Pervious Concrete: Phase two

Pervious Concrete Research Team:

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Client/Technical Advisor

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Presentation Overview

- Project Understanding
- Scope of Services
- Cost of Engineering Services
- Project Scheduling

Project Understanding

- Introduction
  - Pervious Concrete
  - Benefits of Pervious Concrete
  - Demonstration

- Background
  - Pervious Concrete vs. Conventional Concrete
  - Applied Research and Development Building (ARD) parking lot

Project Understanding

- Project Purpose
  - Producing Specimens
  - Laboratory Testing
  - Applying Mixes from Phase One
  - Monitor the Performance

Project Understanding

- Stakeholders
  - Dr. Jun Ho
  - NAU
  - City of Flagstaff
- Existing Conditions
  - Flagstaff Climate
  - Freeze-Thaw cycle
  - ARD parking lot
    - Failure and cracks due to clogging

Project Understanding

- Technical Work
  - Applying Mixes from phase one
  - Monitor Performance
  - Develop the Mix Formula
    - Adding new admixtures (Silica-Fume, Fly ash)
- Challenges
  - High frequency of Freeze-Thaw cycles
  - Monitoring Period

Scope of Services

- Task 1- Team Management
- Task 2- Project Development
- Task 3- State of the Art Literature Review
- Task 4- Material Preparation
- Task 5- Application
- Task 6- Mix Formula Development
- Task 7- Specimen Production
- Task 8- Lab Testing
- Task 9- Data Analysis
- Task 10- Final Deliverable

Scope of Services

- Task 1- Team Management

  1.1 Meetings

- Task 2- Project Development

  2.1 Project description

  2.2 Task Breakdown

  2.3 Timeline, Staff Plan and Budget

  2.4 Final Project Proposal

Scope of Services

- Task 3- State of the Art Literature Review
  - 3.1 Previous Work
  - 3.2 Aggregate Gradation
  - 3.3 Mix design
  - 3.4 Admixtures
- Task 4- Material Preparation
  - 4.1 Material Preparation
  - 4.2 Testing Equipment Preparation
  - 4.3 Sieve Analysis

Scope of Services

- Task 5- Application
  - 5.1 Applying Mixes
  - 5.2 Monitoring
- Task 6- Mix Formula Development
  - 6.1 Proportions Calculation
  - 6.2 Sieve Analysis
  - 6.3 Add new Admixture

Scope of Services

- Task 7- Specimen Production

  7.1 Specimen Production

- Task 8- Lab Testing

  8.1 Void Ratio Test

  8.2 Compression Strength Test

  8.3 Permeability Test

  8.4 Freeze-Thaw Cycle Test

Scope of Services

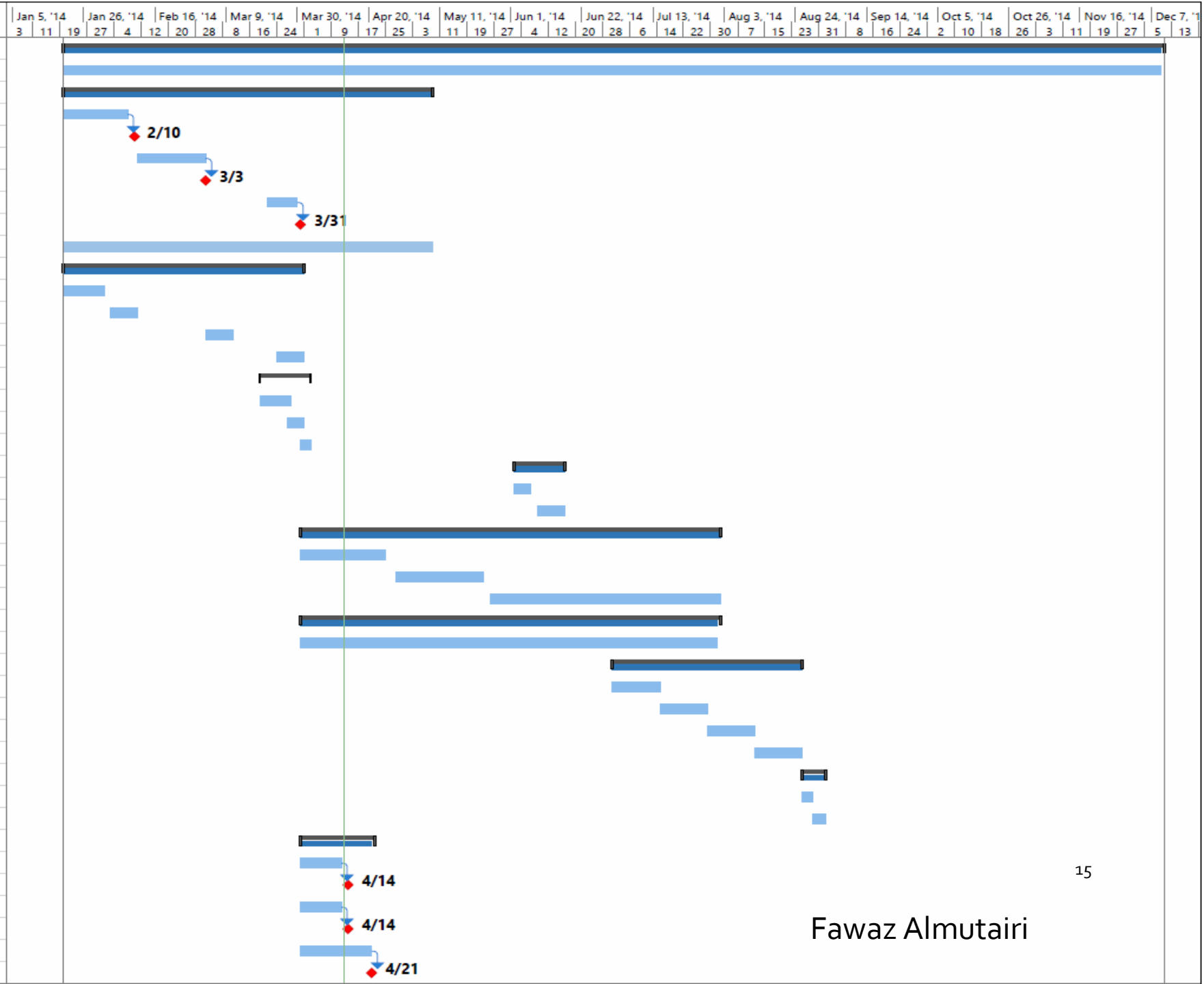
- Task 9- Data Analysis
  - 9.1 Final Data Sheet
  - 9.2 Final Mixture Formula
- Task 10- Final Deliverable
  - 10.1 Research Paper
  - 10.2 Presentation
  - 10.3 Website

Cost of Engineering Services

Task	Estimated Hour	Engineer In charge	Assistant Engineer
Task 1: Team Management	36	Fawaz	Fahad
Task 2: Project Development	36	Fahad	Fawaz
Task 3: Literature Review	60	Fawaz	Fahad
Task 4: Material Preparation	24	Fahad	Fawaz
Task 5: Application	16	Fawaz	Fahad
Task 6: Mix Formula Development	40	Fahad	Fawaz
Task 7: Specimen Production	26	Fawaz	Fahad
Task 8: Lab Testing	80	Fahad	Fawaz
Task 9: Data Analysis	32	Fawaz	Fahad
Task 10: Final Deliverable	60	Fahad	Fawaz
Total Hours	410		

Engineer Fee= 75$/hour
Total cost= 410 hours * 75$/hour= $30,750.00

ID	Task Name	Start	Finish
1	**Team Management**	**Mon 1/20/14**	**Wed 12/10/14**
2	Meetings	Mon 1/20/14	Tue 12/9/14
3	**Project Development**	**Mon 1/20/14**	**Thu 5/8/14**
4	Project description	Mon 1/20/14	Fri 2/7/14
5	Project description	Mon 2/10/14	Mon 2/10/14
6	Task Breakdown	Tue 2/11/14	Sun 3/2/14
7	task Breakdown	Mon 3/3/14	Mon 3/3/14
8	Timeline, Staff Plan and Budget	Fri 3/21/14	Sat 3/29/14
9	timeline, Staff Plan and Budget	Mon 3/31/14	Mon 3/31/14
10	Final Project Proposal	Mon 1/20/14	Thu 5/8/14
11	**State of the Art Literature Review**	**Mon 1/20/14**	**Mon 3/31/14**
12	Previous Work	Mon 1/20/14	Fri 1/31/14
13	Aggregate Gradation	Mon 2/3/14	Mon 2/10/14
14	Mix design	Mon 3/3/14	Mon 3/10/14
15	Admixtures	Mon 3/24/14	Mon 3/31/14
16	**Material Preparation**	**Wed 3/19/14**	**Wed 4/2/14**
17	Material Preparation	Wed 3/19/14	Thu 3/27/14
18	Testing Equipment Preparation	Thu 3/27/14	Mon 3/31/14
19	Sieve Analysis	Mon 3/31/14	Wed 4/2/14
20	**Application**	**Mon 6/2/14**	**Mon 6/16/14**
21	Applying Mixes	Mon 6/2/14	Fri 6/6/14
22	Monitoring	Mon 6/9/14	Mon 6/16/14
23	**Mix Formula Development**	**Mon 3/31/14**	**Fri 8/1/14**
24	Proportions Calculation	Mon 3/31/14	Thu 4/24/14
25	Sieve Analysis	Mon 4/28/14	Fri 5/23/14
26	Add new Admixture	Mon 5/26/14	Fri 8/1/14
27	**Specimen Production**	**Mon 3/31/14**	**Fri 8/1/14**
28	Specimen Production	Mon 3/31/14	Thu 7/31/14
29	**Lab Testing**	**Tue 7/1/14**	**Mon 8/25/14**
30	Void ratio Test	Tue 7/1/14	Mon 7/14/14
31	Compression Strength Test	Tue 7/15/14	Mon 7/28/14
32	Permeability Test	Tue 7/29/14	Mon 8/11/14
33	Freeze-thaw Cycle Test	Tue 8/12/14	Mon 8/25/14
34	**Data Analysis**	**Tue 8/26/14**	**Mon 9/1/14**
35	Final Data Sheet	Tue 8/26/14	Thu 8/28/14
36	Final mixture Formula	Fri 8/29/14	Mon 9/1/14
37	**Final Deliverable**	**Mon 3/31/14**	**Mon 4/21/14**
38	Research Paper	Mon 3/31/14	Fri 4/11/14
39	research Paper	Mon 4/14/14	Mon 4/14/14
40	Presentation	Mon 3/31/14	Fri 4/11/14
41	presentation	Mon 4/14/14	Mon 4/14/14
42	Website	Mon 3/31/14	Sun 4/20/14
43	website	Mon 4/21/14	Mon 4/21/14



Fawaz Almutairi

Special Thanks To

- Dr. Chun-Hsing Jun Ho
- Mr. Vern Harris

  Quality Control Manger – Prescott

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Questions ? ?