Runtime Terrors (Team #5)

Hydroseed Calculator

CSC 131 Section 5

Software Design Document (SDD)

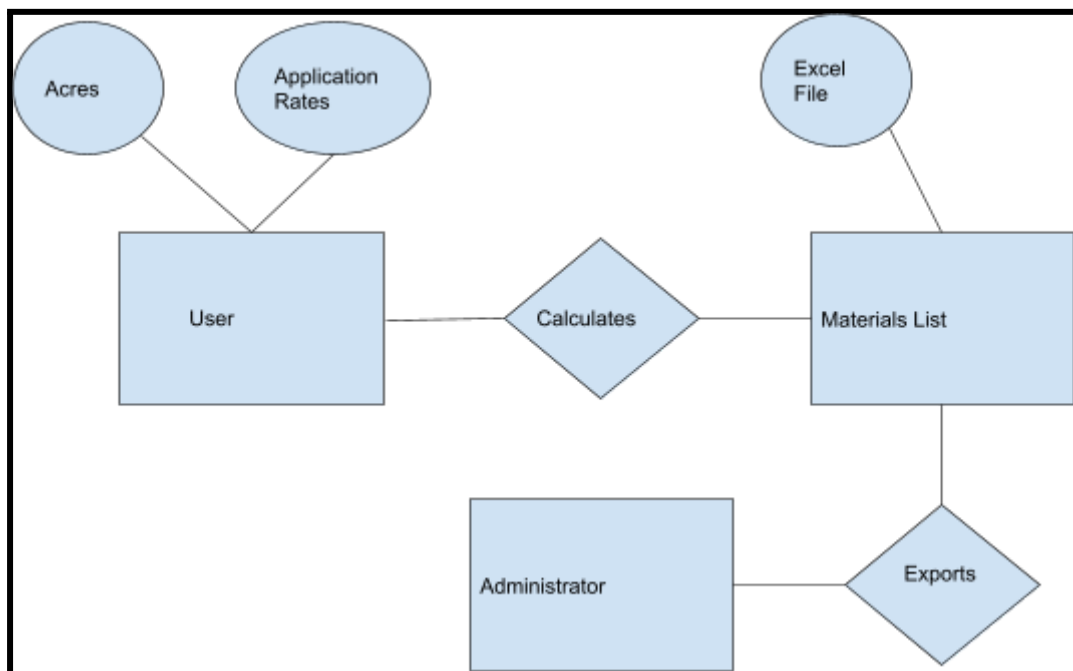**Jesus Beltran, Mickey Huang, Enrique Alvarez, John Kieren, Steven Aguirre**

Software Design Document (SDD)

1. **Introduction**

   1. Project Overview

      The project's goal is to create a calculator which takes a user input of acreage and returns an itemized list of the raw materials (fertilizer, seed, compost, fiber, tackifier) required for the given acreage.
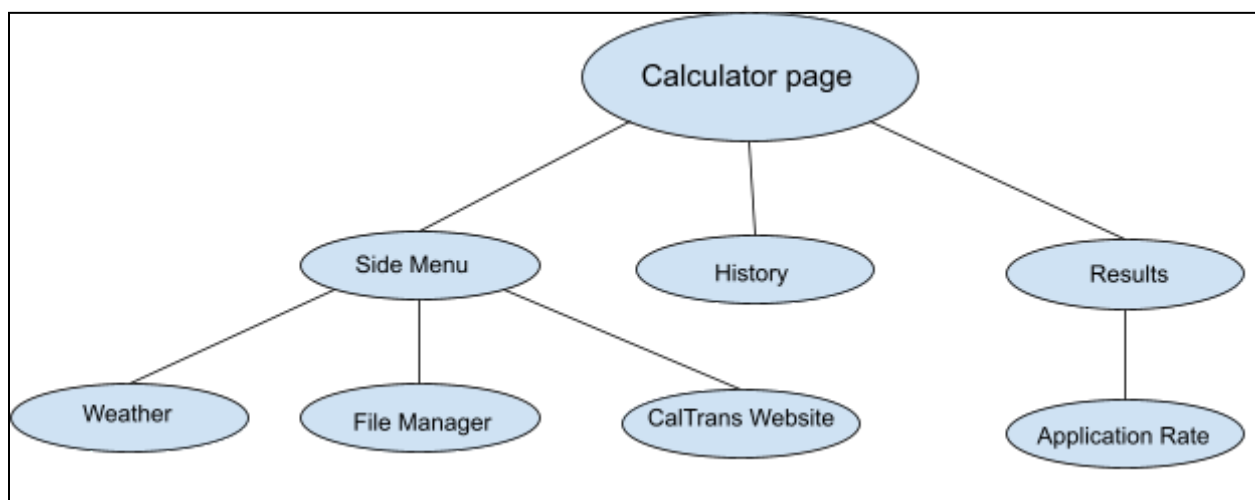
2. **Data Design**

The user, who begins with only an acreage for input and optionally rates of application, calculates the required materials for the job. The materials list can optionally be stored as an excel document and from there be exported to an administrator.
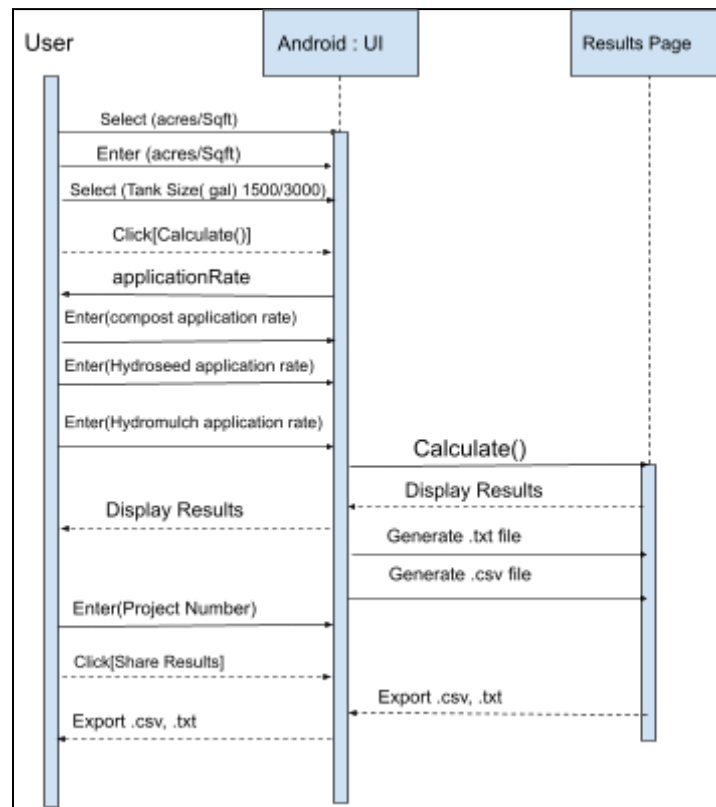
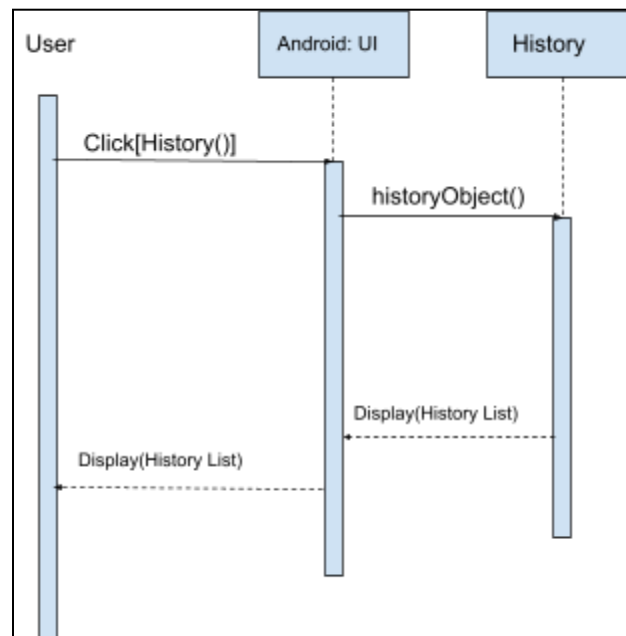3. **Architectural Design**

System and component overview
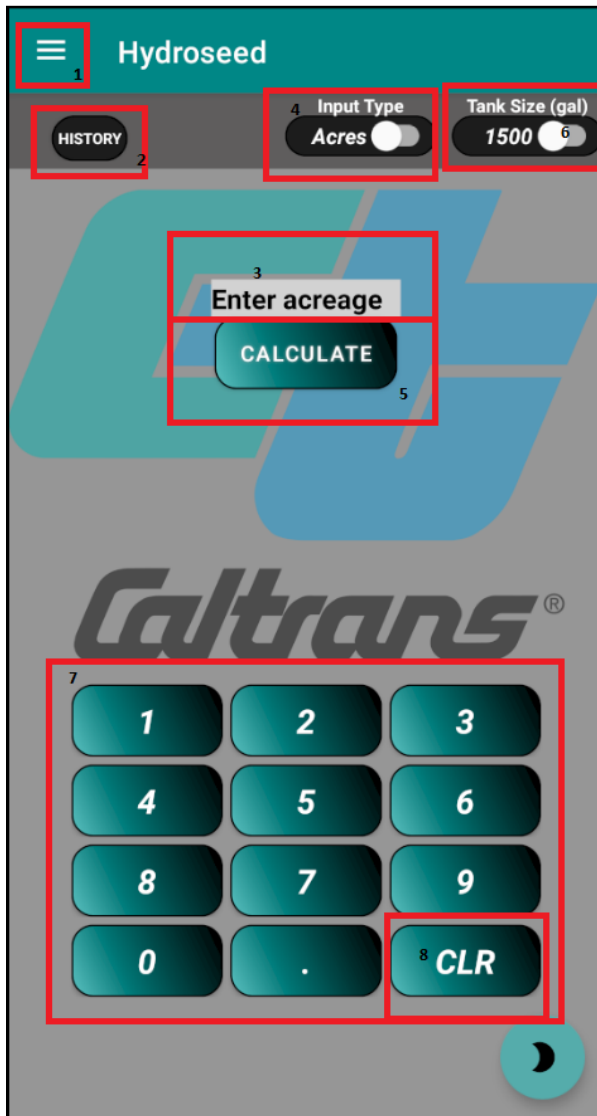
4. Detailed Design

**Calculate Use Case**

History Use Case

5. **User Interface Design**

The Interface Design describes internal and external program interfaces. Interface designs are based on the information obtained from the analysis models. Show menus, submenus, buttons, text boxes, check boxes, down drop lists, links, and tables,

Calculate Page

1.Context Menu to navigate to Calculator, Files, Weather, and Caltrans Website

2. History Button that displays past calculations on click

3. Text box which displays input from the number pad (7) for acreage or square feet depending on the toggle position of (4).

4. Toggle switch for changing user input to acres or square feet.

5. Button to take the user input of (3, 4, 6) and navigate to the rate input screen,

6. Toggle switch for the 2 standard sizes of tanks used by caltrans, 1500 and 3000 gallons.

7. Digital number pad which displays input into field (3), used as the basis for calculation.

8. Clear button which zeroes out the number input in field (3)
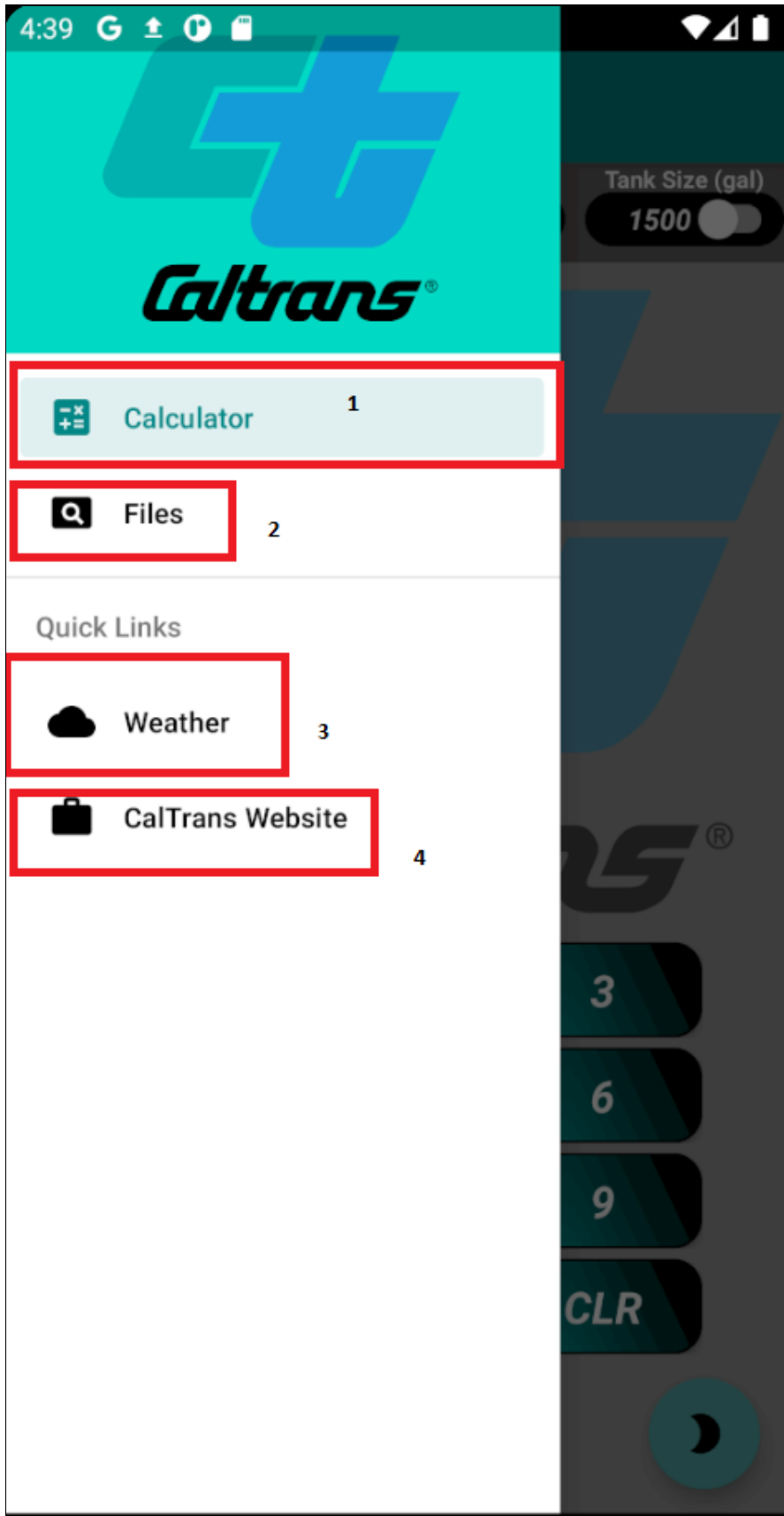
1. Clickable that navigates the user to the calculated page.

2. Clickable that navigates to the Files of previous calculations.

3. Clickable that navigates outside of the application to NOAA.gov website for weather in the users default browser

4. Clickable that navigates outside of the application to dot.ca.gov in the users default browser

Application Rate

1

2.75 acres or 119790.0 sqft

2

Compost Application Rate

Compost: 270.0 cy

Hydroseed Application Rate

Fertilizer: 1700.0 lbs   Fiber: 1000.0 lbs

Additive: 60.0 lbs   Seed: 65.0 lbs

Hydromulch Application Rate

Tackifier: 175.0 lbs   Fiber: 2500.0 lbs

3

GET RESULTS

4

REVERT TO DEFAULT RATES

Caltrans®

Rate Page

1. Clickable that returns the user to the calculated page to modify plot size input, tank size input, or view history or context menu.

2. Text boxes for rates of the various components of the hydroseed application process, all inputs are per acre.

3. Clickable that uses the inputs and computes the final materials list.

4. Clickable that resets the inputs on screen to default rates, which were provided by the client as the highest use case rates.

Calculated Results

2.75 acres or 119790 square foot		

Materials	Input	Output
Compost	270.00 CY / acre	**740 CY**
Hydroseed	**Refer to Fig 1**	**7768 lbs**
Hydromulch	**Refer to Fig 2**	**7356 lbs**

Figure 1		
Materials	Amount	Rate (lb/acre)
Seed	**178 lbs**	65.00 lbs
Fiber	**2750 lbs**	1000.00 lbs
Fertilizer	**94 bag(s)**	1700.00 lbs
Additive	**165 lbs**	60.00 lbs

Figure 2		
Materials	Amount	Rate (lb/acre)
Fiber	**6875 lbs**	2500.00 lbs
Tackifier	**481 lbs**	175.00 lbs
10 tanks of size 1500 for 148 bag(s)		

2
##-######

3
Project Name (Optional)

SAVE DATA
4

SHARE RESULTS
5

Result Page

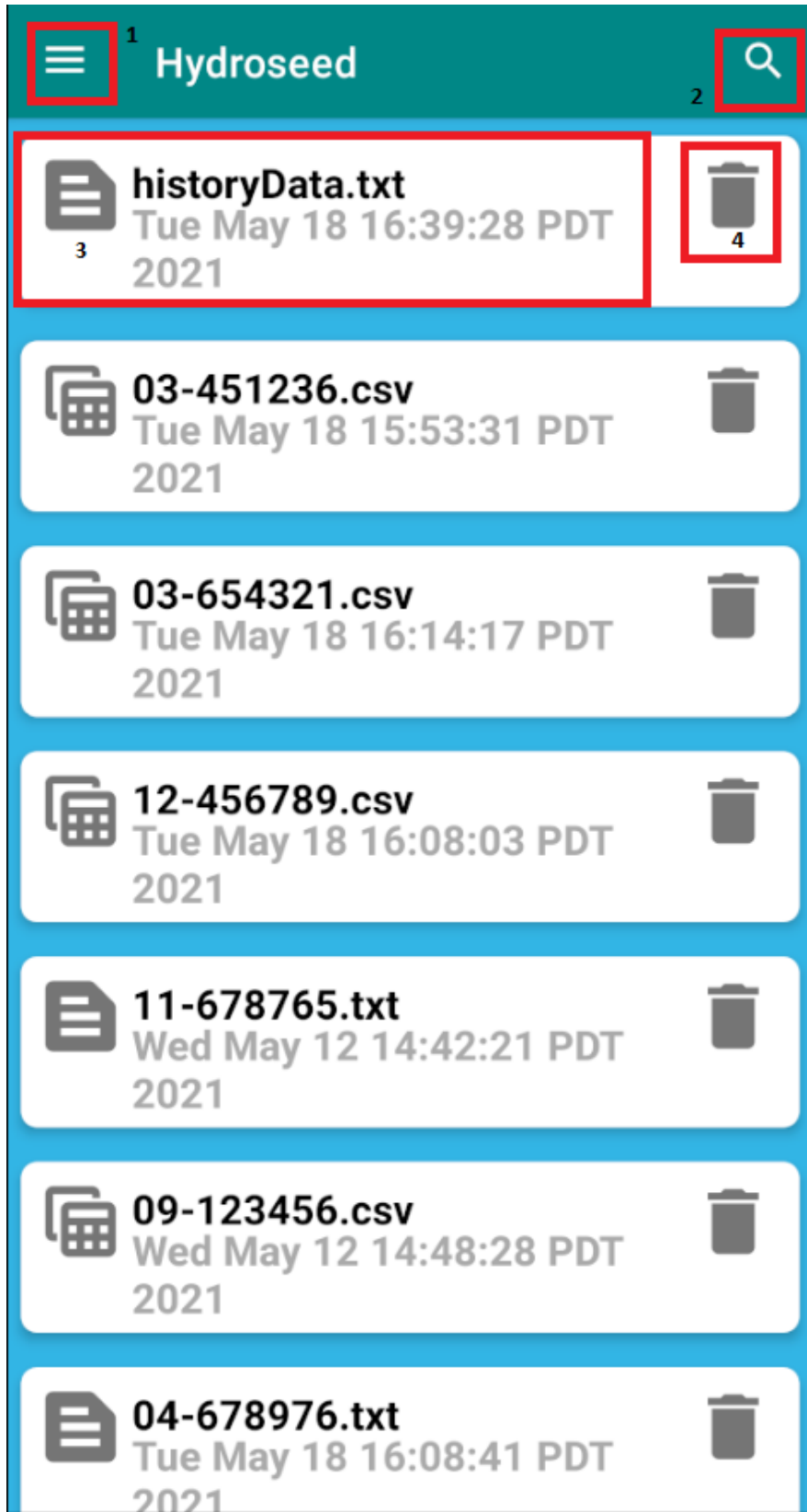1. Clickable that returns the user to the rates page if a modification of rates is needed.

2. Text field to input the project name, limited to the format under which caltrans official projects are categorized.

3. Optional text field for project nicknames for easy reference.

4. Clickable to save the results for later viewing

5. Clickable that opens the phones share menu to export the results through drive or email for example.

Hydroseed

historyData.txt
Tue May 18 16:39:28 PDT 2021

03-451236.csv
Tue May 18 15:53:31 PDT 2021

03-654321.csv
Tue May 18 16:14:17 PDT 2021

12-456789.csv
Tue May 18 16:08:03 PDT 2021

11-678765.txt
Wed May 12 14:42:21 PDT 2021

09-123456.csv
Wed May 12 14:48:28 PDT 2021

04-678976.txt
Tue May 18 16:08:41 PDT 2021

File Page

1. Clickable which opens the menu

2. Clickable that allows the user to search for project

3. Clickable that will show the full results of given calculation

4. Clickable that will delete calculation from the files page.

Calculation History

[1]

[2]

For 26 acres of land:
6992 cubic yards of Compost
1690 lbs of Hydroseed
69550 lbs of Hydromulch

--- Click Here for Extended Information ---

For 5 acres of land:
1345 cubic yards of Compost
325 lbs of Hydroseed
13375 lbs of Hydromulch

--- Click Here for Extended Information ---

For 54 acres of land:
14520 cubic yards of Compost
3510 lbs of Hydroseed
144450 lbs of Hydromulch

--- Click Here for Extended Information ---

For 123 acres of land:
33074 cubic yards of Compost
7995 lbs of Hydroseed
329025 lbs of Hydromulch

--- Click Here for Extended Information ---

For 11 acres of land:
2958 cubic yards of Compost
715 lbs of Hydroseed
29425 lbs of Hydromulch

--- Click Here for Extended Information ---

__History Page__

1. Clickable that returns user to the Calculate Page

2. Clickable that takes user to an Extended History Page that is based off of the Result Page

Calculation History

1. Clickable that returns user to the History Page

26.0 acres or 1132560 square foot		
Materials	**Input**	**Output**
Compost	270.00 CY / acre	**6992 CY**
Hydroseed	**Refer to Fig 1**	**1690 lbs**
Hydromulch	**Refer to Fig 2**	**69550 lbs**

Figure 1		
Materials	**Amount**	**Rate (lb/acre)**
Seed	**1690 lbs**	65.00 lbs
Fiber	**26000 lbs**	1000.00 lbs
Fertilizer	**884 bag(s)**	1700.00 lbs
Additive	**1560 lbs**	60.00 lbs

Figure 2		
Materials	**Amount**	**Rate (lb/acre)**
Fiber	**65000 lbs**	2500.00 lbs
Tackifier	**4550 lbs**	175.00 lbs

6. **Technology and Tools**
   1. Android Studio
   2. BitBucket
   3. Java programming language
   4. NOAA Weather Forecast
   5. Excel Documentation
   6. CalTrans Website
   7. E-mail

7. **Assumption and constraints**
   - Any relevant assumptions and any special design issues, which impact the design or implementation of the software, are noted here.
   - Assumes the users have a firm understanding of the hydroseed application process and the steps involved in that to limit the required amount of built in explanation for the variables being calculated.

8. **Team member's Roles and Approvals**

   Mickey Huang: [Team Lead, floater && Base Code]

   Jesus Beltran: [Data Persistency && BitBucketManager]

   Enrique Alvarez: [GUI, App, && Layout Designer]

   John Kieren: [User Input GUI && UX]

   Steven Aguirre: [Historic Calculations && Storage]