

Segment Tracking System

ITD Cementation India
Limited

Software Requirement Specification (SRS)

The document details the summary of solution architecture and approach for the development of Segment Management System for ITD Projects Limited. The document is based on the inputs, system study, discussions and meeting held between BCI & ITD Cementation India Limited Teams.

REVISION HISTORY

REVISION NO.	DATE	PREPARED BY	REVIEWED BY	COMMENT
1.0	04-10-2022	Omkar Gaonkar	Ashutosh Kroria	SRS Document for Segment Tracking System
1.1	03-11-2022	Omkar Gaonkar	Ashutosh Kroria	Changes in the Process
1.2	17-11-2022	Omkar Gaonkar	Ashutosh Kroria	Changes in the Segment Casting, Moist Curing Area, Yard, Dispatch Plan and loading and Site Installation.

Abbreviations:

Name	Abbreviation
Bar Code India	BCI
ITD Cementation India Limited	ITD Cem

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1 SPECIFICATION ORGANIZATION

The objective of this document to provide the application to create a Segment Management System Application which will facilitate the automation of manual processes using AIDC Technology required in handling and managing Segments in its yard to fixtures and movement to implementation sites.

Section 1: Introduction

This section provides hardware requirements and documentation conventions.

Section 2: User Interface

This section depicts screen design and logic flow, and is categorized into two groups:

- Application Master Module
- Common Routine

Section 3: System Architecture

This section provides information of system architecture.

2 INTRODUCTION

2.1 INTENDED AUDIENCE AND READING SUGGESTIONS

The scope of the software would require the development of the front end application, client device application and to transfer data from application to server. The document lays down the specifications of the middleware application, its architecture and infrastructure requirements.

The entire solution consists of followings:

1. Web Application
2. Mobile Device Application

2.2 PROJECT SCOPE

The scope of the application is to create a Segment Management System Application which will facilitate the automation of manual processes using AIDC Technology required in handling and managing Segments in its yard to fixtures and movement to implementation sites.

Using this application, it is possible to monitor and keep record of the Segment flow, analyze inventory and eliminate the risk of using rejected Segments. The solution will be proved beneficial for ITD Cementation as it aims to improve data accuracy, increase data processing and inspections, eliminates paper work, reduces time & effort required for the activity and provide instant inventory and other types of pertinent reports.

The scope of the software would require the development of the front end application, client device application to transfer data from application to server. The document lays down the specifications of the middleware application, its architecture and infrastructure requirements.

The entire solution consists of followings:

- Web Application
- Mobile Device Application

3 SOFTWARE/HARDWARE REQUIREMENTS

Below are the hardware and the software requirements of the application:

3.1 CLOUD SERVER CONFIGURATION

Central Server Configuration/Database Servers

The solution would require the high performance server with minimum of following:

- Express Intel Xeon E3 (Quad Core) 3.2 GHz 8 MB 1600 MHz 32GB 2x1 TB SATA 7200 RPM 3.5" Simple-Swap MULTI BURNER RAID 0, 1, 5 in built (SR C100)
- Windows 2012 & above server
- MS SQL 2014 STD or Above (Core Based License).
- VPN Connectivity to Central server
- Optional backup

3.2 COMPUTERS

Desktop would require following specifications:-

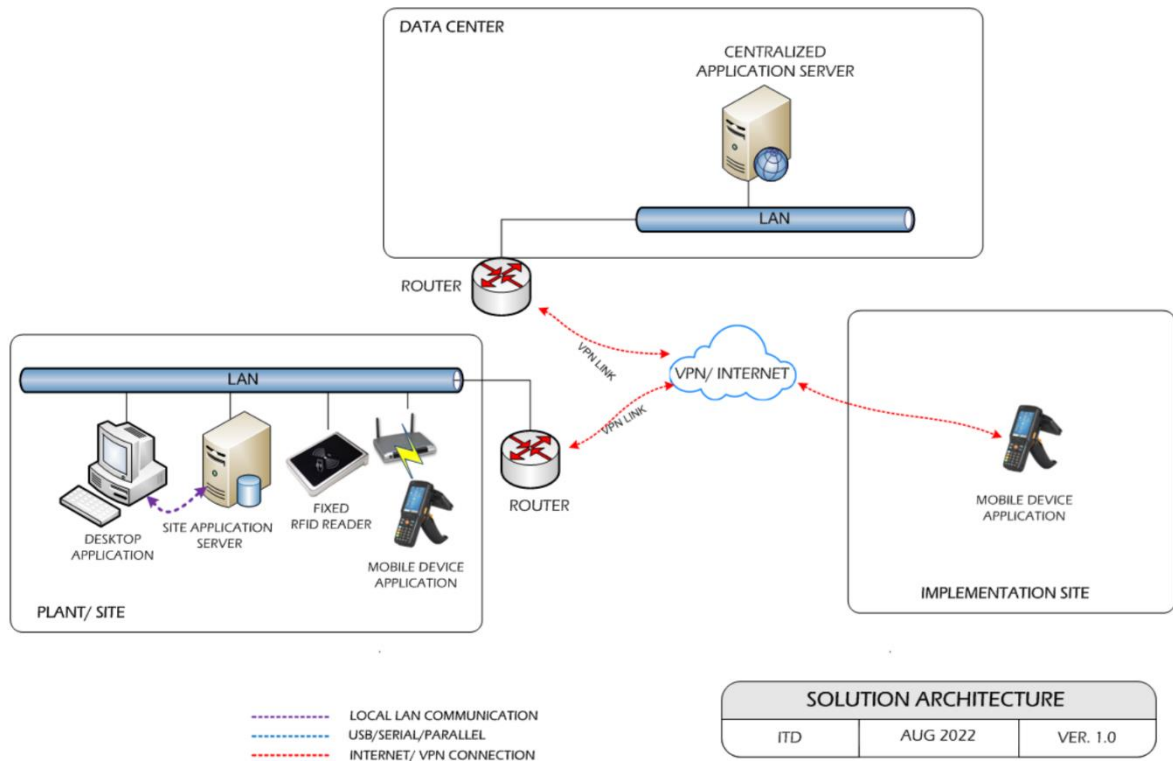
- I5/i7 Processor with Windows 10 operating System
- 8 GB RAM
- 100GB HDD
- Dot net Framework 4.5

3.3 HARDWARE REQUIREMENTS

Hardware required for the application:

- Innova RFID Tag – 80,000 Nos
- Android Handheld Terminals – 8 Nos
- USB RFID reader – 1 No.

4 SOLUTION ARCHITECTURE



5 USER INTERFACE SPECIFICATION CONVENTIONS

This section specifies the user interface portion of the application.

Section Organization

The User Interface Specification presents screen displays or “**Dialogs**”.

Documentation Conventions

This section incorporates illustrations of the application user interface. Each screen display “Dialog” consists of the screen display image, a process name, a paragraph documenting the processing required for the dialog, a paragraph listing the navigation options, and a table listing for each variable field on the dialog, its database source or destination, format, and any instructions required to process the field.

The following section contains a sample dialog with each area identified.

6 SYSTEM LOG

System shall maintain internal logs for application.

6.1 ERROR LOGS

These logs will contain any errors encountered during runtime for faster resolution of any problem post deployment.

6.2 AUDIT LOGS

These logs will monitor the activities of user who accessed the application, made changes to File/ Document and the time stamp of these activities.

7 ARCHITECTURAL DESIGN

Overall System consists of:

- Web Application
- Device Application

7.1 WEB APPLICATION

A Web Application will be developed for performing transactions like Master Creations such as Location, Segment, Drive, Site, Quality Check, Segment Creation, RFID Tag in Mould, Concrete Pouring, De-Moulding and other activities.

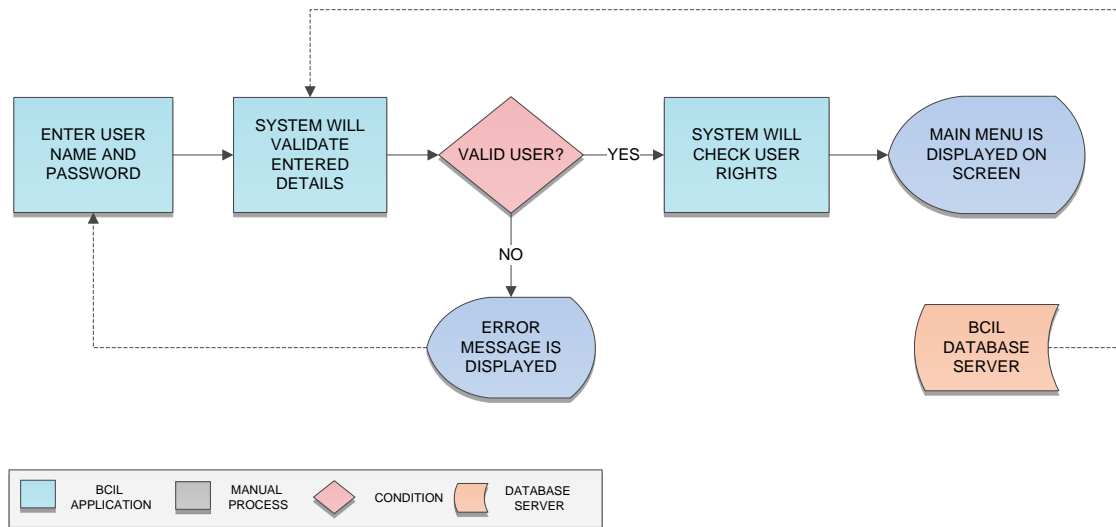
7.2 DEVICE APPLICATION

This application will include transactions including Quality Check Inspection, Putaway, Picklist Creation, Queuing Verification, Picking and Dispatch, Segment Delivery Inspection, Fixture Identification, Segment Grouping.

8 APPLICATION MODULES

8.1 APPLICATION LOGIN- WEB & DEVICE APPLICATION

This login module will provide access to the application modules. Here the admin/user needs to enter the login detail to enter in the application and to perform the desired actions.



Process: User needs to enter the User Name/ID and Password in display fields and press the Login button. Application will validate the user credential.

User will be able to view only those screens/ modules of which he has been given access rights to.

Validation

- User Name/ ID will be unique for all users.
- User Name/ ID and Password length will be set.

After successful login application menu screen will appear; this screen will have the Master and Transaction options etc.

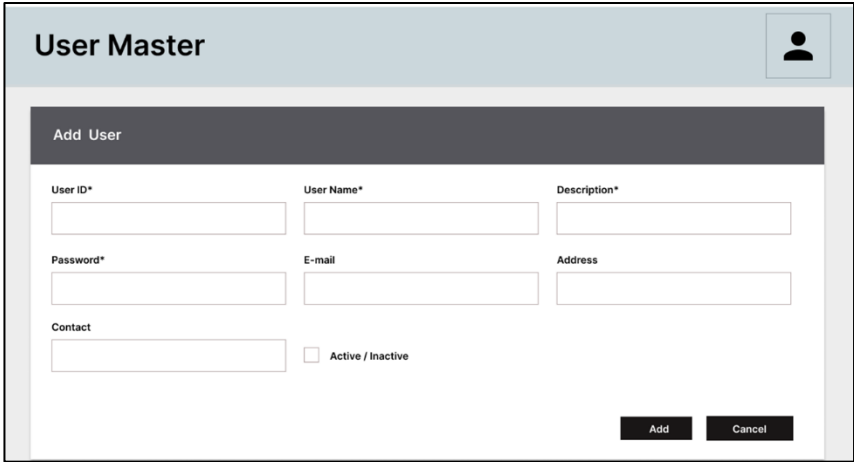
8.2 USER MANAGEMENT

The module will let application administrator to manage the Users, and the rights assigned to the same; the rights will define authorized application access of users.

The User Management & Master data will be created using **Web Application**.

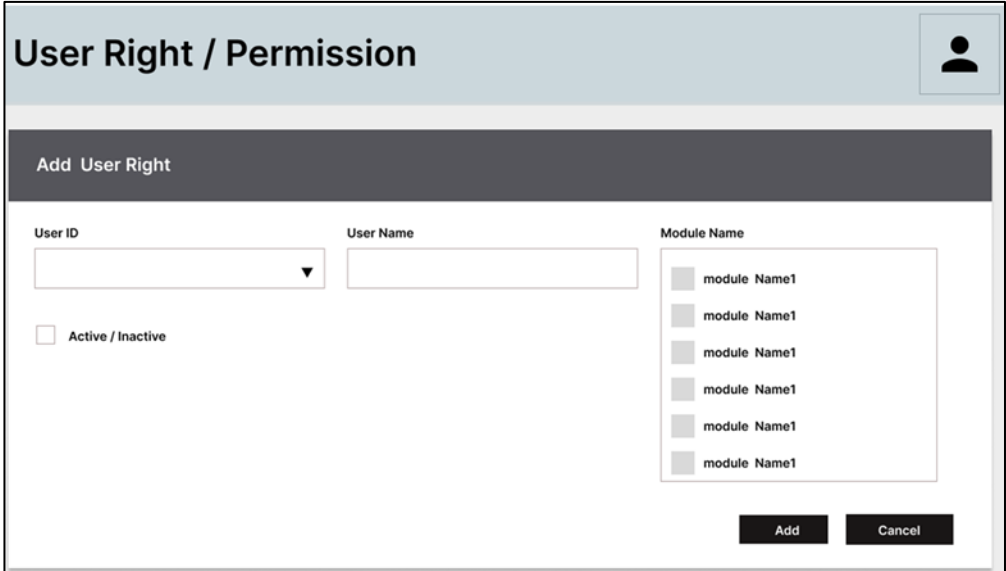
8.2.1 USER MASTER

This module will let user to create application users who will access the application. The master will store the users' details in system.

Data Fields	<ol style="list-style-type: none"> 1. User ID 2. User Name 3. Description 4. Password 5. Email 6. Address 7. Contact 8. Active/ Inactive
Process Steps	<ol style="list-style-type: none"> 1. Enter required details i.e. User ID, User Name, Description, Password in system 2. Email, Address, Contact are optional data fields 3. Check the Active checkbox to make the user active 4. Click on Save button to save details in database 5. Newly added user will appear in data grid
Functions	<ol style="list-style-type: none"> 1. Add, Edit/Update, Delete as per requirement 2. User ID and Password is used to access the application.
Role	Admin will create/ add user details via window application
Sample Screen	


8.2.2 USER RIGHTS/ PERMISSION

This module will let admin to assign module / screen access rights to the application users. Once assigned, authorized users can access the application. Once permissions are assigned, user will be able to view only those screens/ modules of which he has been given access rights to by Admin.

Data Fields	<ol style="list-style-type: none"> 1. User ID/ Name 2. Module /Screen Names
Process Steps	<ol style="list-style-type: none"> 1. Admin will select User Name/ID. 2. Screen/ module names will appear in data grid along with checkbox. 3. Admin will check the checkbox against module/ screen to which selected User should be assigned access permissions. 4. Save and Update the details in database
Functions	Add, Edit/Update as per requirement
Role	Admin / Authorized User will assign access rights to the selected User
Sample Screen	

8.2.3 USER LOGIN

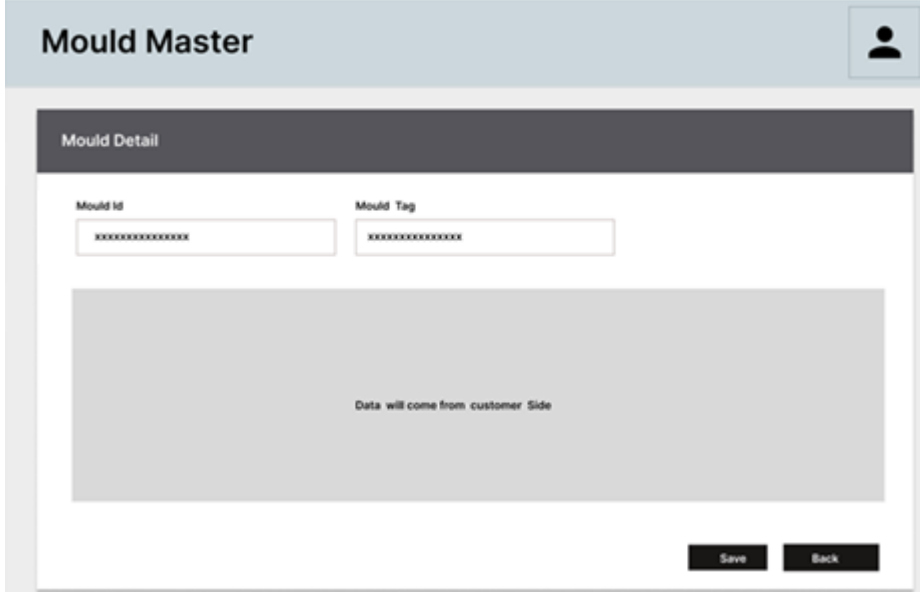
This module will let users to login in to the application. Once assigned, authorized users can access the application. Once permissions are assigned, user will be able to view only those screens/ modules of which he has been given access rights to by Admin.

Data Fields	<ol style="list-style-type: none"> 1. User Name 2. Password
Process Steps	<ol style="list-style-type: none"> 1. User will enter User Name/ID. 2. Enter the Password as per saved by user. 3. System will check the selected User is valid to login. <i>*User can click on forgot password incase don't remember the password</i> 4. Click on Login button to enter the application. 5. The details gets updated in database.
Functions	Login into the application
Role	Admin / Authorized User will able to access the login
Sample Screen	

8.3 MASTERS

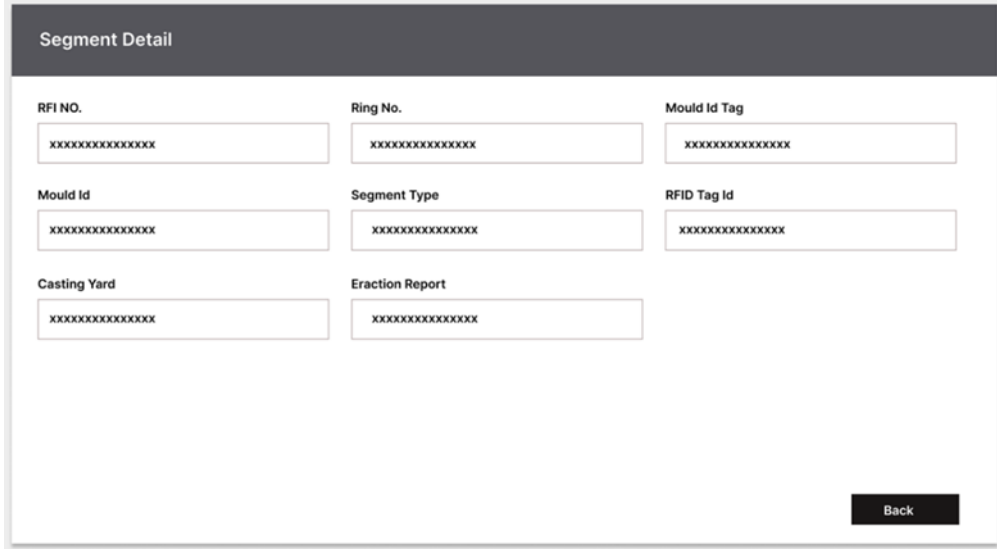
8.3.1 MOULD MASTER

The module will be used to view the Mould ID details downloaded from Customer Site

Data Fields	<ol style="list-style-type: none"> 1. Mould ID 2. Mould tag
Process Steps	<ol style="list-style-type: none"> 1. Enter the Mould Id number 2. Enter the Mould tag details 3. Moulding Master screen will be visible to authorized personnel only 4. BCI application will download Moulding details from Customer database. 5. Save the details in database.
Functions	View details of the Moulding Material and Mould Id.
Sample Screens	

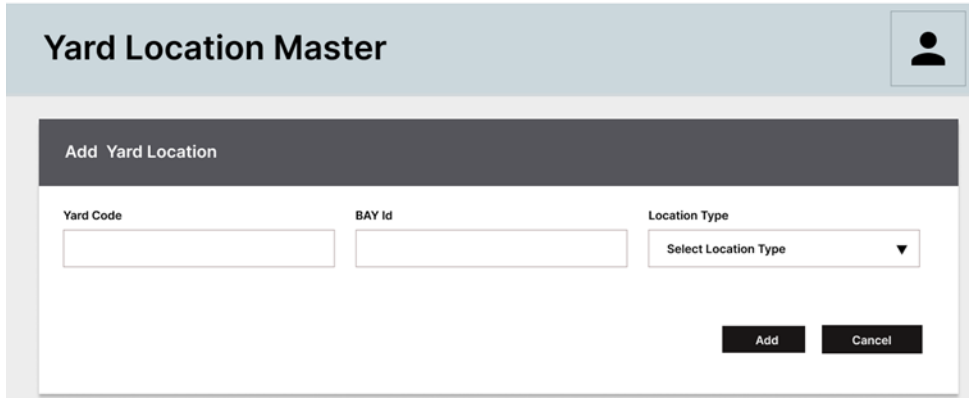
8.3.2 SEGMENT MASTER

The module will be used to view the Segment details downloaded from Customer Site.

Data Fields	<ol style="list-style-type: none"> RFI Number Ring Number Mould ID Segment Type RFID TAG ID Casting Yard Report Link Erection Report at Site
Process Steps	<ol style="list-style-type: none"> Segment Master screen will be visible to authorized personnel only BCI application will download Segment details from Customer database. Downloaded RFI details such as RFI Number, Ring Number, Mould ID, Segment type, RFID TAG ID, Casting Yard Report Link and Erection Report will get displayed in data grid on screen.
Functions	View details of the RFI Segment and UHD RFID tags.
Sample Screen	 <p>The sample screen titled 'Segment Detail' displays a form with the following fields:</p> <ul style="list-style-type: none"> RFI NO. (text box with placeholder 'xxxxxxxxxxxxxxxx') Ring No. (text box with placeholder 'xxxxxxxxxxxxxxxx') Mould Id Tag (text box with placeholder 'xxxxxxxxxxxxxxxx') Mould Id (text box with placeholder 'xxxxxxxxxxxxxxxx') Segment Type (text box with placeholder 'xxxxxxxxxxxxxxxx') RFID Tag Id (text box with placeholder 'xxxxxxxxxxxxxxxx') Casting Yard (text box with placeholder 'xxxxxxxxxxxxxxxx') Erection Report (text box with placeholder 'xxxxxxxxxxxxxxxx') <p>A 'Back' button is located at the bottom right of the form.</p>

8.3.3 YARD LOCATION MASTER

This module will be used to save Location details in database and provide identification to them by unique RFID tag.

Data Fields	<ol style="list-style-type: none"> 1. Yard Code 2. Bay ID 3. Location Type- Accepted, Rejected
Process Steps	<ol style="list-style-type: none"> 1. Enter Yard Location Code and Name. 2. Select Bay ID 3. Select the Location Type i.e. Accepted or Rejected. 4. Save the details in database.
Functions	<ol style="list-style-type: none"> 1. Add, edit/update and Delete Storage Location details as per requirement.
Sample Screen	

8.3.4 ERECTION SITE MASTER

The module will be used for Site details where segment is deployed saved details in the database. User can add, edit and delete the Line details.

Data Fields	<ol style="list-style-type: none"> 1. Site Code 2. Description 3. Address 4. Is Active i.e. Site is Active or Not
Process Steps	<ol style="list-style-type: none"> 1. Enter Site Code number. 2. Enter the description of the Site. 3. Enter Address of located site. 4. Select it's active or in-active. 5. Save the details in database.
Functions	Add, Edit/Update and Delete Line details as per requirement.

Screenshots	Erection Site Master
	<div style="background-color: #444; color: white; padding: 5px; text-align: center; margin-bottom: 10px;">Add Erection Site Detail</div> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;">Site Code <input type="text"/></div> <div style="width: 30%;">Description <input type="text"/></div> <div style="width: 30%;">Address <input type="text"/></div> </div> <div style="margin-top: 10px;"> <input type="checkbox"/> Active / Inactive </div> <div style="text-align: right; margin-top: 10px;"> Add Back </div>

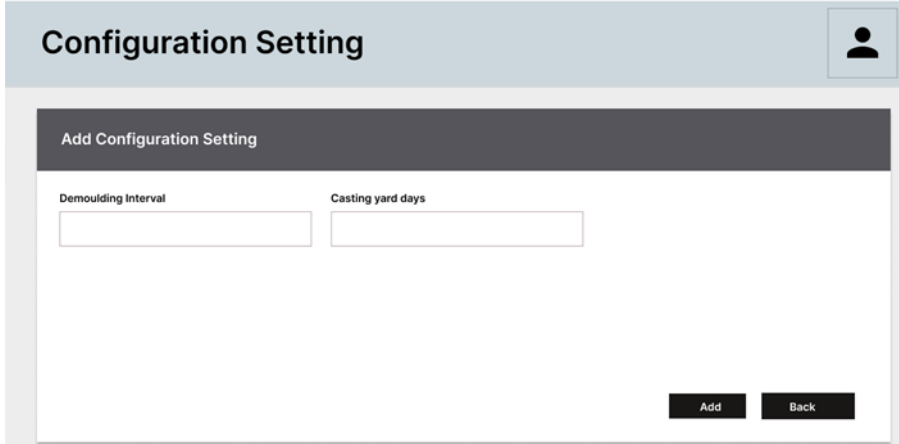
8.3.5 DRIVE (ZONE) MASTER

The module will be used to will be used to save the Drive details in database. The module will be used to add, edit or delete Drive details for segment materials.

Data Fields	<ol style="list-style-type: none"> 1. Site ID 2. Drive ID 3. Drive Description 4. Is Active i.e. Drive is Active or Not
Process Steps	<ol style="list-style-type: none"> 1. User will select the Site ID 2. Enter Drive ID and Drive Description 3. Select it's active or in-active. 4. View Drive details: As user add Drive details, it will be reflected in data grid. 5. Save the details in database.
Functions	Add, Edit/Update, Delete as per requirement.
Sample Screen	<div style="background-color: #d9e1f2; padding: 5px; text-align: center;"> Site Drive Master </div> <div style="background-color: #444; color: white; padding: 5px; text-align: center; margin-top: 10px;">Add Site Drive</div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 30%;">Site Id <input type="text"/></div> <div style="width: 30%;">Drive Id <input type="text"/></div> <div style="width: 30%;">Drive Description <input type="text"/></div> </div> <div style="margin-top: 10px;"> <input type="checkbox"/> Active / Inactive </div> <div style="text-align: right; margin-top: 10px;"> Add Back </div>

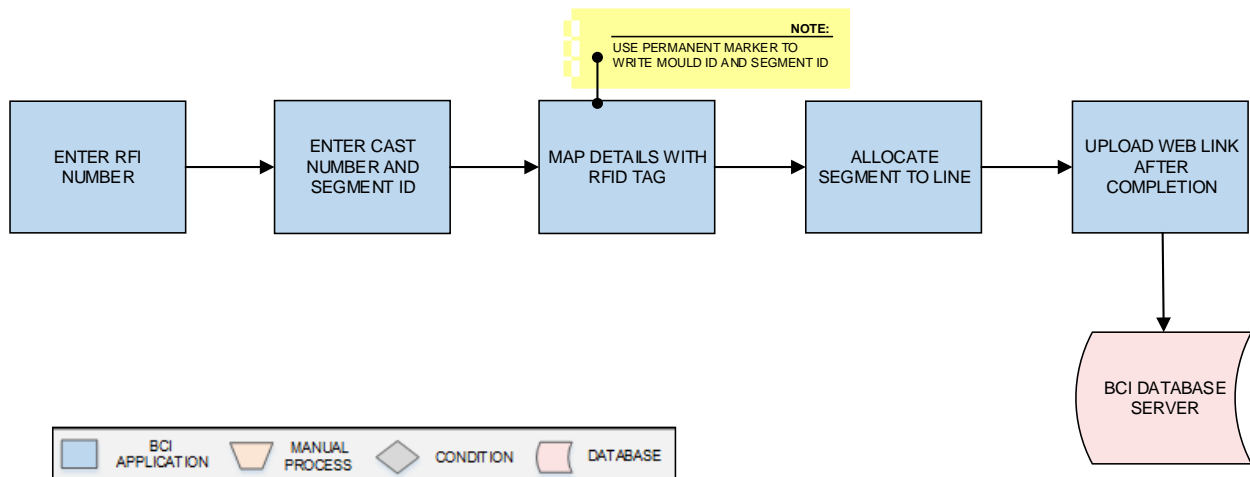
8.3.6 CONFIGURATION SETTING

These module is required for Demoulding blocking time period so user can able to override. Live report for the segment allocated in the Moulding process..

Data Fields	<ol style="list-style-type: none"> Demoulding Interval Casting Yard Hold Interval
Process Steps	<ol style="list-style-type: none"> User will do Configuration setting for modules. User will enter the Demoulding time interval. It will also enter the Casting yard days. Save the details in database.
Functions	Add, Edit/Update, Delete as per requirement.
Sample Screen	

8.4 SEGMENT CREATIONS

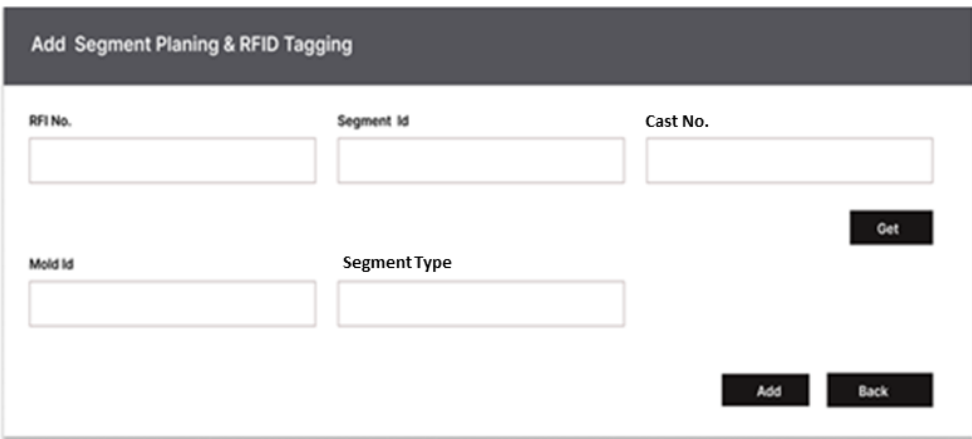
8.4.1 SEGMENT CASTING & RFID TAGGING



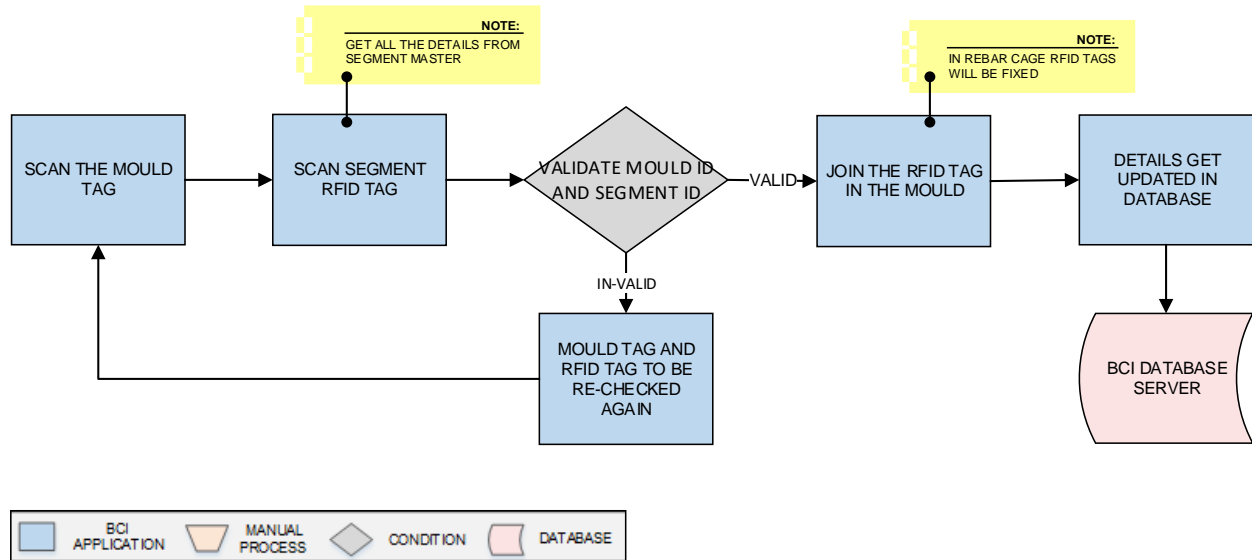
Activities

Module Description	<p>This module will be used to provide facility to map RFI and Cast Number with the RFID Tag and allocate Segment to Line. Two web links will be uploaded after completion of Yard movement. Casting Yard will be for ITD group and Erection link will be for Site.</p> <p><i>*This activity will be done using Web Application.</i></p>
Pre-Conditions	<ol style="list-style-type: none"> 1. Authorized access to the application. 2. Segment RFI number details provided from Customer database.
Process Steps	<ol style="list-style-type: none"> 1. Select /enter RFI Number, Cast Number, and Segment ID. 2. Click on Map, the segment gets mapped with RFID Tag. 3. Corresponding permanent marker will be used to write Mould ID and Segment ID on it E.g. (M1S1 or Cast No.). 4. Segment gets allocated to line user by the system. 5. System will generate two web links which will get uploaded. 6. The links can be uploaded after completion of Yard Movement. 7. Update details in database.
Post-Conditions	<ol style="list-style-type: none"> 1. Segment details will get saved in the database. 2. Segment allocated to line user.

Validations	<ol style="list-style-type: none"> 1. An alert should be displayed in case invalid RFI number is entered. 2. An alert should be displayed in case Segment details not mapped with RFID. 3. An alert should be displayed in case invalid Segment Code is selected. 4. An alert message is displayed in case of any error / invalid activity.
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Sample Screen	
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8.4.2 RFID TAG MOULDING



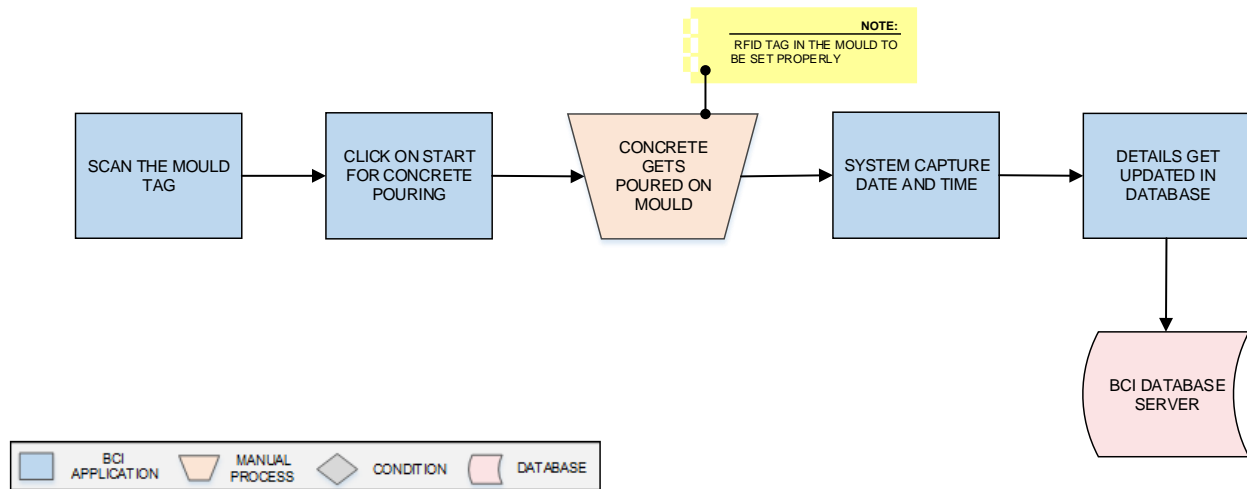
Activities

Module Description	This module is Segment Moulding is done based on the RFID tag confirmation. System will be validated with RFID tag and start the concrete pouring. Concrete is set for 12 or less hours (Configurable).
Pre-Conditions	<ol style="list-style-type: none"> 1. Material should have MOULD ID tags. 2. Mould to be iron cased with tag attached to it.
Process Steps	<ol style="list-style-type: none"> 1. Scan the Mould Tag Number. 2. Scan the Segment of the RFID Tag. 3. System validate the Mould ID and Segment ID. <i>*Incase Mould ID and Segment not matched to be rechecked again.</i> 4. Validated RFID Tag to be join in the Mould Rod. <i>*In Rebar cage RFID Tags will be fixed.</i> 5. Details will be saved in the database.
Post-Conditions	<ol style="list-style-type: none"> 1. Segment details will get saved in the database. 2. Segment RFID tag attached with the Moulding material.

Validations	<ol style="list-style-type: none"> 1. An alert should be displayed in case Mould Tag not scanned. 2. An alert should be displayed in case Segment details not mapped with RFID. 3. An alert should be displayed in case invalid Segment Code is selected. 4. An alert message is displayed in case of any error / invalid activity.
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Sample Screen	<div> <h2>RFID Tag Moulding</h2> <div> <p>Scan Mould Tag</p> <input type="text"/> </div> <div> <p>Scan Segment RFID Tag</p> <input type="text"/> </div> <div> <p>GET</p> </div> <div> <h3>Mould Rod</h3> <div> <p>XXXXXXXXXXXXXX</p> </div> <div> </div> <div> <p>Save Cear</p> </div> </div> </div>
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8.4.3 CONCRETE POURING



Activities

Module Description	This module process the concrete pouring after confirmation by the Moulding team. It is based on the concrete vehicle availability segment pouring operation will be take place. The details of the Moulding with concrete gets saved in database.
Pre-Conditions	<ol style="list-style-type: none"> Concrete poring should be properly put on RFID tag. Read Mould RFID Tag to capture process timestamp and start pouring concrete in Moulding
Process Steps	<ol style="list-style-type: none"> Scan the Mould ID after the RFID tagging process. Click on the Start button the Concrete pouring is put on Mould. System will capture the date and time of the process. <i>*Concrete on Mould to be poured properly on RFID tag.</i> Details gets saved in database.
Post-Conditions	<ol style="list-style-type: none"> Keep concrete in Moulding for strengthening. Auto-data updating on server in real time.
Validations	<ol style="list-style-type: none"> An alert should be displayed in case concrete is over poured in Mould. An alert message is displayed in case of any error / invalid activity.

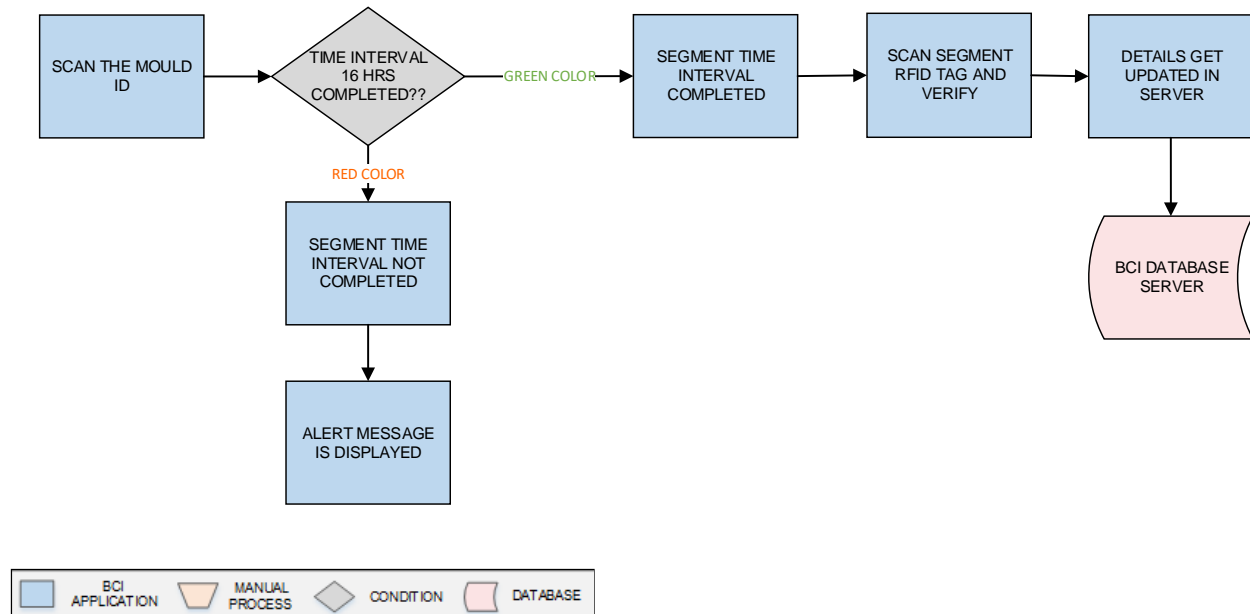
Concrete Pouring

Start

Date	Time	Mould Id

Cear

8.4.4 DE-MOULDING



Activities

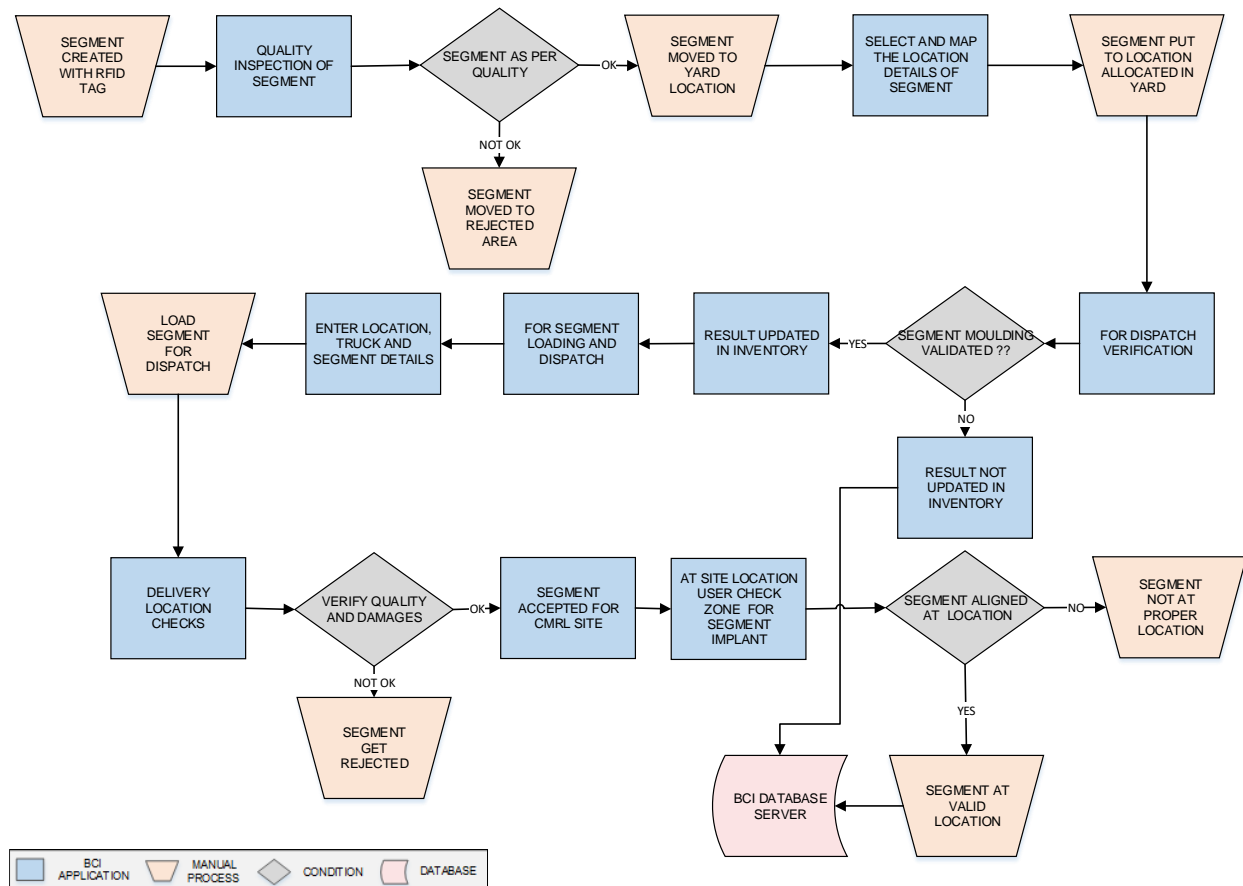
Module Description	<p>In these module it states, after concrete pour into segment, the Mould will be de-Mould after 16 hours of concrete pouring. After 16 hours (As Configurable) application will allow for de-Moulding. In case user try to de-Mould before the set time, application shall give alerts.</p> <p><i>*It will be a device application device.</i></p>
Pre-Conditions	<ol style="list-style-type: none"> Concrete poring should be properly put on RFID tag. Read Mould RFID Tag when Moulding process is complete.
Process Steps	<ol style="list-style-type: none"> Scan the marked Mould ID after concrete poured on it. System will be validated If time interval is complete <ol style="list-style-type: none"> Segment is removed from Moulding Mould ID will be written manually If time interval is not complete <ol style="list-style-type: none"> System will alert user and segment is not allowed to remove. Scan the Segment RFID and verify the details. Corresponding details will get updated in database.

Post-Conditions	<ol style="list-style-type: none"> 1. Keep concrete in Moulding for strengthening. 2. System will validate the time interval based on De-moulding Strength.
Validations	<ol style="list-style-type: none"> 1. An alert message is displayed in case of any error / invalid activity. 2. In case time interval is not complete, an error / alert message will be displayed. 3. Alert should be displayed if de-Moulding timing is more.

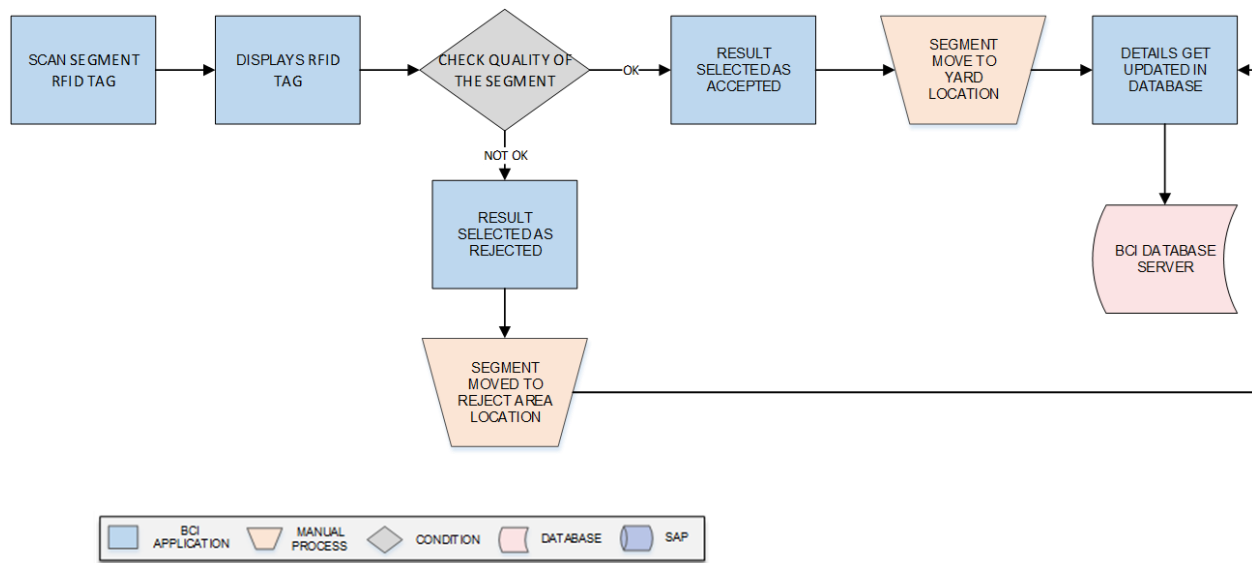
Sample Screen	<div data-bbox="446 598 1006 1764"> <h2>DE-Moulding</h2> <p>Scan Mould Id</p> <input type="text"/> <p>GET</p> <div> <div>Segment RFID</div> <div>Verify</div> </div> <div></div> <div> <div>Save</div> <div>Cear</div> </div> </div>
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8.5 CASTING YARD OPERATIONS

Operation at glance:



8.5.1 QUALITY INSPECTION



Activities

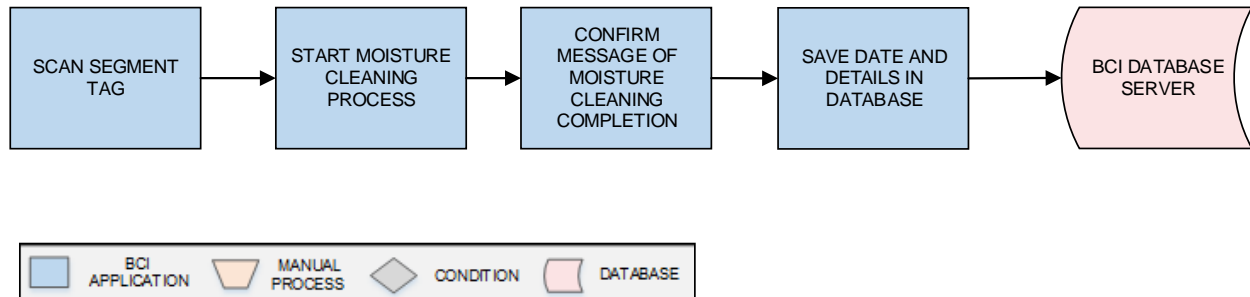
Module Description	<p>This module compliance quality, validation and quality result management. Quality Inspection module is important tool to prevent the non-satisfactory goods to be stored in the segment production.</p> <p><i>*This activity will be done using Device Application.</i></p>
Pre-Conditions	<ol style="list-style-type: none"> QC personal should check Segment produced against defined parameters. QC personal should check the de-Moulding time before quality. Segment should have RFID tag inside Moulding.
Process Steps	<ol style="list-style-type: none"> Scan the Segment RFID tag. Display RFID tag details in the system. User will check quality of the Segment against set parameters. If Segment Quantity is "OK": <ol style="list-style-type: none"> User will enter/ select result as "Accepted" Move Segment to Yard Location for storage. If Segment Quantity is "NOT OK": <ol style="list-style-type: none"> User will enter/ select result as "Rejected". Move Segment to rejection area Location. The quality check details gets updated in the database.

Post-Conditions	<ol style="list-style-type: none"> 1. All accepted Segments shall be moved to Yard Location. 2. All rejected Segments will be moved to Yard Rejection Location.
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Validations	<ol style="list-style-type: none"> 1. An alert message is displayed in case of any error / invalid activity. 2. An alert message is displayed in case Segment details is not available in list. 3. Authorized access to the QC application check. 4. Quality Check should be updated against RFI number.
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Sample Screen	<div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: 350px;"> <div style="background-color: #a4c639; color: white; text-align: center; padding: 5px; font-weight: bold; font-size: 1.2em;">Quality Inspection</div> <div style="margin-top: 10px;"> <p>Scan Segment RFID Tag</p> <input style="width: 100%; height: 25px; border: 1px solid #ccc;" type="text"/> </div> <div style="margin-top: 10px;"> <p>Segment Quantity</p> <input style="width: 100%; height: 25px; border: 1px solid #ccc;" type="text"/> </div> <div style="margin-top: 10px;"> <p>Result</p> <div style="border: 1px solid #ccc; height: 25px; display: flex; justify-content: flex-end; align-items: center; padding-right: 5px;">▼</div> </div> <div style="margin-top: 20px; text-align: center;"> <div style="display: inline-block; background-color: #333; color: white; padding: 5px 15px; border-radius: 3px; margin: 0 5px;">Save</div> <div style="display: inline-block; background-color: #333; color: white; padding: 5px 15px; border-radius: 3px; margin: 0 5px;">Clear</div> </div> </div>
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8.5.2 MOIST CURING AREA

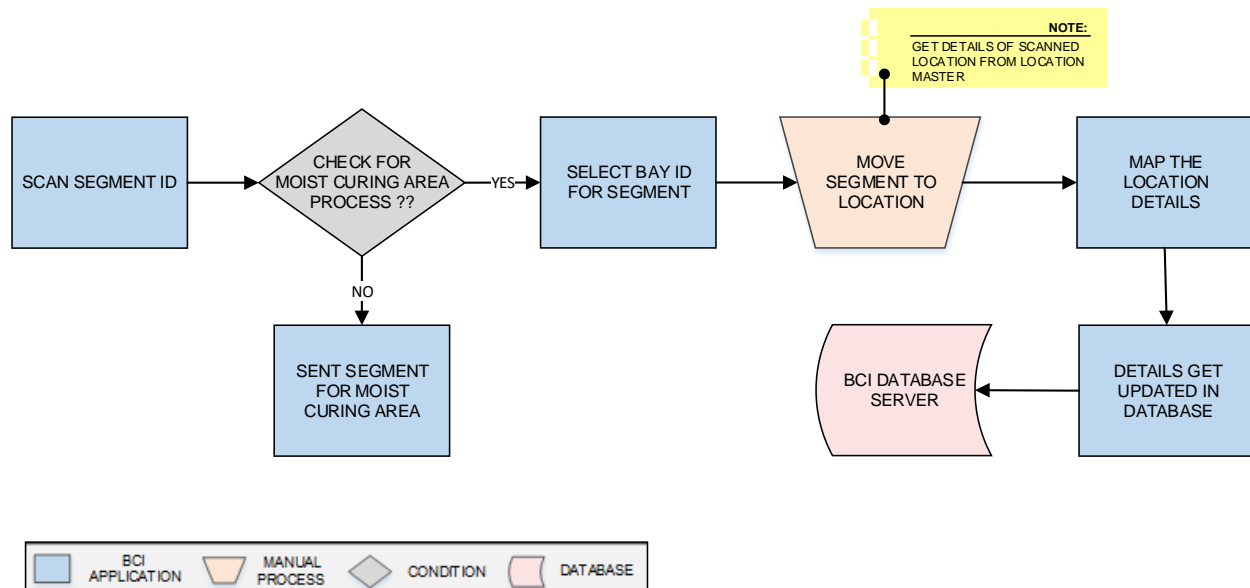


Activities

Module Description	This module will let the user to place Segment Moist Curing Area for 7days. This will be help in remove the moisture on the segment.
Pre-Conditions	<ol style="list-style-type: none"> Once Quality team accepted the segment it can be moved to moisture cleaning. To be kept in the Moist Curing Area for 7days.
Process Steps	<ol style="list-style-type: none"> Scan the Segment RFID tag to be placed. Place the Segment and start the Moisture cleaning process. Confirm the moisture cleaning process completed. <i>*After 7days the moisture cleaning for each segment is completed.</i> Save the details in the database.
Post-Conditions	<ol style="list-style-type: none"> Auto- data updating in real time Segment Inventory.
Validations	<ol style="list-style-type: none"> Segment tracking at highly detailed level An alert message is displayed in case of any error/ invalid activity. An alert message is displayed in case System is not connected.

<p>Sample Screen</p>	<div> <div>Moist Curing Area</div> <div> <div>Scan Segment RFID Tag</div> <div></div> </div> <div> <div>Moisture Cleaning Process</div> <div>Start</div> </div> <div> <div>Result</div> <div></div> </div> <div> <div>Save</div> <div>Cear</div> </div> </div>

8.5.3 YARD MOVEMENT



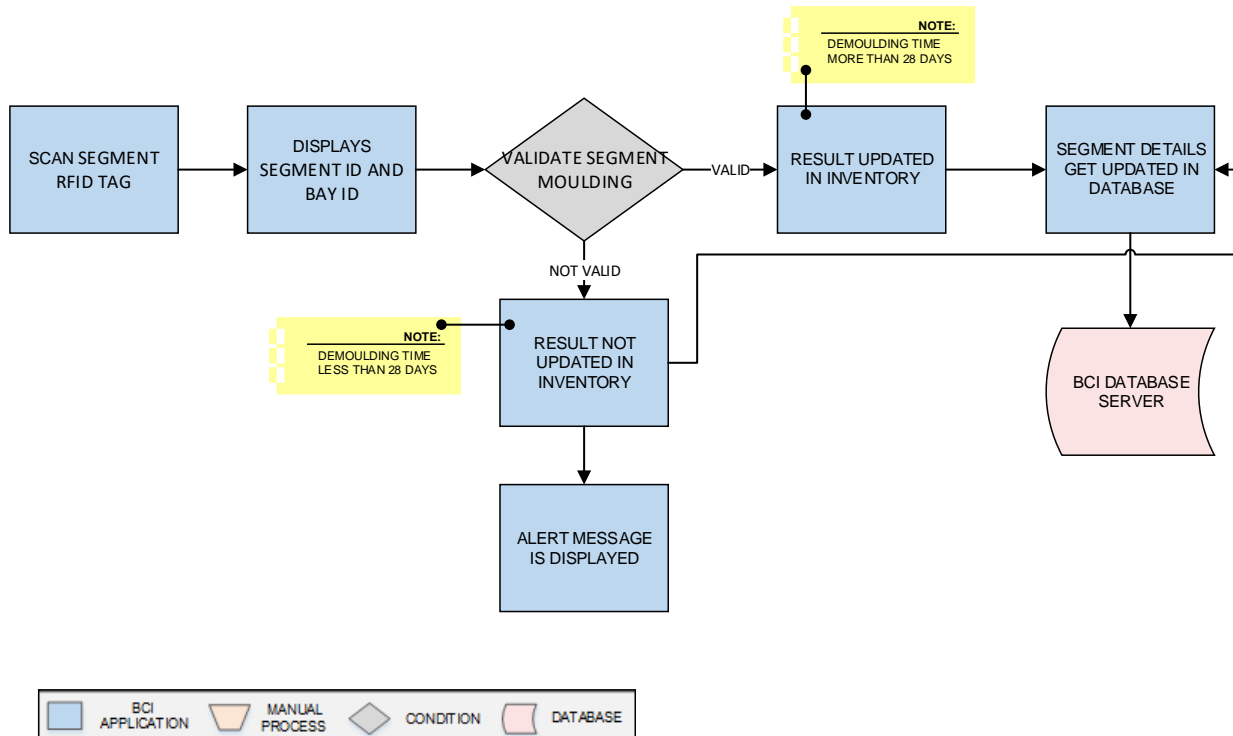
Activities

Module Description	This module will let the user to place Segment in yard bay or location. This will be help in optimizing the yard storage space effectively.
Pre-Conditions	<ol style="list-style-type: none"> Once Quality team accepted the segment it can be moved to yard. Select Bay ID and scan Segment RFID tags and placed it bay.
Process Steps	<ol style="list-style-type: none"> Scan the Segment RFID tag to be placed. Validate the Segment moisture cleaning process. <ol style="list-style-type: none"> Moist Curing Area process completed <ol style="list-style-type: none"> Move the Segment to Bay Id Moist Curing Area process not completed <ol style="list-style-type: none"> Move the segment to Moist Curing Area. Select the Bay ID of the Segment for location. Place the Segment at scanned location availability. Update Location-material mapping details in database. Save the details in the database.

Post-Conditions	1. Auto- data updating in real time Segment Inventory.
Validations	<ol style="list-style-type: none"> 1. Segment tracking at highly detailed level 2. An alert message is displayed in case of any error/ invalid activity. 3. An alert message is displayed in case Segment ID and Bay ID is not integrated with application. 4. An alert message is displayed in case System is not connected.

Sample Screen	<div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: 60%;"> <div style="background-color: #a6b8c8; color: black; text-align: center; padding: 5px; font-weight: bold; font-size: 1.2em;">Yard Movement</div> <div style="margin-top: 10px;"> <p>Bay Id</p> <div style="border: 1px solid #ccc; padding: 5px; display: flex; justify-content: space-between; align-items: center;"> Select Bay Id ▼ </div> </div> <div style="margin-top: 10px;"> <p>Scan Segment RFID Tag</p> <div style="border: 1px solid #ccc; height: 25px; width: 100%;"></div> </div> <div style="margin-top: 20px; text-align: center;"> <div style="display: inline-block; background-color: #333; color: white; padding: 5px 15px; border-radius: 5px; margin: 0 5px;">Save</div> <div style="display: inline-block; background-color: #333; color: white; padding: 5px 15px; border-radius: 5px; margin: 0 5px;">Cear</div> </div> </div>
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8.5.4 DISPATCH VERIFICATION



Activities

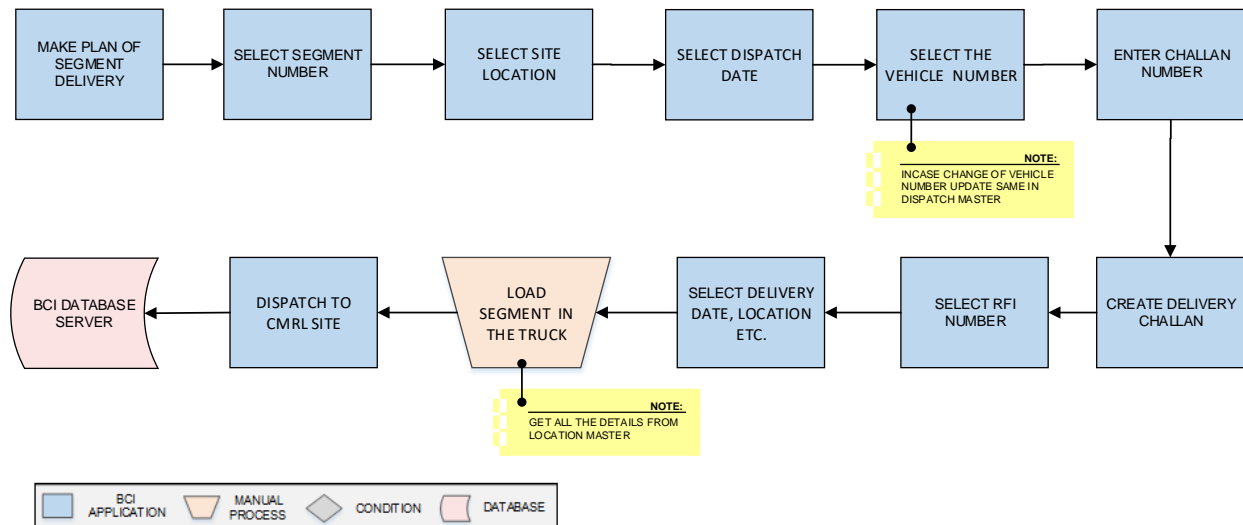
Module Description	<p>The module checks the Segment will be verified and checked whether segment curing is for 28 days. Based on this, it will be help to dispatch segment for site implementation.</p> <p><i>*This activity will be done using Device Application.</i></p>
Pre-Conditions	<ol style="list-style-type: none"> 1. Select RFI Number and scan Segments against Dispatch Plan, Select Truck No. 2. Create Delivery challan by entering RFI Number, Segment ID, Quantity, Destination details in Web Application.
Process Steps	<ol style="list-style-type: none"> 1. User will scan Segment RFID. 2. Segment ID and Bay ID will be displayed. 3. System will be validated for 28 days before it is moulded. 4. If valid (28 days over) updated in Inventory 5. If invalid (less than 28 days) it will not updated in inventory and alert is displayed. 6. Segment details will be updated in the database.

Post-Conditions	<ol style="list-style-type: none"> 1. Load the segments and load into Vehicle for dispatch to CMRL Site. 2. User should be able to view the Dispatch details before sending to Customer.
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Validations	<ol style="list-style-type: none"> 1. An alert message is displayed in case of any error/ invalid activity. 2. An alert message is displayed in case Segment ID and Bay ID is not integrated with application. 3. An alert message is displayed in case System is not connected. 4. An alert message is displayed in case Serial Number is not marked on Segment due to any error.
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Sample Screen	<div> <h3>Dispatch Verification</h3> <p>Scan Segment RFID</p> <input type="text"/> <p>Segment Id</p> <input type="text"/> <p>Bay Id</p> <input type="text"/> <div> <div>Save</div> <div>Cear</div> </div> </div>
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8.5.5 DISPATCH PLAN AND LOADING



Activities

Module Description	<p>This module will let the user to plan the segment delivery and pick the Segment that will be dispatched to destination from Yard against Delivery Challan and details for the same.</p> <p>This will be help user to successfully dispatch the Segment to Site Location.</p>
Pre-Conditions	<ol style="list-style-type: none"> 1. All details required for planning.to be there in system. 2. Selected RFI number and RFID tags, details to be available from database. 3. Segment should have RFID barcode marked. 4. Scan Segment RFID and check Quality. 5. Delivery details to be verified.
Process Steps	<ol style="list-style-type: none"> 1. Select the Segment number of the Segment. 2. Select the Site Location for the ring. 3. Select the dispatch date of the Ring. 4. Select/ Enter the Vehicle Number, driver details in the fields. <i>*In case of change of Vehicle number update same in master.</i> 5. Enter the challan number for the delivery address. 6. The Delivery Challan details get created by user. 7. Select RFI Number, Delivery Date, Location etc.

	<ol style="list-style-type: none"> 8. Load and dispatch segments and dispatch to CMRL Site. 9. Save corresponding details in database.
--	--

Post-Conditions	<ol style="list-style-type: none"> 1. All details planned to be updated in case of change. 2. Segment which are picked can be move for loading. 3. Segment should get updated as per database.
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Validations	<ol style="list-style-type: none"> 1. Segment tracking at highly detailed level 2. An alert message is displayed in case of any error/ invalid activity. 3. An alert message is displayed in case Segment ID and RFI number is not integrated with application. 4. An alert should be displayed in case segment not marked is scanned. 5. An alert should be displayed if Dispatch details is not available in list. 6. An alert should be displayed if wrong segment is picked. 7. An alert will be displayed if Picked segment quantity entered is more than the quantity stated in segment loading and dispatch list.
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Sample Screen

Dispatch Plan

Segment No.

Select Segment No.

Site Location

Select Site Location

Dispatch Date

Truck No.

Challan No.

RFI No.

Select RFI No.

Delivery Date

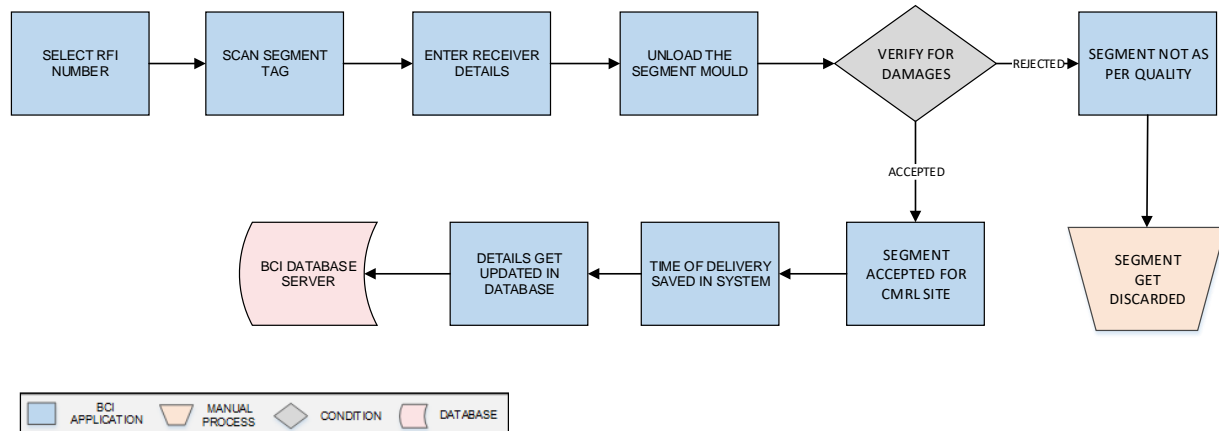
Location

Save

Cear

8.6 SEGMENT SITE IDENTIFICATION OPERATIONS

8.6.1 SEGMENT DELIVERY & QUALITY INSPECTION

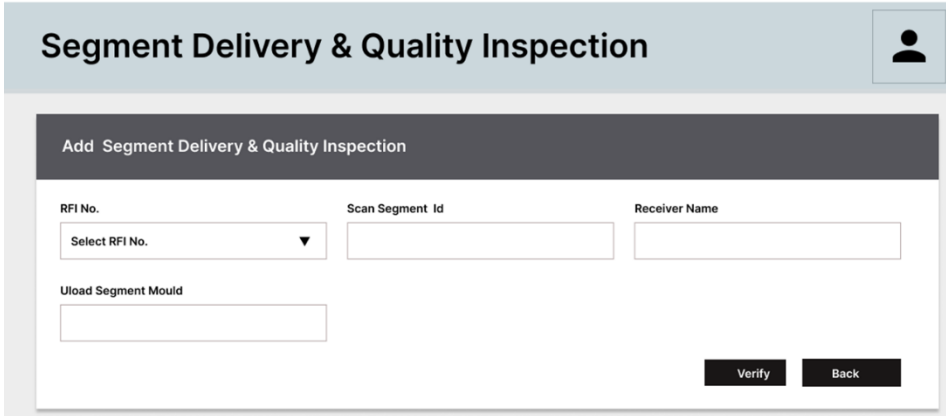


Activities

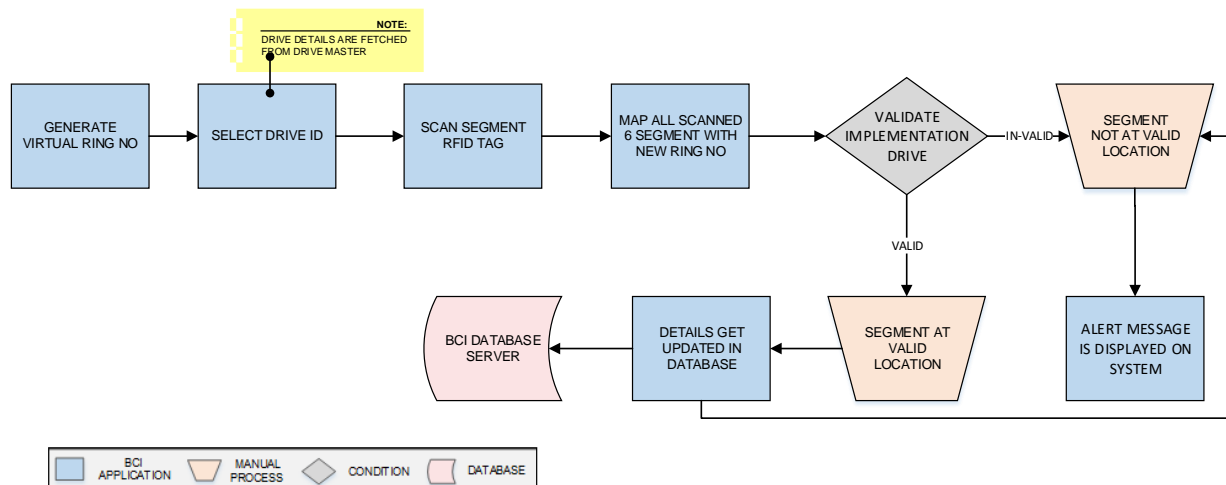
Module Description	<p>This module will be used after dispatch from yard, truck will reach the destination, and Segment will be unloaded at implementation site. In case of any damaged Segment shall be returned to yard. The module will help user to update the Segment delivery details in database.</p> <p><i>This activity will be done using device and Web Application.</i></p>
Pre-Conditions	<ol style="list-style-type: none"> 1. Scan Segment RFID and check Quality. 2. Update Segment Status based on quality – Accepted for Erection or Rejected.
Process Steps	<ol style="list-style-type: none"> 1. Select the RFI no from the list. 2. Scan the Segment RFID Tag Id. 3. Enter the receiver personnel details. 4. Unload segment from the transport vehicle. 5. Verify the segments for any damages while transportation. 6. In case of any damage send the segments is discarded. 7. The time of delivery will captured by the system. 8. Corresponding details will be updated in database.
Post-Conditions	<ol style="list-style-type: none"> 1. All accepted Segments shall be moved to Tunnel Location. 2. All rejected Segments will be moved to Yard Rejection Location.

	3. Segment received details will get saved in the database.
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Validations	<ol style="list-style-type: none"> 1. System will validate input data i.e. text field values and selections. 2. An alert/ error message will be displayed in case invalid / duplicate barcode is being scanned. 3. An alert message is displayed in case of any error / invalid activity.
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Sample Screen	
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8.6.2 SITE INSTALLATION



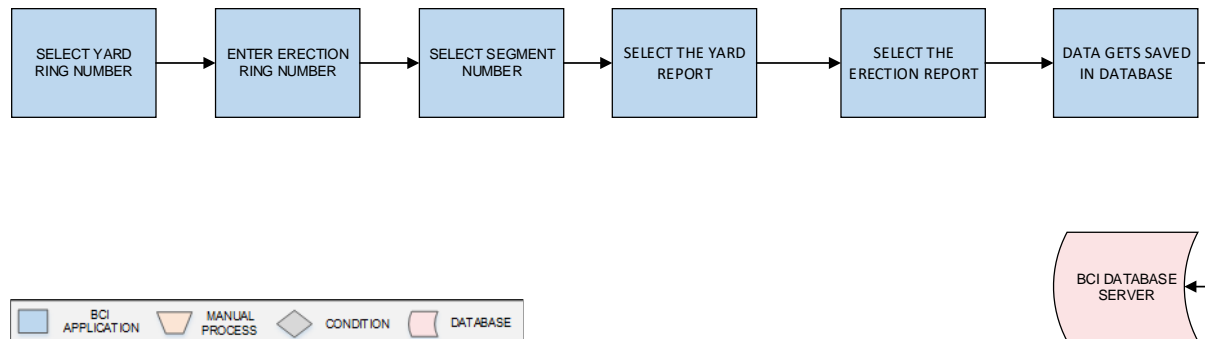
Activities

Module Description	<p>This module will be used to validate after erection for the particular drive. CMRL officials will confirm to drive allocated, corresponding details will be updated. When Wi-Fi/ network connectivity is available, details will be updated in the database.</p> <p><i>*This activity will be done using Device Application.</i></p>
Pre-Conditions	<ol style="list-style-type: none"> ITD Inspection Personnel visit the Implementation Site. Select Drive Area and scan 1 Segment RFID tag.
Process Steps	<ol style="list-style-type: none"> Generate the New virtual Ring No Select Drive ID Scan Segment RFID tag. As all 6 segment scanned system will map all the 6 segment with new Ring No System will validate the implementation drive with database. After complete ring erection Official will confirm with digital signature. <i>*In case location is invalid, alert is displayed.</i> Update corresponding details in the database.
Post-Conditions	<ol style="list-style-type: none"> System will validate the Grouping ID. Segment details are verified by officials and Saved into the database.

Validations	<ol style="list-style-type: none"> 1. An alert message is displayed in case of any error / invalid activity. 2. System will validate input data i.e. text field values and selections 3. Segment validation with implemented Drive/ location 4. System will validate Confirmation with digital signature.
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Sample Screen	<div data-bbox="443 525 979 1554"> <h2>Site Installation</h2> <p>Select Drive ID</p> <div data-bbox="480 697 935 758"> Select Drive ID ▼ </div> <p>Scan Segment RFID tag</p> <div data-bbox="480 816 935 877"></div> <p>Virtual Ring No</p> <div data-bbox="480 926 935 987"></div> <p>Remaining Segment Count</p> <div data-bbox="480 1043 935 1104"></div> <div data-bbox="664 1482 935 1539"> <div>Save</div> <div>Cear</div> </div> </div>
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8.6.3 YARD AND ERECTION DATA



Activities

Module Description	This module will be used to validate after Yard and Erection for the particular data. In these the Ring number for the Yard at production and the ring number at receiving erection data gets uploaded to the database.
Pre-Conditions	<ol style="list-style-type: none"> 1. ITD Inspection Personnel visit the Implementation Site. 2. Data of Yard and erection to be already implemented at Yard and Site Location.
Process Steps	<ol style="list-style-type: none"> 1. Select Yard Ring Number 2. Enter Erection ring number. 3. Select the Yard Report and browse the Yard file. 4. Select the Erection Report and browse the Yard file. 5. Click on Save button to save into the database. 6. Update corresponding details in the database.
Post-Conditions	<ol style="list-style-type: none"> 1. Data to be uploaded in the PDF Formats.
Validations	<ol style="list-style-type: none"> 1. An alert message is displayed in case of any error / invalid activity. 2. System will validate input data i.e. text field values and selections

Sample Screen



Yard and Erection Data

Yard and Erection Data

Yard Ring No.

Select Yard Ring ▼

Erection Ring No.

Segment Number

Select Segment Number ▼

Yard Report

Browse

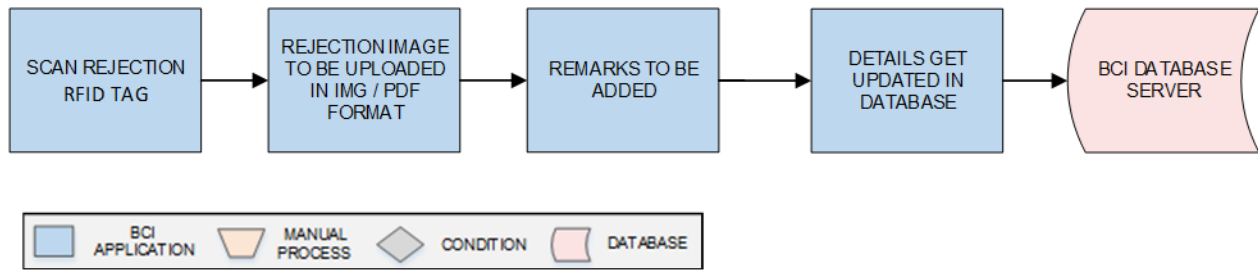
Erection Report

Browse

Save

Clear

8.6.4 SEGMENT REJECTION DATA



Activities

Module Description	This module will be used upload the Segment Images that are been rejected after the quality inspection.
Pre-Conditions	<ol style="list-style-type: none"> 1. QC personal should check Segment produced against defined parameters. 2. QC personal should check the de-Moulding time before quality. 3. Segment should have RFID tag inside Moulding.
Process Steps	<ol style="list-style-type: none"> 1. Scan the Rejection RFID tag. 2. Rejection ring Image to be upload on the Image/ PDF format. 3. Remarks to be added in the Remarks textfields. 4. Data gets saved in the database.
Post-Conditions	<ol style="list-style-type: none"> 1. System will validate Image format and Remarks added. 2. Ring details are verified by officials and Saved into the database.
Validations	<ol style="list-style-type: none"> 1. An alert message is displayed in case of any error / invalid activity. 2. System will validate input data i.e. text field values and selections 3. System will validate Confirmation with digital signature.

Sample Screen

Segment Rejection Data

Segment Rejection Data

Rejection RFID tag

Rejection Ring Image

Browse

Remark

*upload on the Image/ PDF format

Save

Clear

9 SRS SCOPE CHANGE PROCESS

9.1 BEFORE SIGN OFF

Any changes in SRS need to be informed in writing by ITD Cementation Pvt Ltd. It will be incorporated / confirmed only after doing detailed feasibility study by BCI.

- If any change is out of scope then this would be done as a CR post feasibility and priority will be decided based on mutual agreement.
- Once the change is developed , any further change in the same would be considered as a CR

9.2 AFTER SIGN OFF

Any changes in proposed solution after approval of this document by ITD Cementation India Limited are subjected to confirmation from BCI, taking feasibility constraints into account. These changes will be incorporated (if any) into the solution only after delivering proposed solution & may be charged as extra.

- Any change in the proposed solution due to customer system design or process will be considered as CR
- Any process which is not mentioned in this document will not be considered as “mutual understanding or default presence or standard practice”.

The changes in proposed solution before & after acceptance will be mutually agreed and duly signed and accepted by ITD Cementation India Limited & BCI.

9.3 SRS ACCEPTANCE

Agreed and Accepted by ITD Cementation India Limited and Bar Code India

For ITD Cementation Pvt. Ltd

For Bar Code India (BCI)

Name:

Name:

Designation:

Designation:

Department:

Department: