Our Tender Ref: 17CC045
Version: 1.0

PROPOSAL OVERVIEW

PROVISION OF Automated Storage and Retrieval System

for

snackbrands AUSTRALIA

DAIFUKU Always an Edge Ahead

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REVISION HISTORY

Version	Date	Description	Author
1.0	16 AUG 18	For Review	JF
1.1	16 AUG 18	For Release	JF/CS/MM

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1 EXECUTIVE SUMMARY

Over the past several months Daifuku has been working closely with TM Insight and the Snackbrands team to further refine the design now that the site has been selected.

Daifuku BCS has designed the system to meet throughput demand using our efficient ASRS, High Speed Sorting Transfer Vehicles (STV), to include outbound buffer to particularly allow for flexibility in operations, and plan for the unknown. This document outlines the scope of system designed in line with discussions had at workshops, together with TM Insight and Snackbrands.

2 DAIFUKU INTRODUCTION

The Daifuku Group is the largest material handling provider in the world with over 9,000 employees and a turnover of approximately US $3.3 Billion.

With our group headquarters in Japan, Daifuku is a global organisation with locations in many parts of the world. Daifuku BCS is the subsidiary of the parent organisation responsible for various industries in the Asia Pacific region. Since 1937, Daifuku has been focused on material handling – the movement, storage, and management of goods and products. Our world-class systems lead the industry by combining innovative conveying, storage, sorting, picking and control techniques. Our products serve customers in a wide range of industries throughout the world.

Daifuku began in automotive factory automation (AFA), developing chain conveyors during the automobile industry boom. Today, our four core business divisions are AFA operations, factory and distribution automation (FADA), cleanroom factory automation (eFA), and airport technologies (ATec).

Daifuku's Shiga Works in Japan is the world's largest logistics equipment production site, with 11 factories spanning a total of 1.3 million square meters. Our factories produce advanced, quality products backed with 80 years of material handling experience.

Figure 1- Daifuku Shiga Works

In the current era of e-commerce and globalization, "logistics" has become a critical factor for business success. As a leading material handling manufacturer, Daifuku's mission is to provide a personalized logistics solution for each customer and assist you every step of the way. Our Total Solution Experience includes consulting, planning, design, manufacturing, installation, maintenance, upgrading, and retrofitting.

Figure 2- Daifuku ASRS

Daifuku has a diverse range of technologies that greatly benefit the courier and distribution industries. Our ASRS unit-load and mini-load cranes are some of the fastest and most reliable cranes in the industry. Daifuku globally has installed over 40,000 ASRS cranes, more than any other supplier in the world. These systems are operation in various industries, including (but not limited to) Fast Moving Consumer Goods (FMCG), Pharmaceutical, Agriculture, Third Party Logistics (3PL), Retail, Beverage, E-Commerce, and Courier.

To control the entire operations, Daifuku offers a full range WMS and WCS software. The Daifuku eWareNavi software is designed and optimized for automation. The modular design makes it even more flexible to ensure that it has all of the necessary functionality without adding any modules that are not needed.

2.1 Daifuku BCS

Daifuku BCS is a 100% owned subsidiary of the Daifuku Group of Companies. Our core execution centre is based in Melbourne, VIC where we support all regions of Australia.

Daifuku BCS have over 550 staff in Malaysia, Australia and New Zealand.

With our manufacturing facility in Rawang, we manufacture the following components in Malaysia:

- All conveyors.
- All straight chutes for our sorters.
- All spiral chutes for our sorters.
- All specialised baggage-handling equipment.
- Some specialised sorting equipment such as the BTS system for our Daifuku parent.

Daifuku BCS are the supplier of the automatic sortation systems for various TOLL group companies, and TNT throughout Australia, with single project costs valued well over $20M AUD.

2.1.1 Daifuku BCS Experience

Daifuku BCS have delivered material handling solutions to over 50 countries. Our core business is courier sortation systems, Integrated High-bay ASRS, and baggage handling systems.

Below is a summary of recent projects and approximate values for our FA&DA division of Daifuku BCS.

Customer	Description	Approximate USD Value
NZ Post	Design, supply and install freight handling and sortation systems with BCS 3D SCADA	$20,000,000
Toll IPEC Sydney & Melbourne	Design, supply and install freight handling and sortation systems with BCS 3D SCADA and BCS Freightflow	$80,000,000
TNT Sydney, Melbourne, Brisbane	Design, supply and install freight handling and sortation systems with BCS 3D SCADA and BCS Freightflow	$80,000,000
Toll Priority	Design, supply and install freight handling and sortation systems	$25,000,000
Target	Supply and install MHS including AGV's	$25,000,000
Heineken	Supply and Install ASRS including AGV's and WMS software	$3,000,000

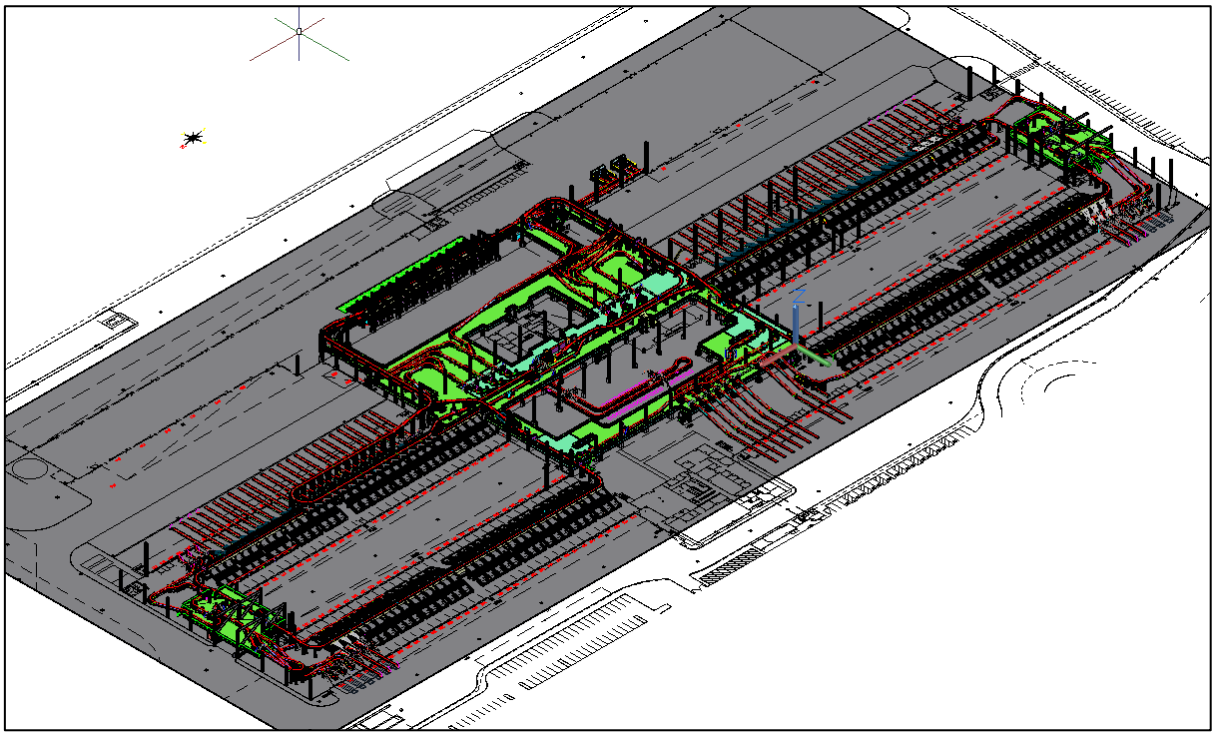

Figure 3- toll IPEC- 36,000 parcels per hour, over 1.8km of crossbelt sorter

3 KEY DESIGN FEATURES

3.1 Overview

Daifuku BCS have proposed Automated Storage and Retrieval System (ASRS) for the handling of palletized goods, such as Thins, CC's, Cheezels, Kettle Chips, and more. The pallet handling system comprises a Double Deep Storage Model with ten (10) aisles, equipped with a single extractor, providing sufficient capacity to accommodate storage and throughput requirements. The system further strategically utilizes Daifuku Sorting Transfer Vehicles (STV) in place of pallet handling conveyor.

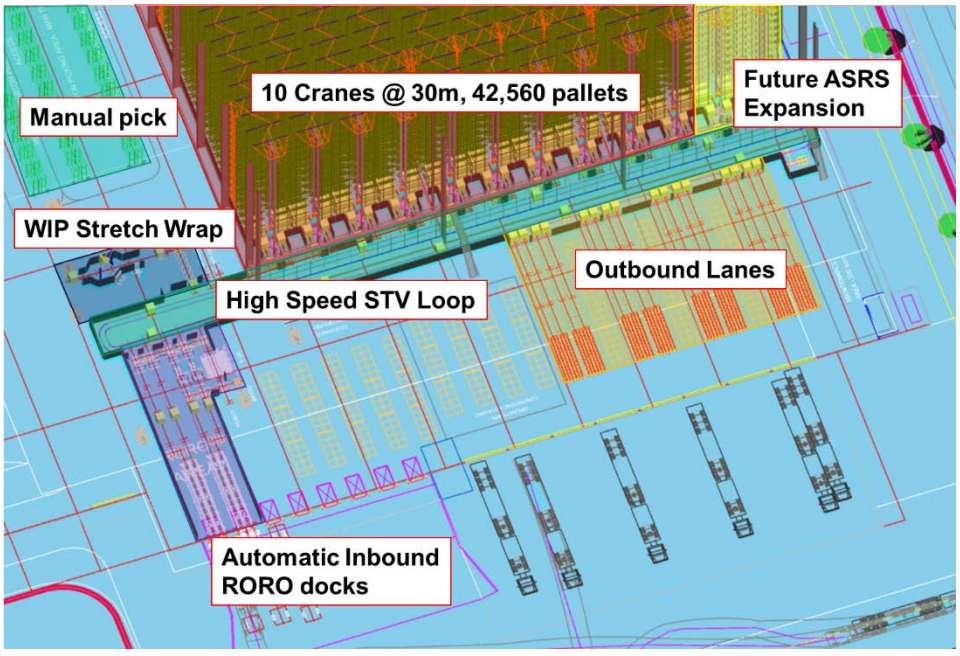

Figure 4- System Overview

3.2 Key System Features

- Integrated RORO system which allows for flexibility as any truck can dock in either bay. The Inbound solution now provides complete redundancy utilizing conveyor crossover lines.
- Pallet ASRS systems to handle Finished Goods pallets and WIP pallets with **42,560 pallet** storage locations. 10 single pallet handling, Double Deep cranes (30m high) provide **high throughput** with an horizontal operating speed of 160 m/min with **high redundancy** as should 1 crane experience issue (or be taken off-line for maintenance) will have minimum impact on the operations.
- Daifuku **high-speed Sorting Transfer Vehicles (STV)** (11 vehicles on the loop) which reduces the need for additional conveyor drives, sensors and controls. Our STV solution allows for 1 extra vehicle for ultimate **redundancy** during maintenance activities. The offline maintenance station allows for maintenance of vehicles separate to the main operating line. The vehicles run at 200 m/min without load (160m/min with load) and are by far the most efficient- vehicle of this type on the market.
- We provide a **dual cycle function** in the control logic of the automated racking- storage and retrieval cranes (SRM) with through-put capacity of 401 cycles/hour. Our dual cycle operation **provides** storage and retrieval functionality in same cycle.
- We use a **"S- Curve"** control/non-stage speed controller functionality – Daifuku ASRS eliminates the "creep" before stopping through smooth acceleration and deceleration of the SRM, **further reducing the cycle time**, reducing load shift and providing the ultimate stability of product on the crane when in motion.
- We boast a **Regenerative converter for power supply** – each crane (SRM) is equipped with power regeneration technology that allows it to use energy when it is braking or lowering the carriage for its own operations, or for the immediate use of another crane in the system.
- Daifuku SRM control logic has our **patented double deep load shuffling method** – by not returning the first pallet to its original location, Daifuku **reduces shuffle time by 30%**
- Each crane is equipment with an **automated vertical lift platform** we call an "Escorter" to allow an operator to service any location at height with maximum consideration towards safety.
- Daifuku **proprietary WCS- eWareNavi**- a global WMS product which is optimized for automated solutions and is used in many applications where we have provided over 40,000 cranes worldwide.
- Daifuku BCS **SYM3 3D SCADA** software package which is completely unique to Daifuku which allows for live product tracking and remote interrogation of live operations from anywhere in the world.
- Our solution allows for various methods of **future proofing** the operations through options such as:
    - Additional pallet racking with the addition of extra cranes (additional throughput and storage- not included in base scope).
    - Various options to facilitate future picking operations. These can be utilized on the same **WCS- eWareNavi** platform.

3.3 Inbound Operations

Pallets of boxes from Blacktown and Smithfield are transported to the site via trucks outfitted with RORO trailers. Pallets are automatically inducted into the system and transported into storage via the High-speed Sorting Transfer Vehicle (STV).

Figure 5- Inbound Operations Layout

Daifuku BCS has been able to move the RORO docks as far to the side of the building as possible as all pallets will be wrapped prior to arriving at the facility. Pallets from Blacktown are to be destacked and turned 90deg for introduction into the ASRS via the high-speed STV.

The standard mode of operating for the input line is as follows:

1. Driver backs truck up to inbound dock and interfaces trailer with RORO system
2. Pallets from Smithfield

Figure 6- Smithfield Inbound Operations

   a. Pallet barcode is scanned
   b. Pallets from Smithfield are conveyed through the pallet destacker and turntable and profile checked
   c. IF any issue is found, and the pallet is rejected, it is immediately conveyed to the rework station
      i. Rework station is in-line allowing for the pallet to be reworked and re-inducted without forklift intervention
   d. IF the pallets passes the profile check, it is conveyed to a station conveyor for the STV to transport it to an ASRS aisle for storage
3. Pallets from Blacktown

Figure 7- Blacktown Inbound Operations

a. Pallet barcode is scanned

b. Pallets from Blacktown are destacked into single pallets, and turned 90 degrees to ensure proper orientation for storage, after which they pass through the profile checking devices

c. IF any issue is found, and the pallet is rejected, it is immediately conveyed to the rework station

   i. Rework station is in-line allowing for the pallet to be reworked and re-inducted without forklift intervention

d. IF the pallets passes the profile check, it is conveyed to a station conveyor for the STV to transport it to an ASRS aisle for storage

4. Container Goods

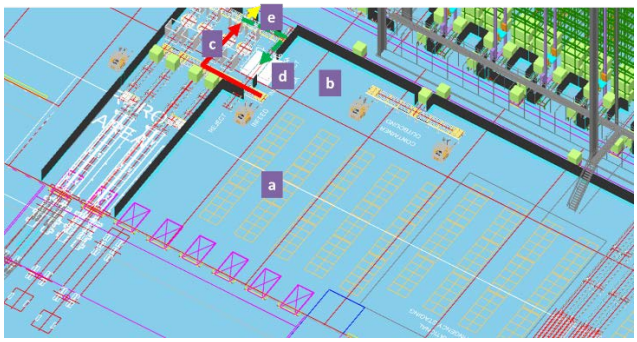

Figure 8- Container Goods Inbound Operations

a. Goods received in containers are manually palletized

b. Finished pallets are wrapped, and labeled with the ID barcode

c. Pallets are profile checked, and inducted into the system via conveyor

d. IF any issue is found, and the pallet is rejected, it is immediately conveyed to the rework station

   i. Rework station is in-line allowing for the pallet to be reworked and re-inducted without forklift intervention

e. IF the pallets passes the profile check, it is conveyed to a station conveyor for the STV to transport it to an ASRS aisle for storage

3.4 Outbound Operations

The ASRS is designed to hold stock until either it is needed for 1 of 3 operations, namely, replenishment to the pick area, WIP goods, and picking of pallets for shipping.

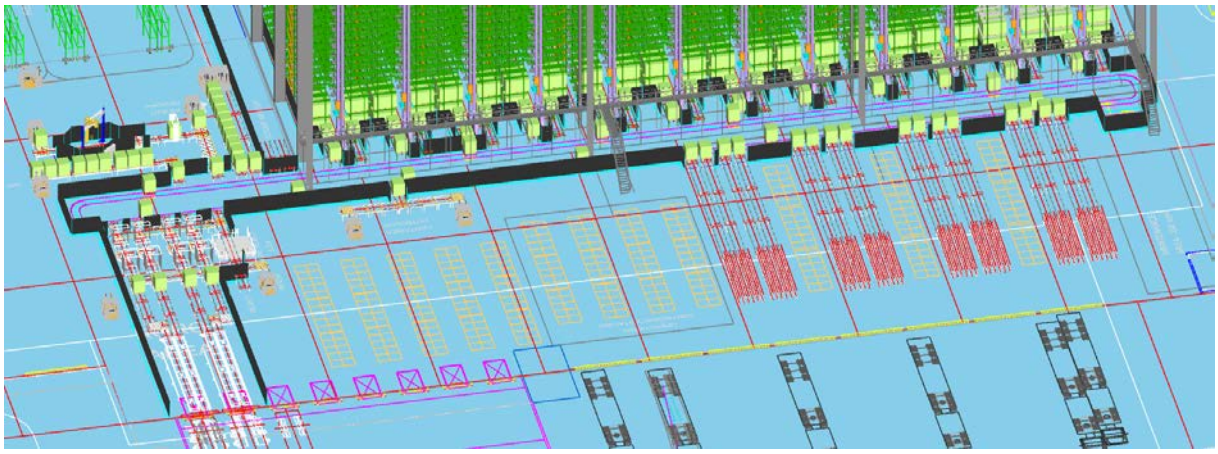

Figure 9- Outbound operations layout

3.4.1 Picking Area Replenishment

The standard operations of the outbound replenishment line is as follows:

a. Snackbrands WMS will request to the Daifuku WCS for a pallet for replenishment

b. Pallet will be pulled from the rack by the SRM (storage and retrieval machine) and place on the aisle conveyor

c. The high-speed STV will transport the pallet from the aisle conveyor to the outbound line closest to the picking area

d. An operator will retrieve the pallet from the conveyor and put in the appropriate rack location

3.4.2 Full Pallet Picking (Single SKU pallets)

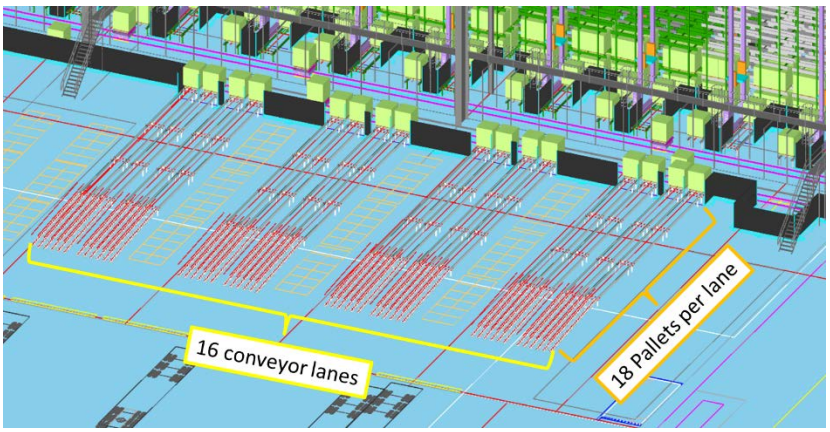

Figure 10- Full Pallet Picking Area

Outbound operations are key to the success of Snackbrands new Automated Warehouse. Daifuku BCS, after much consideration and simulation proposed the following configuration for outbound buffer:

1. The system is designed to accommodate the delivery of 210 pallets/hr to the despatch lanes for loading onto Local, and B-Double trucks.
2. There is a total of 16 conveyor lines (in pairs of 2 to allow for easy retrieval via dual-fork fork trucks).
    a. This configuration allows for a variety of lanes to be used as the schedule dictates, while also allowing for lanes to be help open in the event that a truck out of sequence arrives and needs to be loaded immediately.
    b. 16 conveyor lines x 18 pallets per conveyor = 288 buffered pallets, leaving one B-Double worth of conveyor open for Emergency Trucks (trucks turning up out of

sequence) leave 12 conveyor lines x 18 pallets = 216 pallets – or 3 B-Double worth of buffered pallets

3. Staging on the conveyors allows for only 1 fork moment to load a trailer and eliminates the need for floor storage.
4. All conveyor pairs are identical providing maximum redundancy and flexibility for assigning truck berths
5. Additional Conveyors can be added by either extending the STV loop, or adding conveyor into the container area

3.4.2.1 Normal Outbound operations

a. Snackbrands WMS will request to the Daifuku WCS for a pallet for shipping
b. Pallet will be pulled from the rack by the SRM (storage and retrieval machine) and place on the aisle conveyor
c. The high-speed STV will transport the pallet from the aisle conveyor to the outbound line closest to the shipping storage area
d. Outbound shipping area has sufficient storage to buffer 288 pallets

3.4.2.2 Emergency outbound operations

Should a truck arrive out of sequence, Daifuku's System can pull a full B-Double (72 Pallets) load in approximately 22 mins. In this case, the following operations will apply:

a. Controller will indicate that a truck has arrived, and which conveyor to buffer its pallets to
b. Snackbrands WMS will request to the Daifuku WCS for a pallet for shipping
c. Pallet will be pulled from the rack by the SRM (storage and retrieval machine) and place on the aisle conveyor
d. The high-speed STV will transport the pallet from the aisle conveyor to the outbound line designated by the controller

3.4.3 Local Route Trucks (Multi-SKU pallets)

Trucks for local deliveries are proposed to be handled manually after picking for the design year 2025. However, it is necessary to incorporate RORO dock in the recessed dock area which locks out the picking area from the dock area in the initial build.

As such, Daifuku has made allowance for picked pallets to be sent through the stretch wrapper (same wrapper as WIP) for which they will be automatically wrapped and labelled. If they pass the profile check, they will be transported via STV to the container outbound conveyor. Note that this is transport only and picked pallets will not be stored in the ASRS. It will still be necessary to manually stage picked pallets and sequence them on the floor prior to loading onto local route trucks.

After the initial period of approximately 2 years, in other words once the RORO has been removed, access is restored to the docks from the picking area, therefore picked pallets are to be handled manually and staged at the shipping dock.

At this time, picked pallets can still be automatically wrapped and labelled, however they will be sent to the reject line for final transportation via fork lift to the outbound staging area.

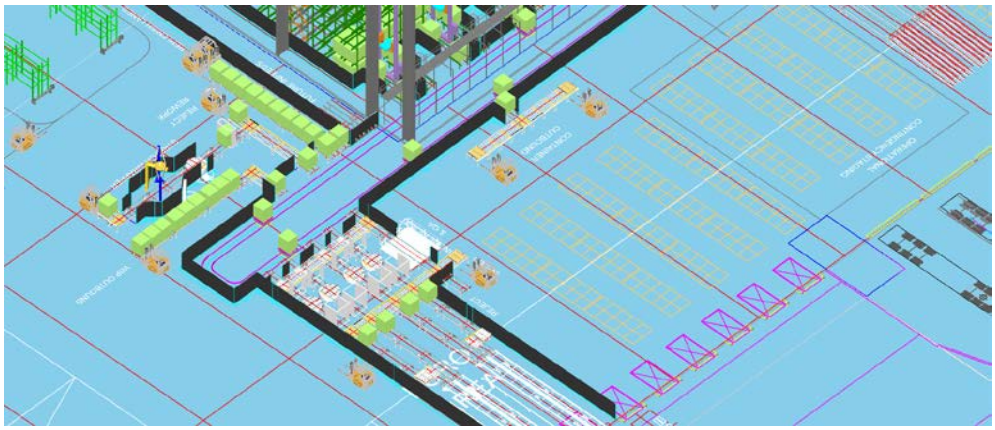

Figure 11- Mixed pallet outbound floor storage

3.5 WIP Operations

The system will receive pallets from Blacktown and Smithfield of 'inners' and goods to be processed in the WIP area. These pallets of goods will be stored in the ASRS highbay until being sent to the WIP area for further processing. The operation for handling of WIP goods is as follows:

Figure 12- WIP inbound/outbound

a. Snackbrands WMS will request to the Daifuku WCS for a pallet for WIP

b. Pallet will be pulled from the rack by the SRM (storage and retrieval machine) and placed on the aisle conveyor

c. The high-speed STV will transport the pallet from the aisle conveyor to the outbound line closest to the WIP area

d. An operator will retrieve the pallet from the conveyor for use in the WIP area

e. Completed WIP products, now finished goods, are brought back to the stretch wrapper

f. Pallets are automatically stretched wrapped, and labeled

g. IF a pallet passes the profile check, it is sent to the ASRS for storage via the STV

h. IF a pallet has any issues (no read barcode, profile error, etc.) the pallet is sent to the reject line to be reworked. After rework, a pallet will have to be manually reinducted to the stretch wrapper via fork lift

3.6 Picking Operations

3.6.1 Manual Picking Operation

To accommodate the original design of the hotpick off of the STV loop given the building constraints would require an extension of the loop. The shape and flow of this loop would also be highly inefficient for the STV operation resulting in required additional vehicles to meet throughput demand. Further to this, and after careful consideration and breakdown of the picking data, Daifuku BCS proposes that the picking operations remain a manual operation, with the inclusion of longer replenishment conveyors to allow for flexibility in replenishment activities.

Though a manual replenishment operation, there is benefit to apply the 'hotpick' concepts to the rack. In other words, Daifuku proposed that there be dedicated replenishment aisles (only fork traffic). Forklifts will replenish by pushing through pallets on the ground level to the pick face.

Using a manual replenishment of the pick faces also keeps the picking area open and clear for future considerations and addition of semi-automated or fully-automated picking solutions.

Selective Rack (provided as option) is currently proposed as 15 bays (2 pallets per bay) x 6 banks x 3 levels = 540 pallets, 90 pick faces. This configuration allows for high movers to be placed in the racks so as to be replenished from the rear in dedicated replenishment aisles. Slow movers can be configured to the pick face as necessary for the days' operations.