UTSPH GARDEN

POR for Bidding

MASTER PLAN: The Master Plan for this project presents a fenced food garden, adjacent outdoor classroom and butterfly garden. The numbers on the Master Plan are used throughout this document as Master Plan Item 1. (title), Master Plan Item 2, (title), etc.

1. Site Preparation
	1. Features to be removed
		1. In the area bounded by the proposed fence on the *Master Plan*, the items to be removed from the site include all of the rocks that are part of the labyrinth, concrete edging, benches, existing plant material, irrigation system, etc. In the area on the *Master Plan* that is to the east of the fenced garden, the material to be removed includes the dwarf Asiatic jasmine ground cover and irrigation that would be affected by the retaining wall and the area above the retaining wall.
	2. Hand rail removal
		1. Two sections of the hand rail along the east side of the garden area are to be removed. These two sections are in the landings. In the lower landing, the two center posts of the rail should be removed and the rail removed to a point where it contacts the posts that are to remain. This will create an opening of approx. 8 ft. The cut ends should be burnished to be certain there is no hazard to people using the hand rail. The center post in the hand rail in the smaller, upper landing should be removed and the two sections of handrail should be cut to the point where they adjoin the two adjacent, outer posts. The cut ends should be burnished to be certain there is no hazard to people who use the handrail. Removal will enable entryways into the garden from the Grant Fay Park side of the garden. These entryways will butt against the cut ends of the handrail. The handrail sections to be removed should be the length of the landings in the sidewalk adjacent to the site. Two garden entryways, the main entryway and an accessible entryway, will be created where the sections of hand rail have been removed.
	3. Grading
		1. The site should be graded so that the area within the area to be fenced on the *Site Plan for Irrigation and Drainage* has a 1 % or greater slope in the north to south direction, i.e., toward Pressler Street. The site should be graded so that it is level in the east to west direction within the boundary of the fence. Extra soil will be needed to the southeast corner of this site to build the area up. A short section of retaining wall will be built were the slope is steeper.
		2. The area of the garden that lies east of the fence should be graded to drain toward Grant Fay Park. Extra soil should be deposited in the area that is to have the retaining wall so that the garden storage building and canopy are set at the level of the rest of the garden.
	4. Density of soil
		1. When soil compaction is needed, the soil throughout the site should be compacted to the density that would allow plant roots to grow through it, not to the density for building construction.
	5. Retaining Walls
		1. A section of retaining wall is to be built in the section of the area to the east of the garden where the outdoor classroom is to be located. This section of retaining wall is shown on the *Site Plan for Irrigation and Drainage*. Soil from within the area of the garden that is to be fenced will be graded into this area and a 28 ft. long wall of 2 layers of 8 in. x 8 in. x 16 in. solid concrete blocks should be installed to front this area where it will start the decline to the base of the UTSPH Building. The loose soil created by grading, which will be under the concrete block retaining, wall should be compacted to be certain the retaining wall stays in place.
		2. A section of retaining wall is to be built in the southeast corner of the area to be fenced. This section of retaining wall is shown on the *Site Plan for Irrigation and Drainage*. Soil from within the area of the garden that is to be fenced will be graded into this area and a 15 ft. long wall of 2 layers of 8 in. x 8 in. x 16 in. solid concrete blocks should be installed to front this area where it will start the decline to the base of the UTSPH Building. This wall should be outside the fenced garden area and is different than the wall that bounds the Large Fruits Bed, *Item 12* on the *Site Plan for Irrigation and Drainage* and *Section 10.h* below, and *Diagram 10.h*. The loose soil created by grading, which will be under the concrete block retaining, wall should be compacted to be certain the retaining wall stays in place.
2. Water distribution at the site should be removed within the area that is to be bounded by the fence. Existing Irrigation should be kept intact in the Butterfly Garden area on the east side of the fence except for the irrigation that exists in the area of the canopy, storage building and the elevated portion of the entry to the garden.
3. Topsoil should be added to the site and graded to a depth of approximately 12 in.
	1. This topsoil should be a sandy loam and NOT a bed mix that contains a lot of organic matter.
	2. This topsoil must NOT be fill soil often used around building sites.
4. Drainage: see drainage diagram on the *Site Plan for Irrigation and Drainage.*
	1. Surface drainage should be provided as described in *Section 1.c*. Grading, above. It will be supplemented by two catch basins as described in *Section 1.c*., below. These catch basins will connect into the south portions of two of the drain lines described in *Section 4.b*., below.
	2. Internal drainage should be provided by 4 in., perforated, corrugated drain pipe with sock. This pipe should be installed in the layer of topsoil described in *Section 3* , above. It should be installed so that the bottom of the drain pipe is set at 10 in. below the surface of this layer. It should be in straight lines following the slope of the site and draining from north to south. It should follow the slope established in preparation of the site. Individual lines should not have undulations up and down, but should be uniform in depth. The position of the drain lines is shown on the *Site Plan for Irrigation and Drainage*. Each of the 4 in. lines should have caps installed on the upper end and a mesh screen on the lower end to prevent animals from entering. The lower ends should drain into the grassy area to the south end of the site, ending outside the garden fence below the raised bed on the south end of the garden site.
	3. Drain Boxes: Two catch basin / drain boxes should be set into the south end of the garden, just north of the raised bed for fruits. These catch basins should connect to the appropriate line of 4 in. drain pipe nearest their site. These two catch basins are marked on the *Site Plan for Irrigation and Drainage*. The purpose of the two catch basins is to enable drainage of water that collects on the north side of the fruit bed that runs from east to west on the south side of the garden site. Catch Basin should be equivalent to NDS 12-in, W Square /Catch Basin, Model 1200BKIT.
	4. Prepare a map of the final drainage scheme.
5. Water supply lines (*Site Plan for Irrigation and Drainage* and *Diagram 5.e*)
	1. Back Flow Prevention: If the water supply is not protected by a back flow prevention valve, one should be installed at the origin of the water lines that run through the garden. This source is in the existing box which is located near the main gate through which one would enter the fenced area of the garden.
	2. Water distribution lines: Two types of water distribution lines will be installed, 1) 1-in. PVC schedule 40 pipe will be the main supply line that runs east-west across the garden area from the water source, and 2) lateral water supply lines will be ¾ in. PVC schedule 40 pipe. These two types of lines are marked on *Site Plan for Irrigation and Drainage*.
	3. In-line cutoff valves: Below ground in-line cutoff valves should be established in the ¾ in. lines where they adjoin the 1 in. PVC main line at the points marked on the *Site Plan for Irrigation and Drainage*. These valves should be located in standard, below grade plastic valve boxes. All of the in-line cutoff valves should be housed in boxes in the ground in positions that will minimize their effect on pedestrians. The best place for each of the boxes would be along the edge of a walkway. All in-line cutoff valve boxes should be flush with the level of the decomposed granite walkways. These cutoff valves should be comparable to American Valve 3/4 –in. PVC Sch 40 Socket In-line Ball Valve, Model Number P200S 3/4
	4. The main water supply line is a 1 in. diameter PVC Schedule 40 pipe that comes off the water supply to the garden. The lateral distribution pipes will be ¾ in. diameter PVC Schedule 40 pipe.
	5. Connection of supply lines to faucets and valves should be as shown in *Diagram 5.e*. Nearly all garden beds will have a faucet or valve in one or more of the corners of the bed. Diagrams for the individual beds show how water is to connect to these beds.
	6. Faucets should be ¾ in. brass, quarter turn hose bibbs, comparable to American Valve ¾ in. Female Hose Bibb, Model M76QT ¾ IN. Ball valves should be ¾ in. PVC ball valves with female hose bibb inlet end to attach to a threaded hose bibb elbow and male hose bibb outlet end so that they can receive a pressure regulator with male hose bibb thread.
	7. Exposed pipes should be insulated with foam tubular pipe insulation.
	8. Prepare a map of the final underground water supply system.
6. Surfaces (*Master Plan* and *Site Plan for Irrigation and Drainage*)
	1. Decomposed granite will be used for all of the walkways between the various types of planter and for the two entryway paths. Decomposed granite, sized for ADA requirements for wheel chairs and walkers, is to have all sizes ¼ in. or smaller. Pieces of granite larger than ¼ in. diameter must be screened out. Decomposed granite should be in a three inch layer on top of the topsoil. It must be compacted to prevent uneven settling.
	2. Pavers will be used for surfacing under the main garden pergola and for surfacing the entryway to the garden and the adjacent outdoor classroom area. Pavers should be standard rectangular paver size 4 in. x 8 in. would be an effective 3.8 in. x 7.7 in. x 2.5 in. The color should be standard red brick paver. The pavers should be set on 1 inch of coarse angular sand. The pavers must be set at the same level and tamped into the surface so that they do not settle after installation. Sand should be swept between the cracks of the pavers once the job has finished.
7. Entryways
	1. *Master Plan Item 1, Main Entryway* , *Master Plan Item 2, Accessible Entryway* and *Diagram 7.a*

The entryways are to be built in the openings where the hand rail has been removed. At both the main garden entry and at the accessible entry identical structures are to be constructed of cedar or cypress in the size specifications on the plan. Each structure will consist of 4 – 4 in. x 4 in. posts, 4 in. x 4 in. beams, 2 in. x 4 in. rafters and 2 in. x 2 in. lath across the top. Each side panel will include 2 in. x 2 in. lath set in the pattern noted on the plan.

* 1. Hardware: The hardware for the entryways should be hot dipped galvanized to prevent staining the wood and to not have a chemical reaction with the wood.
	2. Walkways are to be decomposed granite until they reach the area of the pavers. The upper walkway, which runs from the accessible entry to the outdoor classroom should be level from side to side and have no greater slope than 5%. The lower walkway, which runs from the main entry to the outdoor classroom has an incline which is to be handled by putting risers to create steps where the walkway slope steepens near the outdoor classroom. The bed of decomposed granite for the walkways should be 3 inches thick after it has been packed. The expanded area for a bench and seating should also be surfaced with decomposed granite. The bench should be of the type described in section 13.a.1 below. This bench should be made of cypress or cedar and sanded and finished to reduce the possibility of splinters.
1. Fence
	1. *Master Plan Item 3. Fence* and *Diagram 8.a, and Diagrams 8.c.v.1,* *8.c.v.2,* and *8.c.v.3*
	2. Contour: The fence should be level in the east to west direction and follow the slope in the north to south direction.
	3. The fence is to be built with rough cedar or cypress lumber and livestock panels.
		1. Posts will be 6 in. x 6 in. x 8 ft. and set 2 ft. into the ground with concrete mix at the base. Each post will be capped with a cedar post cap. The posts will be on 8 ft. 6 in. centers to accommodate the livestock panels. Shorter spacings will be used in areas that do not have adequate space for this distance between posts. The 8 ft. x 50 in. livestock panels are to be inserted between the posts without being cut. The livestock panels will be framed with 2 in. x 4 in. boards. The bottom of the bottom rail will be set 6 in. above ground level after the 3 in. layer of decomposed granite has been applied and the bottom of the top rail will be set 46 in. above the top of the 2 in. x 4 in. bottom rail. The livestock panel should be positioned so that it is in the center of the 2 in. x 4 in. top rail and 2 in. x 4 in. bottom rail, i.e., 2 inches below the top edge of the top rail and 2 in. above the bottom edge of the bottom rail.
		2. The 8 ft. x 50 in. livestock panels will have rectangles that are 8 in. along the horizontal and 6 in. along the vertical. The two bottom rows of rectangles will be 8 in. L x 4 in. H. Livestock panel will be 4 gauge, galvanized wire. The livestock panels should be hung so that the rectangles appear in continuous lines from one section of the fence to the next.
		3. Cap boards are to be 2 in. x 6 in. x 8 ft. and attached to the posts at the ends with two screws on each end and to the 2 - 2 in. x 4 in. top rail boards every 2 ft. along their length. The cap board will be 6 in. below the top of the post.
		4. All boards are to be fastened to the posts with 3 ½ in. long wood screws appropriate for use with cedar or cypress without causing staining or corrosion. Cap boards would be attached to the 2 in. x 4 in. rails with the same type of screw. Livestock panel would be held in place with 1 in. hot dipped galvanized staples. These staples will not be visible as they will be bounded on both sides by the 2 in. x 4 in. wood.
		5. Gates: There will be two gates through the fence. Position are marked on the Site Plan.
			1. Large, main gate: This gate is a double panel that enters the garden into the main pergola. The two panels are identical and should be hung to swing out of the small fenced area of the garden. This gate has two panels, each 3 ft. wide. The top section is a portion of the livestock panel. The bottom section of the gate is ¾ in. tongue and groove cedar or cypress boards. The 2 in. x 4 in. boards framing this area should be grooved to enable the wood to be nestled in about 1 inch. The top panel is livestock panel. To insert the livestock panel into the opening, holes should be drilled into the 2 in. x 4 in. to enable a snug fit. The two panels of this gate should be fastened by putting a small piece of pipe in the ground below the edge of one gate. This gate will have a sliding metal peg which will go into this pipe to anchor it. When the gate panel is open, it should have a device that can anchor it to the fence.
			2. Small gate on north side of fence. This is a single, 4 ft. wide, gate panel that will swing outward. It details are similar to the larger, 2 panel gate. The hardware should be set on this gate so that it swings out of the garden.
			3. Hardware on both gates should match. The style should be aged in appearance. It should consist of three hinges per side of gate. The latch mechanism should fasten the gate when it is closed. It should also have a hasp for being locked. The lock should be on the inside of the garden. The gate should have a mechanism to fasten it to the rail of the gate so that when it is open it does not blow in the wind.
2. Outdoor Classroom / Work Area
	1. *Master Plan Item 4. Canopy Pergola*  and *Diagrams 9.a.1, .2, .3, .4*

The outdoor classroom area is tied together by this shade pergola. It uses two of the posts in the Wall Planter *(Section 11.f and Diagrams 11.f.1, .2, .3)*. The Tool Display Cases (*Section 9.e* and *Diagram 9.e*) are under the shade pergola. The shade pergola is backed by the garden storage (*Section 9.d* and *Diagrams 9.d.1, .2, .3, and .4*,) and tool washing basin, (*Section 9.c* and *Diagram 8.d*) and also covers the Produce Handling Basin (*Section 9.b*)

The support of the shade pergola is eight 4 in. x 4 in. x 12 ft. posts. The two posts on the west end are part of the Wall Planter. Four 2 in. x 8 in. x 12 ft. support beams are mounted at a height of 8 ft. at the bottom of the support beam. Eleven 2 in. x 6 in. x 9 ft. cross beams span the support beams as shown in Diagram 9.a.2. The cross beams are notched 2 inches deep to fit into the tops of the support beams. Supported beams are bolted to the tops of the posts and cross beams are attached to the support beams with appropriate length screws. Braces should be installed from the posts to the cross beams and support beams as shown in the diagrams. Posts are to be cemented into the ground.

Produce Handling Basin should be fronted with horizontal lap fiber cement siding that matches the siding on the storage. This siding would be attached to a 2 in. x 4 in. frame on the east and north sides of the shade pergola. The height of this siding, 40 inches, is just below the height of the produce handling basin. Trim should match the color and type of material used for the siding.

Sunbrella shade screen fabric, Sky Blue, is to be installed under the top of the shade pergola. This shade screen fabric should be installed so that it can be lowered to remove leaves and other debris as the situation warrants.

* 1. *Master Plan Item* 5. Produce Handling Wash Basin
		1. The sink and drain unit 90 in. long, 24 in. deep, 44 in. high; 2 sink basins, 2 drain board areas; faucets; faucet spray hose. Length may vary, but it is to fit between two posts of the shade structure that is over it. These two posts are 7 ft. 8 in. apart.
		2. NOTE: These units are often available through surplus programs. A unit that is no longer useable in a restaurant, cafeteria or other food preparation facility would be acceptable for this project.
	2. *Master Plan Item 6. Tool Washing Basin* (*Diagram 9.d*)
		1. This basin is an area 2 1/2 ft. x 2 1/2 ft. It has 2 in. x 8 in. wood edges. The wooden frame should be 2 in. above the paver surface and 2 in. below the height of the bottom of the door that swings over it. In the back it should have a post that rises 4 ft. above the frame to enable the door to be hooked to it when the door is open. It is to be filled with pea gravel. and has 2 lines of 4 in. perforated drain pipe under the gravel surface. These drain lines should connect to the lateral drain that runs from the sink to the drain basin at the base of the UTSPH building.
	3. *Master Plan Item 7. Garden Storage*  and *Diagrams 9.d.1, -2, -3, and -4*.
		1. NOTE: The garden storage should have a floor of 40 to 50 sq. ft., doors that open wide enough to store wheel barrows, ventilation at the top to reduce the heat, tool racks to hang long-handled garden tools, viz. garden rakes, leaf rake, round-pointed shovels, garden hoes, swivel hoes, and a pitchfork, and shelves in the sides and above the tool rack.
		2. 4 ft. wide, 12 ft. long, 8 ft. high; doors open most of the front; shelves in the sides; hooks to hang garden tools; floor space for wheel barrows, buckets, small tiller; same finish as that used for the entry ways, fence and pergola.
		3. Ventilation is to be achieved by keeping the area under the eaves that leads to the rafters open so that air could flow through under the roof. This open space is to be protected from animals, birds and insects by putting ¼ in. silver galvanized mesh hardware cloth.
		4. The proposed structure is shown in a series of diagrams.
			1. Basic structure: The storage is built on 8 - 4 in. x 4 in. x 10 ft. pressure treated posts that are anchored in concrete mix.
			2. Floor joists support a ¾ in. thick plywood.
			3. Wall studs between the posts are marked with their spacing. This spacing is important in part because the studs support framing for shelves and tool rack.
			4. Rafters will be 2 in. x 4 in. boards attached to 2 in. x 6 in. plates attached to the tops of the posts. Wall studs will also be anchored to this “rafter plate”.
			5. Roof battens will be 1 in. x 4 in. lumber and attached to the rafters. On the end walls the space between these battens should be sealed to prevent pests from entering.
			6. The roof will be V metal sheeting. The area under the eaves should have ¼ in. metal hardware cloth to allow air flow and this may also be used to seal the spaces between the battens.
			7. Siding will be cement fiber lap siding, ex. James Hardie siding. The corners will be enclosed with vertical corner strips, approx.. 4 in. wide. The siding is to resemble aged cedar and have the wood grain appearance. Hardie lap siding is preferred in the Heathered moss color. If that color is not available, other colors, in order of preference, would be Monterey taupe, Cobble stone, Autumn tan and Navajo beige.
			8. Doors will be plywood fronted by vertical siding of the same type and texture as the horizontal lap siding. Siding should be mounted on ¾ in. plywood and the plywood should have 1 in. x 4 in. framing wood on the interior of the doors to keep it from warping.
			9. Trim for the corners, doors, etc. should be the same composition material as the siding and door fronts.
			10. Door hardware should be sturdy, metal hardware typical of what would be found on an old barn or old house. It is to include hinges that can carry the weight of the doors, sturdy latches to keep the doors shut, hasps to have a lock on each of the two door panels, strap handles to open and close the doors and hooks to anchor the doors to the sides of the building when they are fully open.
			11. Shelves are depicted in Diagram 8.d.4. Dimensions and spacing are given in the diagram. Tool rack for hanging long-handled garden tools is also shown in this diagram.
	4. *Master Plan Item* 8. Tool Display Cases
		1. The tool cabinet / display case is to be attached to the exposed 4 in. x 4 in. posts that form the back of the wall planter, *Section 9b*, below.
		2. The cabinet(s) for enabling tools is to have a transparent, plexiglass/acrylic, front and have white peg board installed in the inside back to enable easy mounting of tools and labels. There should be no exterior holes so that insects and pests do not use it for nest sites. It is to be approximately 12 ft. long and 4 ft. high with an inside depth from front to back of approximately 4 in. It should have an exterior surface that can withstand the weather since it will not be protected by more than a small slanted “roof” to allow rain to drip away from the transparent front.
		3. The transparent front should be divided into doors that are two to three ft. wide and open to expose four to six ft. of the interior. The doors should open horizontally.
		4. The cases can be commercial type cases, but could also be made with wood and acrylic and mounted to the back of the wall planter. Acrylic doors could be sliding or on hinges to open out. If they are on hinges, note the distance of two of the posts of the pergola so that the doors can open at least 90 degrees.
1. Garden Pergola / Meeting Area
	1. *Master Plan Item* 9. Garden Pergola / Meeting Area *(Diagrams 10.a.1, 10.a.2, and 10.a.3.)*
	2. The garden pergola is the dominant feature in the garden. Dimensions, wood sizes, etc. are presented in the diagrams for this pergola. Hardware should be hot dipped galvanized bolts, screws, etc. or other metal that can be used on cedar or cypress wood without staining or corroding. The entire surface is to have pavers and so interior height to support beams should be from the surface of the pavers.
2. Planters: Each of the planters to be installed in the garden is diagrammed below. The Master Plan Item Numbers are offered as a cross check for these planters.
	1. NOTE 1. Lumber for all planters is to be planed ACQ pressure treated lumber or planed or rough cypress. Since the dimensions will be different if the lumber is planed or rough, the dimensions of the planters will be slightly different and the contractor must allow for this difference.
	2. NOTE 2. Hardware for all planters is to be hot dipped galvanized hardware. This applies to lag bolts, lag screws, nails, etc. Both cypress and ACQ treated wood require HDQ fasteners. The terms lag bolts and lag screws are often used interchangeably in the hardware trade, but screws are to be used where screws are specified.
	3. NOTE 3. The final height of some planters in the *Master Plan* is after a 3 in. layer of decomposed granite has been applied in the walkways. Therefore, it would be important to allow for this 3 in. depth of decomposed granite by putting spacers under these planters during construction since this will likely be done before the decomposed granite has been spread and compacted.
	4. NOTE 4. Planting Media: Four types of planting media will be used in this garden: 1. Fruit bed mix, 2. Vegetable bed mix, 3. Compost and 4. Peatlite Mix with enhanced drainage, such as Metro Mix 340 or 380. The two bed mixes should be sourced from The Ground Up or Nature’s Way Resources. The Compost should be sourced from Nature’s Way Resources. (or could this read The two bed mixes and compost should be of a quality comparable to that produced by Nature’s Way Resources?)
	5. NOTE 5. Water Source and Irrigation for planters: Each garden area, bed and planter will have one or more faucets or valves. The types of faucets and valves is indicated in the description for the planter. The faucets will be used to fill buckets or other containers and for garden hoses. The valves will be used to attach soaker hoses or a drip tape system. Therefore, each valve should not point downward, but be mounted horizontally to aim outward across the bed, as shown in *Diagram 5.e*. A 10 PSI 0.75”Hose Thread Pressure Regulator, 1/10 to 7 GPM, 0.69 BAR, Hose x Hose pressure regulator is to be attached to the threaded male end of the ball valve.
	The faucets are to be used to attach garden hoses or to fill buckets. These faucets should point downward, and be mounted high enough to put a 5 gallon bucket under them. All faucets and valves should have hose bibb threading to enable a standard ¾ in. garden hose to be attached.
	6. *Master Plan Item* 10. Wall Planter (*Diagrams 11.f.1, -.2, -.3*)
		1. The wall planter has an overall dimension of 7 ft. high x 12 ft. long. Planters will be attached to the solid wooden wall and PVC irrigation will be installed on both ends of the wall.
		2. Two of the posts of the wall planter are shared with the shade pergola. These posts are to be 12 ft. long, with specific height, etc. given on the plan for the *(Diagram 9.a.2).* The other posts in the wall are to be 10 ft. long 4 in. x 4 in. posts set to a height of 7 ft. . The posts are to be set 3 ft. into the ground and each anchored with concrete mix.
		3. The west side of the wall planter is to be a solid panel of 2 in. x 8 in. x 12 ft. boards. Boards are to be attached to the 4 in. x 4 in. posts with 1/4 in. x 3 ½ in. lag screws. 2 lag screws should be used at each point of attachment to the posts, at the ends and in-line. 4 lag screws will be needed for points where two boards come together, end to end.
		4. Cap Board is to be over the wall section of this planter and the back wall to which the Display Tool Cases are attached.
		5. Planter boxes should be 10 in. wide, outside dimension, but vary in height and length as shown in *Diagram 11.f.2*. Construction is shown in *Diagram 11.f.3*.
		6. Planting medium is to be Metro Mix 340 or equivalent.
		7. Water and Irrigation: The water system is on both sides of the planter. PVC pipe, ¾ in. diameter, leads to Tee’s and in-line ¾ in. PVC ball valves. Each ball valve is to have a 10 PSI 0.75”Hose Thread Pressure Regulator, 1/10 to 7 GPM, 0.69 BAR, Hose x Hose pressure regulator attached to the threaded male end.
	7. *Master Plan Item* 11. Fruit Bed with T post trellis (*Diagram 11.g*.)
		1. This bed is to be 4 ft. wide x 24 ft. long x 16 in. deep. Corners, joints and in-line supports are to be secured using ¼ in. x 3 ½ in. hot dipped galvanized lag screws into 2 ½ ft. long sections of 4 in. x 4 in. lumber. The 4 in. x 4 in. support posts should be at 6 ft. intervals. Each end to be fastened should have 2 lag screws, joints will need 4 lag screws. Pilot holes should be used if the wood tends to split. The heads are to be drawn down to the surface of the boards, but should not be countersunk. The top of the 4 in. x 4 in. supports should be flush with the top of the 2 in. x 8 in. boards. The bottoms should be anchored into the soil to a depth of approx. 14 in. The 4 in. x 4 in. supports do not need to be anchored in concrete mix.
		2. Four - 8 ft. long, heavy duty Tee posts should be set at 6 ft. intervals. These posts are to be set 2 ft. below the soil surface at the top of the raised bed. The Tee posts should have anchoring flanges at the base, evenly distributed studs and painted with green enamel paint. White tops on T posts is acceptable.
		3. Water and Irrigation: The water supply for this bed is supplied in both corners in the front of the bed to allow for the different berries that will be grown in the bed. Water should come in just above the surface of the bed as shown in *Diagram 5.e*. Each ball valve is to have a 10 PSI 0.75”Hose Thread Pressure Regulator, 1/10 to 7 GPM, 0.69 BAR, Hose x Hose pressure regulator attached to the threaded male end.
		4. Planting Medium: This bed is to be filled with vegetable bed mix level with the top of the wooden frame after settling has occurred. A 1 in. layer of compost should be applied to the surface once the medium has settled.
		5. Four – 3 gallon southern highbush blueberry plants are to be planted between two of the pairs of T posts and 4 – 1 gallon blackberry plants are to be planted between the other 2 pairs of T posts. The varieties depend on availability, but variety should be approved by the garden project leader.
	8. *Master Plan Item 12. Large Fruits Bed* see also (*Site Plan for Irrigation and Drainage*, *Diagram 5.e*, and *Diagram 11.h.*)
		1. NOTE: The dimensions of this bed are determined by features outside the garden area. The bed is approximately 56 ft. long x 8 ft. wide, but the length and width at the ends of this bed is determined by the position of the entryway to the gate of the Centerpoint Energy Enclosure on the west side and the sharp decline on the east side. A small retaining wall would be built to provide support on this east side.
		2. The south side of this bed is to be made with a double row of 8 in. x 8 in. x 16 in. solid concrete blocks. The two rows of blocks should be staggered and the face of the top row set 1 in. back from the face of the bottom row so that this wall leans in to the raised fruit bed. The north side of this bed is to be made with a single row of 8 in. x 8 in. x 16 in. solid concrete blocks. Both rows of blocks must be set on a stable base of compacted earth and decomposed granite.
		3. Water and Irrigation: On each end of this bed a ¾ in. ball valve is to be mounted as shown in *Diagram 5.e*. The two ball valves, one on each end of the bed as shown in *Site Plan for Irrigation and Drainage*, should point toward the opposite side of the bed. Each ball valve is to have a 10 PSI 0.75”Hose Thread Pressure Regulator, 1/10 to 7 GPM, 0.69 BAR, Hose x Hose pressure regulator attached to the threaded male end.

In addition to the ball valves, a ¾ in. brass, quarter turn, hose bibb faucet should be mounted on an 18 in. riser near the center of the bed, just inside the row of concrete blocks, as shown in the irrigation *Site Plan for Irrigation and Drainage*. This faucet should point north in the direction of the School of Nursing Building and mounted so that the opening points down. The exposed pipe should be insulated.

* + 1. Planting medium: This bed is to be filled with fruit crop planting medium. After settling has occurred, the medium in this bed should be 2 ft. deep in the center, 16 in. deep and flush with the top of the double tier of concrete blocks on the south side and 8 in. deep and flush with the single row of concrete blocks on the north side. A 1 in. layer of compost should be applied to the surface once the medium has settled.
		2. Plants for this bed are to include 10 gallon fruit trees. These should include a Fuyu persimmon, Owari satsuma, Celeste fig, Purple Passion fig, Big Jim loquat, Acres Home pear, Garnet Sash pomegranate, Page mandarin and Nagami kumquat
	1. *Master Plan Item* 13. Vegetable Bed, 8 ft. (*Diagrams 11.i.)*
		1. These beds are to be 4 ft. wide x 8 ft. long x 16 in. deep. Corners and in-line supports are to be secured using ¼ in. x 3 ½ in. hot dipped galvanized lag screws into 2 ½ ft. long sections of 4 in. x 4 in. lumber. The 4 in. x 4 in. support posts should be at 4 ft. intervals. Each in-line or end support is to be fastened using 2 lag screws. Pilot holes should be used if the wood tends to split. The heads are to be drawn down to the surface of the boards but should not be countersunk. The top of the 4 in. x 4 in. supports should be flush with the top of the 2 in. x 8 in. boards. The bottoms should be anchored into the soil to a depth of approx. 14 in. The 4 in. x 4 in. supports do not need to be anchored in concrete mix.
		2. Water and Irrigation: Water for each of the vegetable beds is brought in according to the *Site Plan for Irrigation and Drainage* and *Diagram 5.e*. All of the vegetable beds are to have a ¾ in. PVC Ball Valve that terminates in male, hose bibb threading to attach the irrigation line. Each ball valve is to have a 10 PSI 0.75”Hose Thread Pressure Regulator, 1/10 to 7 GPM, 0.69 BAR, Hose x Hose pressure regulator attached to the threaded male end.
		3. Planting Medium: This bed is to be filled with vegetable bed mix to a level that is to be flush with the top of the wooden frame after settling has occurred. A 1 in. layer of compost should be applied to the surface once the medium has settled.
	2. *Master Plan Item* 14. Vegetable Bed, 12 ft. (*Diagrams 11.i.)*
		1. These beds are to be 4 ft. wide x 12 ft. long x 16 in. deep. Corners and in-line supports are to be secured using ¼ in. x 3 ½ in. hot dipped galvanized lag screws into 2 ½ ft. long sections of 4 in. x 4 in. lumber. The 4 in. x 4 in. support posts should be at 6 ft. intervals. Each in-line or end support is to be fastened using 2 lag screws. Pilot holes should be used if the wood tends to split. The heads are to be drawn down to the surface of the boards but should not be countersunk. The top of the 4 in. x 4 in. supports should be flush with the top of the 2 in. x 8 in. boards. The bottoms should be anchored into the soil to a depth of approx. 14 in. The 4 in. x 4 in. supports do not need to be anchored in concrete mix.
		2. Water and Irrigation: Water for each of the vegetable beds is brought in according to the *Site Plan for Irrigation and Drainage* and *Diagram 5.e*. All of the vegetable beds are to have a ¾ in. PVC Ball Valve that terminates in male, hose bibb threading to attach the irrigation line. Each ball valve is to have a 10 PSI 0.75”Hose Thread Pressure Regulator, 1/10 to 7 GPM, 0.69 BAR, Hose x Hose pressure regulator attached to the threaded male end.
		3. Planting Medium: This bed is to be filled with vegetable bed mix to a level that is to be flush with the top of the wooden frame after settling has occurred. A 1 in. layer of compost should be applied to the surface once the medium has settled.
	3. *Master Plan Item* 15. Vegetable Bed, 20 ft. (*Diagrams 11.i.)*
		1. These beds are to be 4 ft. wide x 20 ft. long x 16 in. deep. Corners, joints and in-line supports are to be secured using ¼ in. x 3 ½ in. hot dipped galvanized lag screws into 2 ½ ft. long sections of 4 in. x 4 in. lumber. The 4 in. x 4 in. support posts should be at 5 ft. intervals. Each in-line or end support is to be fastened using 2 lag screws, joints will required 4 lag screws. Pilot holes should be used if the wood tends to split. The heads are to be drawn down to the surface of the boards but should not be countersunk. The top of the 4 in. x 4 in. supports should be flush with the top of the 2 in. x 8 in. boards. The bottoms should be anchored into the soil to a depth of approx. 14 in. The 4 in. x 4 in. supports do not need to be anchored in concrete mix.
		2. Water and Irrigation: Water for each of the vegetable beds is brought in according to the *Site Plan for Irrigation and Drainage* and *Diagram 5.e*. All of the vegetable beds are to have a ¾ in. PVC Ball Valve that terminates in male, hose bibb threading to attach the irrigation line. Each ball valve is to have a 10 PSI 0.75”Hose Thread Pressure Regulator, 1/10 to 7 GPM, 0.69 BAR, Hose x Hose pressure regulator attached to the threaded male end.
		3. Planting Medium: This bed is to be filled with vegetable bed mix to a level that is to be flush with the top of the wooden frame after settling has occurred. A 1 in. layer of compost should be applied to the surface once the medium has settled.
	4. *Master Plan Item* 16. Vegetable Bed, 16 ft. (*Diagrams 11.i.)*
		1. These beds are to be 4 ft. wide x 16 ft. long x 16 in. deep. Corners, joints and in-line supports are to be secured using ¼ in. x 3 ½ in. hot dipped galvanized lag screws into 2 ½ ft. long sections of 4 in. x 4 in. lumber. The 4 in. x 4 in. support posts should be at 4 ft. intervals. Each in-line or end support is to be fastened using two lag screws, joints would require 4 lag screws. Pilot holes should be used if the wood tends to split. The heads are to be drawn down to the surface of the boards but should not be countersunk. The top of the 4 in. x 4 in. supports should be flush with the top of the 2 in. x 8 in. boards. The bottoms should be anchored into the soil to a depth of approx. 14 in. The 4 in. x 4 in. supports do not need to be anchored in concrete mix.
		2. Water and Irrigation: Water for each of the vegetable beds is brought in according to the *Site Plan for Irrigation and Drainage* and *Diagram 5.e*. All of the vegetable beds are to have a ¾ in. PVC Ball Valve that terminates in male, hose bibb threading to attach the irrigation line. Each ball valve is to have a 10 PSI 0.75”Hose Thread Pressure Regulator, 1/10 to 7 GPM, 0.69 BAR, Hose x Hose pressure regulator attached to the threaded male end.
		3. Planting Medium: This bed is to be filled with vegetable bed mix to a level that is to be flush with the top of the wooden frame after settling has occurred. A 1 in. layer of compost should be applied to the surface once the medium has settled.
	5. *Master Plan Item* 17. Espalier Planter *(Diagrams 11.m.1, -.2)*
		1. This bed is to be 3 ft. wide x 24 ft. long x 20 in. deep. The height of the trellis structure is 7 ft. from ground level or 5 ft. 4 in. from the top of the frame of the planting bed.
		2. This planter bed at the base is to be 3 ft. wide x 24 ft. long x 20 in. deep. Corners, joints and in-line supports are to be secured using three ¼ in. x 3 ½ in. hot dipped galvanized lag screws into 3 ft. long sections of 4 in. x 4 in. lumber. The 4 in. x 4 in. support posts should be at 6 ft. intervals. Each in-line or end support is to be fastened with 3 lag screws, 6 lag screws will be used for joints. Pilot holes should be used if the wood tends to split. The heads are to be drawn down to the surface of the boards, but should not be countersunk. The top of the 4 in. x 4 in. supports should be flush with the top of the 2 in. x 8 in. boards. The bottoms should be anchored into the soil to a depth of approx. 14 in. The 4 in. x 4 in. supports do not need to be anchored in concrete mix.
		3. This bed is to be filled with vegetable mix to a level that be 1 in. above the top of the wooden frame after settling has occurred.
		4. The trellis structure is to use 4 in. x 4 in. x 10 ft. posts at 6 ft. intervals. These posts are to stand 7 ft. above the surface of the ground, 5 ft. 4 in. above the frame of the raised bed. The posts will be set 2 ½ ft. into the ground below the planter base and each post is to be anchored with 1 bag of concrete mix. A 2 in. x 4 in. rail is to be inset along the top of the posts so that the surfaces of the post and the post and 2 in. x 4 in. are flush. This is essential for proper mounting of the cattle panel. A 2 in. x 6 in. board is to be mounted horizontally as a top rail along the tops of the posts and attached 2 in. x 4 in. board.
		5. Cattle panel is to be mounted from the bottom of the 2 in. x 6 in. top rail. Two sheets of cattle paned will be needed, each cut to a 12 ft. length. The remnants should be reserved for use in other parts of the garden. The cattle panel is to be attached to the posts and top rail with 1 ½ in. hot dipped galvanized staples (steeples); this should be done to every second lateral on the posts and every third lateral on the 2 in. x 4 in. under the top rail. The bottom is to be left unsecured.
		6. Planting Medium: This bed is to be filled with fruit bed mix to a level that is to be flush with the top of the wooden frame after settling has occurred. A 1 in. layer of compost should be applied to the surface once the medium has settled.
		7. Plants for the espalier bed should include 5 gallon Improved Meyer lemon, Carnaval apple, and Clementine mandarin orange.
		8. Water and Irrigation: Two ball valves, one on each end of the bed as shown in *Site Plan for Irrigation and Drainage*, should point toward the opposite side of the bed. Each ball valve is to have a 10 PSI 0.75”Hose Thread Pressure Regulator, 1/10 to 7 GPM, 0.69 BAR, Hose x Hose pressure regulator attached to the threaded male end.
	6. *Master Plan Item* 18. Compost Area (Diagram 11.n)
		1. The compost area is an open space, approximately 8 ft. long and four ft. deep. A water faucet will be plumbed to the area so that it is along the south side and adjacent to the Espalier Planter in *Diagram* 10.
		2. The small composters that will be used will be a separate item and not the obligation of the contractor.
		3. Water and Irrigation: A ¾ in. brass, quarter turn, hose bibb faucet should be mounted on an 18 in. riser near the center of the bed, just outside the frame of the Espalier Bed, Diagram 10.m.1, as shown in the irrigation *Site Plan for Irrigation and Drainage*. This faucet should point north in the direction of the main garden School of Nursing Building and mounted so that the opening points down. The exposed pipe should be insulated.
	7. *Master Plan Item* 19. Multi-level Bed *(Diagrams 11.o.1, -.2)*
		1. NOTE: The final heights of this planter are to be after a 3 in. layer of decomposed granite has been applied in the walkways. It is important to put spacers of some type under the planter to allow for this depth.
		2. This bed is a series of 4 - 4 ft. x 4 ft. planting areas, each set a different height.
		3. Each of the 4 beds is to be 4 ft. wide x 4 ft. long. The 4 depths are 8 in., 16 in., 24 in. and 32 in. The four beds are contiguous and share some common structure. Corners and in-line supports are to be secured using ¼ in. x 3 ½ in. hot dipped galvanized lag screws into 4 in. x 4 in. posts set at different heights to accommodate the required heights. The 4 in. x 4 in. support posts form inside corners of each of the levels of the bed, but two are used where a joint is required between a 2 in. x 8 in. x 12 ft. board with a 2 in. x 8 in. x 4 ft. board, as shown in the Diagram. Each in-line or end support is to be fastened using 2 lag screws, 4 lag screws being required where two boards are to be adjoined. Pilot holes should be used if the wood tends to split. The heads are to be drawn down to the surface of the boards but should not be countersunk. The top of the 4 in. x 4 in. supports should be flush with the top of the 2 in. x 8 in. boards. The bottoms should be anchored into the soil to a depth of approx. 12 in. In two sections of the planter a 2 in x 8 in. x 3 ft. 9 in. board (approximate length) is attached at the bottom on the inside to act as support to prevent the planter from pushing outward from the weight of the bed mix. The 4 in. x 4 in. supports do not need to be anchored in concrete mix.
		4. Water and Irrigation: Water for each of the sections of this multilevel bed is to be situated according to the *Site Plan for Irrigation and Drainage* and *Diagram 5.e*. All of the four sections of this bed are to have a ¾ in. PVC Ball Valve that terminates in male, hose bibb threading to attach the irrigation line. Each ball valve is to have a 10 PSI 0.75”Hose Thread Pressure Regulator, 1/10 to 7 GPM, 0.69 BAR, Hose x Hose pressure regulator attached to the threaded male end. Each ball valve is to point across each section of this bed toward Pressler St.
		5. Planting Medium: This bed is to be filled with vegetable bed mix to a level that is to be flush with the top of the wooden frame of each section after settling has occurred. A 1 in. layer of compost should be applied to the surface once the medium has settled.
	8. *Master Plan Item* 20. A-frame Planter *(Diagrams 11.p.1, -.2, -.3)*
		1. NOTE: This planter is actually two planter boxes connected by an A-frame trellis. The dimensions must be as marked since this planter is designed for people who use wheelchairs and to the dimensions of a person in the standard wheelchair.
		2. NOTE: The final heights of this planter are to be after a 3 in. layer of decomposed granite has been applied in the walkways. It is important to put spacers of some type under the planter to allow for this depth.
		3. Planter boxes are to be 4 ft. long, 18 in. wide and 1 ft. high. Each box is connected by 4 – 1 ft. long 4 in. x 4 in. posts in the corners. The tops of these corner posts are to be flush with the 2 in. x 12 in. side and end boards. Boards are to be attached to the posts with 3 – ¼ x 3 ½ in. hot dipped galvanized lag screws. The boxes are to be parallel to each other and 5 ft. apart.
		4. A-frame trellis is to be 6 ft. tall from the ground to the apex of the A. Most of its structure is achieved from the cattle paned that forms the A-frame trellis. The cattle panel is attached to 2 in. x 4 in. lumber, 2 pieces for each of the four sides of the A-frame. The outer piece of 2 in. x 4 in. lumber extends diagonally across the ends of the planter boxes and attached with three – 1.4 x 3 ½ in. lag screws. The inner piece is attached to this outer board with 3 in. hot dipped galvanized nails. The cattle panel should be cut to the appropriate length to go from one end to the other of the A-frame. Once the length has been established, it is to be bent into the A-frame shape. The cattle panel will not extend all the way down to the planter box, but each end cross piece of the panel will be about 8 in. above the planter box. The cattle panel is to be attached to the 2 in. x 4 in. A frame with 1 in. hot dipped galvanized staples (steeples).
		5. Planting Medium: The planter boxes are to be filled with vegetable bed mix to a level that is flush with the top of the planter box after the mix has settled. A 1 in. layer of compost should be applied to the surface once the medium has settled.
		6. Water and Irrigation: Water for each of the two boxes is to be brought in according to the *Site Plan for Irrigation and Drainage* and *Diagram 5.e*. Both of the planter boxes are to have a ¾ in. PVC Ball Valve that terminates in male, hose bibb threading to attach the irrigation line. Each ball valve is to point across the width of the planter to the other side of the box, NOT toward the opposite end of the box. Each ball valve is to have a 10 PSI 0.75”Hose Thread Pressure Regulator, 1/10 to 7 GPM, 0.69 BAR, Hose x Hose pressure regulator attached to the threaded male end.
	9. *Master Plan Item* 21. Seat Edge Planter (Diagrams 11.q.1)
		1. NOTE: The final height of this planter is to be 24 in. after a 3 in. layer of decomposed granite has been applied in the walkways. It is important to put spacers of some type under the planter to allow for this depth.
		2. This planter is to be constructed with 2 in. x 8 in. boards and 4 in. x 4 in. corner posts. The seat is a 2 in. x 8 in. board along the top edge.
		3. The final dimension of the body of the planter is to be 4 ft. wide, 8 ft. long, 2 ft. high. Three 2 in. x 8 in. x 4 ft. boards form each end and three 2 in. x 8 in. x 7 ft. 9 in. boards form the sides. This body is made by using 2 - ¼ x 3 ½ in. lag screws per end or in-line joint with the 4 in. x 4 in. post. The 4 in. x 4 in. posts should be 3 ft. long to enable approximately 12 in. to go into the ground. These 4 x 4 posts should be flush with the 2x8 side boards at the top. To tie the two sides together, 1 - 2 x 8 in. board, approx. 3 ft. 9 in. long, should be attached to the two center posts.
		4. The seat on the top edge should be mounted so that it extends 2 in. beyond the planter sides and ends. It should be attached to the 2 in. x 8 in. boards and 4 in. x 4 in. posts with ¼ x 3 ½ in. lag screws. The 45 degree / 135 degree angles at the ends should match for the side and end boards of this seat.
		5. Planting Medium: This planter should be filled with the vegetable bed mix to a level flush with the top of the seat after the medium has settled. A 1 in. layer of compost should be applied to the surface once the medium has settled.
		6. Water and Irrigation: Water for seated planter is brought in according to the *Site Plan for Irrigation and Drainage* and *Diagram 5.e*. This planter is to have a ¾ in. PVC Ball Valve that terminates in male, hose bibb threading to attach the irrigation line. This ball valve is to have a 10 PSI 0.75”Hose Thread Pressure Regulator, 1/10 to 7 GPM, 0.69 BAR, Hose x Hose pressure regulator attached to the threaded male end.
	10. *Master Plan Item* 22. Vertical Planter *(Diagrams 11.r.1, -.2, -.3, -.4, -.5)*
		1. Frame: All lumber is to be cypress of ACQ treated lumber. Dimensions will vary slight and need to be adjusted if the wood is planed or not planed. The vertical planter is a two-sided planter. The construction plan shows a basic frame made of 4 in. x 4 in. posts and cross pieces. This frame is held together with 3/8 in. x 5 ½ in. hot dipped galvanized lag screws. Pilot holes will be needed and the heads of the lag screws are to be countersunk so that they are flush. The posts are 8 ft. long with 2 ft. cemented into the ground so that the final height is 6 ft. above ground. Each post is to be anchored with a bag of cement mix in each hole. It is essential that the frame be leveled in all directions and especially important that the top is level in all directions.
		2. End and Base Boards: On each end of the planter there are three 2 in. x 8 in. boards. Three 2 in. x 6 in. boards are on each side of the base. These two in. boards on the ends should extend beyond the 4 in. x 4 in. posts to be flush with the bottom boards. This forms an inset into which the cattle panel will be attached. All 2 in. x 2 in. lumber is to be attached to 4 in. x 4 in. frame with hot dipped galvanized 3/8 in. x 3 ½ in. lag screws.
		3. Bottom of planter is to be pieces of 2 in. x 6 in. lumber cut to match the sides of the bottom 4 in. x 4 in. frame, mounted across the width of the planter and spaced approximately 1/2 in. apart to allow drainage. These cross pieces should be attached with 3 ½ in. hot dipped galvanized nails.
		4. Cattle Panel: the cattle panel is to be cut so that it forms a rectangle. The smaller rectangles are to be located at the bottom of the cattle panel frame. The cattle panel will be inset into the “frame” created for it by the end and base boards. The cattle panel is to be attached to the frame with ¼ in. x 1 in. hot dipped galvanized lag screws so that the heads of the lag screws secure the cattle panel tight against the frame. One lag screw should be in each corner of the frame and the lag screws should be put in the appropriate corner of every other rectangle of the cattle panel along all four edges.
		5. Plastic liner should be 6 mil or heavier. One continuous piece should be draped down the two sides with excess to allow the plastic to settle in as the planter is being filled. Once the bottom of the plastic has been determined, several strips 1 ft. long x 1 in. wide should be removed from where it sits on the bottom cross boards to allow drainage.
		6. Water and Irrigation: Water Distribution Apparatus / Rain Gutter and PVC pipe: A ¾ in. brass, quarter turn, hose bibb faucet should be plumbed inside the frame in one corner so that the faucet is parallel to the end of the frame and over the inside end of the rain gutter. The end of the faucet should point down into the rain gutter.
			1. The rain gutter should have end caps and support brackets so that it is attached inside the frame along the side of one of the top 4 in. x 4 in. pieces and the rain gutter should be attached so that it is level in all directions.
			2. Holes should be cut or drilled into the bottom of the rain gutter at 1 ft. intervals starting at 6 in. from one end. These holes should be the size of the outside diameter of the 1 in. PVC pipe that will be attached to them. Each 1 in. PVC pipe should have an end cap glued on the bottom end and a series of 1/16 in. holes drilled into two sides at 8 in. intervals from bottom to top.
			3. The 1 in. PVC pipe should be secured to the rain gutter by two PVC flanges that have an inside diameter the same size as the outside diameter of the pipe. One flange is below the rain gutter floor and the other is above the rain gutter floor. PVC cement is to be put on all surfaces that are in contact with each other so that the pipe is both attached and sealed.
			4. The height of the PVC pipe above the floor of the rain gutter should be less than 1 in. and the height of all PVC pipes should be level so that when water is put into the rain gutter it will flow down all of the pipes.
		7. Planting Medium: This planter is to be filled with peatlite mix that has good drainage suitable for large containers, for ex. Metro Mix 340 or 380. This mix should be filled into the planter and the planter thoroughly watered. Then the planter should be filled again so that the top of the medium is an inch below the top of the rain gutter trough mounted inside the top of the planter.
	11. *Master Plan Item* 23. Pan Planter *(Diagrams 11.s.1, -.2, -.3)*
		1. NOTE: The final height of this planter the planter frame and each of the three pans is to be after a 3 in. layer of decomposed granite has been applied in the walkways and under the open base of this planter. It is important to put spacers of some type under the planter to allow for this depth if it is to be built before the decomposed granite is in place.
		2. NOTE: This planter consists of a heavy, 3-sided frame into which 3 metal plantable pans are inserted. Construction must coordinate the metal pans with the dimensions of the frame.
		3. NOTE: The final height of the planter frame is to be 40 in. If planed wood is used for the planter frame, the top layer is to be a 2 in. x 6 in. board to match the 4 in. x 6 in. lumber that makes the frame to bring it to the 40 in. height.
		4. Frame of planter: The planter frame is to be constructed from 4 in. x 6 in. lumber laid down so that the 4 in. width is the height of the board. Ten layers of 4 in. wide lumber is to be used to achieve the 40 in. height. The frame is to be 12 ft. long and 3 ½ ft. wide. Alternating ranks of wood are to be cut so that they interlock in the corners. The frame is to be built by attaching each layer to the layer below it. 7 in. long hot dipped galvanized landscape timber nails are to be used. If spikes greater than ¼ in. in diameter are used, pilot holes are to be drilled to avoid splitting the wood.
		5. Planter pans: The three metal planter pans are to be made from heavy sheet metal, 12 to 14 gauge, to insure longevity and safety. These pans can be made at a metal shop. The dimensions of the three pans are the same, but they are to be mounted at three different heights within the frame, each 3 in. below the height of the next. The three heights for the tops / bottoms of the pans are as follows: 38 in. / 32 in.; 35 in. / 29 in. ; and 32 in. / 26 in. The dimensions of the three pans are 30 in. wide, 43 in. long and 6 in. to 8 in. deep. The pans are 6 in. deep in front and 8 in. deep in the back. The slope from front to back is a steady decline so that the pans will drain in the back i.e., near the back planter wall. Each planter is to have a drain hole cut in to enable effective drainage. The drain system is outlined in *Site Plan for Irrigation and Drainage.*
		6. Pans are to be attached to the 4 in. x 6 in. lumber frame so that the height of the top is achieved from the decomposed granite surface. Each side that is has an interface with the lumber should have 3 – 3/8 in. x 3 in. hot dipped galvanized lag screws set 1 in. from the top of the planter edge. Where the planters are adjacent to each other, three 3/8 x 1 in. hot dipped galvanized lag bolts should be used. Three bolts should be set at intervals, 1 in. from the top edge of the lower planter at each of the sides that adjoin each other. This would set the hole 4 in. from the top of the higher of the two planter pans. 4 in. x 4 in. posts should be set under the point where two planter pans adjoin each other in the front of the planter. These two 4 in. x 4 in. posts should be cut at the top so that one edge is 3 in. higher than the other and the two top edges both support the respective planter pan. The bottom of each of the two support posts should sit on a flat 12 in. x 12 in. paver to offer extra support so that it does not settle into the decomposed granite at its base.
		7. Drainage: The drainage system for these planters is shown in *Diagrams 11.5.2 and 11.5.3.* It consists of a hole drilled into one end of the planter pan at a diameter that would allow a 1 in. PVC elbow to fit through it. The elbow is attached to a 40 in. length of 1 in. dia. PVC fitted with an end cap and into which a series of ¼ in. holes have been drilled on the lower facing half of this pipe. These holes should be at six in. intervals and three holes should be drilled at each length of the pipe to improve drainage. It is to be installed with the holes at the base and the PVC ell pushed through the hole in the pan. This pipe is to be covered with 2 in. of pea gravel and over the bottom of the pan and this is to be covered with plastic screen fabric.
		8. Planting Medium. Vegetable bed mix is the planting medium to be used in these planter pans. It is to be filled so that it is level with the surface of the planter after it has settled. A 1 in. layer of compost should be placed over the surface of the medium.
		9. Water and Irrigation: This planter is to be hand-watered. A ¾ in. brass, quarter turn, hose bibb faucet should be mounted on an 18 in. riser near the side of the bed, just outside the frame, as shown in the irrigation *Site Plan for Irrigation and Drainage* and in Diagram 10.s.1. This faucet should point east in the direction of Grant Fay Park and be mounted so that the opening points down. The exposed pipe should be insulated. A 100 foot metal hose reel should be mounted on the side of the Pan Planter and near the faucet. This should be comparable to the Garden Treasures Steel 100-ft Wall-Mount Hose Reel,  Model #: S214-09A. The location of the faucet and the hose reel should be accessible to a person who is using a wheel chair.
	12. *Master Plan Item* 24. Toe Recess Planter *(Diagrams 11.t.1, -.2)*
		1. NOTE: The toe recess at the bottom of this planter is achieved by setting the two bottom layers of 4 in. x 6 in. boards progressively inward by half the width of the board so that the outer edge of the bottom board is about 6 in. recessed inward from the outer edge of the main planter.
		2. NOTE: The final heights of this planter are to be established after a 3 in. layer of decomposed granite has been applied in the walkways. It is important to put spacers of some type under the planter to allow for this depth.
		3. The finished height of this planter should be 20 in.
		4. The top of this planter is a seat. The exposed wood should be sanded or planed to reduce the possibility of splinters.
		5. To construct this planter the bottom layer would be 12 in. shorter on the sides and ends than the main body of the planter, and the second layer from the bottom would be 6 in. shorter on the sides and ends than the main body of the planter. Each of the bottom two layers would be offset 3 inches inward from the layer on top of it. Each layer of the planter should interlock with the layer below it by alternating the lengths of the boards on the ends and sides. Each layer of 4 in. x 6 in. wood is to be connected to the layer below it with 6 in. long or longer, hot dipped galvanized, grip-tight, landscape timber nails or spikes. If the diameter of the spike is greater than ¼ in., pilot holes should be drilled to avoid splitting the wood.
		6. Water and Irrigation: Water for the toe recess planter is brought in according to the *Site Plan for Irrigation and Drainage* and *Diagram 5.e*. This planter is to have a ¾ in. PVC Ball Valve that terminates in male, hose bibb threading to attach the irrigation line. This ball valve is to have a 10 PSI 0.75”Hose Thread Pressure Regulator, 1/10 to 7 GPM, 0.69 BAR, Hose x Hose pressure regulator attached to the threaded male end. The ball valve is to be located in one of the south corners of this planter and is to point north toward the School of Nursing Building.
		7. Planting Medium: The planting medium for this planter is to be the vegetable bed mix used in most of the planters in this garden. It should be applied so that it is level with the top of the planter after settling has occurred. A 1 in. layer of compost should be applied to the surface once the medium has settled.
	13. *Master Plan Item* 25. Fence Planter Area (Diagrams 11.u.1, -.2)
		1. This area is to be adjacent to the Container Garden Area, 5.o. This is an open section of fence onto which the containers will be mounted. The water source for the container garden area should be adjacent to this area. There will be two types of containers 1. Standard vinyl Rain Gutter, 2. Large 6 in. aluminum rain gutter.
			1. Standard Rain Gutter planter is to be an 8 ft. section of severe weather, white, vinyl rain gutter. This rain gutter should have both end caps securely attached and sealed. This 8 ft. section of rain gutter should be securely mounted to an 8 ft. 6 in. long section of 2 in. x 6 in. ACQ pressure treated lumber. Attachment should have a bracket at both ends and at 2-ft. intervals to carry the extra weight of the growing medium and plants that are to be grown in the gutter planter. The 2 in. x 6 in. board is to be mounted to two of the fence posts at a height of 5 ft. with two 3/8 in. x 4 ½ in. hot dipped galvanized lag screws on each end. Pilot holes should be drilled through the 2 in. x 6 in. board and into the 6 in. x 6 in. post to prevent splitting. A series of ¾ in. holes should be drilled at 6 in. intervals along the center of the gutter floor to promote drainage.
			2. Large commercial rain gutter, 6 in. wide and deep, white finish on aluminum. This 8 ft. section of rain gutter should be mounted to a 2 in. x 6 in. x 8 ft. 6 in. pressure treated board and the board mounted to the fence at two of the posts. The gutter should have extra hangers to allow for the weight of growing medium and plants. Hangers should be placed near the ends and at 2 ft. intervals. The 2 in. x 6 in. board is to be mounted to two of the fence posts at a height of 3 1/2 ft. with two 3/8 in. x 4 ½ in. hot dipped galvanized lag screws on each end. Pilot holes should be drilled through the 2 in. x 6 in. board and into the 6 in. x 6 in. post to prevent splitting. A series of ¾ in. holes should be drilled at 6 in. intervals along the center of the gutter floor to promote drainage.
		2. Planting Medium: These rain gutter planters are to be filled with peatlite mix that has good drainage suitable for large containers, for ex. Metro Mix 340 or 380. This mix should be filled into the planter and the planter thoroughly watered. Then the planter should be filled again so that the top of the medium is flush with the top of the rain gutter after the medium has settled. An inch of compost should then be applied to the surface of the medium.
		3. Water and Irrigation: The rain gutter planters will be hand-watered. The source of the water will be two ¾ in. brass, quarter turn, hose bibb faucets set on a riser that is 18 inches high. One faucet should be mounted on each side of a PVC Tee. This double faucet should be near the fence on the east end of the rain gutters, as shown in the *Site Plan for Irrigation and Drainage*. One faucet should point east and toward the ground and the other should point west and toward the ground. A hose reel for a 50 ft. length of hose should be placed beside the faucets and it should be connected to the west facing faucet. The hose reel should be comparable to the Suncast Plastic Hideaway Hose Reel, Model CPLSMT205WJ8.
	14. *Master Plan Item* 26. Container Garden Area
		1. The container garden area is divided into open spaces around the garden. The main container garden area is along the section of fence on the north side of the garden. This area is served by the double faucet that also serves the fence planter area as shown in *Diagrams 11.u.1 and 11.u.2*.
		2. Containers: Various types of containers will be acquired to demonstrate the concept of gardening in containers. The bid should include four 24 in. dia. X 19 in. high round containers with a weathered terra cotta finish. These containers must be exterior grade and durable. They could be synthetic composition or natural material.
		3. Water and Irrigation: The container garden area will be serviced by the double faucet that has been set at the end of the rain gutter fence planters.
		4. Planting Medium: the medium to fill the containers should be a well-drained, peatlite mix, equivalent to MetroMix 340 or 380.
1. *Master Plan Item* 27. Butterfly Garden

The butterfly garden will be managed jointly by campus landscaping and the SPH garden. This area will have mounds of garden bed mix into which plants that are attractive to butterflies will be planted. The planting plan for this area should be developed cooperatively between campus landscaping and the garden project manager. Garden staff will help acquire the plants. Examples of the plants to be selected for this area include Aesculus, Aloysia, Aniscanthus, Aquilegia, Aristolochia, Aesclepias, Bauhinia, Buddleia, Callicarpa, Capsicum, Cuphea, Cercis, Duranta, Guara, Gomphrena, Hamelia, Hibiscus, Ilex, Justicia, Lantana, Malvaviscus, Monarda, Othosiphon, Passiflora, Penta, Pavonia, Plumbago, Rivinia, Russelia, Salvia, Scuttelaria, Sophora, Stachytarpheta, Tagetes, Tecoma,Verbena, Vitex, Viburnum, and Zinnia.

1. Benches
	1. *Master Plan 28. Benches (Diagrams 13.a.1 and 13.a.2)*

One bench is to be built in the garden, in the area bounded by the end of the multilevel planter and the vertical planter. The bench is to be constructed of cedar or cypress. It uses 3/8 inch all thread as bolts to hold the pieces together and sits on two 4 in. x 4 in. legs. One method for attaching the legs to the bench top is suggested, but other possibilities will be considered.