**Traceability Record**

**Team Collaboration System for Mobility Water Monitoring**

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**Document History**

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**\* WT = Mr.Worrasete Tansurat**

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**Chapter 7-1|Introduction**

## 1.1 Purpose

The purpose of the traceability record document, it shows the relation of Team Collaboration System for Mobility Water Monitoring project. The traceability is linked relationship between user requirement specification (URS) to system requirement specification (SRS), use case (UC), activity diagram (AD), sequence diagram (SD), user interface (UI) and test case (TC).

## 1.2 Project scope

The TCS is developed in both mobile application and web application and also apply the calculation component to reach the water parameter result. There are six main features of TCS are shown below:

Feature 1: Authentication and member management system

Feature 2: Project management

Feature 3: Map location management

Feature 4: Water parameter calculation

Feature 5: Parameter result tracing

Feature 6: Messaging System

.

# Chapter 7-2 |Traceability Record Table

## 2.1 User Requirement Specification (URS) / System Requirement Specification (SRS)

| **No** | **URS**  **SRS** | **USR-01** | **USR-02** | **USR-03** | **USR-04** | **USR-05** | **USR-06** | **USR-07** | **USR-08** | **USR-09** | **USR-10** | **USR-11** | **USR-12** | **USR-13** | **USR-14** | **USR-15** | **USR-16** | **USR-17** | **USR-18** | **USR-19** | **USR-20** | **USR-21** | **USR-22** | **USR-23** | **USR-24** | **USR-25** | **USR-26** | **USR-27** | **USR-28** | **USR-29** | **USR-30** | **USR-31** | **USR-32** | **USR-33** | **USR-34** | **USR-35** | **USR-36** | **USR-37** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **SRS-001** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **2** | **SRS-002** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **3** | **SRS-003** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **4** | **SRS-004** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **5** | **SRS-005** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **6** | **SRS-006** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **7** | **SRS-007** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **8** | **SRS-008** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **9** | **SRS-009** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **10** | **SRS-010** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **11** | **SRS-011** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **12** | **SRS-012** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **13** | **SRS-013** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **14** | **SRS-014** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **15** | **SRS-015** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **16** | **SRS-016** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **17** | **SRS-017** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **18** | **SRS-018** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **19** | **SRS-019** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **20** | **SRS-020** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **21** | **SRS-021** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **22** | **SRS-022** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **23** | **SRS-023** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **24** | **SRS-024** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **25** | **SRS-025** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **26** | **SRS-026** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **27** | **SRS-027** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **28** | **SRS-028** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **29** | **SRS-029** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **30** | **SRS-030** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **31** | **SRS-031** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **32** | **SRS-032** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **33** | **SRS-033** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **34** | **SRS-034** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **35** | **SRS-035** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **36** | **SRS-036** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **37** | **SRS-037** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **38** | **SRS-038** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **39** | **SRS-039** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **40** | **SRS-040** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **41** | **SRS-041** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **42** | **SRS-042** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **43** | **SRS-043** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **44** | **SRS-044** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **45** | **SRS-045** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **46** | **SRS-046** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **47** | **SRS-047** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **48** | **SRS-048** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **49** | **SRS-049** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **50** | **SRS-050** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **51** | **SRS-051** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **52** | **SRS-052** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **53** | **SRS-053** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **54** | **SRS-054** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **55** | **SRS-055** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **56** | **SRS-056** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **57** | **SRS-057** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **58** | **SRS-058** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **59** | **SRS-059** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **60** | **SRS-060** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **61** | **SRS-061** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **62** | **SRS-062** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **63** | **SRS-063** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **64** | **SRS-064** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **65** | **SRS-065** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **66** | **SRS-066** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **67** | **SRS-067** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **68** | **SRS-068** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **69** | **SRS-069** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **70** | **SRS-070** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **71** | **SRS-071** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **72** | **SRS-072** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **73** | **SRS-073** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **74** | **SRS-074** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **75** | **SRS-075** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **76** | **SRS-076** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **77** | **SRS-077** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **78** | **SRS-078** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **79** | **SRS-079** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **80** | **SRS-080** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **81** | **SRS-081** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **82** | **SRS-082** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **83** | **SRS-083** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **84** | **SRS-084** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **85** | **SRS-085** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **86** | **SRS-086** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **87** | **SRS-087** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **88** | **SRS-088** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **89** | **SRS-089** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **90** | **SRS-090** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **91** | **SRS-091** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **92** | **SRS-092** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **93** | **SRS-093** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **94** | **SRS-094** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **95** | **SRS-095** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **96** | **SRS-096** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **97** | **SRS-097** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **98** | **SRS-098** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **99** | **SRS-099** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **100** | **SRS-100** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **101** | **SRS-101** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **102** | **SRS-102** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **103** | **SRS-103** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **104** | **SRS-104** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **105** | **SRS-105** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **106** | **SRS-106** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **107** | **SRS-107** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **108** | **SRS-108** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **109** | **SRS-109** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **110** | **SRS-110** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **111** | **SRS-111** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **112** | **SRS-112** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **113** | **SRS-113** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **114** | **SRS-114** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **115** | **SRS-115** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **116** | **SRS-116** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **117** | **SRS-117** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **118** | **SRS-118** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **119** | **SRS-119** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **120** | **SRS-120** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **121** | **SRS-121** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **122** | **SRS-122** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **123** | **SRS-123** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **124** | **SRS-124** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **125** | **SRS-125** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **126** | **SRS-126** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **127** | **SRS-127** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **128** | **SRS-128** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **129** | **SRS-129** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **130** | **SRS-130** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **131** | **SRS-131** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **132** | **SRS-132** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **133** | **SRS-133** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **134** | **SRS-134** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **135** | **SRS-135** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **136** | **SRS-136** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **137** | **SRS-137** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **138** | **SRS-138** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **139** | **SRS-139** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **140** | **SRS-140** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **141** | **SRS-141** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **142** | **SRS-142** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **143** | **SRS-143** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **144** | **SRS-144** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **145** | **SRS-145** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **146** | **SRS-146** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **147** | **SRS-147** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **148** | **SRS-148** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **149** | **SRS-149** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **150** | **SRS-150** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **151** | **SRS-151** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **152** | **SRS-152** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **153** | **SRS-153** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **154** | **SRS-154** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **155** | **SRS-155** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **156** | **SRS-156** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **157** | **SRS-157** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **158** | **SRS-158** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **159** | **SRS-159** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **160** | **SRS-160** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **161** | **SRS-161** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **162** | **SRS-162** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **163** | **SRS-163** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **164** | **SRS-164** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **165** | **SRS-165** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **166** | **SRS-166** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **167** | **SRS-167** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **168** | **SRS-168** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **169** | **SRS-169** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **170** | **SRS-170** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

## 2.2 User Requirement Specification (URS) / Use Case (UC)

| **No** | **URS**  **UC** | **USR-01** | **USR-02** | **USR-03** | **USR-04** | **USR-05** | **USR-06** | **USR-07** | **USR-08** | **USR-09** | **USR-10** | **USR-11** | **USR-12** | **USR-13** | **USR-14** | **USR-15** | **USR-16** | **USR-17** | **USR-18** | **USR-19** | **USR-20** | **USR-21** | **USR-22** | **USR-23** | **USR-24** | **USR-25** | **USR-26** | **USR-27** | **USR-28** | **USR-29** | **USR-30** | **USR-31** | **USR-32** | **USR-33** | **USR-34** | **USR-35** | **USR-36** | **USR-37** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **W-UC-01** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **2** | **W-UC-02** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **3** | **W-UC-03** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **4** | **W-UC-04** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **5** | **W-UC-05** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **6** | **W-UC-06** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **7** | **W-UC-07** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **8** | **W-UC-08** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **9** | **W-UC-09** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **10** | **W-UC-10** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **11** | **W-UC-11** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **12** | **W-UC-12** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **13** | **W-UC-13** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **14** | **W-UC-14** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **15** | **W-UC-15** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **16** | **W-UC-16** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **17** | **W-UC-17** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **18** | **W-UC-18** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **19** | **W-UC-19** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **20** | **M-UC-01** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **21** | **M-UC-02** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **22** | **M-UC-03** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **23** | **M-UC-04** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **24** | **M-UC-05** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **25** | **M-UC-06** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **26** | **M-UC-07** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **27** | **M-UC-08** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **28** | **M-UC-09** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **29** | **M-UC-10** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **30** | **M-UC-11** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **31** | **M-UC-12** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

## 2.3 User Requirement Specification (URS) / Activity Diagram (AD)

| **No** | **URS**  **AD** | **USR-01** | **USR-02** | **USR-03** | **USR-04** | **USR-05** | **USR-06** | **USR-07** | **USR-08** | **USR-09** | **USR-10** | **USR-11** | **USR-12** | **USR-13** | **USR-14** | **USR-15** | **USR-16** | **USR-17** | **USR-18** | **USR-19** | **USR-20** | **USR-21** | **USR-22** | **USR-23** | **USR-24** | **USR-25** | **USR-26** | **USR-27** | **USR-28** | **USR-29** | **USR-30** | **USR-31** | **USR-32** | **USR-33** | **USR-34** | **USR-35** | **USR-36** | **USR-37** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **AD -01** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **2** | **AD -02** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **3** | **AD -03** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **4** | **AD -04** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **5** | **AD -05** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **6** | **AD -06** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **7** | **AD -07** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **8** | **AD -08** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **9** | **AD -09** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **10** | **AD -10** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **11** | **AD -11** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **12** | **AD -12** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **13** | **AD -13** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **14** | **AD -14** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **15** | **AD -15** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **16** | **AD -16** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **17** | **AD -17** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **18** | **AD -18** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **19** | **AD -19** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **20** | **AD -20** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **21** | **AD -21** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **22** | **AD -22** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **23** | **AD -23** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **24** | **AD -24** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **25** | **AD -25** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **26** | **AD -26** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **27** | **AD -27** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **28** | **AD -28** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **29** | **AD -29** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **30** | **AD -30** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **31** | **AD -31** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **32** | **AD -32** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **33** | **AD -33** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **34** | **AD -34** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **35** | **AD -35** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **36** | **AD -36** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **37** | **AD -37** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

## 2.4 User Requirement Specification (URS) / Class Description (CD)

| **No** | **URS**  **UC** | **USR-01** | **USR-02** | **USR-03** | **USR-04** | **USR-05** | **USR-06** | **USR-07** | **USR-08** | **USR-09** | **USR-10** | **USR-11** | **USR-12** | **USR-13** | **USR-14** | **USR-15** | **USR-16** | **USR-17** | **USR-18** | **USR-19** | **USR-20** | **USR-21** | **USR-22** | **USR-23** | **USR-24** | **USR-25** | **USR-26** | **USR-27** | **USR-28** | **USR-29** | **USR-30** | **USR-31** | **USR-32** | **USR-33** | **USR-34** | **USR-35** | **USR-36** | **USR-37** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **W-CD-01** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **2** | **W-CD-02** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **3** | **W-CD-03** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **4** | **W-CD-04** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **5** | **W-CD-05** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **6** | **W-CD-06** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **7** | **W-CD-07** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **8** | **W-CD-08** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **9** | **M-CD-01** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **10** | **M-CD-02** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **11** | **M-CD-03** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **12** | **M-CD-04** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **13** | **M-CD-05** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **14** | **M-CD-06** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **15** | **M-CD-07** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **16** | **M-CD-08** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **17** | **M-CD-09** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

## 2.5 User Requirement Specification (URS) / Sequence Diagram (SD)

| **No** | **URS**  **SD** | **USR-01** | **USR-02** | **USR-03** | **USR-04** | **USR-05** | **USR-06** | **USR-07** | **USR-08** | **USR-09** | **USR-10** | **USR-11** | **USR-12** | **USR-13** | **USR-14** | **USR-15** | **USR-16** | **USR-17** | **USR-18** | **USR-19** | **USR-20** | **USR-21** | **USR-22** | **USR-23** | **USR-24** | **USR-25** | **USR-26** | **USR-27** | **USR-28** | **USR-29** | **USR-30** | **USR-31** | **USR-32** | **USR-33** | **USR-34** | **USR-35** | **USR-36** | **USR-37** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **SD -01** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **2** | **SD -02** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **3** | **SD -03** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **4** | **SD -04** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **5** | **SD -05** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **6** | **SD -06** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **7** | **SD -07** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **8** | **SD -08** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **9** | **SD -09** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **10** | **SD -10** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **11** | **SD -11** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **12** | **SD -12** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **13** | **SD -13** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **14** | **SD -14** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **15** | **SD -15** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **16** | **SD -16** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **17** | **SD -17** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **18** | **SD -18** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **19** | **SD -19** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **20** | **SD -20** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **21** | **SD -21** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **22** | **SD -22** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **23** | **SD -22** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **24** | **SD -22** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **25** | **SD -22** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **26** | **SD -22** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **27** | **SD -22** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **28** | **SD -22** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **29** | **SD -22** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **30** | **SD -22** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **31** | **SD -22** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **32** | **SD -22** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **33** | **SD -22** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **34** | **SD -22** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **35** | **SD -22** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **36** | **SD -22** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **37** | **SD -22** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

## 2.6 User Requirement Specification (URS) / User Interface (UI)

| **No** | **URS**  **UI** | **USR-01** | **USR-02** | **USR-03** | **USR-04** | **USR-05** | **USR-06** | **USR-07** | **USR-08** | **USR-09** | **USR-10** | **USR-11** | **USR-12** | **USR-13** | **USR-14** | **USR-15** | **USR-16** | **USR-17** | **USR-18** | **USR-19** | **USR-20** | **USR-21** | **USR-22** | **USR-23** | **USR-24** | **USR-25** | **USR-26** | **USR-27** | **USR-28** | **USR-29** | **USR-30** | **USR-31** | **USR-32** | **USR-33** | **USR-34** | **USR-35** | **USR-36** | **USR-37** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **UI-01** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **2** | **UI-02** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **3** | **UI-03** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **4** | **UI-04** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **5** | **UI-05** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **6** | **UI-06** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **7** | **UI-07** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **8** | **UI-08** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **9** | **UI-09** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **10** | **UI-10** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **11** | **UI-11** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **12** | **UI-12** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **13** | **UI-13** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **14** | **UI-14** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **15** | **UI-15** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **16** | **UI-16** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **17** | **UI-17** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **18** | **UI-18** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **19** | **UI-19** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **20** | **UI-20** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **21** | **UI-21** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **22** | **UI-22** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **23** | **UI-23** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **24** | **UI-24** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **25** | **UI-25** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **26** | **UI-26** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **27** | **UI-27** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **28** | **UI-28** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

## 2.7 User Requirement Specification (URS) / Unit Test case (UTC)

| **No** | **URS**  **UTC** | **USR-01** | **USR-02** | **USR-03** | **USR-04** | **USR-05** | **USR-06** | **USR-07** | **USR-08** | **USR-09** | **USR-10** | **USR-11** | **USR-12** | **USR-13** | **USR-14** | **USR-15** | **USR-16** | **USR-17** | **USR-18** | **USR-19** | **USR-20** | **USR-21** | **USR-22** | **USR-23** | **USR-24** | **USR-25** | **USR-26** | **USR-27** | **USR-28** | **USR-29** | **USR-30** | **USR-31** | **USR-32** | **USR-33** | **USR-34** | **USR-35** | **USR-36** | **USR-37** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **UTC -01** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **2** | **UTC -02** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **3** | **UTC -03** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **4** | **UTC -04** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **5** | **UTC -05** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **6** | **UTC -06** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **7** | **UTC -07** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **8** | **UTC -08** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **9** | **UTC -09** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **10** | **UTC -10** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **11** | **UTC -11** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **12** | **UTC -12** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **13** | **UTC -13** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **14** | **UTC -14** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **15** | **UTC -15** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **16** | **UTC -16** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **17** | **UTC -17** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **18** | **UTC -18** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **19** | **UTC -19** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **20** | **UTC -20** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **21** | **UTC -21** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **22** | **UTC -22** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **23** | **UTC -23** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **24** | **UTC -24** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **25** | **UTC -25** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **26** | **UTC -26** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **27** | **UTC -27** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **28** | **UTC -28** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **29** | **UTC -29** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **30** | **UTC -30** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **31** | **UTC -31** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

## 2.8 User Requirement Specification (URS) / System Test case (STC)

| **No** | **URS**  **STC** | **USR-01** | **USR-02** | **USR-03** | **USR-04** | **USR-05** | **USR-06** | **USR-07** | **USR-08** | **USR-09** | **USR-10** | **USR-11** | **USR-12** | **USR-13** | **USR-14** | **USR-15** | **USR-16** | **USR-17** | **USR-18** | **USR-19** | **USR-20** | **USR-21** | **USR-22** | **USR-23** | **USR-24** | **USR-25** | **USR-26** | **USR-27** | **USR-28** | **USR-29** | **USR-30** | **USR-31** | **USR-32** | **USR-33** | **USR-34** | **USR-35** | **USR-36** | **USR-37** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **STC -01** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **2** | **STC -02** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **3** | **STC -03** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **4** | **STC -04** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **5** | **STC -05** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **6** | **STC -06** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **7** | **STC -07** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **8** | **STC -08** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **9** | **STC -09** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **10** | **STC -10** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **11** | **STC -11** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **12** | **STC -12** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **13** | **STC -13** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **14** | **STC -14** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **15** | **STC -15** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **16** | **STC -16** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **17** | **STC -17** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **18** | **STC -18** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **19** | **STC -19** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **20** | **STC -20** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **21** | **STC -21** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **22** | **STC -22** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **23** | **STC -23** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **24** | **STC -24** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **25** | **STC -25** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **26** | **STC -26** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **27** | **STC -27** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **28** | **STC -28** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **29** | **STC -29** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **30** | **STC -30** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **31** | **STC -31** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **32** | **STC -32** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **33** | **STC -33** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **34** | **STC -34** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **35** | **STC -35** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **36** | **STC -36** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **37** | **STC -37** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

# Chapter 7-3 |Appendix

## 3.1 User Requirement Specification (URS)

|  |  |
| --- | --- |
| **No.** | **User Requirements Specification** |
| URS-01 | Administrator, Team leader, and Collector can log in to the system on a web application. |
| URS-02 | Administrator, Team leader, and Collector can logout from the system on a web application. |
| URS-03 | Team leader and Collector can log in to the system on a mobile application. |
| URS-04 | Team leader and Collector can logout from the system on a mobile application. |
| URS-05 | New collector can send register request to the administrator on a mobile application requesting to be a member. |
| URS-06 | Administrator can view list of new collector requests sorted by date on a web application. |
| URS-07 | Administrator can search a new collector request by using new collector name on a web application. |
| URS-08 | Administrator can select to approve or decline new member on a web application. |
| URS-09 | Administrator can create a team which contains a team name, team leader and team members on a web application. |
| URS-10 | Administrator and team leader can view list of team sorted by team name on a web application. |
| URS-11 | Administrator and Team leader can search the team by using team name on a web application. |
| URS-12 | Administrator and Team leader can modify the selected team information on a web application. |
| URS-13 | Administrator and Team leader can view the selected team information includes a team name, team leader name, and list of members on a web application. |
| URS-14 | Administrator can remove a team out of the system on a web application. |
| URS-15 | Administrator, Team leader, and Collector can edit profile information which includes a name, password and telephone number on a web application. |
| URS-16 | Administrator can create the project includes a project name, project description, and team on a web application. |
| URS-17 | Administrator can remove the project out of the system on a web application. |
| URS-18 | Administrator can view list of all projects sorted by created date of the project on a web application |
| URS-19 | Team leader and Collector can view list of the involved projects sorted by created date of the project on a web application and mobile application. |
| URS-20 | Administrator, Team leader and Collector can search the project by using project name on a web application. |
| URS-21 | Administrator can modify the project information includes editing project name, editing project description, and changing a team on a web application. |
| URS-22 | Administrator can view detail of selected projects information which consisting of map with assigned pins and location information on a web application. |
| URS-23 | Team leader and Collector can view detail of selected projects information which consisting of map with assigned pins and location information of the selected project on a web application and mobile application. |
| URS-24 | Administrator can view list of water parameter of the selected member sorted by date on a web application. |
| URS-25 | Team leader and Collector can view list of water parameter of the selected member sorted by date on a web application and mobile application. |
| URS-26 | Team leader can assign work location on Google map to each collectors on a web application. |
| URS-27 | Team leader and Collector can view the direction to the selected location on Google Maps on a mobile application. |
| URS-28 | Team leader and Collector can view location information of each assigned pin on selected project by pressing on the pin on a mobile application. |
| URS-29 | Collector can add water parameter to collect the test data on a mobile application. |
| URS-30 | Collector can delete water parameter on a mobile application. |
| URS-31 | Collector can choose the image from camera roll or take a new photo to collect RGB value with the test result on a mobile application. |
| URS-32 | Collector can manage the data to let the system calculate the test result based on standard color scale on a mobile application. |
| URS-33 | Administrator can view detail of test result of selected water parameter on a web application. |
| URS-34 | Team leader and Collector can view detail of test result of selected water parameter on a web application and mobile application. |
| URS-35 | Team leader can mark status of the selected water parameter to “Recollect” on a web application and mobile application. |
| URS-36 | Team leader can mark status of the selected water parameter to “Finish” on a web application and mobile application. |
| URS-37 | Team leader and Collector can send the message to each other via group message within the team on a mobile application. |

## 3.2 System Requirement Specification (SRS)

**[URS-01] Administrator, Team leader, and Collector can login to the system on a web application.**

SRS001: The system shall provide login page to login using email and password.

SRS002: The system shall check the format of input data.

SRS003: The system shall validate email and password with the database.

SRS004: The system shall allow user to access the application.

SRS005: The system shall show the error messages “Invalid e-mail or password”.

SRS006: The system shall redirect to the project list page.

SRS007: The system shall show email on the screen.

SRS008: The system shall show “●” instead a password in type of string on the screen.

**[URS-02] Administrator, Team leader, and Collector can logout from the system on a web application.**

SRS009: The system shall provide “Logout” menu.

SRS010: The system shall quit a session of the user.

SRS011: The system shall return to the login page.

**[URS-03] Team leader and Collector can login to the system on a mobile application.**

SRS001: The system shall provide login page to login using email and password.

SRS002: The system shall check the format of input data.

SRS003: The system shall validate email and password with the database.

SRS004: The system shall allow user to access the application.

SRS005: The system shall show the error messages “Invalid e-mail or password”.

SRS006: The system shall redirect to the project list page.

SRS007: The system shall show email on the screen.

SRS008: The system shall show “●” instead a password in type of string on the screen.

**[URS-04] Team leader and Collector can logout from the system on a mobile application.**

SRS009: The system shall provide “Logout” menu.

SRS010: The system shall quit a session of the user.

SRS011: The system shall return to the login page.

SRS012: The system shall show popup asking for confirmation “Do you want to logout?”.

SRS013: The system shall cancel to quit a session of the user.

**[URS-05] New collector can send register request to the administrator on a mobile application requesting to be a member.**

SRS014: The system shall provide registration page include the input textboxes; name, password, telephone number.

SRS015: The system shall validate the format of the input data and the existing data.

SRS016: The system adds a new account into the database.

SRS017: The system shall show the message “Registered Successfully”.

SRS018: The system shall show the error message “E-mail must be an email format.

SRS019: The system shall show the error message shows “Telephone number must be a numeric only”.

SRS020: The system shall show error message “Please fill in all required fields”.

SRS021: The system shall show a name on the screen.

SRS007: The system shall show email on the screen.

SRS008: The system shall show “●” instead a password in type of string on the screen.

SRS022: The system shall show the telephone number on the screen.

**[URS-06] Administrator can view list of new collector requests sorted by date on a web application.**

SRS023: The system shall provide new collector request page.

SRS024: The system shall retrieve the user information from database by the status of user should be a new collector.

SRS025: The system shall display list of new account requests with the “Approve” and “Decline” buttons behind each account.

**[URS-07] Administrator can search a new collector request by using new collector name on a web application.**

SRS026: The system shall retrieve the information of new collector request that exist in the system from database.

SRS027: The system shall display all of new collector request list including user Id, name, e-mail, telephone number on the new collector request page.

SRS028: The system shall provide the text box for searching a new collector request on the top right page.

SRS029: The system shall check the format of the input data.

SRS030: The system shall retrieve the information of a new collector request that searched by user from database.

SRS031: The system shall show a new collector request that searched by user on the project list page.

SRS032: The system shall show message “No matching records found”.

SRS021: The system shall show a name on the screen.

**[URS-08] Administrator can select to approve or decline new member on a web application.**

SRS023: The system shall provide new collector request page.

SRS033: The system shall retrieve the user information from database.

SRS025: The system shall display list of new account requests with the “Approve” and “Decline” buttons behind each account.

SRS034: The system shall show popup asking for confirmation “Do you want to approve?” with “Cancel” and “OK” buttons.

SRS035: The system shall remove the name of selected as a member from user interface.

SRS036: The system shall update user status in the database.

SRS037: The system shall show popup message “Approve User Success”.

SRS038: The system shall shows popup asking for confirmation “Do you want to decline?” with “Cancel” and “OK” buttons.

SRS039: The system shall delete an account from the database.

SRS040: The system shall redirect to new collector request page.

**[URS-09] Administrator can create a team which contains a team name, team leader and team members on a web application.**

SRS041: The system shall provide the team information page.

SRS042: The system shall retrieve user information from the database which status type is a member in system.

SRS043: The system shall provide a text box to input the team name and list of members, the check boxes for adding the collector to the team and the radio buttons for defining the team leader.

SRS002: The system shall check the format of input data.

SRS044: The system shall create the new team in a database.

SRS045: The system shall display popup message “Save data success”.

SRS046: The system shall redirect to the team list page.

SRS047: The system shall show error message “Please input team name”.

SRS048: The system shall show error message “Please select members”.

SRS049: The system shall show error message “Please select the team leader”.

SRS050: The system shall show error message “Team name is already”.

**[URS-10] Administrator and team leader can view list of team sorted by team name on a web application.**

SRS051: The system shall provide the team list page.

SRS052: The system shall retrieve the information of the team from database.

SRS053: The system shall display all of team list including team Id, team name, and member on the team list page.

SRS054: The system shall provide list of team which user is the team leader.

**[URS-11] Administrator and Team leader can search the team by using team name on a web application.**

SRS052: The system shall retrieve the information of the team from database.

SRS053: The system shall display all of team list including team Id, team name, and member on the team list page.

SRS055: The system shall provide the text box for searching the team on the top right page.

SRS029: The system shall check the format of the input data.

SRS056: The system shall retrieve the information of the team searched by user from database.

SRS057: The system shall show the team searched on the team list page.

SRS032: The system shall show message “No matching records found”.

SRS058: The system shall show team name on the screen.

SRS047: The system shall show error message “Please input team name”.

SRS048: The system shall show error message “Please select members”.

SRS049: The system shall show error message “Please select the team leader”.

**[URS-12] Administrator and Team leader can modify the selected team information on a web application.**

SRS052: The system shall retrieve the information of the team from database.

SRS059: The system shall display all of team list including team Id, team name, and member with “View”, “Edit”, and “Delete” buttons on the team list page.

SRS042: The system shall retrieve user information from the database which status type is a member in system.

SRS043: The system shall provide a text box to input the team name and list of members, the check boxes for adding the collector to the team and the radio buttons for defining the team leader.

SRS002: The system shall check the format of input data.

SRS060: The system shall update new information of team in the database.

SRS061: The system shall show popup message “Save data success”.

SRS046: The system shall redirect to the team list page.

SRS062: The system shall add new members to the team in the database.

SRS063: The system shall delete members from the team in the database.

SRS064: The system shall show name of team on the screen.

SRS060: The system shall update new information of team in the database.

SRS065: The system shall show “þ” front of member that user selected to be a team member.

SRS066: The system shall show “¤” behind a member that user selected to be a team leader.

SRS067: The system shall show “o” behind a member that user selected to remove a member out of the team.

**[URS-13] Administrator and Team leader can view the selected team information includes a team name, team leader name, and list of members on a web application.**

SRS068: The system shall retrieve the list of team that exist in the system from database.

SRS059: The system shall display all of team list including team Id, team name, and member with “View”, “Edit”, and “Delete” buttons on the team list page.

SRS069: The system shall display all of team list including team Id, team name, and member with “View” and “Edit buttons on the team list page.

SRS070: The system shall show the popup of team information including a team name, team leader name and list of team members on the team list page.

**[URS-14] Administrator can remove a team out of the system on a web application.**

SRS068: The system shall retrieve the list of team that exist in the system from database.

SRS059: The system shall display all of team list including team Id, team name, and member with “View”, “Edit”, and “Delete” buttons on the team list page.

SRS093: The system shall show popup asking for confirmation “Do you want to delete?” with “OK” and “Cancel” buttons.

SRS071: The system shall delete the team in the database.

SRS072: The system shall show popup message “Delete Team Success”.

SRS073: The system shall remove the selected team out of team list page.

SRS074: The system shall redirect to team list page.

**[URS-15] Administrator, Team leader, and Collector can edit profile information which includes is name, password and telephone number on a web application.**

SRS075: The system shall provide the edit profile page.

SRS076: The system shall retrieve the user information (i.e. name, password, and telephone) from database.

SRS077: The system shall provide text boxes for updating the profile (i.e. name, password, telephone).

SRS002: The system shall check the format of input data.

SRS078: The system shall update the information in the database.

SRS079: The system shall show message “Profile update successful”.

SRS006: The system shall redirect to the project list page.

SRS080: The system shall show the error message will show “Please input a name”.

SRS081: The system shall show the error messages “Password does not match with confirm password”.

**[URS-16] Administrator can create the project includes a project name, project description, and team on a web application.**

SRS082: The system shall retrieve the list of project that exist in the system from database.

SRS083: The system shall display all of project list including project Id, project name, description, team name, leader name, create date on the project list page.

SRS084: The system shall provide a text box to input the project name, project description and a combo box to select the team to do the project on new project page.

SRS029: The system shall check the format of the input data.

SRS085: The system shall create the new project in database.

SRS086: The system shall distribute the notifications to the team leader.

SRS045: The system shall display popup message “Save data success”.

SRS006: The system shall redirect to the project list page.

SRS087: The system shall show error message “Please input project name more than 6 characters”.

SRS088: The system shall show error message “Please select the team” on the screen.

SRS089: The system shall show the name of project on the screen.

SRS090: The system shall show description on the screen.

SRS091: The system shall show the team name on the screen.

SRS092: The system shall show error message “Project name is already”.

**[URS-17] Administrator can remove the project out of the system on a web application.**

SRS082: The system shall retrieve the list of project that exist in the system from database.

SRS083: The system shall display all of project list including project Id, project name, description, team name, leader name, create date on the project list page.

SRS093: The system shall show popup asking for confirmation “Do you want to delete?” with “OK” and “Cancel” buttons.

SRS094: The system shall delete the project in the database.

SRS095: The system shall show popup message “Delete project Success”.

SRS096: The system shall remove the selected project out of the team list page.

SRS006: The system shall redirect to the project list page.

**[URS-18] Administrator can view list of all projects sorted by created date of the project on a web application**

SRS082: The system shall retrieve the list of project that exist in the system from database.

SRS097: The system shall display all of project list including project Id, project name, description, team name, leader name, created date on the project list page.

**[URS-19] Team leader and Collector can view list of the involved projects sorted by created date of the project on a web application and mobile application.**

SRS098: The system shall retrieve the list of project that involved with the user from database.

SRS099: The system shall display involved project list including project Id, project name, description, team name, leader name, created date on the project list page.

**[URS-20] Administrator, Team leader and Collector can search the project by using project name on a web application.**

SRS098: The system shall retrieve the list of project that involved with the user from database.

SRS099: The system shall display involved project list including project Id, project name, description, team name, leader name, created date on the project list page.

SRS100: The system shall provide the text box for searching the project on the top right page.

SRS029: The system shall check the format of the input data.

SRS101: The system shall retrieve the information of the project searched by user from database.

SRS102: The system shall show the project searched on the project list page.

SRS032: The system shall show message “No matching records found”.

SRS103: The system shall show project name on the screen.

**[URS-21] Administrator can modify the project information includes editing project name, editing project description, and changing a team on a web application.**

SRS082: The system shall retrieve the list of project that exist in the system from database.

SRS097: The system shall display all of project list including project Id, project name, description, team name, leader name, created date on the project list page.

SRS104: The system shall retrieve the project information from the database.

SRS084: The system shall provide a text box to input the project name, project description and a combo box to select the team to do the project on new project page.

SRS002: The system shall check the format of input data.

SRS105: The system shall update new information of project in the database.

SRS061: The system shall show popup message “Save data success”.

SRS006: The system shall redirect to the project list page.

SRS106: The system shall show error message “Please input project name”.

SRS087: The system shall show error message “Please input project name more than 6 characters”.

SRS107: The system shall show error message “Please select the team”.

**[URS-22] Administrator can view detail of selected projects information which consisting of map with assigned pins and location information on a web application.**

SRS108: The system shall retrieve the project information from database.

SRS109: The system shall display project information page that has a map with a pin and a list of the location information consisting of place name, collector name, latitude, longitude, status of collecting(Initial, Pending, Recollect, Finish), and date of updated.

**[URS-23] Team leader and Collector can view detail of selected projects information which consisting of map with assigned pins and location information of the selected project on a web application and mobile application.**

SRS108: The system shall retrieve the project information from database.

SRS110: The system shall display project information page that has a map with a pin and a list of the location information consisting of place name, collector name, latitude, longitude, status of collecting(Initial, Pending, Recollect, Finish), and update dated.

SRS111: The system shall retrieve all location information of every collectors.

SRS112: The system shall retrieve only location information that was assigned by team leader of the selected project.

**[URS-24] Administrator can view list of water parameter of the selected member sorted by date on a web application.**

SRS113: The system shall retrieve the list of water parameter from database.

SRS114: The system shall display list of water parameter consisting of parameter name, predicted result, status, date and time that a member tested on parameter list page.

**[URS-25] Team leader and Collector can view list of water parameter of the selected member sorted by date on a web application and mobile application.**

SRS113: The system shall retrieve the list of water parameter from database.

SRS114: The system shall display list of water parameter consisting of parameter name, predicted result, status, date and time that a member tested on parameter list page.

**[URS-26] Team leader can assign work location on Google map to each collectors on a web application.**

SRS115: The system shall provide the assignment page contains Google maps and “+place” button on the top right page.

SRS116: The system shall provide a window on the right hand side to user consisting of a marker on Google maps, a text box for the location name and a drop down list to select the team member (Collector).

SRS002: The system shall check the format of input data.

SRS117: The system shall add the assignment to the team member in the database.

SRS118: The system shall distribute the notifications to each collectors.

SRS045: The system shall display popup message “Save data success”.

SRS119: The system shall hide the assignment window and marker disappear.

SRS120: The system shall display popup message “Please input place name”.

SRS121: The system shall display the new assignment as “Initial” status in the list below of Google maps and add a new marker on Google maps.

**[URS-27] Team leader and Collector can view the direction to the selected location on Google Maps on a mobile application.**

SRS122: The system shall provide the assignment location by using Google maps with place name, collector name, status of collecting (Initial, Pending, Recollect, Finish), latitude and longitude on project information page.

SRS123: The system shall obtain the shortest direction from Google maps.

SRS124: The system shall display the assignment location using blue line on a Google maps.

SRS125: The system shall hide the direction.

**[URS-28] Team leader and Collector can view location information of each assigned pin on selected project by pressing on the pin on a mobile application.**

SRS126: The system shall provide the assignment location by using Google maps with place name, user, status, latitude and longitude on project information page.

SRS127: The system shall display information of selected pin consisting of place name, collector name, and date of assigned on Google maps.

**[URS-29] Collector can add water parameter to collect the test data on a mobile application.**

SRS128: The system shall retrieve the list of the water parameter consisting of parameter name, predicted result, status, date and time that a member tested from database.

SRS129: The system shall display list of water parameters on parameter list page.

SRS130: The system shall display popup “Please input parameter” to input the data with “Ok” and Cancel buttons.

SRS002: The system shall check the format of input data.

SRS131: The system shall update the information of water parameter in database.

SRS132: The system shall display new water parameter on parameter list page.

SRS133: The system shall redirect to the parameter list page.

SRS134: The system shall show error message “Please input parameter more than 1 character”.

**[URS-30] Collector can delete water parameter on a mobile application.**

SRS135: The system shall retrieve the information of the water parameter consisting of parameter name, predicted result, status, date and time that a member tested from database.

SRS129: The system shall display list of water parameters on parameter list page.

SRS093: The system shall show popup asking for confirmation “Do you want to delete?” with “OK” and “Cancel” buttons.

SRS136: The system shall delete selected water parameter out of database.

SRS137: The system shall update the information of the water parameter in database.

SRS138: The system shall display the water parameters remaining in the system on parameter list page.

SRS133: The system shall redirect to the parameter list page.

**[URS-31] Collector can choose the image from camera roll or take a new photo to collect RGB value with the test result on a mobile application.**

SRS139: The system shall provide the camera roll.

SRS140: The system shall redirect to parameter information page with the image for collecting RGB value consisting of date and time.

SRS141: The system shall provide the camera window to take a photo.

**[URS-32] Collector can manage the data to let the system calculate the test result based on standard color scale on a mobile application.**

SRS142: The system shall provide the fields to input band value and RGB text from an image.

SRS143: The system shall return to display the RGB value of first band of standard color scale obtain from calculation component on the screen.

SRS144: The system shall return to display the RGB value of testing indicator obtain from calculation component on the screen.

SRS145: The system shall record the RGB value of the test indicator.

SRS146: The system shall send the data to calculation component.

SRS147: The system shall return to display the test result of water parameter on the screen.

SRS148: The system shall save the test result with the information into the database.

SRS149: The system shall update the status to “Pending” on the water parameter on parameter list page.

SRS133: The system shall redirect to the parameter list page.

SRS150: The system shall show information of test result consisting of parameter name, predicted result, status, date and time that a member tested on parameter list page.

SRS151: The system shall remove value of test result in the database.

SRS152: The system shall remove value of test result out of the user interface.

SRS153: The system shall show error message “Please input the value”.

SRS154: The system shall show error message “Please mark the RGB value”.

SRS155: The system shall show error message “Please input the value more than 1 value”.

**[URS-33] Administrator can view detail of test result of selected water parameter on a web application.**

SRS156: The system shall provide the parameter list page.

SRS157: The system shall retrieve the information of water parameter from database.

SRS158: The system shall display detail of test result consisting of name of parameter, predicted result with the RGB value, status and image with data that used to calculate the test result on parameter information page.

**[URS-34] Team leader and Collector can view detail of test result of selected water parameter on a web application and mobile application**

SRS156: The system shall provide the parameter list page.

SRS157: The system shall retrieve the information of water parameter from database.

SRS159: The system shall display detail of test result consisting of name of parameter, predicted result with the RGB value, status and image with data that used to calculate the test result and also provides “Recollect” and “Finish” buttons for review the test result on parameter information page.

SRS158: The system shall display detail of test result consisting of name of parameter, predicted result with the RGB value, status and image with data that used to calculate the test result on parameter information page.

**[URS-35] Team leader can mark status of the selected water parameter to “Recollect” on a web application and mobile application.**

SRS160: The system shall provide the parameter information page.

SRS161: The system shall update new status of water parameter to be recollect in the database.

SRS162: The system shall distribute the notifications to the collector.

SRS163: The system shall display status “Recollect” on selected water parameter on parameter list page.

SRS164: The system shall redirect to parameter list page.

**[URS-36] Team leader can mark status of the selected water parameter to “Finish” on a web application and mobile application.**

SRS160: The system shall provide the parameter information page.

SRS165: The system shall update new status of water parameter to be finish in the database.

SRS166: The system shall display status “Finish” on selected water parameter on parameter list page.

SRS164: The system shall redirect to parameter list page.

**[URS-37] Team leader and Collector can send the message to each other via group message within the team on a mobile application.**

SRS051: The system shall provide the team list page.

SRS167: The system shall retrieve the information of the message.

SRS168: The system shall display team id, team name, team member, and position of member.

SRS169: The system shall display all of the old message with date and time on the screen.

SRS170: The system shall display the message in the group of project.

## 3.3 Use Case (UC)

|  |  |
| --- | --- |
| **Use Case – Web application part** | |
| **Use case ID** | **Use case name** |
| W-UC-01 | Authentication |
| W-UC-02 | View list of new collector |
| W-UC-03 | Search new collector request |
| W-UC-04 | Select to approve or decline new collector |
| W-UC-05 | Create team |
| W-UC-06 | View list of team consisting information |
| W-UC-07 | Search team |
| W-UC-08 | Modify team |
| W-UC-09 | Delete team |
| W-UC-10 | Edit profile |
| W-UC-11 | Create project |
| W-UC-12 | Delete project |
| W-UC-13 | View list of project consisting information |
| W-UC-14 | Search project |
| W-UC-15 | Modify project |
| W-UC-16 | View list of water parameter |
| W-UC-17 | Assign work |
| W-UC-18 | View detail of test result |
| W-UC-19 | Manage status |
| **Use case – Mobile application part** | |
| **Use case ID** | **Use case name** |
| M-UC-01 | Authentication |
| M-UC-02 | Register |
| M-UC-03 | View list of project consisting information |
| M-UC-04 | View list of water parameter |
| M-UC-05 | View direction of assigned location |
| M-UC-06 | View pin information |
| M-UC-07 | Modify water parameter |
| M-UC-08 | Choose image or take a photo |
| M-UC-09 | Manage data to calculate |
| M-UC-10 | View detail of test result |
| M-UC-11 | Manage status |
| M-UC-12 | Message |

## 

## 3.4 Activity Diagram (AD)

|  |  |
| --- | --- |
| **No.** | **Activity Diagram** |
| AD-01 | Log in to the system on a web application |
| AD-02 | Logout from the system on a web application |
| AD-03 | Log in to the system on a mobile application |
| AD-04 | Logout from the system on a mobile application |
| AD-05 | Send register request to the administrator on a mobile application requesting to be a member |
| AD-06 | View list of new collector requests sorted by date on a web application |
| AD-07 | Search a new collector request by using new collector name on a web application |
| AD-08 | Select to approve or decline new member on a web application |
| AD-09 | Create a team which contains a team name, team leader and team members on a web application |
| AD-10 | View list of team sorted by team name on a web application |
| AD-11 | Search the team by using team name on a web application |
| AD-12 | Modify the selected team information on a web application |
| AD-13 | View the selected team information includes a team name, team leader name, and list of members on a web application. |
| AD-14 | Remove a team out of the system on a web application |
| AD-15 | Edit profile information which includes a name, password and telephone number on a web application |
| AD-16 | Create the project includes a project name, project description, and team on a web application |
| AD-17 | Remove the project out of the system on a web application |
| AD-18 | View list of all project sorted by created date of the project on a web application |
| AD-19 | View list of the involved projects sorted by created date of the project on a web application and mobile application |
| AD-20 | Search the project by using project name on a web application |
| AD-21 | Modify the project information includes editing project name, editing project description, and changing a team on a web application |
| AD-22 | View detail of selected projects information which consisting of map with assigned pins and location information on a web application |
| AD-23 | View detail of selected projects information which consisting of map with assigned pins and location information of the selected project on a web application and mobile application |
| AD-24 | View list of water parameter of the selected member sorted by date on a web application |
| AD-25 | View list of water parameter of the selected member sorted by date on a web application and mobile application |
| AD-26 | Assign work location on Google map to each collectors on a web application |
| AD-27 | View the direction to the selected location on Google Maps on a mobile application |
| AD-28 | View location information of each assigned pin on selected project by pressing on the pin on a mobile application |
| AD-29 | Add water parameter to collect the test data on a mobile application |
| AD-30 | Delete water parameter on a mobile application |
| AD-31 | Choose the image from camera roll or take a new photo to collect RGB value with the test result on a mobile application |
| AD-32 | Manage the data to let the system calculate the test result based on standard color scale on a mobile application |
| AD-33 | View detail of test result of selected water parameter on a web application |
| AD-34 | View detail of test result of selected water parameter on a web application and mobile application |
| AD-35 | Mark status of the selected water parameter to “Recollect” on a web application and mobile application |
| AD-36 | Mark status of the selected water parameter to “Finish” on a web application and mobile application |
| AD-37 | Send the message to each other via group message within the team on a mobile application |

## 3.5 Class Description (CD)

|  |  |
| --- | --- |
| **No.** | **Class description** |
| W-CD-01 | The overview of this class is a controller to control the authentication of the users. |
| W-CD-02 | The overview of this class is controller to control the member in the system. |
| W-CD-03 | The overview of this class is controller to control the team in the system. |
| W-CD-04 | The overview of this class is controller to control the project in the system. |
| W-CD-05 | The overview of this class is a model to receive the user information from the database. |
| W-CD-06 | The overview of this class is a model to receive the member information from the database. |
| W-CD-07 | The overview of this class is a model to receive the team information from the database. |
| W-CD-08 | The overview of this class is a model to receive the project information from the database. |
| M-CD-01 | The overview of this class is to check the authentication of user. |
| M-CD-02 | The overview of this class is to control the data transfer with a web service via JSON. |
| M-CD-03 | The overview of this class is to receive a JSONObject and returns a list of lists containing latitude and longitude. |
| M-CD-04 | This class is a fragment about the project list that user involved. |
| M-CD-05 | The overview of this class is a fragment about the location on Google Map and parsing the Google Places in JSON format. |
| M-CD-06 | The overview of this class is about the water parameter list containing in each place. |
| M-CD-07 | The overview of this class is about the team list containing in each place. |
| M-CD-08 | The overview of this class is about the picture selection and preparing for water result calculation with the developed component. |
| M-CD-09 | The overview of this class is about the messenger system using Firebase API (Firebase is a real time chatting application platform for Android). |

## 3.6 Sequence Diagram (SD)

|  |  |
| --- | --- |
| **No.** | **Sequence Diagram** |
| SD-01 | Log in to the system on a web application |
| SD-02 | Logout from the system on a web application |
| SD-03 | Log in to the system on a mobile application |
| SD-04 | Logout from the system on a mobile application |
| SD-05 | Send register request to the administrator on a mobile application requesting to be a member |
| SD-06 | View list of new collector requests sorted by date on a web application |
| SD-07 | Search a new collector request by using new collector name on a web application |
| SD-08 | Select to approve or decline new member on a web application |
| SD-09 | Create a team which contains a team name, team leader and team members on a web application |
| SD-10 | View list of team sorted by team name on a web application |
| SD-11 | Search the team by using team name on a web application |
| SD-12 | Modify the selected team information on a web application |
| SD-13 | View the selected team information includes a team name, team leader name, and list of members on a web application. |
| SD-14 | Remove a team out of the system on a web application |
| SD-15 | Edit profile information which includes a name, password and telephone number on a web application |
| SD-16 | Create the project includes a project name, project description, and team on a web application |
| SD-17 | Remove the project out of the system on a web application |
| SD-18 | View list of all project sorted by created date of the project on a web application |
| SD-19 | View list of the involved projects sorted by created date of the project on a web application and mobile application |
| SD-20 | Search the project by using project name on a web application |
| SD-21 | Modify the project information includes editing project name, editing project description, and changing a team on a web application |
| SD-22 | View detail of selected projects information which consisting of map with assigned pins and location information on a web application |
| SD-23 | View detail of selected projects information which consisting of map with assigned pins and location information of the selected project on a web application and mobile application |
| SD-24 | View list of water parameter of the selected member sorted by date on a web application |
| SD-25 | View list of water parameter of the selected member sorted by date on a web application and mobile application |
| SD-26 | Assign work location on Google map to each collectors on a web application |
| SD-27 | View the direction to the selected location on Google Maps on a mobile application |
| SD-28 | View location information of each assigned pin on selected project by pressing on the pin on a mobile application |
| SD-29 | Add water parameter to collect the test data on a mobile application |
| SD-30 | Delete water parameter on a mobile application |
| SD-31 | Choose the image from camera roll or take a new photo to collect RGB value with the test result on a mobile application |
| SD-32 | Manage the data to let the system calculate the test result based on standard color scale on a mobile application |
| SD-33 | View detail of test result of selected water parameter on a web application |
| SD-34 | View detail of test result of selected water parameter on a web application and mobile application |
| SD-35 | Mark status of the selected water parameter to “Recollect” on a web application and mobile application |
| SD-36 | Mark status of the selected water parameter to “Finish” on a web application and mobile application |
| SD-37 | Send the message to each other via group message within the team on a mobile application |

## 3.7 User Interface (UI)

|  |  |
| --- | --- |
| **No.** | **User Interface Design** |
| UI-01 | W-Login page |
| UI-02 | WA-New User Request Page |
| UI-03 | WA-Edit profile page |
| UI-04 | WA-Project list page |
| UI-05 | WA-Project information page |
| UI-06 | WA-New project page |
| UI-07 | WA-Edit project page |
| UI-08 | WA-Team list page |
| UI-09 | WA-New team page |
| UI-10 | WA-Team information page |
| UI-11 | WA-Edit team page |
| UI-12 | WT-Project list page |
| UI-13 | WT-Assignment page |
| UI-14 | WT-Project information page |
| UI-15 | WT-Team list page |
| UI-16 | WT-Team information page |
| UI-17 | WT-Edit team page |
| UI-18 | W-Parameter information page |
| UI-19 | WT-Parameter information page |
| UI-20 | M-Login page |
| UI-21 | M-Project list page |
| UI-22 | M-Parameter list page |
| UI-23 | M-Project information page |
| UI-24 | M-Calculation page |
| UI-25 | MC- Parameter information page |
| UI-26 | MT- Parameter information page |
| UI-27 | M-Register page |

## 3.8 Test Case (Unit test case)

|  |  |
| --- | --- |
| UTC-01 | Test login on web application |
| UTC-02 | Test gets size of new user requests in array list |
| UTC-03 | Test gets the detail of new user request in array list by team id |
| UTC-04 | Test gets size of teams in array list |
| UTC-05 | Test gets the detail of team in array list by team id |
| UTC-06 | Test adds new team to the array list |
| UTC-07 | Test deletes a team in array list by team id. Array list contains three teams |
| UTC-08 | Test gets size of projects in array list |
| UTC-09 | Test gets the detail of project in array list by project id |
| UTC-10 | Test gets the detail of assigned project in array list by user id |
| UTC-11 | Test adds new project to the array list |
| UTC-12 | Test deletes a project in array list by project id. Array list contains two projects |
| UTC-13 | Test gets size of water parameters in array list |
| UTC-14 | Test gets the detail of water parameter in array list by water id |
| UTC-15 | Test changes the status of water (8 equal to “Finished” and 7 equal to “Recollect”) |
| UTC-16 | Test gets size of water results in array list |
| UTC-17 | Test gets the detail of test result in array list by result id |
| UTC-18 | Test login on mobile application |
| UTC-19 | Test gets the detail of user in array list by a username and password |
| UTC-20 | Test gets size of projects in array list |
| UTC-21 | Test gets the detail of project in array list by project id |
| UTC-22 | Test gets size of assigned projects in array list by user id |
| UTC-23 | Test gets size of locations in array list |
| UTC-24 | Test gets the detail of location in array list by location id |
| UTC-25 | Test gets size of assigned locations in array list by user id |
| UTC-26 | Test gets size of water parameters in array list |
| UTC-27 | Test gets the detail of water parameter in array list by water id |
| UTC-28 | Test adds new water parameter into array list |
| UTC-29 | Test removes water parameter from array list. Array list contains two water parameters |
| UTC-30 | Test gets size of water results in array list |
| UTC-31 | Test gets size of water result in array list by result id |

## 3.9 Test Case (System test case)

|  |  |
| --- | --- |
| **No.** | **System Test Case** |
| STC-01 | Administrator, Team leader, and Collector can log in to the system on a web application. |
| STC-02 | Administrator, Team leader, and Collector can logout from the system on a web application. |
| STC-03 | Team leader and Collector can log in to the system on a mobile application. |
| STC-04 | Team leader and Collector can logout from the system on a mobile application. |
| STC-05 | New collector can send register request to the administrator on a mobile application requesting to be a member. |
| STC-06 | Administrator can view list of new collector requests sorted by date on a web application. |
| STC-07 | Administrator can search a new collector request by using new collector name on a web application. |
| STC-08 | Administrator can select to approve or decline new member on a web application. |
| STC-09 | Administrator can create a team which contains a team name, team leader and team members on a web application. |
| STC-10 | Administrator and team leader can view list of team sorted by team name on a web application. |
| STC -11 | Administrator and Team leader can search the team by using team name on a web application. |
| STC-12 | Administrator and Team leader can modify the selected team information on a web application. |
| STC-13 | Administrator and Team leader can view the selected team information includes a team name, team leader name, and list of members on a web application. |
| STC-14 | Administrator can remove a team out of the system on a web application. |
| STC-15 | Administrator, Team leader, and Collector can edit profile information which includes a name, password and telephone number on a web application. |
| STC-16 | Administrator can create the project includes a project name, project description, and team on a web application. |
| STC-17 | Administrator can remove the project out of the system on a web application. |
| STC-18 | Administrator can view list of all projects sorted by created date of the project on a web application |
| STC-19 | Team leader and Collector can view list of the involved projects sorted by created date of the project on a web application and mobile application. |
| STC-20 | Administrator, Team leader and Collector can search the project by using project name on a web application. |
| STC-21 | Administrator can modify the project information includes editing project name, editing project description, and changing a team on a web application. |
| STC-22 | Administrator can view detail of selected projects information which consisting of map with assigned pins and location information on a web application. |
| STC-23 | Team leader and Collector can view detail of selected projects information which consisting of map with assigned pins and location information of the selected project on a web application and mobile application. |
| STC-24 | Administrator can view list of water parameter of the selected member sorted by date on a web application. |
| STC-25 | Team leader and Collector can view list of water parameter of the selected member sorted by date on a web application and mobile application. |
| STC-26 | Team leader can assign work location on Google map to each collectors on a web application. |
| STC-27 | Team leader and Collector can view the direction to the selected location on Google Maps on a mobile application. |
| STC-28 | Team leader and Collector can view location information of each assigned pin on selected project by pressing on the pin on a mobile application. |
| STC-29 | Collector can add water parameter to collect the test data on a mobile application. |
| STC-30 | Collector can delete water parameter on a mobile application. |
| STC-31 | Collector can choose the image from camera roll or take a new photo to collect RGB value with the test result on a mobile application. |
| STC-32 | Collector can manage the data to let the system calculate the test result based on standard color scale on a mobile application. |
| STC-33 | Administrator can view detail of test result of selected water parameter on a web application. |
| STC-34 | Team leader and Collector can view detail of test result of selected water parameter on a web application and mobile application. |
| STC-35 | Team leader can mark status of the selected water parameter to “Recollect” on a web application and mobile application. |
| STC-36 | Team leader can mark status of the selected water parameter to “Finish” on a web application and mobile application. |
| STC-37 | Team leader and Collector can send the message to each other via group message within the team on a mobile application. |