**Software Design Schedule**

**for**

**North Shore Extension**

**Version 4.0 approved**

**Prepared by Garrett Grube, Jeff Deely, Ritesh Misra, Spencer Worms, Xavier Torgerson**

**Blue Team**

**12/15/2016**

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**Revision History**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Date** | **Reason For Changes** | **Version** |
| Garrett Grube | 9/24/16 | Document Created | 1.0 |
| Garrett Grube | 9/26/16 | Content added to Milestones, Sprints, and Calendar sections | 1.1 |
| Garrett Grube | 9/28/16 | Added Resource Allocation section | 1.2 |
| Jeff Deely | 9/28/16 | Fixed Document Formatting | 1.3 |
| Spencer Worms | 9/28/16 | Added Train Model | 1.4 |
| Ritesh Misra | 9/28/16 | Added CTC | 1.5 |
| Jeff Deely | 9/29/16 | Finished Version | 1.6 |
| Garrett Grube | 11/4/16 | Updated for Work Package 2 | 2.0 |
| Garrett Grube | 12/11/16 | Updated for Work Package 3 | 3.0 |
| Xavier Torgerson | 12/11/16 | Update for Work Package 3 | 3.1 |
| Spencer Worms | 12/13/16 | Updated for Work Package 3 | 3.2 |
| Spencer Worms | 12/14/16 | Finished | 4.0 |

# **Introduction**

## **Purpose**

The purpose of this document is to detail the work plan that will be used to complete the North Shore Extension Project. It will include major milestones, major tasks, and team member resource allocated.

## **Schedule Description**

The software design schedule is broken down into milestones and sprints. Milestones are due dates for the completion of significant amounts of work within the project. Sprints are groups of related project tasks to be completed over a specified period of time.

## **Module Assignments**

CTC Office: Ritesh Misra

Track Controller: Jeff Deely

Track Model: Xavier Torgerson

Train Model: Spencer Worms

Train Controller: Garett Grube

# **Milestones**

## **Work Package 1** (Status: Completed)

### **Date**

Work Package 1 is to be completed by 2/29/16

### **Description**

Documentation required for Work Package 1 includes:

1. Coding Standard (CS)

2. Defect Tracking Policy & Workflow (DTPW)

3. Risk Assessment (RA)

4. Software Development Schedule (SDS)

5. Software Requirement Specification (SRS)

6. User Interface Design (UID)

7. User Manual (UM)

### **Sprints**

#### ***Prepare Work Package 1***

##### Duration

Prepare Work Package 1 starts 9/19/16 and ends 9/29/16

##### Description

Developers will prepare the documentation for Work Package 1.

## **Rapid Prototype Complete** (Status: Completed)

### **Date**

The rapid prototype is to be completed by 10/21/16

### **Description**

Blue team will develop a rapid prototype of the system. This prototype will include all functionality and operate as closely to correct as possible. This prototype will help the team to understand the project in its full scope and assist with creating design documentation for Work Package 2

### **Sprints**

#### ***Develop Rapid Prototype***

##### Duration

Develop Rapid Prototype starts 9/30/16 and ends 10/14/16

##### Description

Developers will code a rapid prototype of the system

#### ***Create Java Docs***

##### Duration

Create Java Docs starts 10/14/16 and ends 10/18/16

##### Description

Developers will create Java Docs of their code to make it easier to peer review. These documents will also aid in writing design documents for work package 2.

#### ***Test Rapid Prototype***

##### Duration

Test Rapid Prototype starts 10/18/16 and ends 10/21/16

##### Description

Developers will test and peer review the rapid prototype.

### **Team Member Tasks**

#### ***CTC office***

Finishing layout and event triggers of Java GUI: 2 hrs.

Completed: 5 hrs

Loading the data user enters into “Set Suggestion” menu into the program: 1 hr.

Completed: 1 hr

Prototype sending suggestions to wayside controller: 3 hrs.

Completed: 6 hrs

Sending data of user-selected switches to wayside controller: 2 hrs.

Completed: 1 hr

Making the “Show Schedule” button open up the table: 1 hr

Completed: 3 hrs

Have the schedule table be filled with actual data that I get from the wayside controller: 3 hrs.

Completed: 3 hrs

Program the “Set Authority” button located on the schedule: 5 hours

Completed: 7 hrs

Having “Edit Track” open up the block manager with the latest data from the wayside controller: 2 hrs.

Completed: 3 hrs

Adding notifications: 2 hrs.

Completed: 1 hr

Loading schedule: 3 hrs

Completed: 6 hrs

#### ***Track Controller***

Create method to read block data from track model: 6 hrs.

Completed: 10hrs

Create a Preset compiled PLC code for a Wayside controller: 5 hrs.

Completed: 7hrs

Create an interpreter for PLC code: 10 hrs.

Completed: 10hrs

Make PLC output instructions to Track and CTC: 2 hrs.

Completed: 2hrs

Implement GUI with Real Time Updates: 6 hrs.

Completed: 12hrs

Create java docs: 2 hrs.

Completed: 1hrs

#### ***Track Model***

Load the supplied .csv version of the track into a virtual database: 5 hrs.

Completed: 2hrs

Interface with blocks data by numbers and clicking interface: 4 hrs.

Completed: 2hrs

Generate Java docs: 2 hrs.

Completed: 1hrs

#### ***Train Model***

Convert power from train controller to velocity: 8hrs.

Completed: 15hr

Implement communication between other modules and train model: 4hrs.

Completed: 5hr

Generate java docs: 2hrs.

Completed: 2 hrs

#### ***Train Controller***

Implement train controller motion controls: 10 hrs.

Completed: 15hrs

Implement train controller vehicle controls: 10 hrs.

Completed: 10 hrs

Design safety critical architecture: 5 hrs.

Completed: 5 hrs

## **Work Package 2** (Status: Completed)

### **Date**

Work Package 2 is to be completed by 11/3/16

### **Description**

Documentation for Work Package 2 includes:

1. System Architecture & Design

2. Test Plan

3. Updated Schedule with resource assignment

### **Sprints**

#### ***Prepare Work Package 2***

##### Duration

Prepare Work Package 2 starts 10/21/16 and ends 11/3/16

##### Description

Developers will prepare the documentation for Work Package 2.

### **Team Member Tasks**

#### ***CTC office***

Create the CTC office section of the System Architecture & Design document: 2 hrs.

Completed: 3hrs

Create a test plan for the CTC office: 5 hrs.

Completed: 2 hrs

Update the Software Design Schedule: 2 hrs.

Completed: 2 hrs

#### ***Track Controller***

Create the train controller section of the System Architecture & Design document: 2 hrs.

Completed: 7hrs

Create a test plan for the train controller: 5 hrs.

Completed: 1hrs

Update the Software Design Schedule: 2 hrs.

Completed: 2hrs

#### ***Track Model***

Create the track model section of the System Architecture & Design document: 2 hrs.

Completed: 7hrs

Create a test plan for the track model: 5 hrs.

Completed: 4hrs

Update the Software Design Schedule: 2 hrs.

Completed: 1hrs

#### ***Train Model***

Create the train model section of the System Architecture & Design document: 2 hrs.

Completed: 2 hrs.

Create a test plan for the train model: 5 hrs.

Completed: 5 hrs.

Update the Software Design Schedule: 2 hrs.

Completed: 2 hrs.

#### ***Train Controller***

Create the train controller section of the System Architecture & Design document: 2 hrs.

Completed: 2 hrs.

Create a test plan for the train controller: 5 hrs.

Completed: 5 hrs.

Update the Software Design Schedule: 2 hrs.

Completed: 2 hrs.

## **System Completed** (Status: Completed)

### **Date**

The system is to be completed by 11/18/16

### **Description**

The entire system is to be completed, functional and tested at this point.

### **Sprints**

#### ***Develop System***

##### Duration

Develop System starts 11/4/16 and ends 11/11/16

##### Description

Developers will implement the North Shore Extension system from the design documents prepared for Work Package 2.

#### ***Test System***

##### Duration

Test System starts 11/11/16 and ends 11/18/16

##### Description

Developers will test the implementation of the system to verify it works correctly.

### **Team Member Tasks**

#### ***CTC office***

Implement feedback from system prototype demonstration: 5 hrs.

Completed: 3 hrs

Receiving suggestion status (denied or taken) from wayside controller: 2 hrs.

Completed: 2 hrs

Start investigating control edge cases beyond the basic tests: 15 hrs.

N/A

Write user checks to prevent user from making unsafe decisions: 10 hrs.

N/A

Program the automatic mode: 10 hrs.

Completed: 12 hrs

Test the CTC with other modules: 20 hrs.

Completed: 5 hrs

Take part in the system wide testing: 20 hrs.

Completed: 1 hr

#### ***Track Controller***

Create PLC File Syntax: 2 hrs.

Completed: 4hrs

Create PLC File Reader/Compiler: 6 hrs.

Completed: 10hrs

Complete GUI with working components 5 hrs.

Completed: 2hrs

Recode the track controller module based off the prototype: 10 hrs.

Completed: 20hrs

Test the track controller with other modules: 20 hrs.

Completed: 8hrs

Take part in the system wide testing: 20 hrs.

Completed: 3hrs

#### ***Track Model***

Define architecture for blocks tracking neighbors: 4hr

Completed: 8hr

Parse Block directions

Completed: 3hr

Interface with other components: 3hr

Completed: 7hr

Account for all block infrastructure: 5hr

Completed: 5hr

Add manually invoked failures: 1hr

Completed: 1hr

Test the track model with other modules: 20 hrs.

Completed: 10hr

Take part in the system wide testing: 20 hrs.

Completed: 4hr

#### ***Train Model***

Recode the train model module based off the prototype: 10 hrs.

Completed: 20hr

Implement test mode for train model: 4hrs.

Completed: 4hr

Add manually invoked failures: 4hrs.

Completed: 4hr

Test the track controller with other modules: 20 hrs.

Completed: 10hr

Take part in the system wide testing: 20 hrs.

Completed: 10hr

#### ***Train Controller***

Recode the train controller module based off the prototype: 25 hrs.

Completed: 20 hrs.

Test the train controller with other modules: 20 hrs.

Completed: 20 hrs.

Take part in the system wide testing: 20 hrs.

Completed: 20 hrs.

## **Documentation Completed** (Status: Completed)

### **Date**

All documentation is to be completed by 12/9/16

### **Description**

This includes updated past documentation, and completed documentation due for work package 3

### **Sprints**

#### ***Document System***

##### Duration

Document System starts 11/18/16 and ends 12/9/16

##### Description

Developers will document the system.

### **Team Member Tasks**

#### ***CTC office***

Add the CTC office to the Installation guide: 2 hrs.

Completed: 1 hr.

Contribute to the configuration management document: 2 hrs.

Completed: 1 hr.

Execute preliminary unit tests: 3 hrs

Completed: 1 hr.

Execute test plans: 15 hrs.

Completed: 15 hrs.

Document results: 3 hrs.

Completed: 3hrs.

Prepare defect reports: 1 hrs.

Completed: 1 hr.

Updated design schedule: 1 hrs.

Completed: 1 hr.

#### ***Track Controller***

Add the track controller to the Installation guide: 2 hrs.

Completed: 1hr.

Contribute to the configuration management document: 2 hrs.

Completed: 2hr.

Execute test plans: 15 hrs.

Completed: 3hr.

Prepare defect reports: 1 hrs.

Completed: 1hr.

Updated design schedule: 1 hrs.

Completed: 1hr.

#### ***Track Model***

Add the track model to the Installation guide: 2 hrs.

Completed: 1hr

Contribute to the configuration management document: 2 hrs.

Completed: 1hr

Test invoked failures: 1hr

Completed: 1hr

Perform unit tests: 3hr

Completed: 3hr

Perform functional tests: 1hr

Completed: 2hrs

Prepare defect reports: 1 hrs.

Completed: 1hr

Updated design schedule: 1 hrs.

Completed: 1hr

#### ***Train Model***

Add the train model to the Installation guide: 2 hrs.

Completed: 1hr

Contribute to the configuration management document: 2 hrs.

Completed: 5hr

Test invoked failures: 1hr

Completed: 2hr

Perform unit tests: 2hr

Completed: 3hr

Perform functional tests: 1hr

Completed: 2hr

Prepare defect reports: 1 hrs.

Completed: 1hr

Updated design schedule: 1 hrs.

Completed: 1hr

#### ***Train Controller***

Add the train controller to the Installation guide: 2 hrs.

Completed: 1 hr

Contribute to the configuration management document: 2 hrs.

Completed: 1 hr

Execute test plans: 15 hrs.

Completed: 5 hr

Prepare defect reports: 1 hrs.

Completed: 1 hrs

Updated design schedule: 1 hrs.

Completed: 1 hr

## **Work Package 3** (Status: Completed)

### **Date**

Work package 3 is to be completed by 12/15/16

### **Description**

Documentation required for Work Package 3:

1. Installation Guide

2. Configuration Management

3. Executed Test Plans

4. Defect Reports

5. Updated Work Schedule with resource assignment

Additional, the project codebase is required.

All of the above will be part of a project presentation

#### ***Sprints Prepare Work Package 3***

##### Duration

Prepare Work Package 3 starts 12/8/16 and ends 12/15/16

##### Description

Developers will prepare the documentation and codebase for Work Package 3. They will also prepare a project presentation.

### **Team Member Tasks**

#### ***CTC office***

Proofread all documentation: 2 hrs.

Completed: 2 hrs.

Practice presentation: 6 hrs.

Completed: 6hrs.

#### ***Track Controller***

Proofread all documentation: 2 hrs.

Completed: 2hrs.

Practice presentation: 6 hrs.

Completed: 6 hrs.

#### ***Track Model***

Proofread all documentation: 2 hrs.

Completed: 1hr

Practice presentation: 6 hrs.

Completed: 6 hrs

#### ***Train Model***

Proofread all documentation: 2 hrs.

Completed: 2hr

Practice presentation: 6 hrs.

Completed: 8hr

#### ***Train Controller***

Proofread all documentation: 2 hrs.

Completed: 4 hrs

Practice presentation: 6 hrs.

Completed: 10 hrs

## Total Hours vs Expected Hours

|  |  |  |
| --- | --- | --- |
| Person (Module) | Total Hours | Expected Hours |
| Ritesh Misra (CTC Office) | 101 | 120 |
| Jeff Deely (Wayside Controller) | 115 | 138 |
| Xavier Torgerson (Track Model) | 72 | 95 |
| Spencer Worms (Train Model | 104 | 133 |
| Garret Grube (Train Controller) | 122 | 132 |
| Total | 514 | 614 |

# **Calendar**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| |  |  | | --- | --- | | **Milestone** | **Date** | | **Work Package 1** | 9/29/16 | | **Rapid prototype Completed** | 10/21/16 | | **Work package 2** | 11/3/16 | | **System completed** | 11/18/16 | | **Documentation completed** | 12/9/16 | | **Work package 3** | 12/15/16 | | |  |  |  | | --- | --- | --- | | **Sprint** | **Starting** | **Ending** | | **Repair work package 1** | 9/19/16 | 9/29/16 | | **Create rapid prototype** | 9/30/16 | 10/14/16 | | **Create java docs** | 10/14/16 | 10/18/16 | | **Test Rapid Prototype** | 10/18/16 | 10/21/16 | | **Prepare work package 2** | 10/21/16 | 11/3/16 | | **Develop system** | 11/4/16 | 11/11/16 | | **Test system** | 11/11/16 | 11/18/16 | | **Document system** | 11/18/16 | 12/9/16 | | **Prepare work package 3** | 12/8/16 | 12/15/16 | |