

# Subjects: Geometry and English

## Landscape Plan and Bid

Grade Levels: 9 – 12

Written: August, 2009

### Lesson Overview

#### **Overview:**

The following lesson plans were designed to incorporate real world construction ideas gained from a Landscaping Company. Student will learn scale drawing, writing a bid, and designing a Landscape Plan.

#### **Implementation and “Product”:**

The *ideal* situation in implementing these lesson plans is to have a space where students can actually implement the Landscaping Plans they create. A school garden, open space, or even students’ own backyards would be great examples. This would give them a very authentic product.

However, this lesson still works as a ‘hypothetical’, where students don’t actually get to implement their designs. They will still have products, including scale drawings of the classroom, one of which *can* be implemented. They also would have designs and scale drawings of what they would like to see in an area (the quad of a school or their backyard, for example), and bids showing how they spent money.

#### **Incentives:**

If possible, include an incentive for the projects. For example, have students vote on two ‘bests’. One could be the best overall design in terms of function and aesthetics. Another could be the best design for the least amount of money (bang for your buck). Whether the incentive is a sandwich or the opportunity to actual implement their room designs, students will most likely be much more motivated.

#### **Depth of Lesson:**

While this lesson is fairly deep in terms of real world learning, problem solving, and academics, it could be even deeper. For example, students could map out plumbing and water lines to feed a BBQ or Fountain and calculate pressure needed or volume of gas and/or water running through the lines. They could also do independent research on pricing for their own ideas that are not included in the materials list. Or, for certain classes, such as ecology or botany, students could

be required to use a certain amount of native plants.

The bid section of the project also has huge potential to get even more complicated and intensive. For example, students can try to make a profit by subtracting their total cost from the allotted \$20,000. Students can also calculate where they get the most out of their money comparing labor and materials. Basically, the teacher should feel free to cater to the class, based on the skill and ability of students as well as the general class curriculum.

On the other hand, many teachers may have time constraints and may be able to do only parts of the lesson. This lesson can be modified in that direction as well. For example, a teacher may decide to avoid the bid section of the project altogether and focus only on the design and scale drawing aspects. Or, they could reduce the number of Technical Specifications by modifying that sheet. Finally, they could simply have the students do the room lesson plan.

### Materials Included in this Lesson (please see end of this document for these materials).

- Labor Costs Sheet
- Materials Cost Sheet
- Technical Specifications Sheet
- Assessment Suggestions Sheet
- Sample Bid Sheet

### Other Materials for this Lesson

Please see individual lessons below for materials lists. Materials will also vary depending on school site and teacher necessities.

### Skills the Student will Learn

Please see individual lessons below for skills, goals, and objectives

### Student Deliverables

- Room scale drawing
- Visualized quad landscape design
- Final Landscape Plan
- Bid for Landscape Plan

## Length of Lesson: 2-10 Days

### Activity/Lesson One: Making a Scale Drawing of the Room (2 Days)

Topic: Making a Scale Drawing

CA Standards addressed (includes all 3 lessons):

- Reading 2.1 – Analyze the structure and format of workplace documents.
- Reading 2.6 – Following technical directions.
- Writing: 2.6a – Report information and convey ideas effectively
- Speaking Applications 2.2 – Deliver expository presentations

- Geometry 8.0 – Students know, derive, and solve problems relating to area, perimeter, circumference, and volume of common geometric figures.
- Geometry 10.0 – Students compute areas of rectangles, triangles, parallelograms, and trapezoids.
- Geometry 11.0 – Students determine how changes in dimensions affect perimeter, area, and volume.
- Geometry (general) – Students use ruler and compass

Materials Needed:

- 3-4 Tape measures or yardsticks
- Rulers
- Graph Paper
- Lined Paper
- Pencils
- A very basic scale drawing of the room (prepared by teacher beforehand). This should include room dimensions, non-moveable objects, and furniture. Be sure to list the scale or ratio on the drawing (for example, 1 square on the graph paper = 2 ft.). Alternatively, you can have the students create this.

Time needed: About 2-3 hours (2-3 class sessions). Homework after the first session is to complete their scale drawing designs.

General Goals:

Students will learn to represent objects to scale. Also, students will see the benefit of using scale drawings as a design tool.

Specific Objectives:

- Students will learn/reengage with measurement
- Students will learn/reengage with ratio and scale
- Students will practice a scale drawing using measurements of actual furniture (desks, tables, etc.)
- Students will design a new room layout based on their ideas

Anticipatory Set:

Teacher tells students they have the opportunity to redesign the room. Teacher will show them a scale drawing of the room and tell them that if they can design a better layout, it will be used.

Procedure: (Please note – scale drawing can be done with anything; a garden, quad area, library, or other area. Basic procedure still applies).

*Day 1:*

1. Pass out copies of room scale drawing. Ask students to look at the drawing and compare it to the room.
2. Ask one student to pick a random piece of furniture or other moveable object. Tell student to move that object to a different part of the room. Have the student measure

- how far it is from the walls. Have all students mark that new location on their drawing.
3. Now have students list the sizes of the different items in the room. They should base this off of the scale drawing you made. For example, the table is 4 ft x 8 ft., the teacher's desk is 3 ft x 6 ft., etc.
  4. Now, have them design their own scale drawings of the room in groups of 3. Each student must have their own drawing. *Homework: Students must finish their designs.*

*Day 2:*

5. When finished, have groups present their drawings. You may need to make copies of them or use an overhead.
6. Students vote on the best design. Then, they work together, using tape measures and yardsticks, to implement the design.

Taking the lesson further:

*Scientific Method:*

- Pick 3 of the best designs. Make enough copies for the students.
- Have students write a hypothesis regarding which design will work the best. They do this individually.
- Ask students to design a test to test the hypothesis. Probably, they will want to test the hypothesis by trying out the designs.
- Then, collect "data". Have students do a silent vote. Collect the results and write up the data. Have students copy this.
- Have students write a conclusion about which design was agreed to be the best.

## Activity/Lesson Two: Making a Rough Landscape Plan (1-2 days)

*[Note: For this lesson, the school quad is the design space. However, students can use their own backyards, a garden space at school, or any other authentic space. In fact, the best option is a space where students can actually implement their design, either individually or as a group.]*

Topic: Imagining and making a rough Landscape plan of a useable space.

CA Standards addressed (includes all 3 lessons):

- Reading 2.1 – Analyze the structure and format of workplace documents.
- Reading 2.6 – Following technical directions.
- Writing: 2.6a – Report information and convey ideas effectively
- Speaking Applications 2.2 – Deliver expository presentations
- Geometry 8.0 – Students know, derive, and solve problems relating to area, perimeter, circumference, and volume of common geometric figures.
- Geometry 10.0 – Students compute areas of rectangles, triangles, parallelograms, and trapezoids.
- Geometry 11.0 – Students determine how changes in dimensions affect perimeter, area, and volume.

- Geometry (general) – Students use ruler and compass

Materials Needed:

- Lined Paper
- Blank paper
- Colored and regular pencils
- Materials list (included in this packet)
- Graph paper taped together (4 or more pieces to fit shape of area)

Time needed: One hour in class plus homework

General Goals:

Students are to imagine that they are hired to do the work of a Landscape designer. Students will conceptualize how they would like a real space to look and function. They will use visualization techniques to get ideas. Then, they will make a rough plan that will be used later to build a real landscape design.

Specific Objectives:

- Students will learn visualization techniques
- Students will capture their creative designs in a design (not to scale)
- Students will measure the quad (or area of choice) and write the dimensions (to scale) on graph paper.

Anticipatory Set:

See step 2 below. Ask them to pay attention to what they like and don't like in the pictures and write them down on a scrap piece of paper.

Procedure:

1. Make sure students have a piece of lined paper and a piece of blank paper in front of them. Give students the materials worksheet that lists all materials they can use and their cost. Go over some of these to prime their ideas.
2. Show students examples of Landscape Designs in pictures, ideally incorporating concrete walkways, patios, fences, trees, shrubs, flowers, sod (grass), fountains, boulders, and mulch. Be sure to point out some terms, such as mulch, that students might not know. Use the *Material Cost Sheet* to see all possible items. Show several pictures to grab different styles and function. These pictures can be found all over the Internet.
3. Now, ask students to close their eyes and imagine what they would like to see in the quad/their backyard/school garden/etc, specifically things off that *Material Cost* list. Then, have them write what they would like to see on a piece of lined paper. Give them 3 – 5 minutes.
4. Now, have students draw a rough plan. It does not have to be to scale. They should spend their time making it colorful and realistic. Stress that the students should keep in mind both aesthetics and functionality, using the materials list as a guide.
5. Near the end of the class, take students out side and have them measure, in groups, the dimensions of the quad. Make sure that they draw a rough picture of the quad and label

- sides with dimensions rather than simply writing a list of dimensions.
6. For homework, have them translate their rough design onto taped together graph paper in the form of a simple scale drawing. They should be comfortable with this from the previous lesson.

Taking the lesson further:

- For Geometry students, have them calculate the area of the quad or other space being used.
- Challenge students to hypothesize what the diagonals will be and then have them measure. Use the Pythagorean theorem by measuring the diagonal and one side only and then ask them to calculate area.
- Identify parallelograms, trapezoids, and other geometric shapes.

Activity/Lesson Three – Writing a Bid (3-5 days)

*[Note: For this lesson, the school quad is the design space. However, students can use their own backyards, a garden space, or any other authentic space at the school. In fact, the best option is a space where students can actually implement their design, either individually or as a group.]*

Topic:

Student will write a bid and make a final Landscape Plan. Both will be based on their original Landscape Plan combined with technical specifications they are given. **In the process of doing the bid, students are expected to change their original designs as needed.**

CA Standards addressed (includes all 3 lessons):

- Reading 2.1 – Analyze the structure and format of workplace documents.
- Reading 2.6 – Following technical directions.
- Writing: 2.6a – Report information and convey ideas effectively
- Speaking Applications 2.2 – Deliver expository presentations
- Geometry 8.0 – Students know, derive, and solve problems relating to area, perimeter, circumference, and volume of common geometric figures.
- Geometry 10.0 – Students compute areas of rectangles, triangles, parallelograms, and trapezoids.
- Geometry 11.0 – Students determine how changes in dimensions affect perimeter, area, and volume.
- Geometry (general) – Students use ruler and compass

Background Knowledge/Skill Needed:

- Students must know how to calculate the Area of triangles, squares, circles

(circumference) and other shapes (trapezoids, kites).

- Students must know how to calculate Perimeter
- Students must know how to calculate Volume.
- Students must understand the terms linear feet, feet squared, and feet cubed

*Note: Teacher may decide to do a review of these items prior to this lesson*

#### Materials Needed:

- Computers with Microsoft Excel, Word (for tables), or a pre-made table that students can fill in. *Excel can be used for the bid, which would incorporate a technology aspect.*
- Materials List table
- Labor Cost table
- Sample Bid
- Technical Specifications (Specs)
- 4 pieces of graph paper taped together
- Students original Scale Drawing Plan/Design (should be to scale from previous assignment.)

Time needed: 2-3 class periods plus 2 homework days

#### General Goals:

Students will write a professional bid based on their landscape design. This bid will incorporate labor and materials and follow the technical specifications.

#### Specific Objectives:

- Students will read technical writing
- Students will write and organize bids using technical writing
- Students will calculate costs of materials and labor and try to keep a budget.
- Student will calculate perimeter (fences), area (grass, plants), and volume (concrete patio or walkway)
- Students will modify their original plan to meet the demands of the Technical Specifications and bid limitations.
- Students will synthesize data from multiple sources (bid, tech specs, and original design plan)
- Students will make informed decisions by analyzing options and using cost/benefit analysis.

#### Anticipatory Set:

Ask students how much money they think it would cost to redesign the quad? Write numbers up on the board. Then tell them that they will have \$20,000 (or any other number that works for your situation) to try to implement their designs and must write a bid (amount should be adjusted based on the size of the area).

#### Procedure:

*Day 1:*

1. Anticipatory Set
2. Tell students that they will almost certainly have to modify their original plans.
3. Review the Materials List. Remind students that these costs are **only** for the materials and don't include the cost of doing the work.
4. Review the Labor Costs. Emphasize the worker's compensation aspect.
5. Show an example on the board (planting a tree, for example). Show them how to calculate the final price of planting a tree by adding the labor and materials cost. Then, do another example using fencing. Show them that depending on the length of fence, their cost will have to be adjusted for both labor and materials.
6. Have students practice by calculating the cost of installation of 20 feet of irrigation pipe (materials plus labor, including worker's comp).
7. Now, go over the Technical Specifications sheet. Tell students that they have to follow the 'specs', as required by the city building codes. Use Mulch as an example by explaining that when calculating the amount of mulch, they must assume a 2" depth in calculating the volume.
8. Show students the sample bid. Tell them that their bids will be more complicated and longer, but that it can give them an idea. *Note: Some schools can use Microsoft Excel to make the bids. Others can use MS word tables. Bids can also be neatly hand-written.*
9. Have students work on bids in pairs for the remainder of the period. Split time so that both students are working on one plan for part of the time and the other plan for the rest. This will ensure that everyone begins to develop an understanding of the process.

Homework: Students will make a revised plan NOT TO SCALE. This should be their new visualized plan, revised because of what they learned from the expenses from the bid.

*Day 2:*

1. Students should work in pairs for the class period. They should work on their turning their revised plan (not to scale) into a final scale landscape drawing, using graph paper taped together. Essentially, they will be making the plan and writing the bid concurrently, in most cases.
2. Have the students work together revising bids and making their Landscape Plans. Be sure to set aside specific time for them to work together.

Homework: Students should finish their scale drawings and bids over the next few days, in class and at home. They should add real world colors to their design to make it more understandable. For example, the grass should be green, mulch brown, walkway grey.

ASSESSMENT (please see assessment sheets)

## Enrichment Suggestions

Please see individual activity/lessons above for "Taking it Further".

## Student Resources

Internet would be very helpful, especially for students to view landscape photos to get ideas. Excel Spreadsheets can be used in the bid process.

## State Standards Met

Please see individual activity/lessons above for standards met.

## Lesson Plan Relevance To Externship

The externship was at Environmental Landscape Solutions (ELS). The main purpose of the business is to bid projects and design and implement landscape designs (including planting, concrete work, electrical work, fences, and more). The above lesson is essentially doing the design and bid process and is a fairly realistic representation of how ELS operated.

## Assessment Ideas

Presentation:

Student should give a 5-minute presentation about their Plan. They should emphasize both the functionality and aesthetic value of their plans. Rubric is shown on next page.

FINAL PRODUCTS: Student should have a packet including the following:

- Room scale drawing
- Original Landscape Plan, not to scale
- Original Landscape Plan, to scale
- Bid
- Final Landscape Plan, with color
- In a perfect world, students would be able to actually implement their final design. Obviously, this is hard because of financial constraints, skilled labor needed, etc. However, a follow up project could be done doing a Landscape Plan for a simple, small garden at the school or some similar area.

Good questions to ask during the presentation:

1. How many workers would you hire and, based on that number, how long would this project take?
2. What was the most challenging part of the project?
3. How much did you change your original design after doing the bidding process and looking at the specifications?
4. Do you think you could manage a project of this size now that you've done all the plans and bidding?
5. If you had to cut out parts of the project to meet a tighter budget, what would you cut

out?

## Rubric for Landscape Project

<b>TASK/PRODUCT</b>	<b>EXCEEDS EXPECTATIONS (4)</b>	<b>MEETS EXPECTATIONS (3)</b>	<b>APPROACHES EXPECTATIONS (2)</b>	<b>DOES NOT MEET EXPECTATIONS (1)</b>
Room Scale Drawing	Student has met the expectations and, additionally, incorporated creative solutions such as angled furniture, multiple levels, or other ideas.	Student has accurately represented the classroom dimensions. Student has accurately represented, to scale, the furniture and other items. Design makes sense and is functional.	Student has attempted to represent scale drawing with some errors. Functionality is attempted but not necessarily achieved.	Student does not use scale effectively. Student does not attempt to think about function of the space.
Original Landscape Plan (to scale)	Student showed exceptional creativity in providing a functional, aesthetically pleasing design.	Student has a creative, functional design, drawn to scale.	Student has attempted a creative design that is somewhat functional. Design is mostly to scale with a few mistakes.	Student did not seem to attempt to create a functional design. Design is mostly not to scale.
Final Bid	Bid has very effective, organized layout and clearly demonstrates material costs and labor costs. Bid correctly calculates costs. Student may have an equation used to represent some information.	Bid has effective layout that clearly demonstrates material costs and labor costs. Bid correctly calculates costs. Student understands their bid well enough to discuss how they would cut costs, add aesthetics, etc.	Bid has fairly effective layout. Bid is mostly correct in terms of calculating costs. Bid incorporates almost all items on the final scale drawing.	Bid is not in an effective format. Bid has many errors in calculations. Bid does not represent items in the scale drawing.
Final Landscape Plan (to scale)	Plan is to scale. Plan demonstrates exceptional planning and execution and has all the required details.	Plan is to scale. Plan has correctly implemented student's ideas and the bid. Plan has all the required	Plan is mostly to scale. Plan has mostly implemented student's designs and bids with some	Plan is not to scale. Student did not seem to attempt to implement their design in their final plan.

	<p>Plan is neat. Plan is color coordinated, complex, and easy to read/use.</p>	<p>details (sprinkler radius, for example). Plan is color coordinated for ease of use. Plan should be fairly complex and incorporate both aesthetic value and function.</p>	<p>errors. Student attempted to include all the required details. Plan may be very simple.</p>	
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## Technical Specifications

Note: The following specifications apply to your Landscape plan and bid. Any plan or bid that does not follow these specifications will not be considered.

### Final Landscape Plan:

- The plan must include both a bid and a scale drawing.
- The scale drawing must be color coded for ease of use.
- The bid must meet a budget of \$30,000, as required by the city.

### Employee compensation:

- Employer must use prevailing wage of \$20/hour for all workers.
- Workers compensation (8% of total pay) is required. 8% of the final cost of labor should be added to get the total pay to get the cost of the worker.
- Bid **must** include total man-hours required for the project.

### Irrigation:

- Sprinkler feed must overlap in all areas where plants are located.
- Each plant and tree must be in the range of a sprinkler (water must hit all of the plant)
- Final Landscape Plan **must** show, in dotted lines, the sprinkler patterns.
- Final Landscape Plan **must** show, in dotted lines, the irrigation lines.
- Irrigation lines can only go in straight lines (you can't 'curve' the pipe)
- There must be one water pump somewhere on the plan. Irrigation lines should connect from the pump to each sprinkler.

### General Aesthetic Design:

- Minimum of 2 square shapes incorporated into design
- Minimum of 1 rectangle shape incorporated into design
- Minimum of 1 triangle shape incorporated into design
- EITHER 1 trapezoid, 1 Circle, OR 1 kite shape incorporated into design

### Planting:

- You must Mulch where planting flowers, garden/food plants, or shrubs. Mulch must be 2" high in all planted areas.
- You must add Topsoil where planting flowers, garden/food plants, and shrubs. Topsoil must be 4" high in all planted areas.
- Flowers must be planted a minimum of 1 foot apart
- Shrubs must be planted at least 2 feet apart from other shrubs and 1 foot from flowers.
- Trees must be planted at least 4 feet from all other plants and must have a radius of 3' of mulch around them.
- A minimum of 5% of the total area MUST be shaded, from trees or a patio.

### Walkway/Patio:

- Patios must be at least 2.5 feet deep.
- Walkways must be at least 1.5 feet deep
- Walkways must be at least 3 feet wide and no larger than 30 feet wide.
- Patio covers/shade structures are 10 feet x10 feet units only. However, you can combine them together to make bigger structures.

### Fountains:

- Fountains must be surrounded by at least 1 foot of concrete on all sides
- Fountains can be any shape.

### Other:

- If BBQ is installed, ½" gas line must be used. Gas line must come up next to the BBQ in concrete.
- Final Landscape Plan **must** show, with solid lines (and labeled), any gas lines.

## Materials Cost

<b>Item</b>	<b>Cost</b>	<b>Size of item</b>	<b>Measurement type</b>
<i>Basketball Hoop</i>	<ul style="list-style-type: none"> <li>\$150</li> </ul>	4' x 4'	n/a
<i>Boulder</i>	<ul style="list-style-type: none"> <li>2 ft diameter = \$80</li> <li>3 ft diameter = \$100</li> </ul>	2 ft – 3 ft radius	Area
<i>Bricks</i>	<ul style="list-style-type: none"> <li>\$1 per square foot</li> </ul>	1 square foot	Linear Feet
<i>Chain Link Fence</i>	\$2 per linear ft	n/a	Linear Feet
<i>Concrete Patio or Walkway</i>	\$2 per cubic foot	Variable	Volume
<i>Fire Pit</i>	\$50	Variable	Area
<i>Flowering Plants/Garden Plants</i>	\$3 each	1 square foot	Area
<i>Gas Line for BBQ (1/2")</i>	\$3 per linear foot	n/a	Linear Feet
<i>Gas Line for BBQ (3/8")</i>	\$2 per linear foot	n/a	Linear Feet
<i>Irrigation Lines</i>	\$.20 per foot	n/a	Linear Feet
<i>Irrigation Pump</i>	\$200	n/a	n/a
<i>Mulch</i>	\$0.50 per cubic foot	Variable	Volume
<i>Patio Covers, Canvas</i>	\$300 each	10 ft. x 10 ft.	Area
<i>Patio Covers, Wood</i>	\$700 each.	10 ft. x 10 ft.	Area
<i>Permanent BBQ 4 burner</i>	\$500	3 ft. x 5 ft.	Area
<i>Permanent BBQ 8 burner</i>	\$800	4 ft. x 7 ft.	Area
<i>Plumbing for Water Fountain</i>	\$0.50 per foot	n/a	Linear Feet
<i>Redwood Fence</i>	\$6 per linear ft.	n/a	Linear Feet
<i>Rock Speakers (They look like rocks but are speakers. They run remotely by batteries)</i>	\$75 each	1 ft. squared	Area
<i>Shrub</i>	\$15 each	1 ft – 3 ft. radius	Area
<i>Sod (Grass)</i>	\$0.50 per square foot	Variable	Area
<i>Soil Amendment (Soil improvement)</i>	\$.10 per square foot	Variable	Area
<i>Sprinklers</i>	10 ft. radius = \$5 each 20 ft. radius = \$6 each 30 ft. radius = \$10 each	Sprays radius of 5 – 10 feet	Area
<i>Topsoil (for planted areas)</i>	\$0.50 per cubic foot	Variable	Volume
<i>Tree</i>	\$60 each	5 ft. – 15 ft. radius	Area
<i>Water Fountain</i>	\$200 per ft. radius	2 ft – 10 ft. radius	Area
<i>Wood Benches</i>	\$15 each	1 ft. x 4 ft.	Area
<i>Wood Tables (seating built in)</i>	\$30 each	4 ft. x 6 ft.	Area

## Labor Costs

Rates below apply to **one worker**, unless otherwise noted.

<b>Task</b>	<b>Time</b>
<i>Basketball Hoop</i>	2 hours for first, 1 hour for each additional hoop.
<i>Boulder</i>	2 hours for first boulder, 30 minutes for each after that.
<i>Brick-laying</i>	5 square feet per hour
<i>Chain Link Fence</i>	8 linear feet per hour
<i>Concrete Patio or Walkway</i>	10 cubic feet per hour
<i>Fire Pit</i>	2 hours per fire pit
<i>Flowering Plants</i>	8 per hour
<i>Gas Line for BBQ (1/2") (digging + install)</i>	10 linear feet per hour
<i>Gas Line for BBQ (3/8") (digging + install)</i>	10 linear feet per hour
<i>Irrigation Lines (digging + installing)</i>	15 linear feet per hour
<i>Irrigation Pump (to push water into the irrigation from the water source)</i>	2 hours
<i>Mulch</i>	200 square feet per hour
<i>Patio Covers, Canvas</i>	4 hours
<i>Patio Covers, Wood</i>	8 hours <b>for 2 workers</b>
<i>Permanent BBQ 4 burner</i>	4 hours to install for <b>2 workers</b>
<i>Permanent BBQ 8 burner</i>	4 hour install for <b>2 workers</b>
<i>Plumbing for Water Fountain (dig + install)</i>	10 linear feet per hour
<i>Redwood Fence</i>	5 linear feet per hour
<i>Rock Speakers (These are speakers that can be incorporated into the plan. They look like rocks but are speakers. They run remotely by batteries)</i>	2 speakers per hour
<i>Shrub</i>	5 per hour
<i>Sod (Grass)</i>	20 square feet per hour
<i>Soil Amendment (Soil improvement)</i>	100 square feet per hour
<i>Sprinklers</i>	2 per hour
<i>Topsoil (for planted areas)</i>	75 square feet per hour
<i>Tree</i>	1 per hour
<i>Water Fountain</i>	4 hours <b>per foot radius</b>
<i>Wood Benches</i>	1 hour each
<i>Wood Tables (seating built in)</i>	4 hours each

**IMPORTANT: Workers compensation must be paid! This is 8% of the total cost of labor. So final cost of labor is:**

**(Labor hours x Prevailing wage) + (8% x Total money spent on labor) = TOTAL LABOR COST**

*See Technical Specifications for Prevailing Wage*

SAMPLE BID

Sample Bid

Goal/Item	Material Cost	Labor Hours	Labor Cost (hourly wage + worker's comp)	Total Cost
20 Trees planted	<b>\$1,200</b>	20	400 + 32 = <b>\$432</b>	<b>\$1,632</b>
200 Feet of wood fence	<b>\$1200</b>	40	800 + 64 = <b>\$864</b>	<b>\$2,064</b>
(5) 2 ft. boulders	<b>\$400</b>	4	80 + 6.40 = <b>\$86.40</b>	<b>\$486.40</b>
400 square feet of sod	\$200	ETC.	ETC.	<b>ETC.</b>
40 foot concrete path	\$800	ETC.	ETC.	<b>ETC.</b>
1 patio (10 feet) with wood cover	\$700	ETC.	ETC.	<b>ETC.</b>
35 plants planted	\$105	ETC.	ETC.	<b>ETC.</b>
300 feet of irrigation line	\$60	ETC.	ETC.	<b>ETC.</b>
20 Sprinklers @ 5' radius	\$100	ETC	ETC.	<b>ETC</b>
10 Sprinklers @ 10' radius	\$100	ETC	ETC	<b>ETC.</b>
ETC., ETC.	ETC.	ETC.	ETC.	<b>ETC.</b>

**Total Cost: \$9,350.40**