	REJECT: Good drainage is critical in 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	C1.12 C1.13	Need to add guard rails/railings at S/W entering campus per L.1.12 & 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)



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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	A2.01	Add storage rooms off commons per attached sketch.	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)



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Item #	Doc	Description	Advantages	Comment	Design Team/District Recommendation	
A-3A	A2.01	Eliminate telescoping auditorium seating in commons.	Use portable seating on main floor for assembly seating		<p>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.</p>	(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, dining tables and or seating on each tier.		<p>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.</p>	(277,000)



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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	A2.01	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. 1 mechanical attic 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)

0



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Item #	Doc	Description	Advantages	Comment	Design Team/District Recommendation	
S-3	S2.01	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	S2.01	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	S4.01	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



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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
M-1	Cost estimate-11/12/12	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	Cost 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	Cost 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)
M-4	Grandstand Cost estimate-11/12/15	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)



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Item #	Doc	Description	Advantages	Comment	Design Team/District Recommendation	
M-5	Grandstand 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	Alternate Bid-Ground Loop cost estimate	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 <u>\$5,000</u> per bore.	Reduce the alternate bid cost estimate by - \$660,000 assuming there will be 220 bores drilled.		ACCEPT:	(915,000)
M-7	Alternate Bid-Ground Loop cost estimate	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	Alternate 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)



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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 \$.11-.25/Sq. Ft. Traditional 4-pipe fan coil systems can cost between \$.40-.50/ 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)



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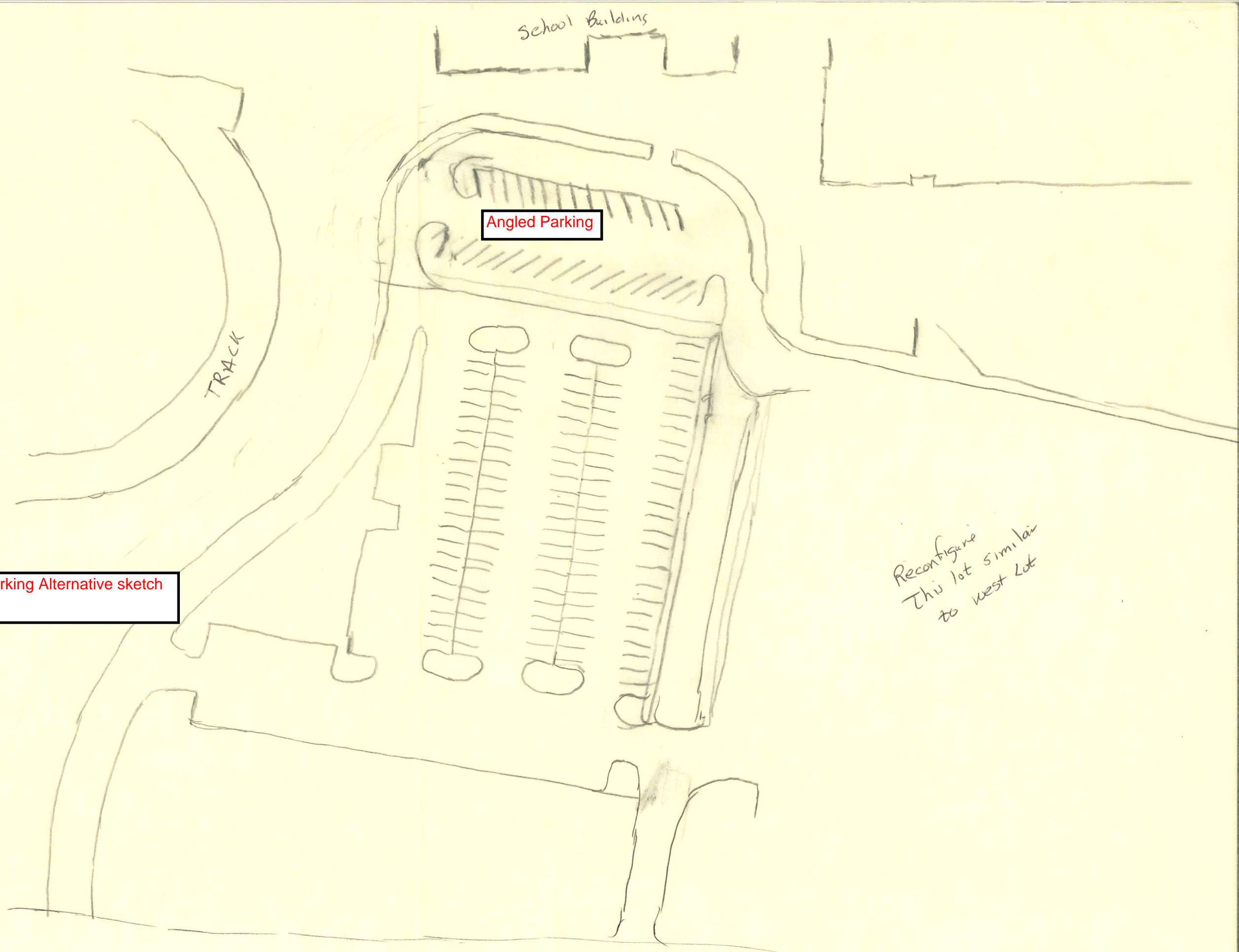
Item #	Doc	Description	Advantages	Comment	Design Team/District Recommendation	
E-4		Allow the use of riser cable for systems cabling in lieu of plenum cable	Reduce cost of project.	Cost determined by previous like projects.	ACCEPT: No plenum cable is planned for this project, so no savings	0
E-5		Allow 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 covers 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



Specialists in School Buildings

WOODLAND SCHOOL DISTRICT New High School Value Engineering Implementation Plan

Item #	Doc	Description	Advantages	Comment	Design Team/District Recommendation	
Recommended Additional Costs		\$26,000	Total Recommended Savings	(\$5,586,000)	Net Recommended Savings	(\$5,560,000)
Accepted Additional Costs		\$24,000	Total Accepted Savings	(\$3,313,000)	<u>Net Accepted Savings</u>	(\$3,289,000)



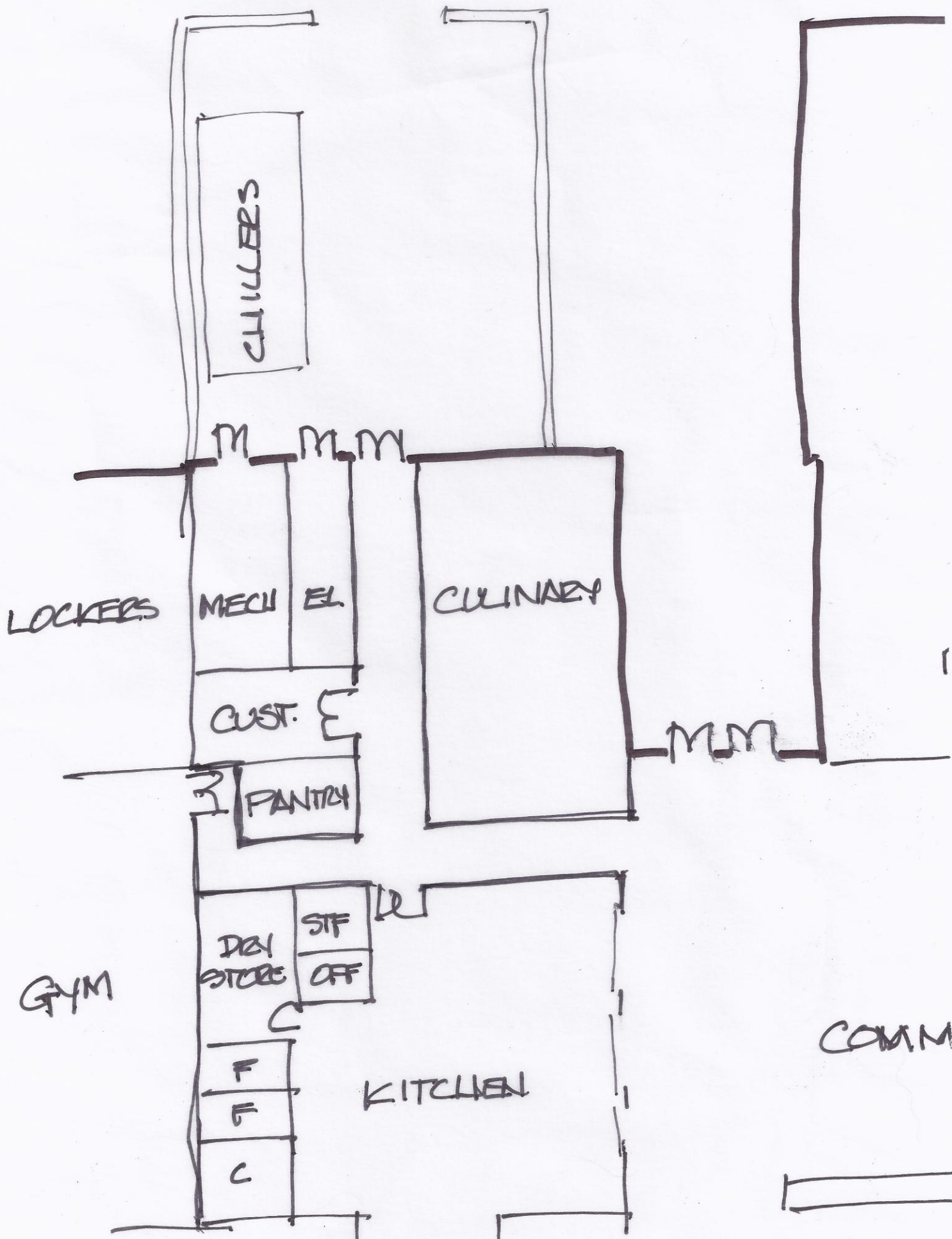
School Buildings

TRACK

Angled Parking

ITEM C-6: Parking Alternative sketch

Reconfigure
This lot similar
to west lot



CHILLERS

LOCKERS

MECH

EL

CULINARY

CUST.

PANTRY

GYM

DEP
STORE

STF
OFF

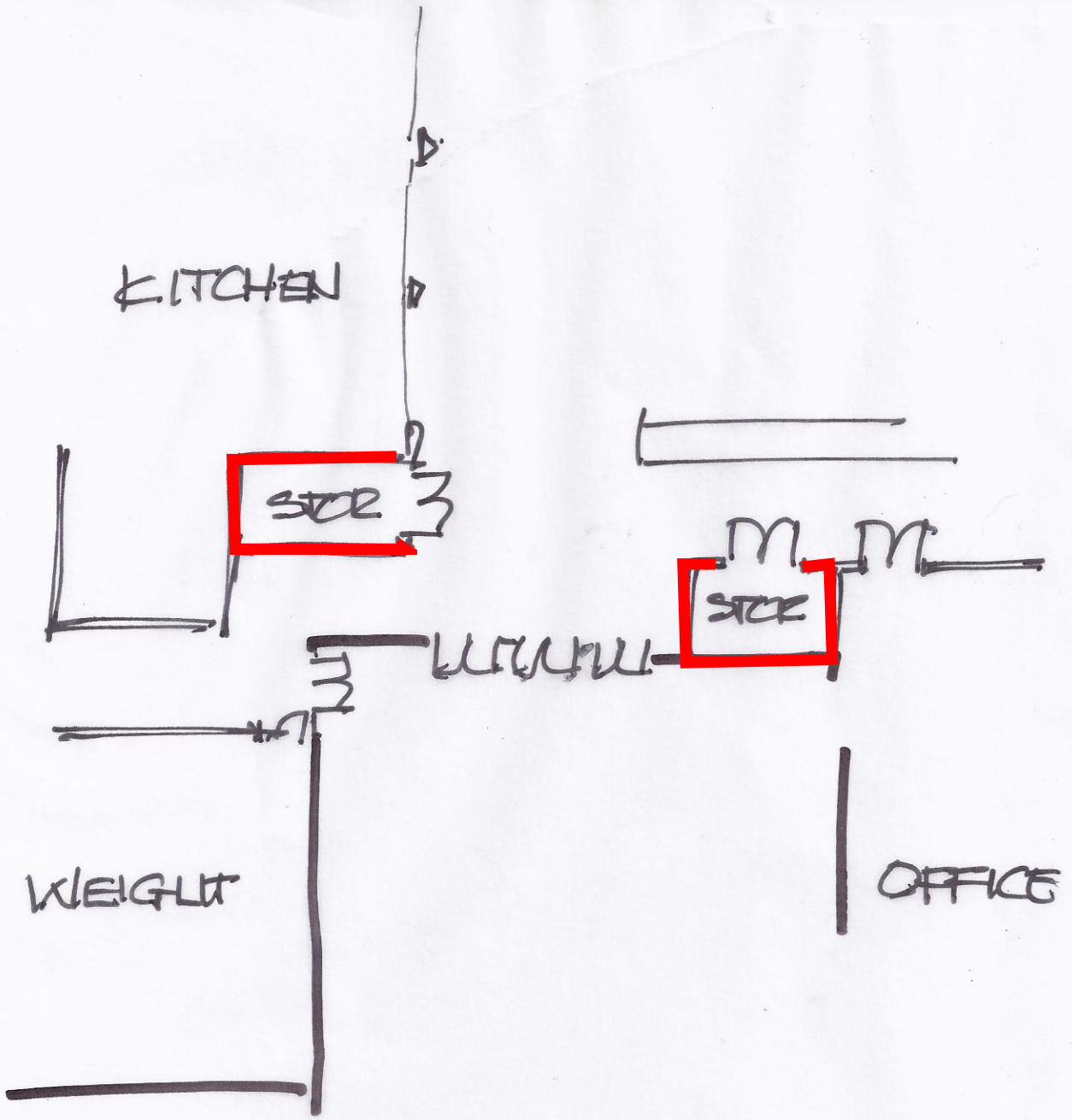
F

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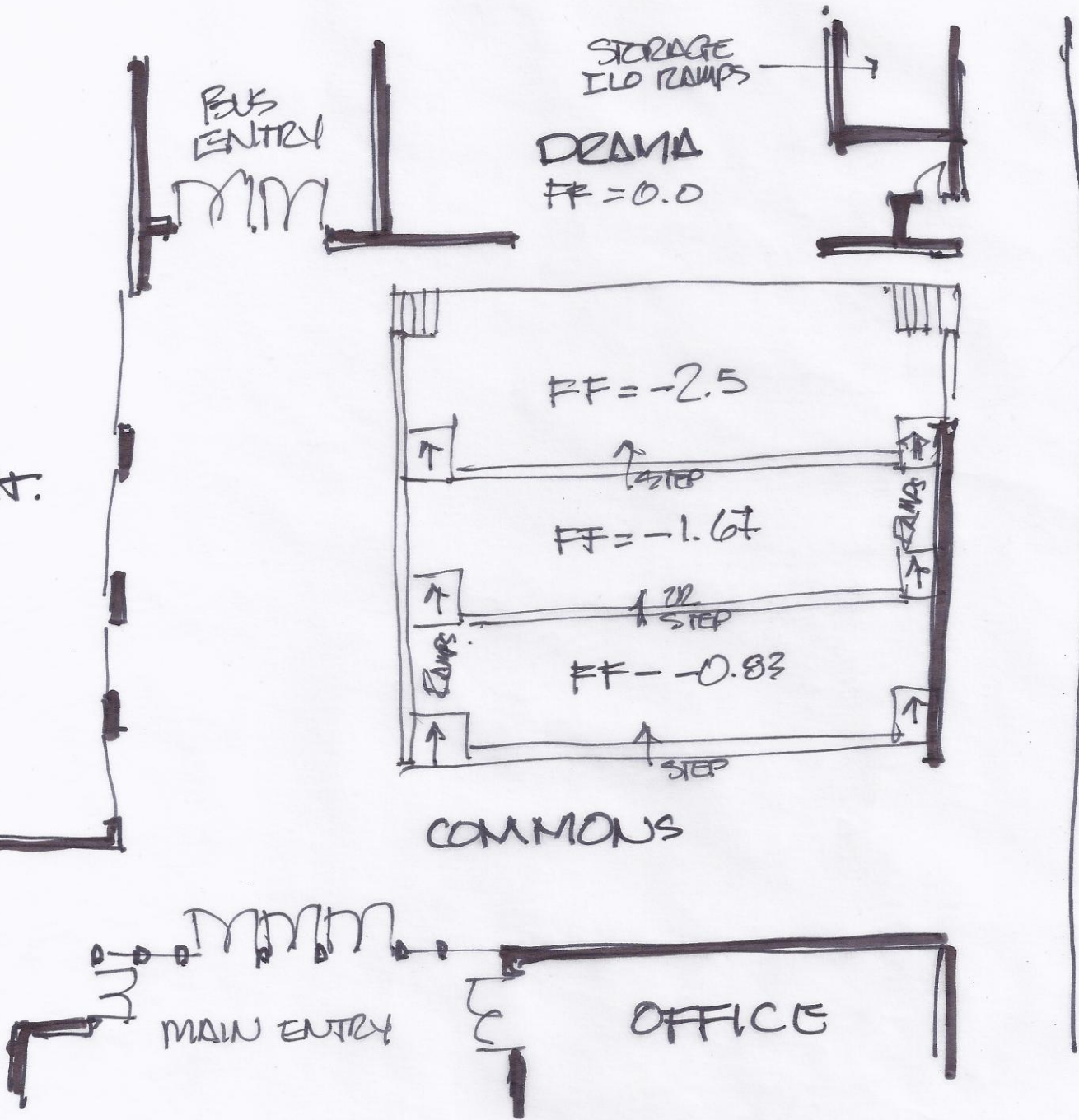
C

KITCHEN

COMM



ITEM A-2: Add Storage Rooms off Commons



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

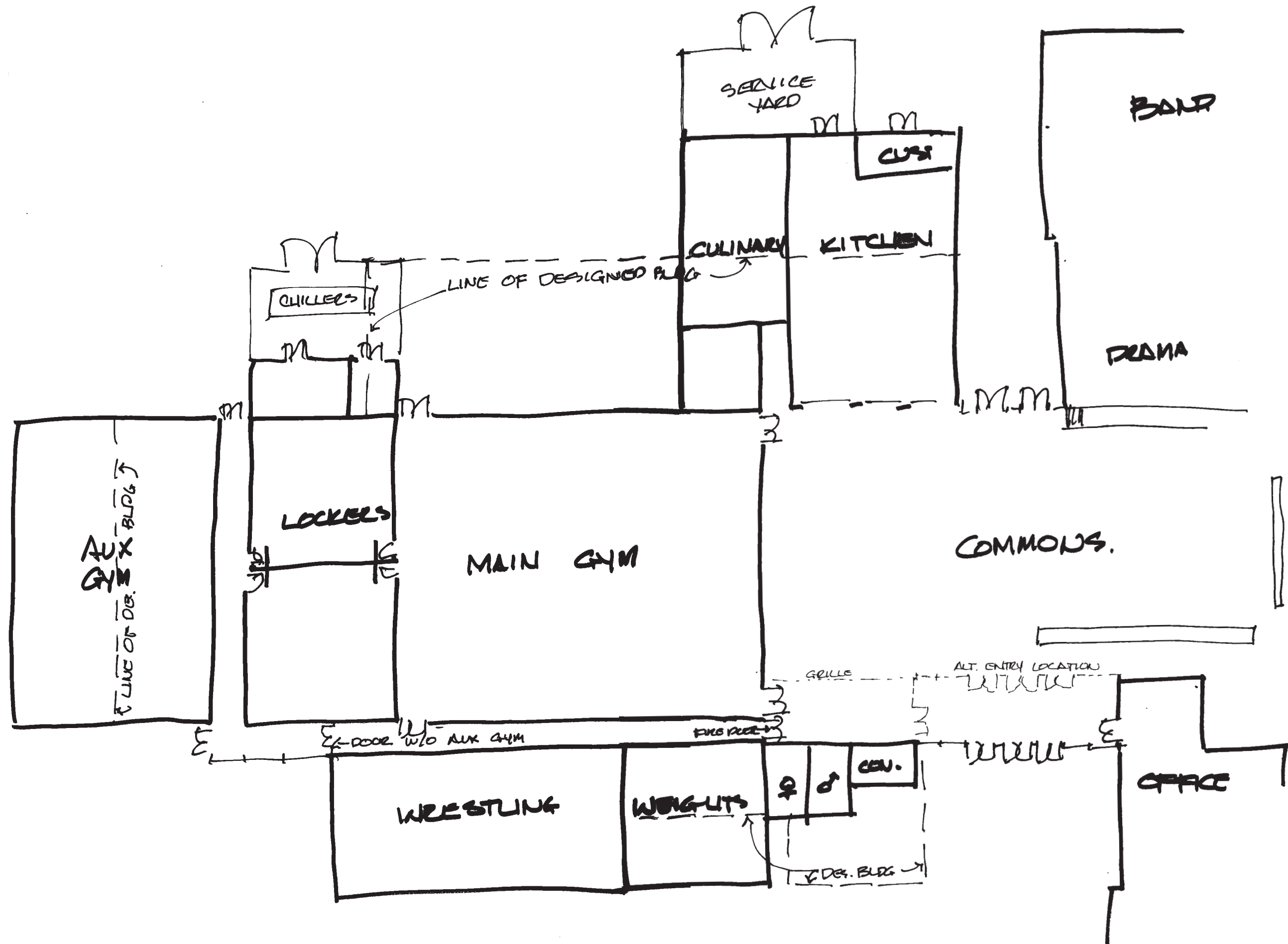


TIER OF SEATS
= 6 ROWS X 19 = 114

TIER OF TABLES
= 2 ROWS X 92 = 184

3 TIERS SEATING = 342 SEATS
 2 TIERS TABLES = 184 SEATS

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



ITEM A-13: Reconfigure Public Spaces

