

# **AUTOMATED WASTE COLLECTION SYSTEM (AWCS)**

**By Ir. CHEA THEAN TEIK  
STREAM GROUP SDN. BHD.**



# PRESENTATION OUTLINE

Stream Group of Companies

Conventional Waste Management & the Issues

Automated Waste Collection System (AWCS) & Why AWCS?

Case Studies

Project References & Our Customers







Stream Group of Companies



# STREAM Growth & Plan



1991

Started as Nexa Corporation Sdn Bhd selling first Malaysian made Central Vacuum System.



1996

Acquired by Aldes Corporation of France, renaming Nexa Corporation Sdn Bhd to Nexaldes Sdn Bhd.



2004

Nexaldes Sdn Bhd became a member of AWC Berhad.



2010

Established Stream Environment Sdn Bhd alongside Nexaldes Group as a holding company.



2021

STREAM is represented in 7 countries: Malaysia, Singapore, United Arab Emirates, Qatar, Australia, China & India.



Brand name "STREAM" established, representing the meaning of vacuum conveying technology for all streams of homogenous waste.



1999

First milestone of STREAM conveying municipal solid waste in Singapore. Developing its own Automated Waste Collection System.



2007

STREAM secured contracts valued over AED 400 million in United Arab Emirates.



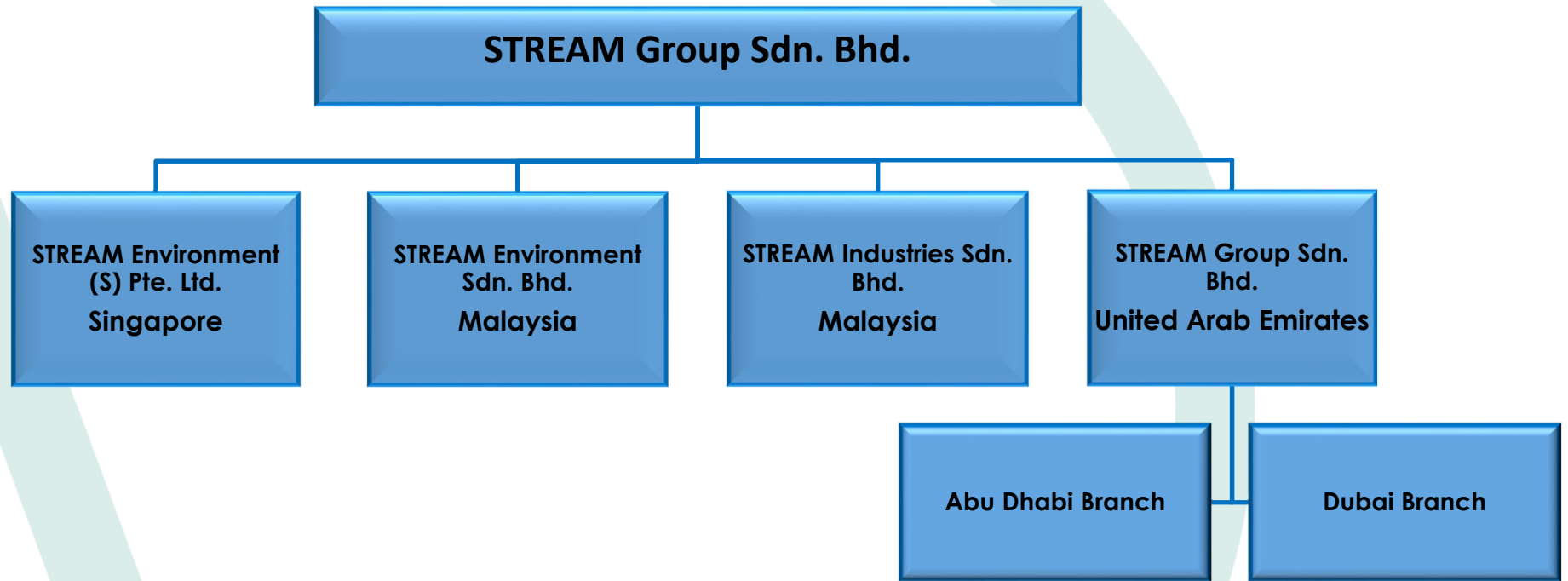
2017

Renamed as Stream Group Sdn Bhd focusing on business development via expanding dealership networks across Asia countries.



STREAM plans for EXPANSION of Business Development activities and Dealership Networks to many more countries in next 10 years.

# STREAM Organization



## Local Representations



## Projects by STREAM

> 280

No. of Projects by **STREAM** **Worldwide**



# STREAM GLOBAL PRESENCE





- 
- Conventional Waste Management & the Issues**
- 
- 
-



## Conventional Waste Management: Key Issue-1, Commingle of Wet & Dry Waste





## Conventional Waste Management: Key Issue-2, Open Storage, Pest Breeding Ground



**Colony of Rats (Pest) in Refuse Centre, Breeding Ground for Pest**



# Conventional Waste Management: Key Issue-3, Pest in Mall, Hygiene Issues



**Pest, Hygiene Issues**





## Conventional Waste Management: Key Issue-3, Public and Environmental Nuisances



**Public Nuisance,  
collection & transporting  
waste**



**Environmental Nuisance,  
Leachate & odor**

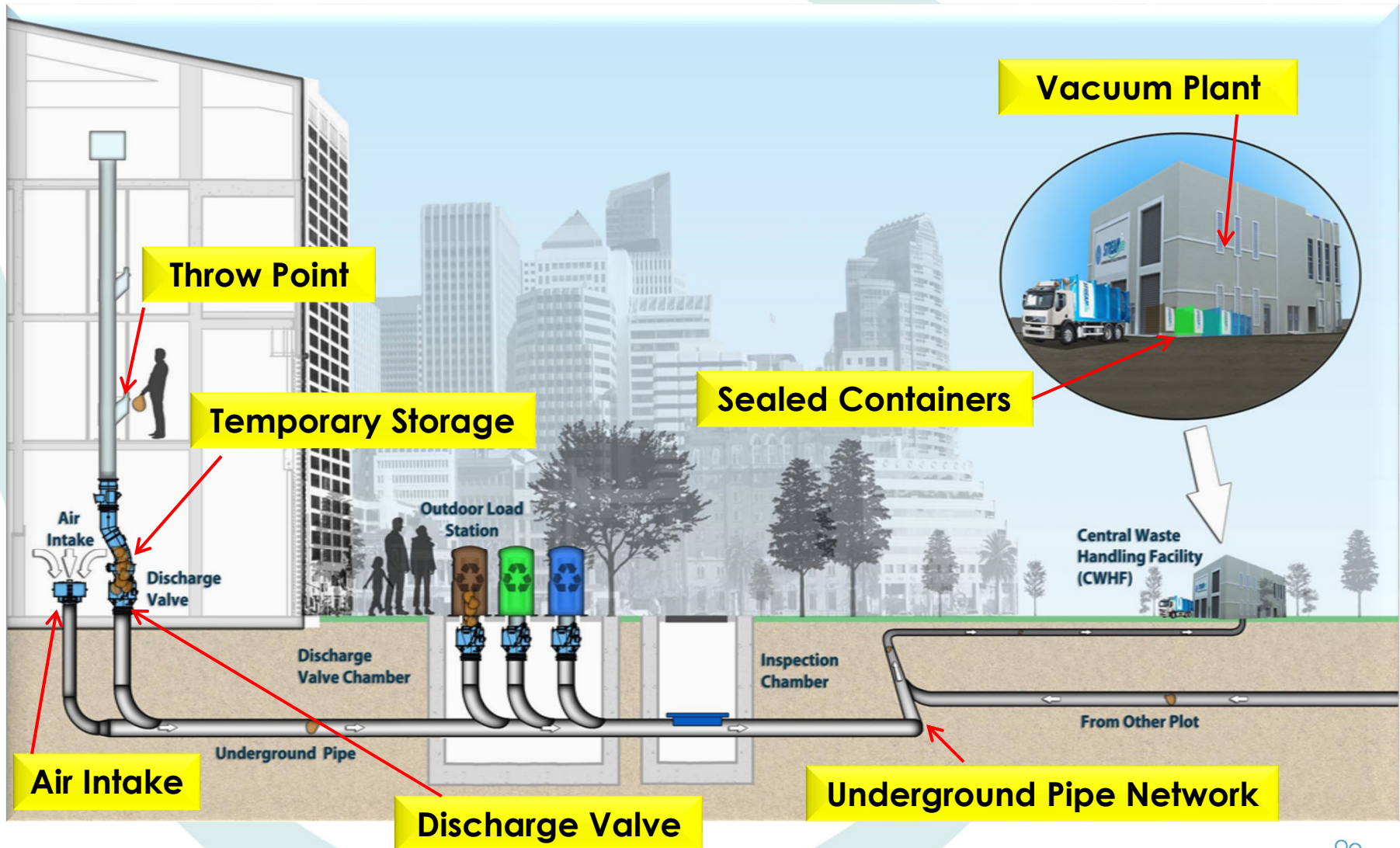




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- 
- Automated Waste Collection System (AWCS) & Why AWCS?**
- 
-

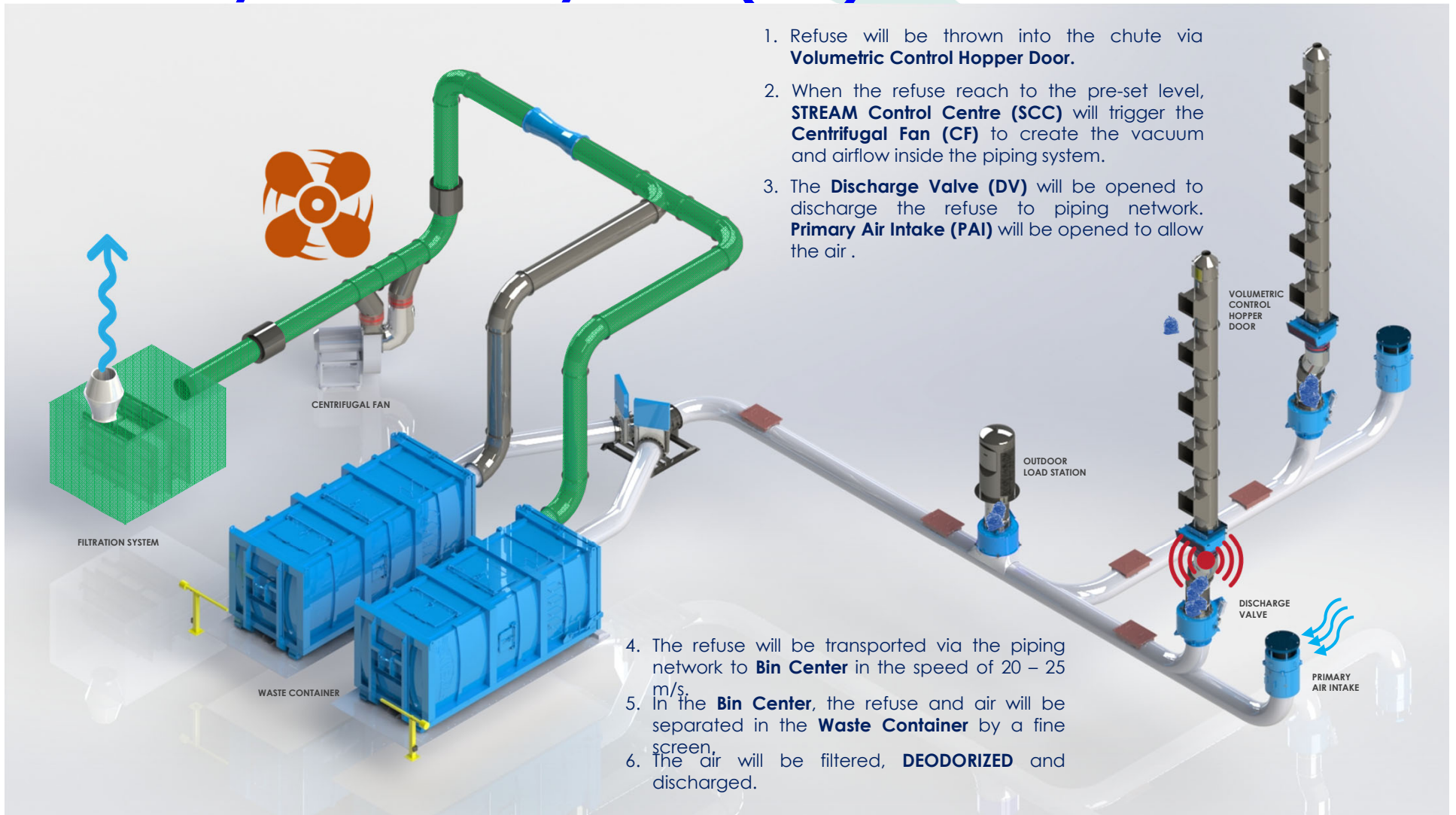


# AUTOMATED WASTE COLLECTION SYSTEM COMPONENT

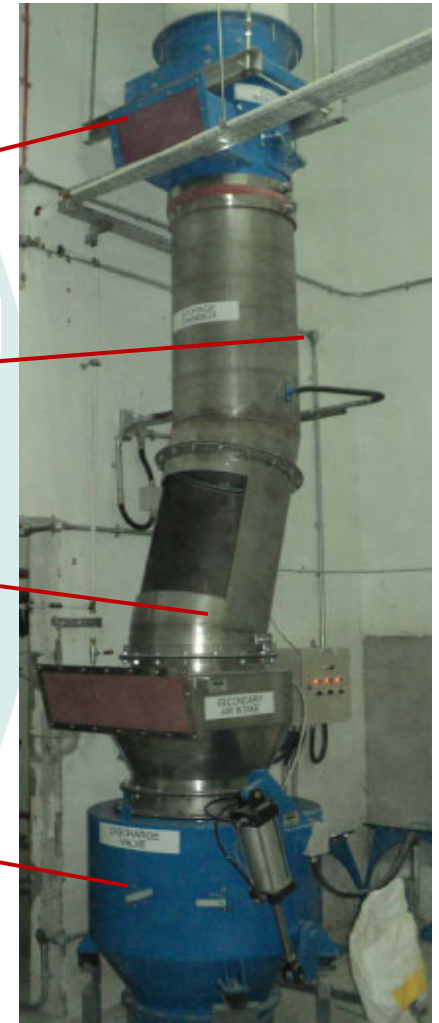
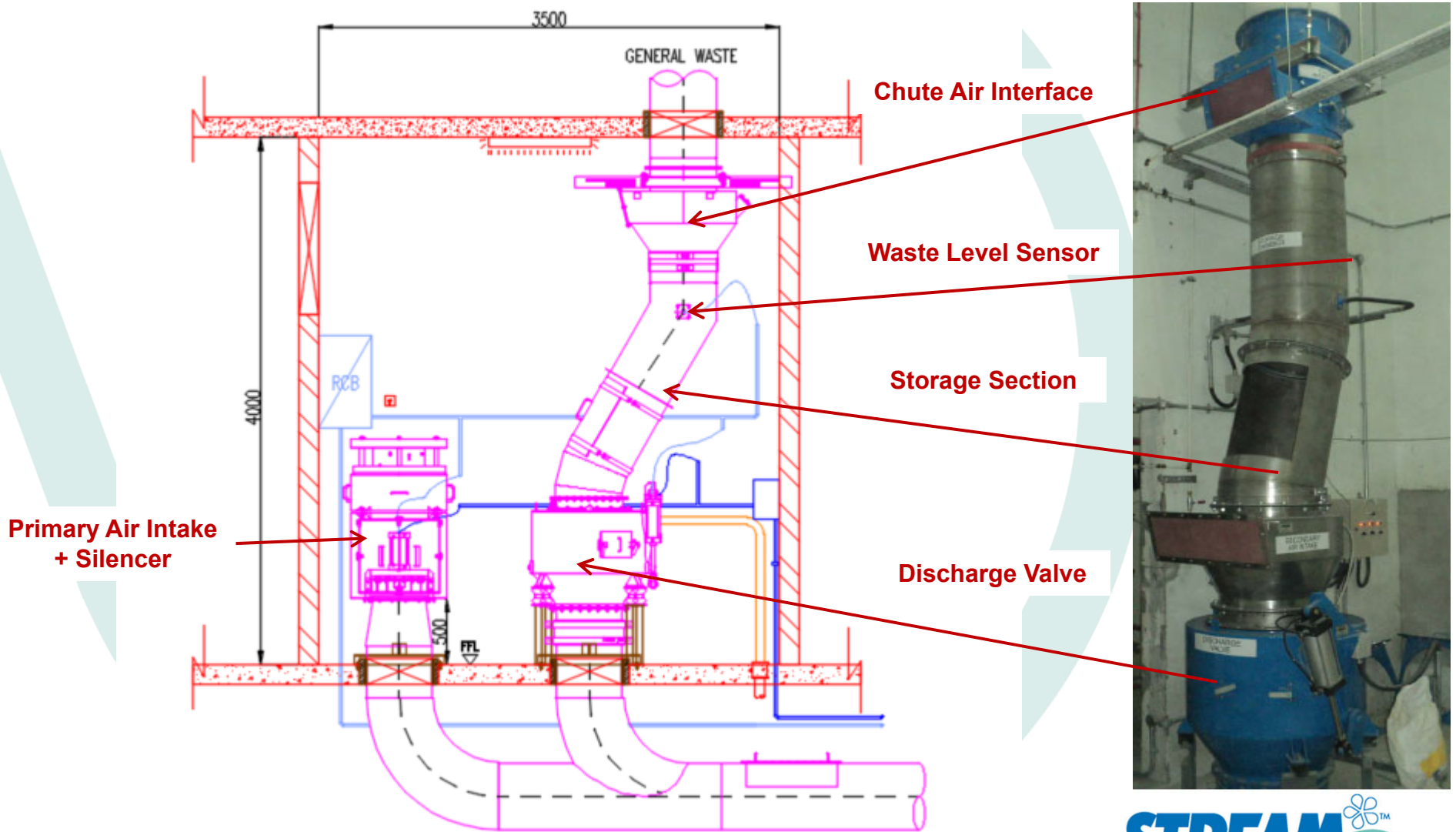




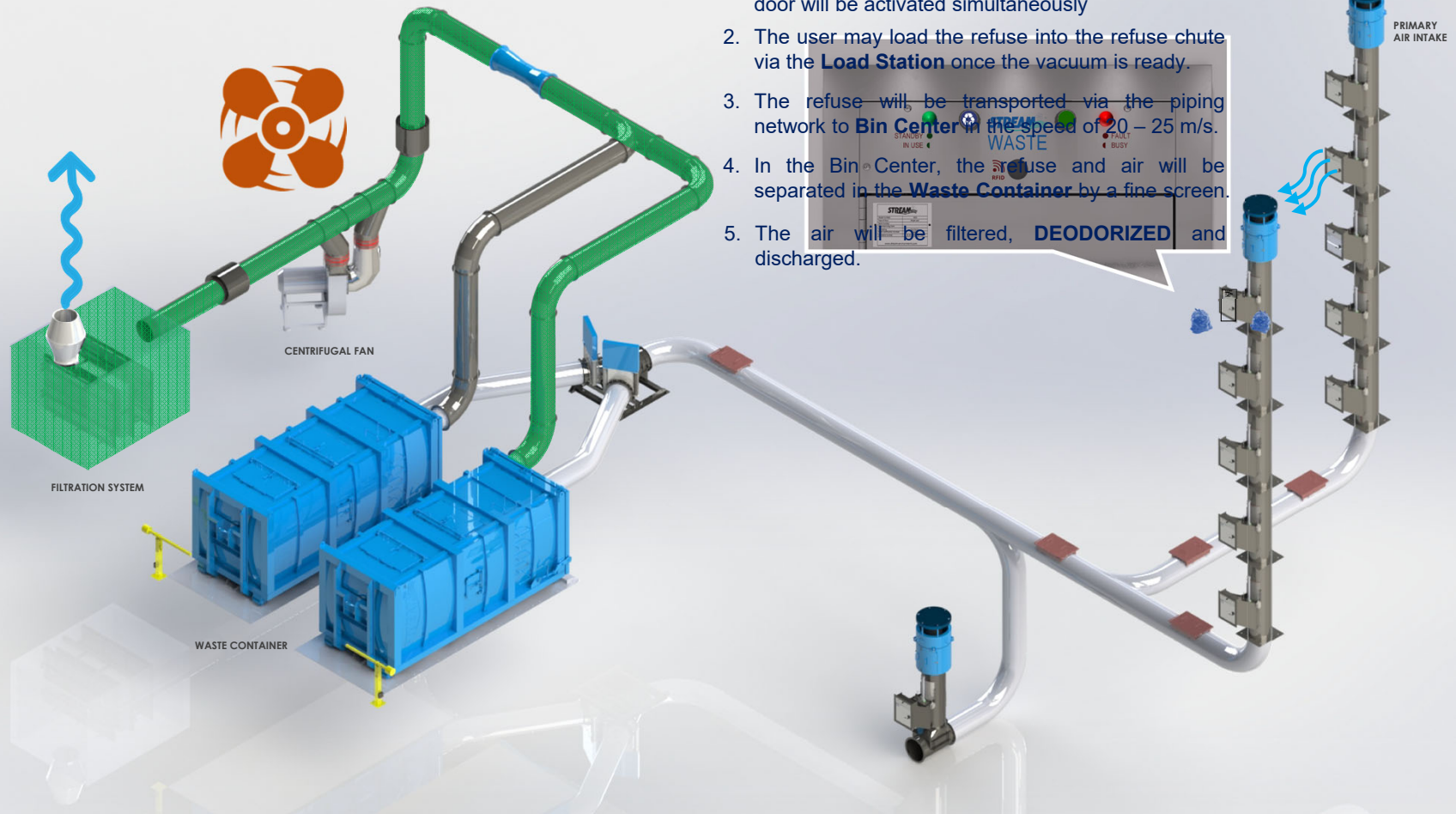
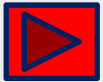
# Gravity Vacuum System (GV)



# Gravity Vacuum System Component – Discharge Valve Room



# Full Vacuum System (FV)

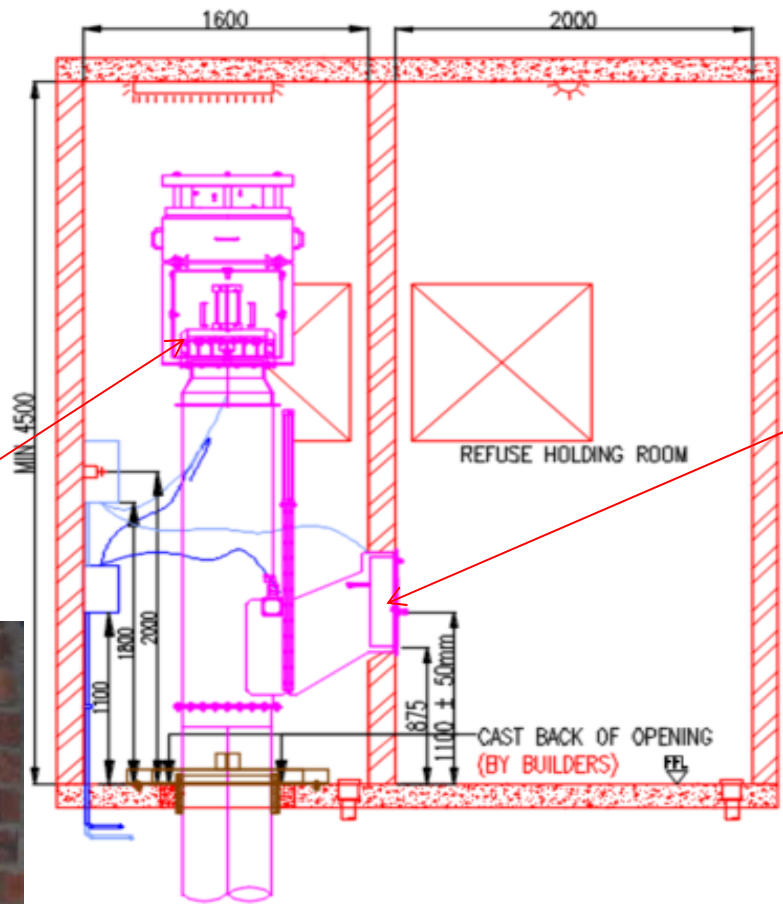


1. When **Load Station (LS)** switch is activated, **Main Control Centre (MCC)** will trigger the **Centrifugal Fan (CF)** and **Primary Air Intake (PAI)** & LS inner door will be activated simultaneously
2. The user may load the refuse into the refuse chute via the **Load Station** once the vacuum is ready.
3. The refuse will be transported via the piping network to **Bin Center** in the speed of 20 – 25 m/s.
4. In the **Bin Center**, the refuse and air will be separated in the **Waste Container** by a fine screen.
5. The air will be filtered, **DEODORIZED** and discharged.

# Full Vacuum System Component – Load Station Room



Primary Air Intake



SECTIONAL VIEW

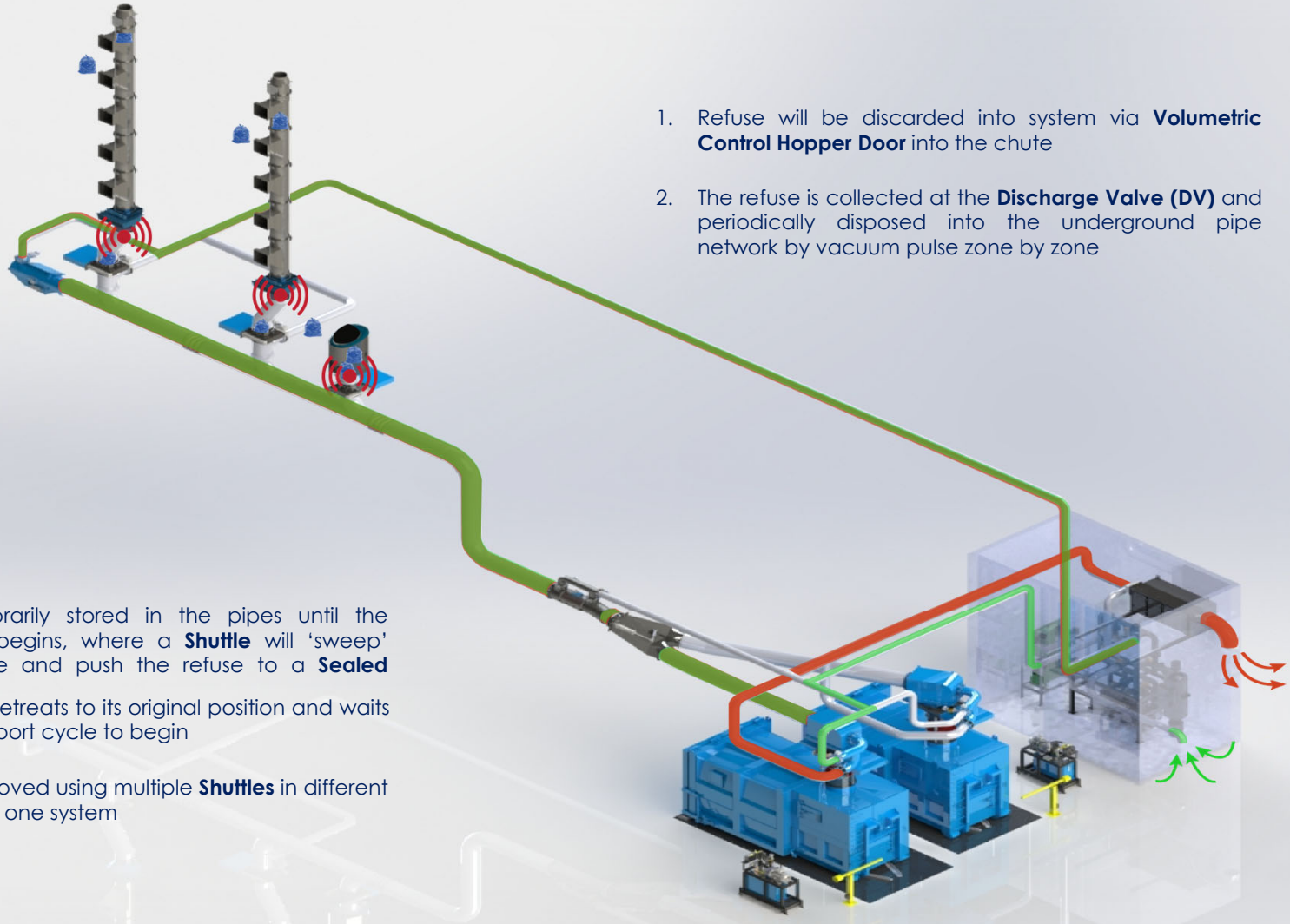


Load Station Door





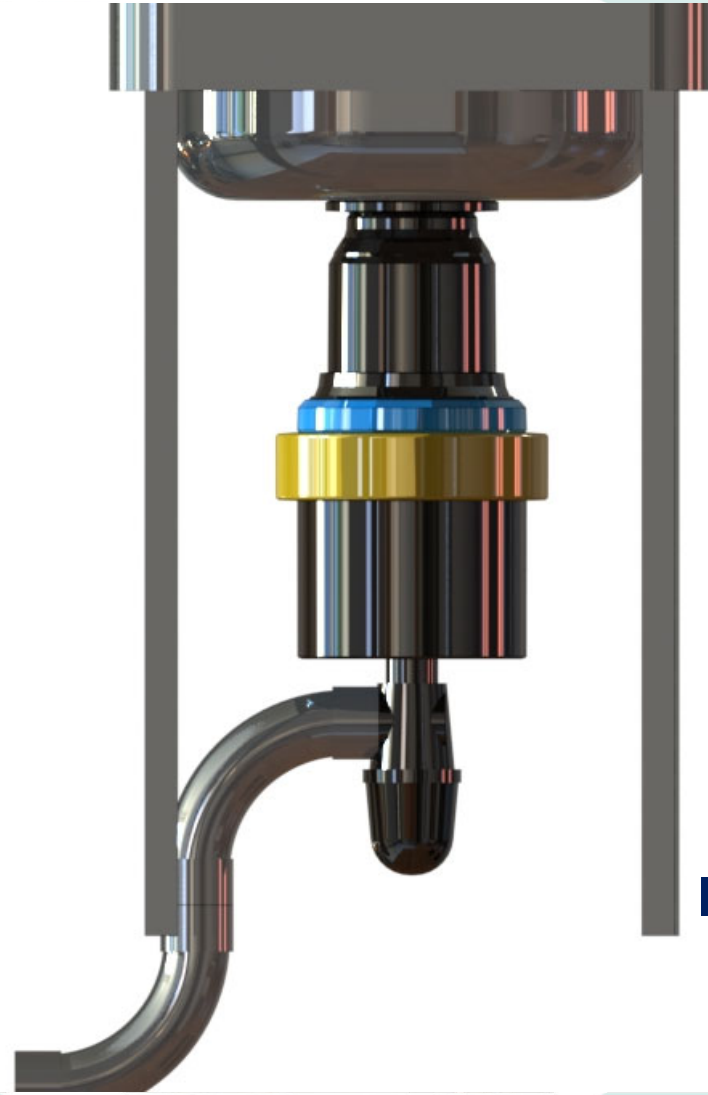
# Waste Shuttle System (WS)



1. Refuse will be discarded into system via **Volumetric Control Hopper Door** into the chute
2. The refuse is collected at the **Discharge Valve (DV)** and periodically disposed into the underground pipe network by vacuum pulse zone by zone

3. Refuse is temporarily stored in the pipes until the transport cycle begins, where a **Shuttle** will 'sweep' through the pipe and push the refuse to a **Sealed Container**
4. The **Shuttle** then retreats to its original position and waits for the next transport cycle to begin
5. Refuse can be moved using multiple **Shuttles** in different diameter pipes in one system

# Pneumatic Food Waste System (PFWS)

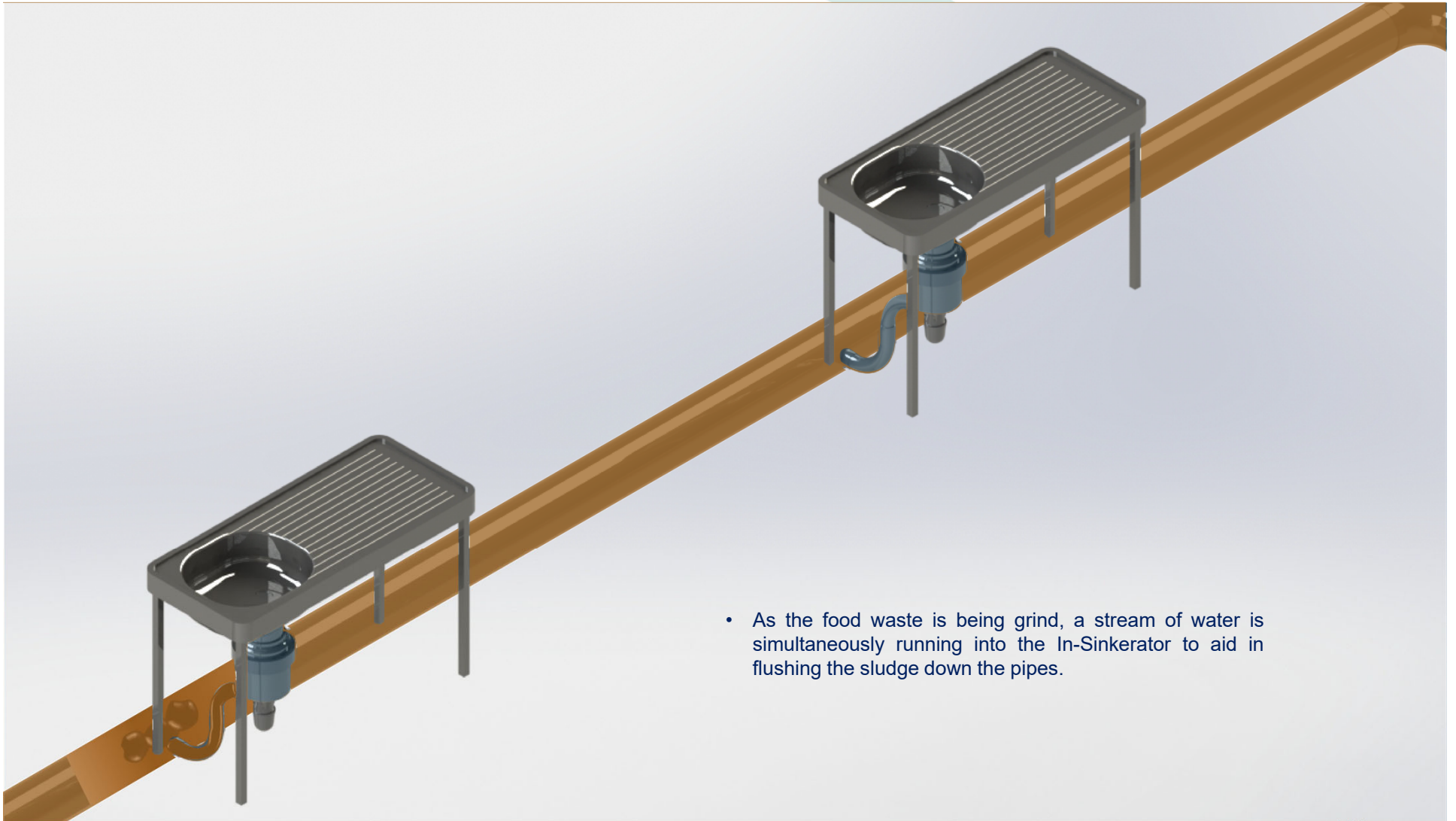


**IN-SINKERATOR**



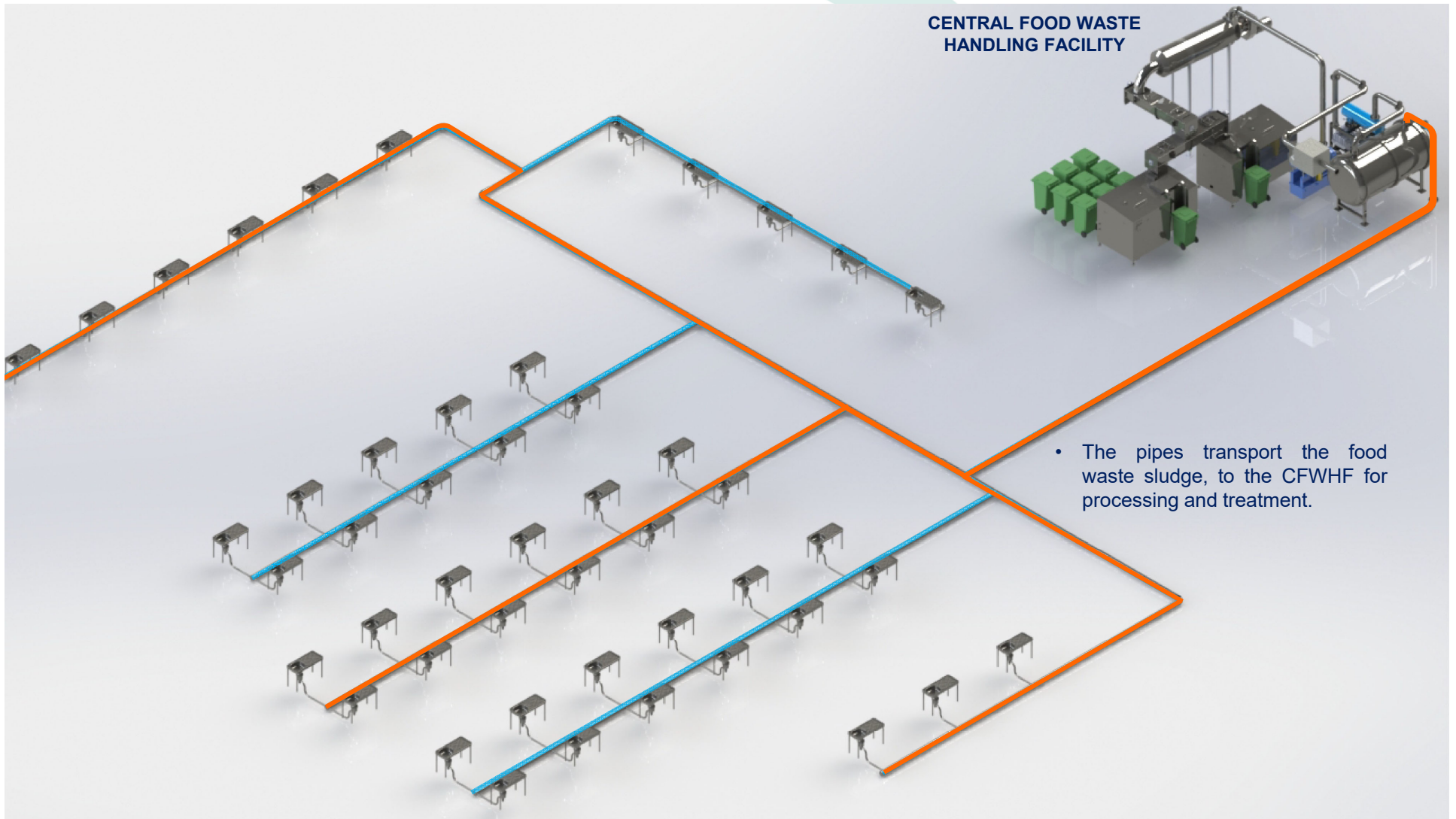


# Pneumatic Food Waste System (PFWS)



- As the food waste is being grind, a stream of water is simultaneously running into the In-Sinkerator to aid in flushing the sludge down the pipes.

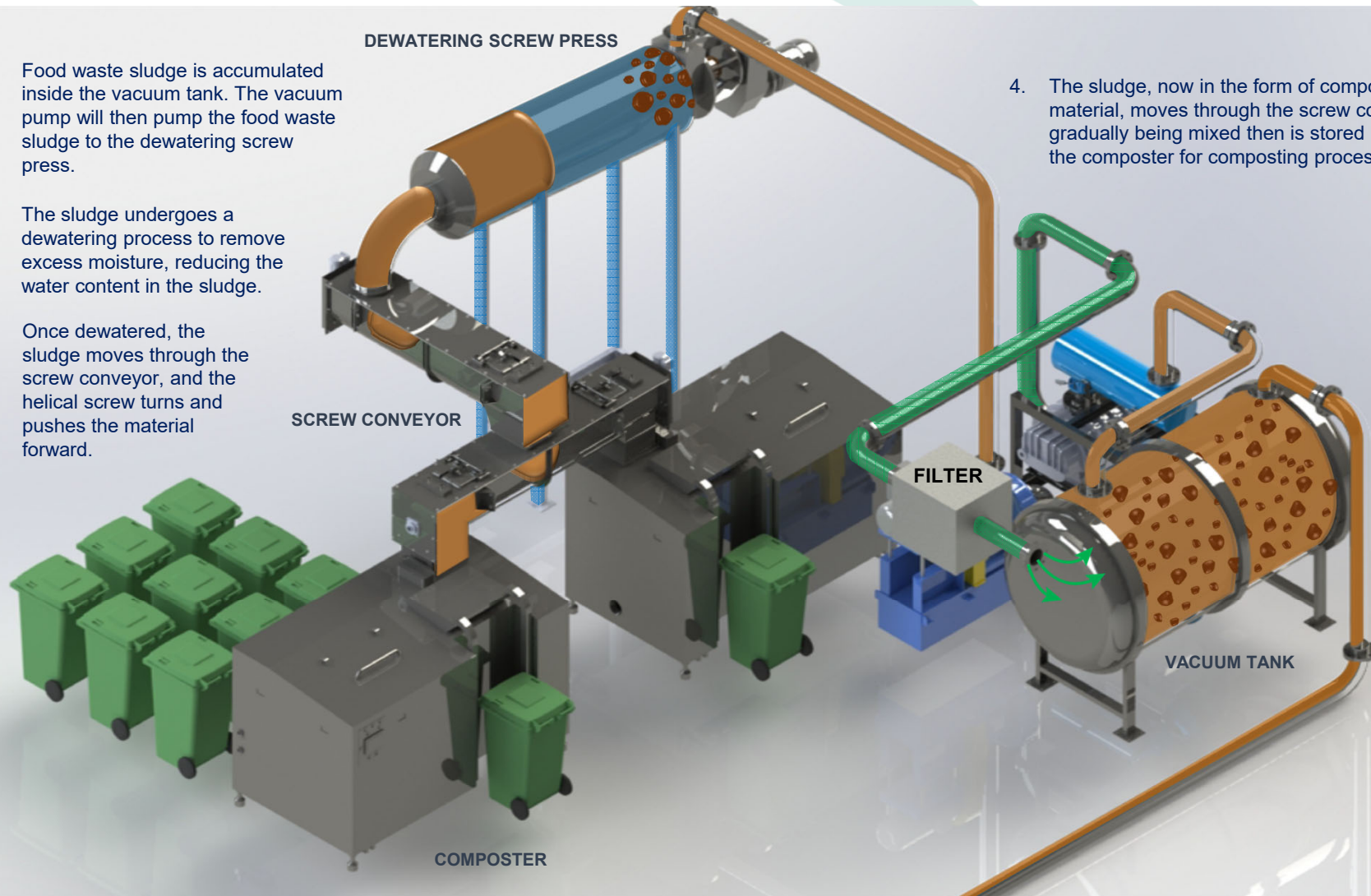
# Pneumatic Food Waste System (PFWS)



# Pneumatic Food Waste System (PFWS)

1. Food waste sludge is accumulated inside the vacuum tank. The vacuum pump will then pump the food waste sludge to the dewatering screw press.
2. The sludge undergoes a dewatering process to remove excess moisture, reducing the water content in the sludge.
3. Once dewatered, the sludge moves through the screw conveyor, and the helical screw turns and pushes the material forward.

4. The sludge, now in the form of compostable material, moves through the screw conveyor, gradually being mixed then is stored inside the composter for composting process.





# Central Waste Handling Facility Typical Layout

Waste Container



Air Compressor



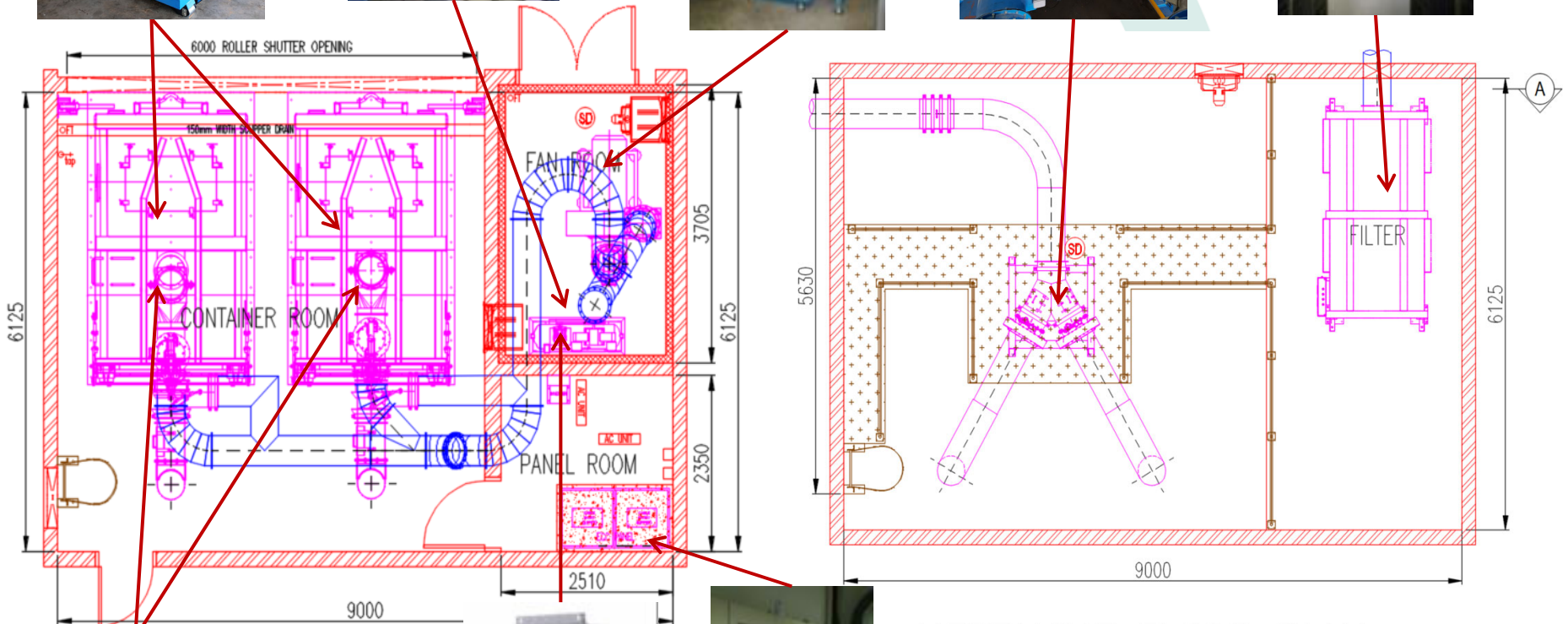
Centrifugal Fan



Waste Diverter



Air Filtration System



GROUND FLOOR

MEZZANINE FLOOR PLAN



Docking



Inverter



Control Panel



# Central Waste Handling Facility

**Air Filtration System**



**Waste Diverter**



**Waste Separator**



**Fan Silencer**



**Fan Header & Check Valve**



**Centrifugal Fan**



**Waste Container**





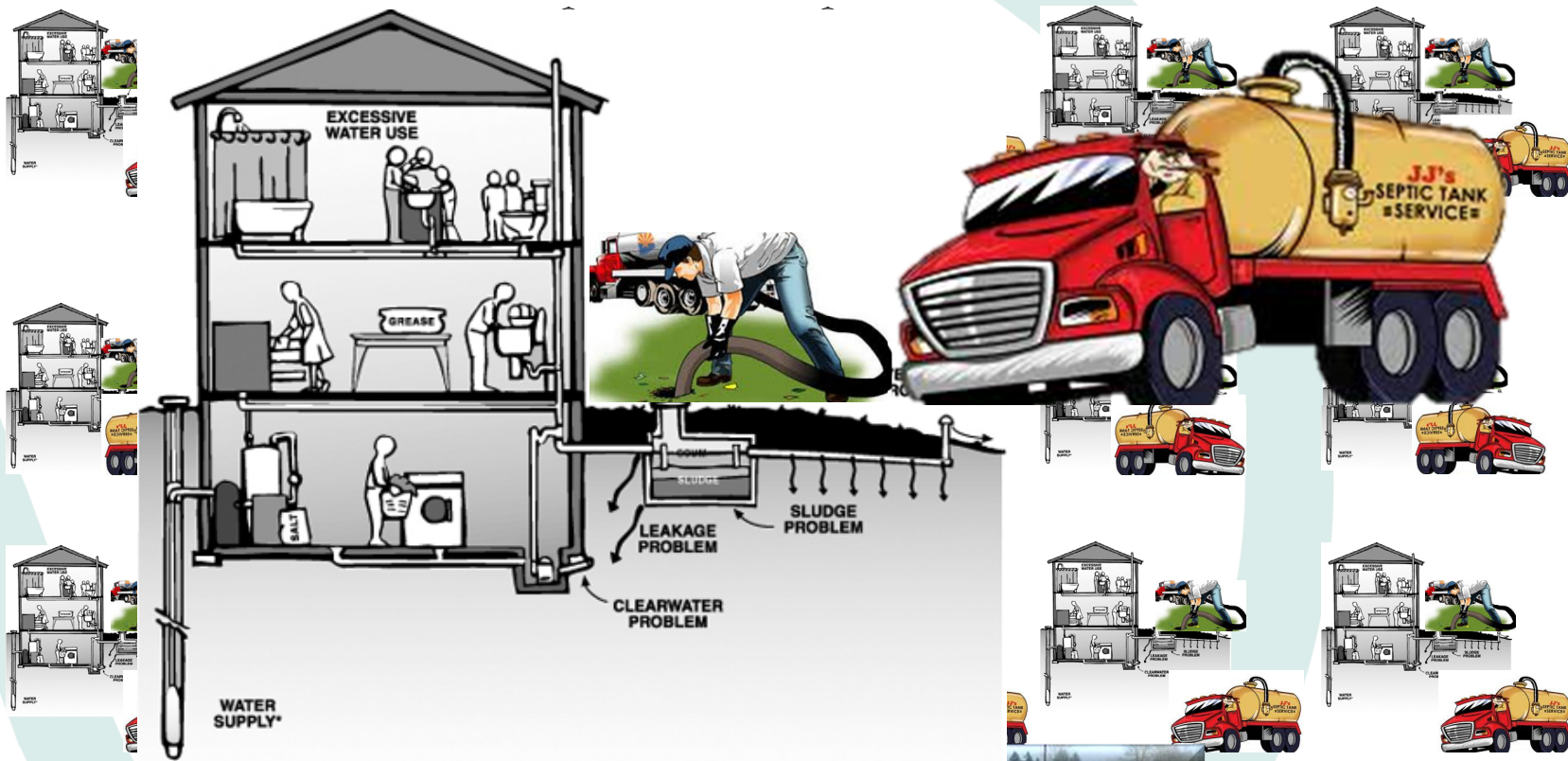
## REMEMBERING SEWERAGE: Before 60s



Why AWCs?



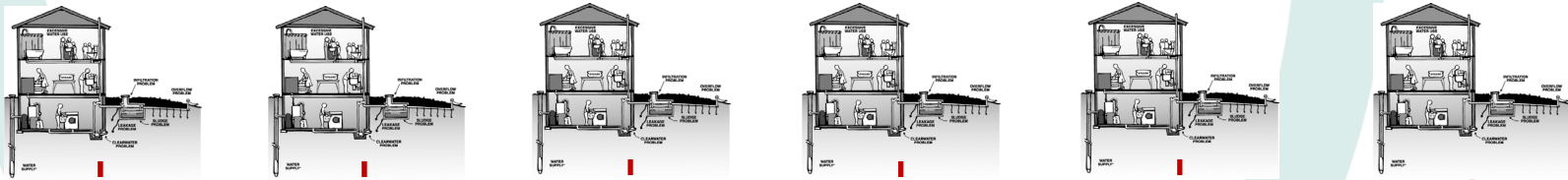
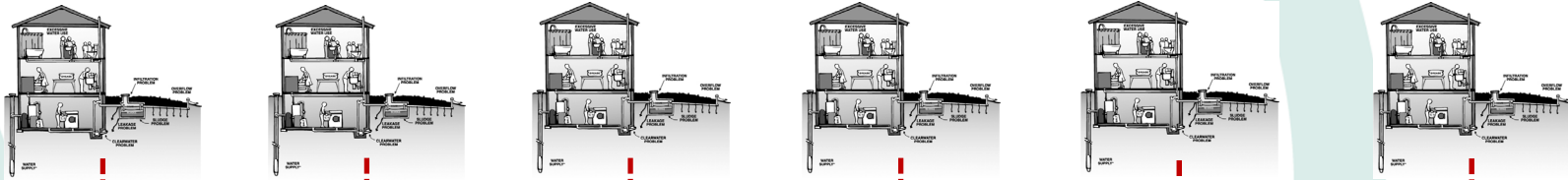
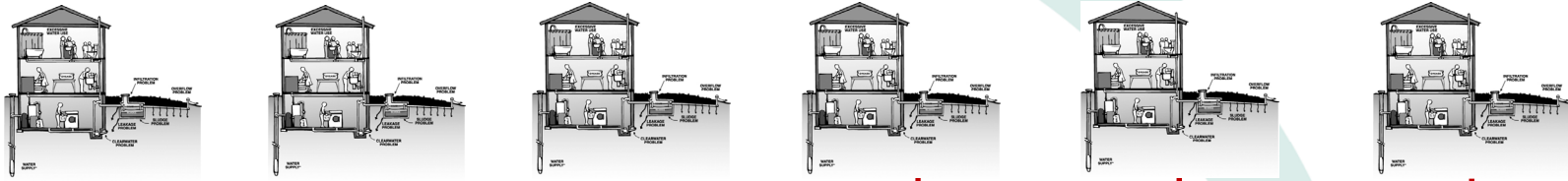
# REMEMBERING SEWERAGE: After 60s (Septic Tank introduced)



Treatment Plant



# REMEMBERING SEWERAGE: After 90s (sewerage treatment plant)



(Automated Sewerage Collection System)













# IMAGINE THIS LIFT LOBBY...



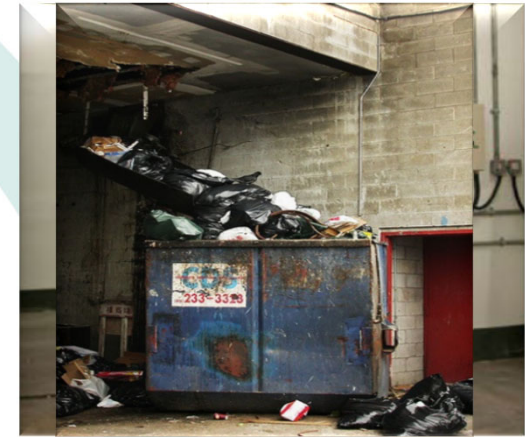


## WHY YOU ALLOW THIS?





# CONVENTIONAL WASTE COLLECTION SYSTEM









# CONVENTIONAL WASTE HANDLING



Landfill



# WHY NOT AWCS ??



Material Recovery Facility



Aerobic Digestion Plant

(Automated Waste Collection System)

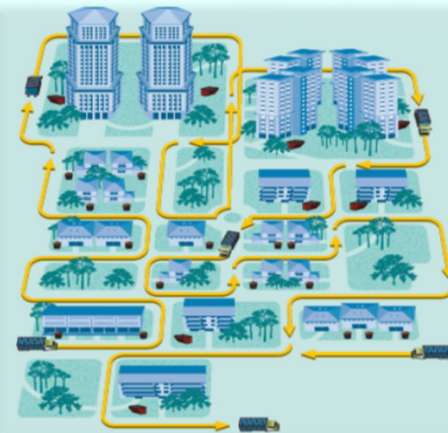


## BENEFIT OF AWCS

1. Less storage space
2. Less odor - Removal before biodegrading
3. Reduce traffic
4. Lowest carbon foot print
5. Pest free
6. Quiet
7. Sealed system
8. Reduce Labor
9. Low cost, low maintenance hook lift truck
10. Eliminate Security Threats



**AWCS: Centralized Refuse Collection**



**Conventional: Door-Door/  
House-House Collection**



# SINGAPORE GOVERNMENT HOUSING & DEVELOPMENT BOARD INITIATIVE

## ALL-IN-ONE VILLAGE

This integrated development next to Admiralty MRT combines housing, health-care and care facilities, and shops amid lush greenery in a bid to be a 'modern kampung'

### Studio apartments

- Two blocks with about 100 units, up for sale in the July Build-To-Order exercise
- New features: induction stoves, "resilient flooring" with a parquet design and retractable racks for easier drying of laundry

### Community park

- Features fruit trees such as rambutan and kaffir lime
- Includes a three-generational playground for both young and old

### Community farm

Residents can grow vegetables, herbs and ornamental plants

### Eldercare and childcare centre

- Located side by side to promote bonding between generations
- The eldercare centre has space for about 100 seniors, and the childcare centre will offer 200 places

### Admiralty Medical Centre



- Spans two levels with an area of 8,500 sq m
- Offers outpatient consultation, day surgery, rehabilitation and diagnosis

### Hawker centre

- Will have 50 cooked food stalls and about 900 seats

## GREEN FEATURES

### GREEN FEATURES

#### Pneumatic waste conveyance system

- Household trash will zoom through vacuum pipes underground into a sealed container which will be collected by trucks

#### Bioswales

- Rainwater will be filtered through these sloping stretches of plants and soil on the ground floor

#### Solar panels

- The apartment blocks will be topped with solar panels to power common lighting, for instance

## Pneumatic waste conveyance system

- Household trash will zoom through vacuum pipes underground into a sealed container which will be collected by trucks

offer

store 500 bicycles

# SINGAPORE GOVERNMENT NEA NEWS RELEASES



## New Non-Landed Private Residential Developments To Have Improved Recycling & Waste Collection Infrastructure

*MEWR/NEA to mandate the provision of dual chutes for refuse and recyclables and pneumatic waste conveyance systems for new non-landed private residential developments*

Singapore, 8 March 2017– The Ministry of the Environment and Water Resources (MEWR) and the National Environment Agency (NEA) will mandate the provision of dual chutes for refuse and recyclables for new non-landed private residential developments taller than four storeys, and Pneumatic Waste Conveyance Systems (PWCS) for new

**Singapore, 8 March 2017–** The Ministry of the Environment and Water Resources (MEWR) and the National Environment Agency (NEA) will mandate the provision of dual chutes for refuse and recyclables for new non-landed private residential developments taller than four storeys, and Pneumatic Waste Conveyance Systems (PWCS) for new non-landed private residential developments with at least 500 dwelling units. This is part of efforts to improve Singapore's recycling and waste collection infrastructure, and help achieve a 70 per cent recycling rate by 2030 as set out in the Sustainable Singapore Blueprint 2015 (see **Annex A** for more details on NEA's current 3R efforts).

each level, which render it very convenient for residents to dispose of their waste without first retrieving the recyclables.

4 The Government has progressively enhanced the infrastructure of residential developments to enable more convenient recycling. In 2014, the Housing & Development Board (HDB) announced that all new Build-to-Order flats would have recycling chutes adjacent to centralised refuse chutes with throw points on each level.

5 To expand on these efforts, MEWR/NEA will mandate the provision of recycling chutes for all new non-landed

### Pneumatic waste conveyance systems (PWCS)

7 A Pneumatic Waste Conveyance System (PWCS) is an automated and enclosed waste collection system. It conveys waste by air suction from individual buildings through a network of pipes to a central location for collection. Unlike conventional waste collection systems, PWCS does away with the need for waste to be manually collected from the refuse chambers at the bottom of each building, and brought to a central collection centre in the development. Such conventional practices are more labour intensive and can also cause public health disamenities due to spillage, odour and pest issues (see **Annex C** for illustration of a PWCS).

conventional practices are more labour intensive and can also cause public health disamenities due to spillage, odour and pest issues (see **Annex C** for illustration of a PWCS).

8 The merits of the PWCS have already attracted some private developers to become early adopters of the technology. To date, more than 100 private residential developments have installed the PWCS. In the public sector, HDB has piloted the PWCS at Yuhua estate in Jurong under the HDB Greenprint Programme, and will be installing PWCS in new HDB housing areas such as Tampines North and Bidaran.

9 To expand on these efforts, MEWR/NEA will mandate the provision of the PWCS to all new non-landed private residential developments with at least 500 dwelling units. This measure will come into effect for all new residential development applications submitted to URA from 1 April 2018<sup>1</sup>.

Source: <http://www.nea.gov.sg/corporate-functions/newsroom/news-releases/improved-recycling-waste-collection-infrastructure>



# SINGAPORE GOVERNMENT NEA NEWS RELEASES

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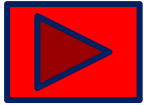


**SS 642 : 2019**  
(ICS 13.030.40)

SINGAPORE STANDARD  
**Code of practice for pneumatic waste  
conveyance system**



# GREEN BUILDING TOOLS / GUIDELINE



**PPSPPA Guideline – PART 7.5:  
SISTEM PNEUMATIK  
Pneumatic Waste Conveying System**



**GBI – PART 6: INNOVATION  
Central Waste Conveyance System/ Central  
Pneumatic Waste Collection System**



**GreenRE - Part 5: OTHERS GREEN  
FEATURES  
Pneumatic Waste Collection System**



**SINGAPORE : GREENMARK – PART 5:  
INNOVATION  
Pneumatic Waste Collection System**



# Current Piped/Cabled/Infra-structured utilities :

# Non-Piped Utility

## Water Supply



## Sewage



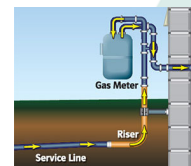
## Power Supply



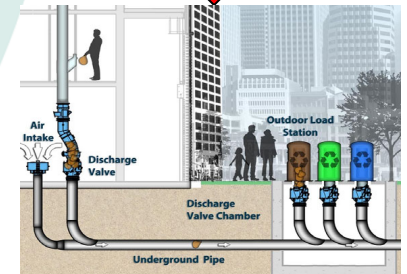
## Transportation



## City Gas

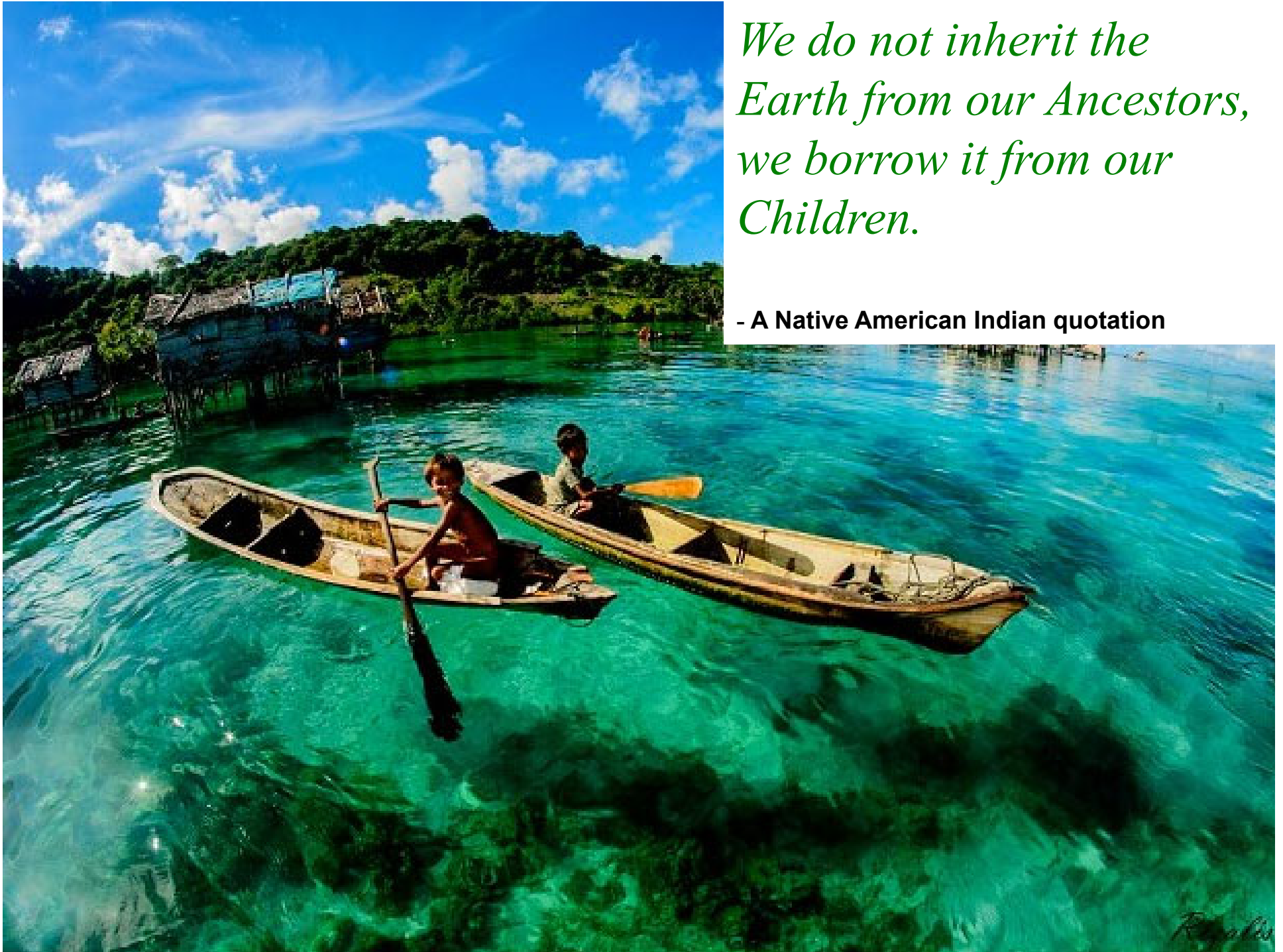


## Solid Waste

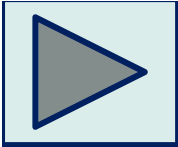


*We do not inherit the  
Earth from our Ancestors,  
we borrow it from our  
Children.*

**- A Native American Indian quotation**







**STREAM** ™  


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- Case Studies
- [Blank bar]

## Project-1: TROPEZ, JB

### Project Information

- ▶ Country : Malaysia
- ▶ City : Johor Bahru
- ▶ Developer : Tropicana Property
- ▶ Project Startup : 2012
- ▶ Project Completed : 2014
- ▶ Application : Small Residential
- ▶ Size of development : 1,100 dwelling units

### STREAM Automated Waste Collection System

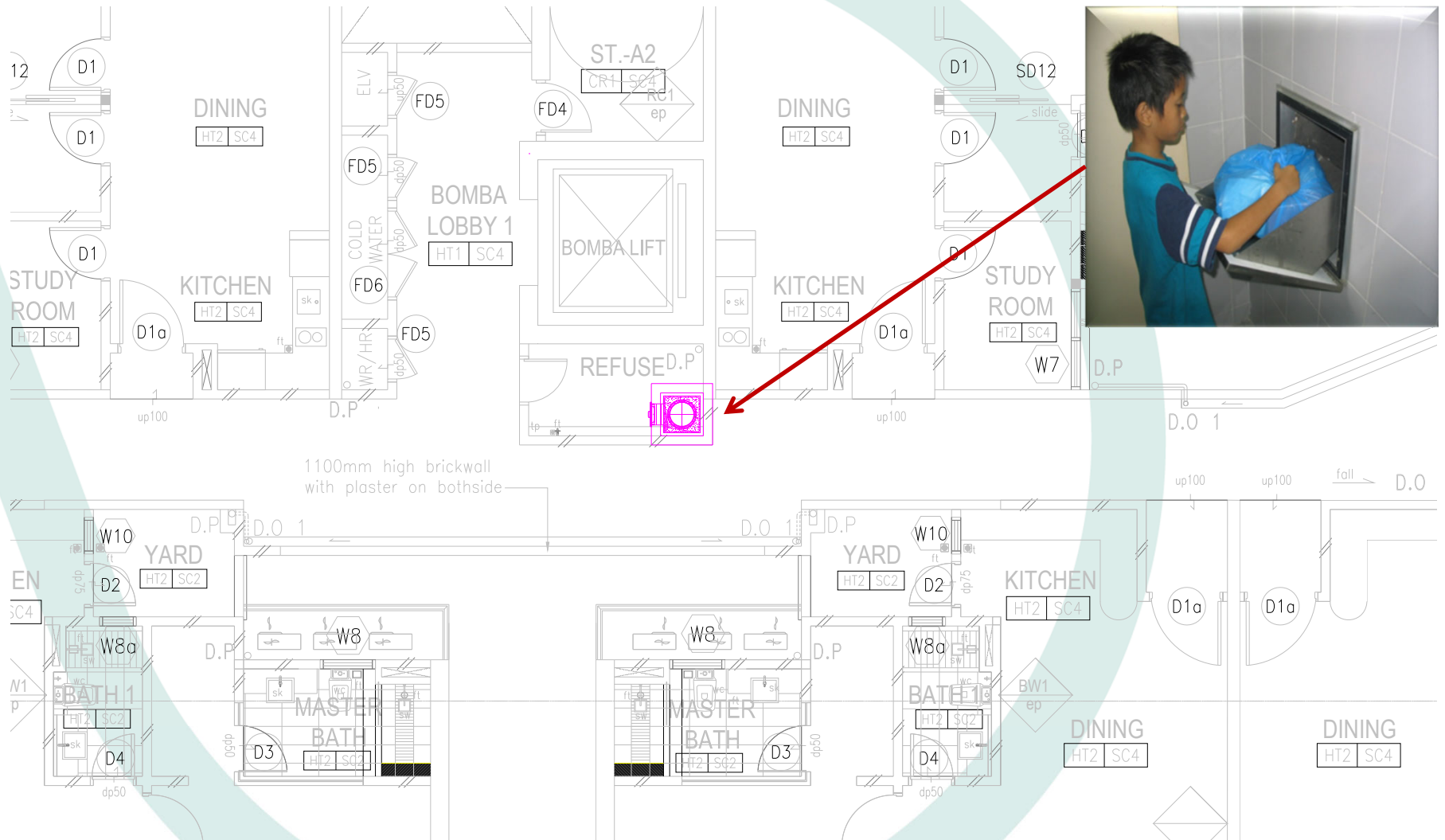
- ▶ Type of System : Gravity Vacuum + Full Vacuum System
- ▶ Total Pipe Length : 350m
- ▶ AVWCS Capacity : 2.84 metric ton/day



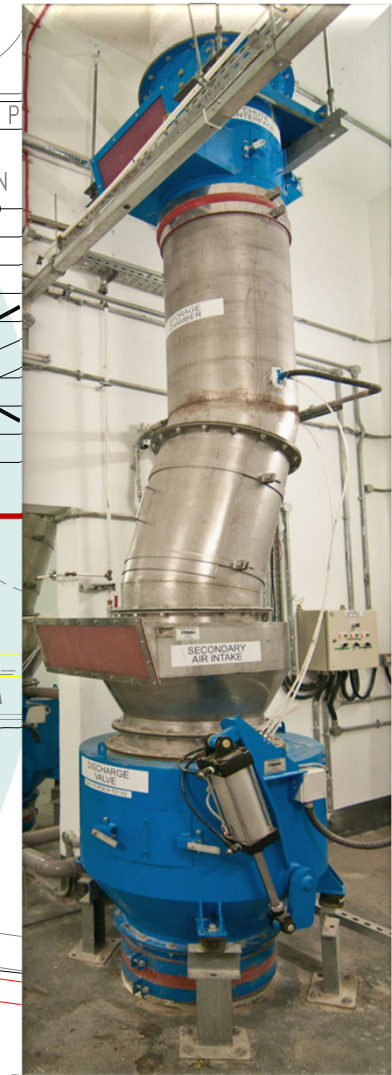
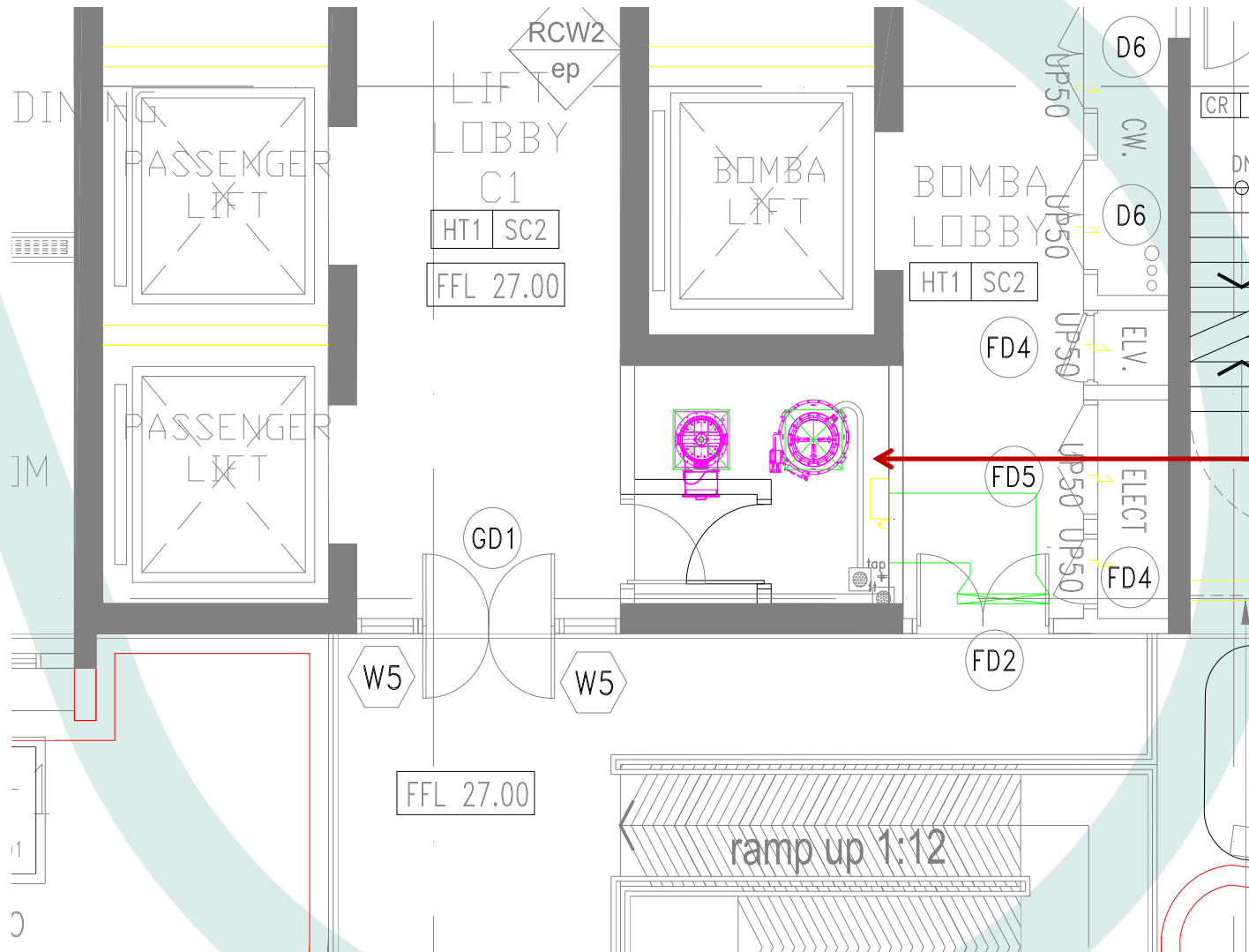
# AWCS – SCHEMATIC DIAGRAM



# AWCS COMPONENT – GRAVITY LOAD STATION

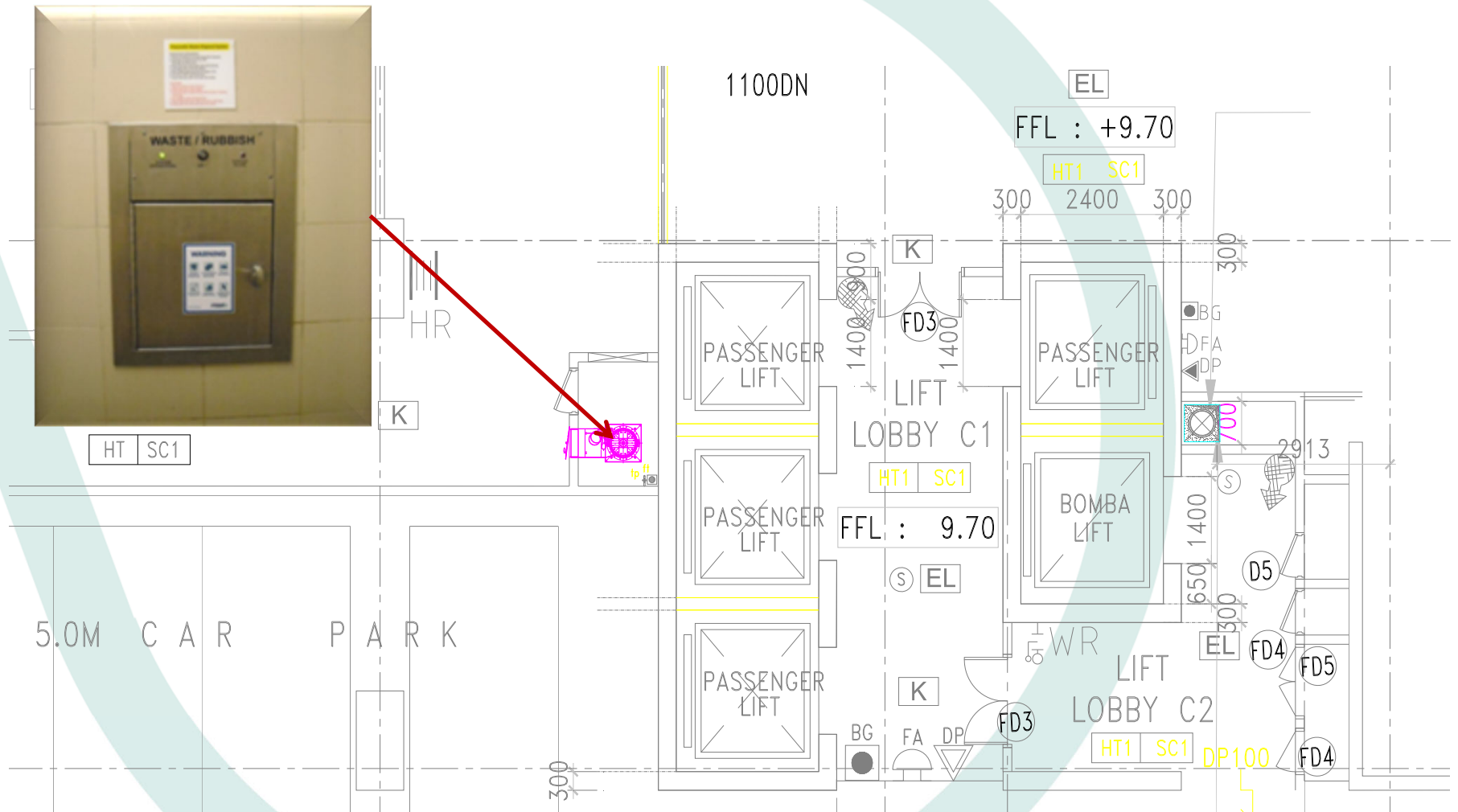


# AWCS COMPONENT – DISCHARGE VALVE & TEMPORARY STORAGE

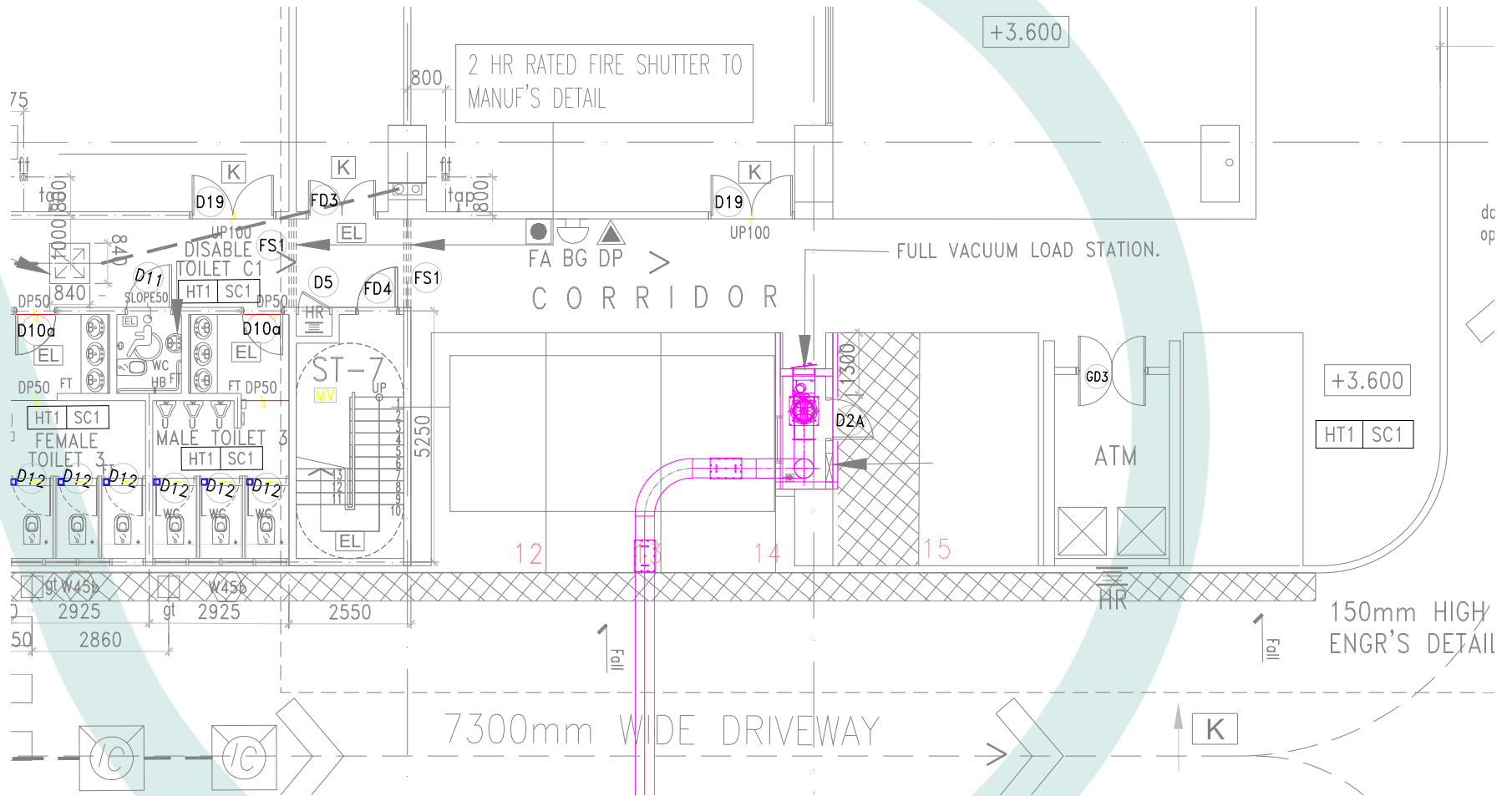




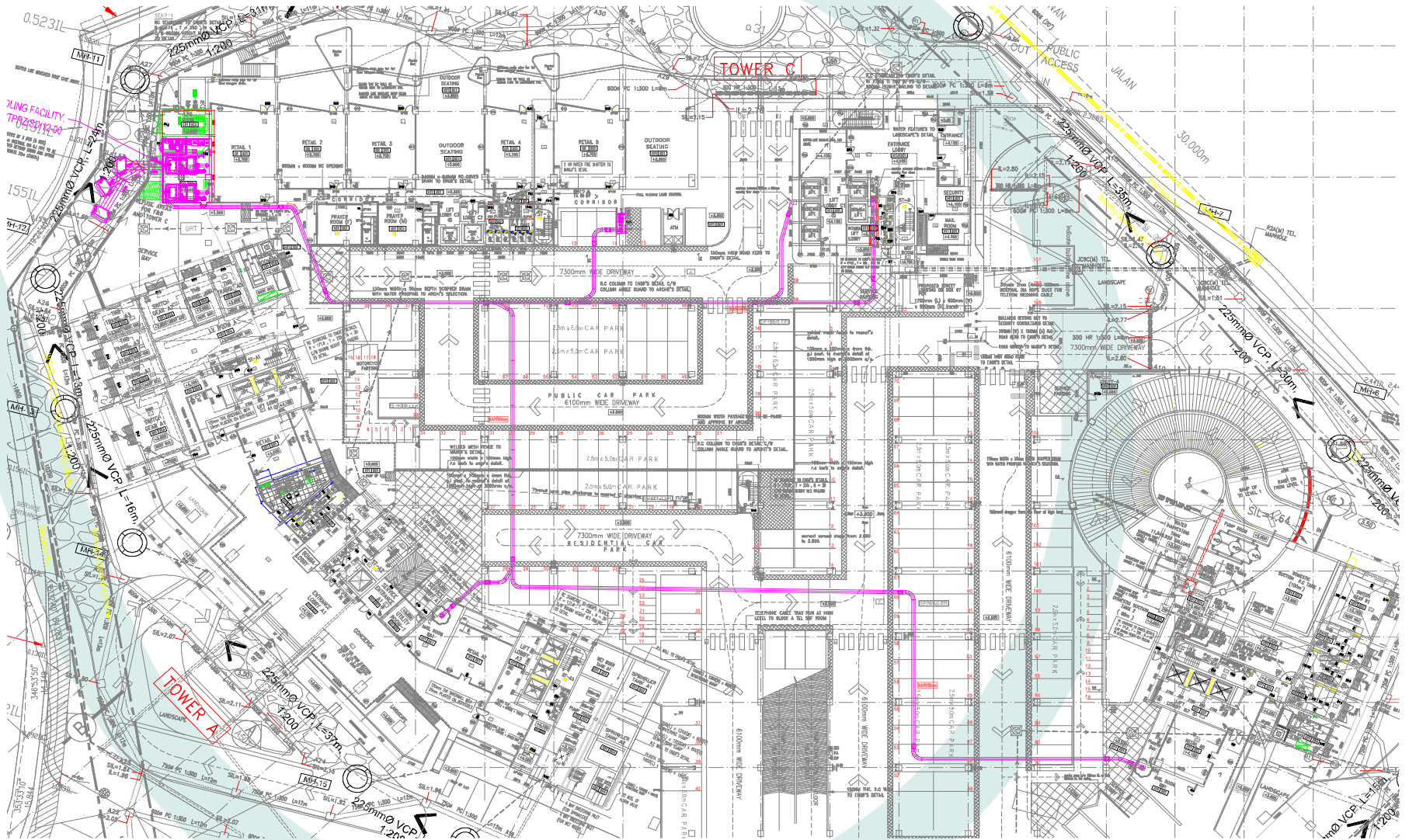
# AWCS COMPONENT – FULL VACUUM STATION



# AWCS COMPONENT – FULL VACUUM LOAD STATION

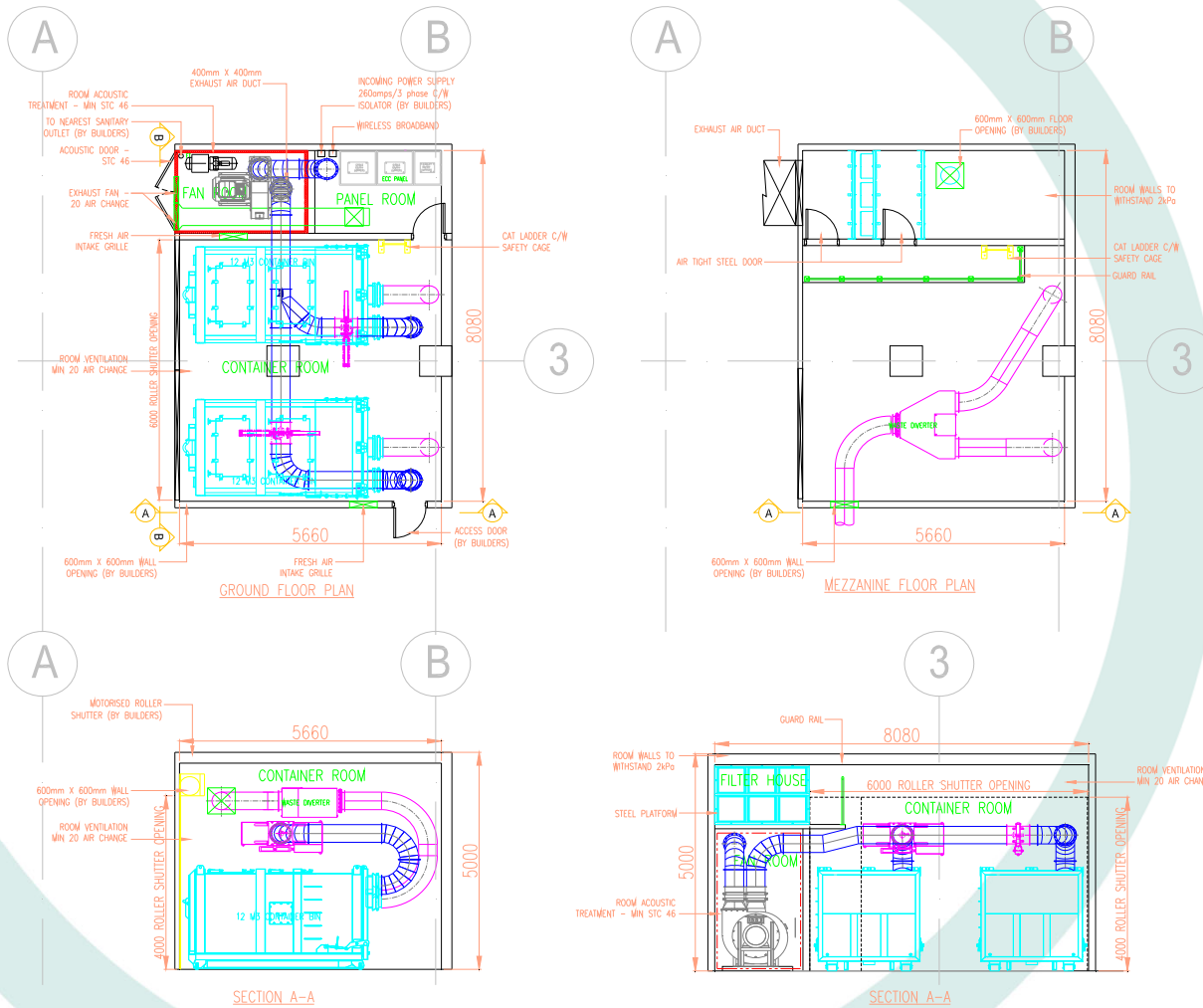


# AWCS COMPONENT –WASTE TRANSPORT PIPING LAYOUT





# AWCS COMPONENT – BIN CENTRE



## Project-2: ASPEN VISION CITY, ECOCITY, BATU KAWAN

### Project Information

- ▶ Country : Malaysia
- ▶ City : Penang
- ▶ Developer : Aspen Group
- ▶ Project Startup : 2018
- ▶ Project Completed : 2021...++
- ▶ Application : Mixed Development
- ▶ Area of development : 245 Acres


### STREAM Automated Waste Collection System

- ▶ Type of System : Gravity Vacuum + Full Vacuum System  
– District Wide System
- ▶ Total Pipe Length : >3,000m
- ▶ AVWCS Capacity : 20.5 metric ton/day (Module-1 of 3)



# EcoCity Batu Kawan

**2011**



MPSP and PDC initiate the first **Eco-city in Penang**, turning Batu Kawan in Central Seberang Prai into an Eco-town with high standards of sustainability.

## a) Pengurusan sisa pepejal .

Bagi pengurusan sisa pepejal adalah di cadangkan kaedah sistem vakum . Infrastruktur yang perlu disediakan adalah :-

### i. RangkaianLaluan Sistem Paip (Piping Network)



### ii. Pusat Pengumpulan.

**EcoCity**  
BATU KAWAN



MAJLIS PERBANDARAN  
SEBERANG PERAI

GARISPANDUAN PERANCANGAN  
DAN  
PELAN INDUK PEMBANGUNAN



## b) Kemudahan-Kemudahan Yang Perlu Disediakan.

Bagi memastikan sistem pengurusan sisa pepejal ini efektif beberapa kemudahan perlu di sediakan iaitu :-

- Depo Lori – Unit Kejiranan 6
- Pusat Kompos /Pusat Recycle /Pusat E-waste – Unit Kejiranan 1,2,3 dan 4
- Pusat pelupusan sisa parit/ pasir/sisa CnD – Unit Kejiranan 6



# CASE STUDY 2: ASPEN VISION CITY MODULE 1



A prestigious project jointly developed by:





# CASE STUDY 2: ASPEN VISION CITY MODULE 1



# CASE STUDY 2: ASPEN VISION CITY MODULE 1

PEMBANGUNAN  
BERCAMPUR  
47.10 ek

UNIVERSITI

17.30 ek

CENTRAL WASTE HANDLING FACILITY.  
REF DWG : SEMY/417-16/AVCO/QT/01-01

Module 1

CENTRAL WASTE HANDLING FACILITY.  
REF DWG : SEMY/417-16/AVCO/QT/02-01

Module 2 & 3

Module 1 Underground  
Waste Transport Pipe

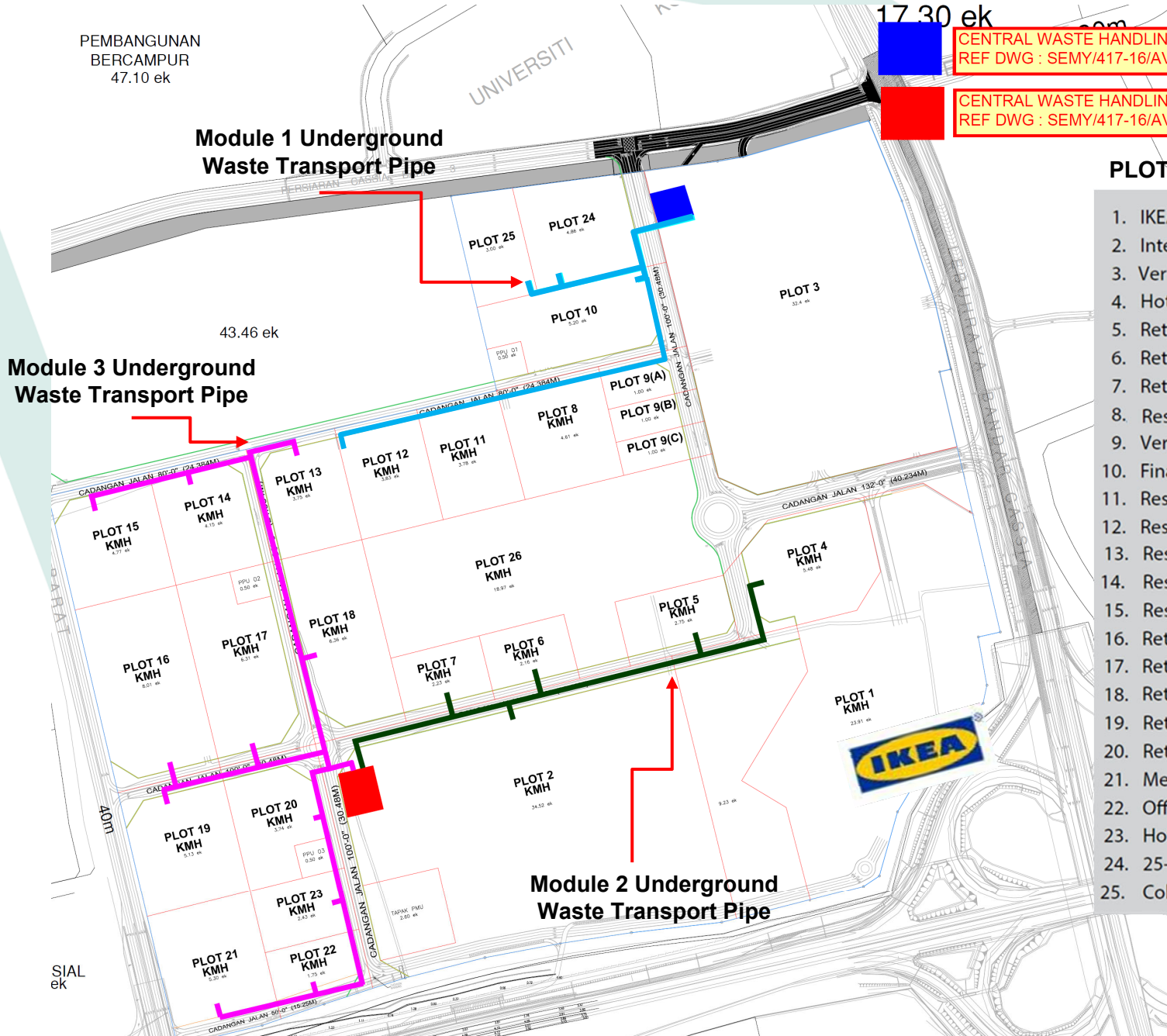
Module 3 Underground  
Waste Transport Pipe

43.46 ek

Module 2 Underground  
Waste Transport Pipe

## PLOTS:

1. IKEA Store
2. Integrated Regional Shopping Centre
3. Vervéa Shop Offices
4. Hotel, Office Tower & Serviced Suites
5. Retail & Serviced Suites
6. Retail & Serviced Suites
7. Retail & Serviced Suites
8. Residential
9. Vertu Resort
10. Financial Hub
11. Residential
12. Residential
13. Residential
14. Residential
15. Residential
16. Retail / Office & Residential
17. Retail / Office & Residential
18. Retail / Office & Residential
19. Retail & Serviced Suites
20. Retail & Serviced Suites
21. Medical Centre & Healthcare Facilities
22. Office
23. Hotel
24. 25-acre Central Island Park
25. Columbia Asia Hospital



SIAL  
EK





- Waste Infrastructure Pipeline
- CWHF Central Waste Handling Facility / Bin Center









## CASE STUDY 2: CONSTRUCTION PHASE





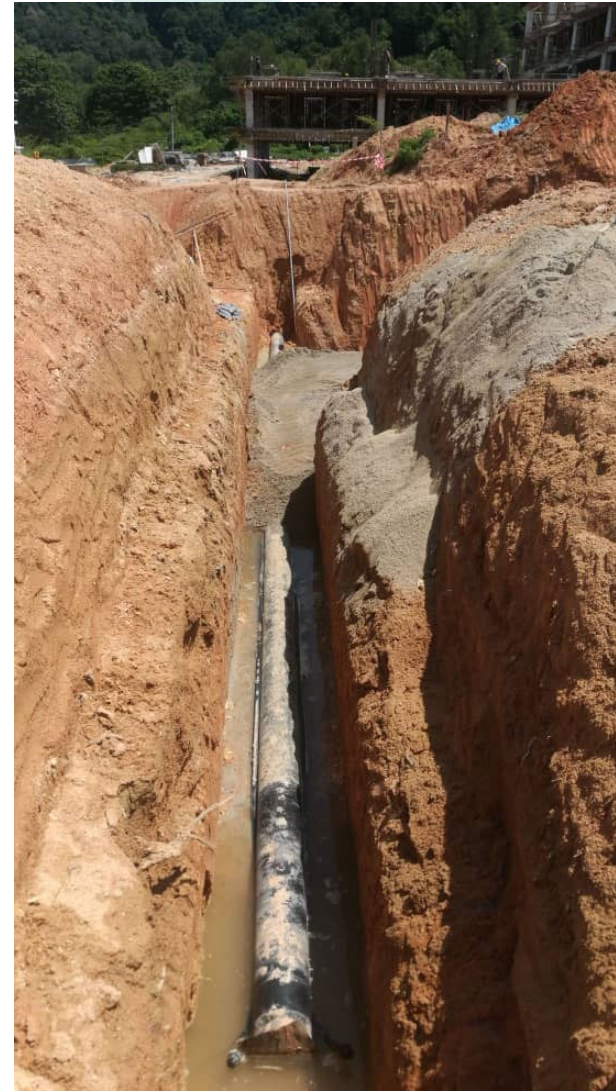
## CASE STUDY 2: CONSTRUCTION PHASE



Central Waste Handling Facility (CWHF) in progress



## CASE STUDY 2: CONSTRUCTION PHASE

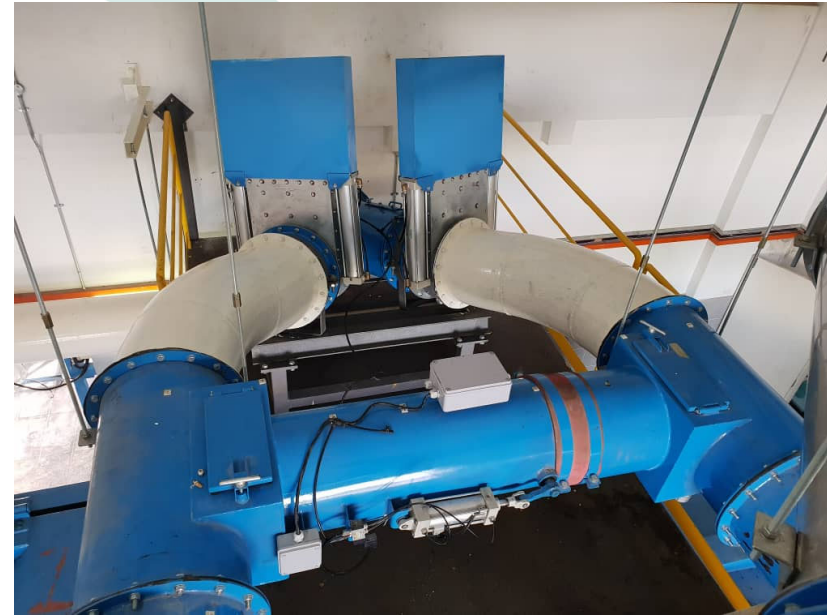


Underground piping installation in progress





## CASE STUDY 2: CONSTRUCTION PHASE





## CASE STUDY 2: CONSTRUCTION PHASE



Completed Central Waste Handling Facility (CWHF)



## Project-3: KOTA ISKANDAR MALAYSIA

### Project Information

- ▶ Country : Malaysia
- ▶ City : Johor Bahru
- ▶ Developer : Johor State Government
- ▶ Project Startup : 2006
- ▶ Project Completed : 2009
- ▶ Application : State Government New Administrative Centre
- ▶ Area of development : 110 Acres

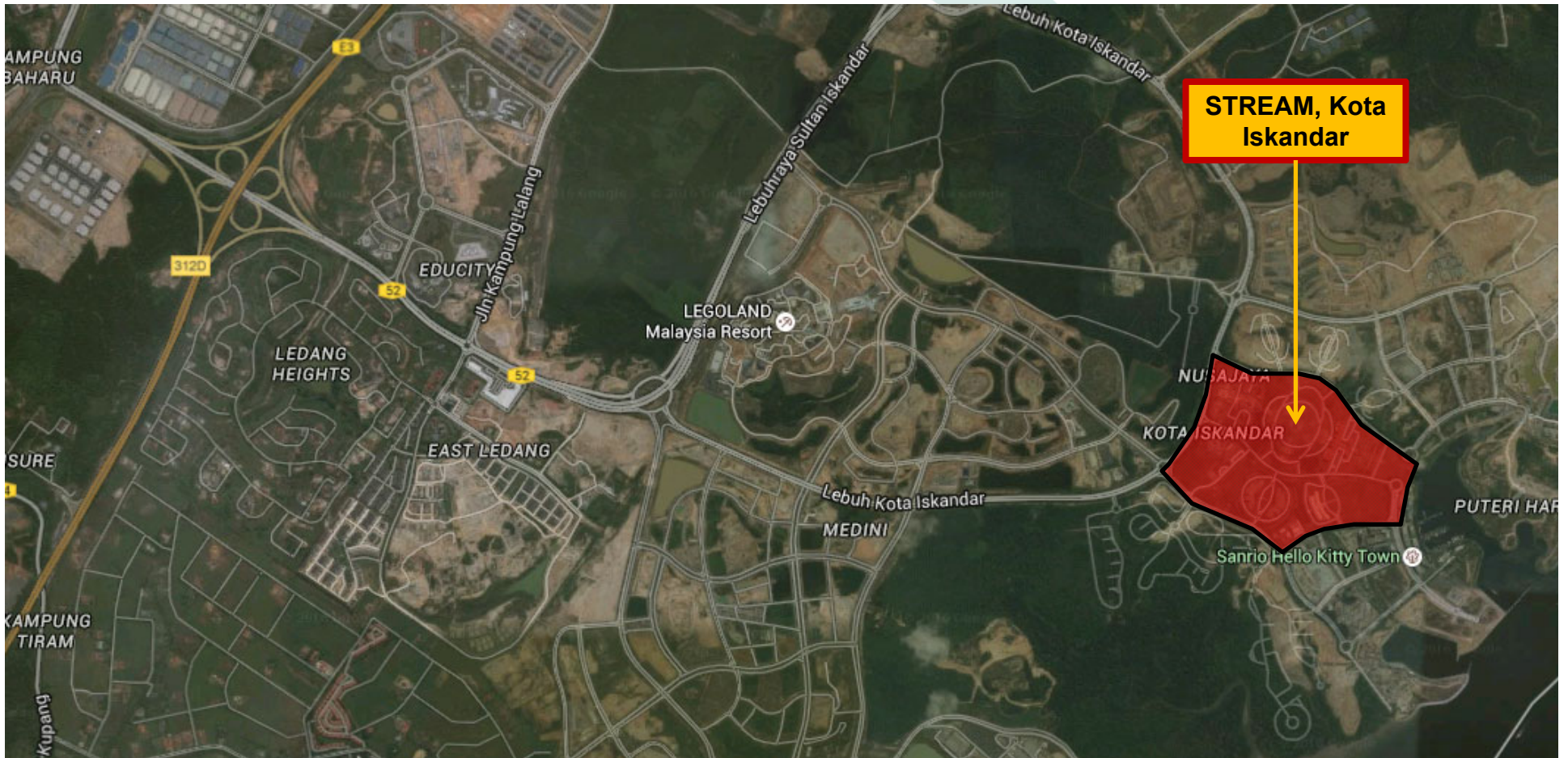
### STREAM Automated Waste Collection System

- ▶ Type of System : Gravity Vacuum + Full Vacuum System  
– District Wide System
- ▶ Total Pipe Length : 4,300m
- ▶ AVWCS Capacity : 30 metric ton/day



# Project-3: KOTA ISKANDAR MALAYSIA

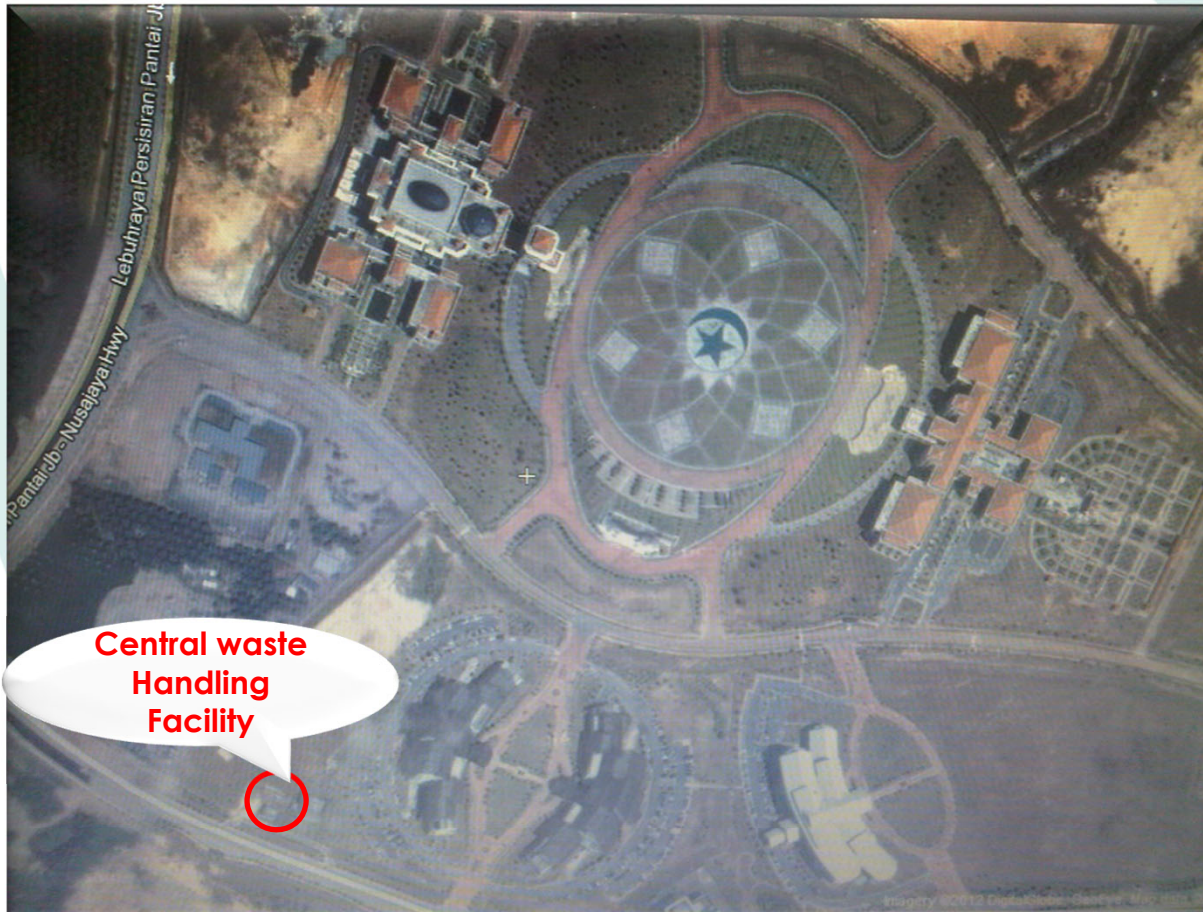
## AERIAL VIEW OF NUSAJAYA & MEDINI, MALAYSIA



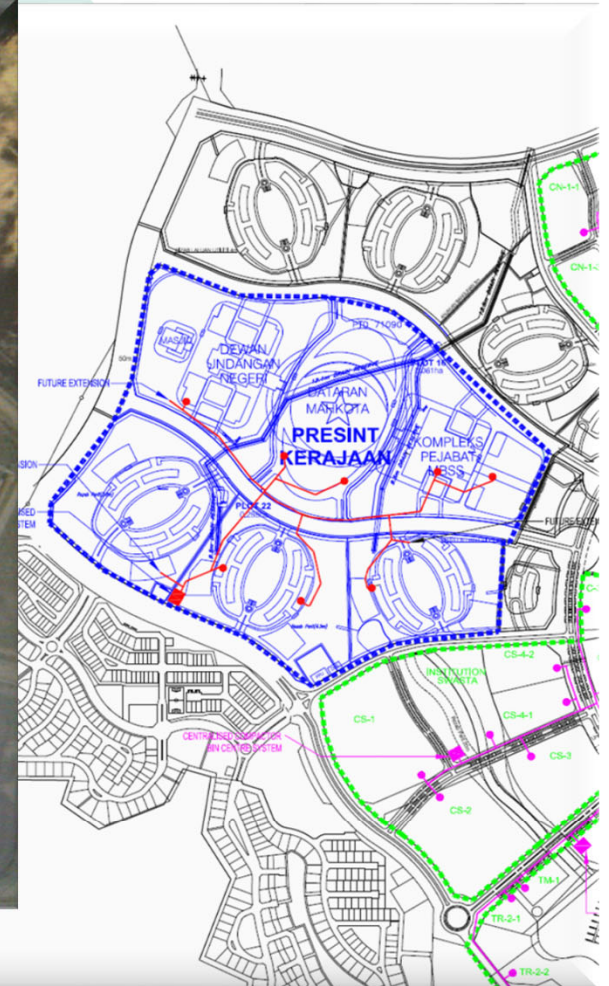


# Project-3: KOTA ISKANDAR MALAYSIA

## AERIAL VIEW OF KOTA ISKANDAR\_NUSAJAYA



Central waste  
Handling  
Facility





# Project-3: KOTA ISKANDAR MALAYSIA

## INFRA PIPING LAYOUT PLAN



# Project-3: KOTA ISKANDAR MALAYSIA

## FIELD FEEDER COMPONENT



Volume Control  
Hopper Door

Full Vacuum  
Station



Outdoor Throw  
Station



Storage Section

Discharge  
Valve

Front View of  
Full Vacuum  
Station





# Project-3: KOTA ISKANDAR MALAYSIA

## CENTRAL WASTE HANDLING FACILITY

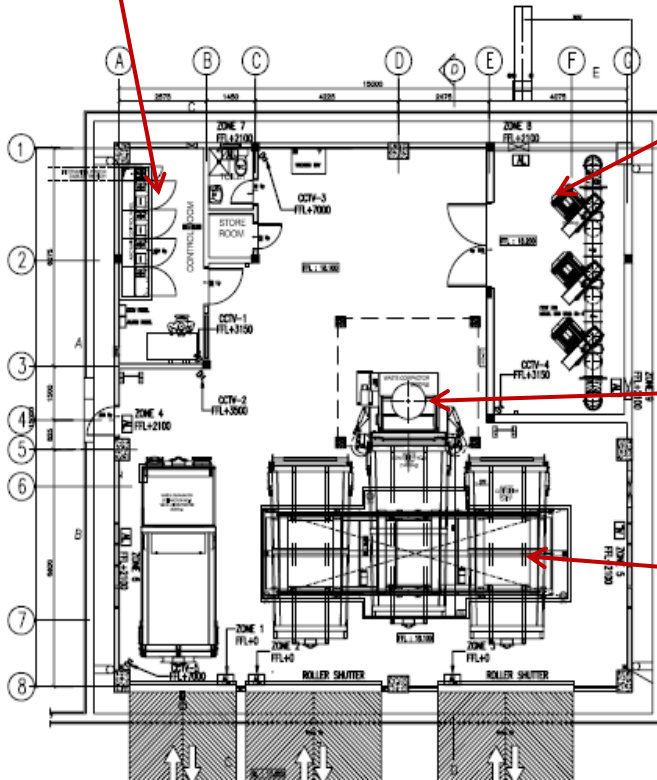
Control Panel



Exhauster



Separator



Compactor



Conveyor

## Project-4: HDB Tampines North, Singapore

### Project Information

- ▶ Country : Singapore
- ▶ City : Tampines North
- ▶ Developer : Housing Development Board (HDB) 
- ▶ Project Startup : 2014
- ▶ Project Completed : 2019
- ▶ Application : Government Non Landed Residential Development
- ▶ Size of development : >2,600 dwelling units

### STREAM Automated Waste Collection System

- ▶ Type of System : Gravity Vacuum c/w Outdoor Throw Station  
– District Wide System
- ▶ Total Pipe Length : 1,400m
- ▶ AVWCS Capacity : 8 metric ton/day, 2 Fractions





**LEGEND**

- RESIDENTIAL BLOCK
- CARPARK
- Ⓛ CARPARK LIFT LOBBY
- Ⓜ ELECTRICAL SUBSTATION
- BIN CENTRE
- PRECINCT PAVILION
- Ⓟ BUS STOP    Ⓟ FUTURE BUS STOP
- ▬ COVERED LINKWAY
- ▬ FUTURE COVERED LINKWAY
- ▬ FUTURE PEDESTRIAN OVERHEAD BRIDGE
- ▬ BARRIER-FREE ACCESS ROUTE

**COMMERCIAL / SOCIAL COMMUNAL FACILITIES**

- RCC RESIDENTS' COMMITTEE CENTRE
- CCC CHILDCARE CENTRE
- EH EATING HOUSE
- SM SUPERMARKET
- S SHOPS
- FSCF FUTURE AMENITIES

**PRECINCT LEVEL FACILITIES**

- CLR COMMUNITY LIVING ROOM
- DOP DROP OFF PORCH
- FBC FUTURE 3-ON-3 BASKETBALL COURT
- PARK PARK
- ▬ PERGOLA, SHELTER

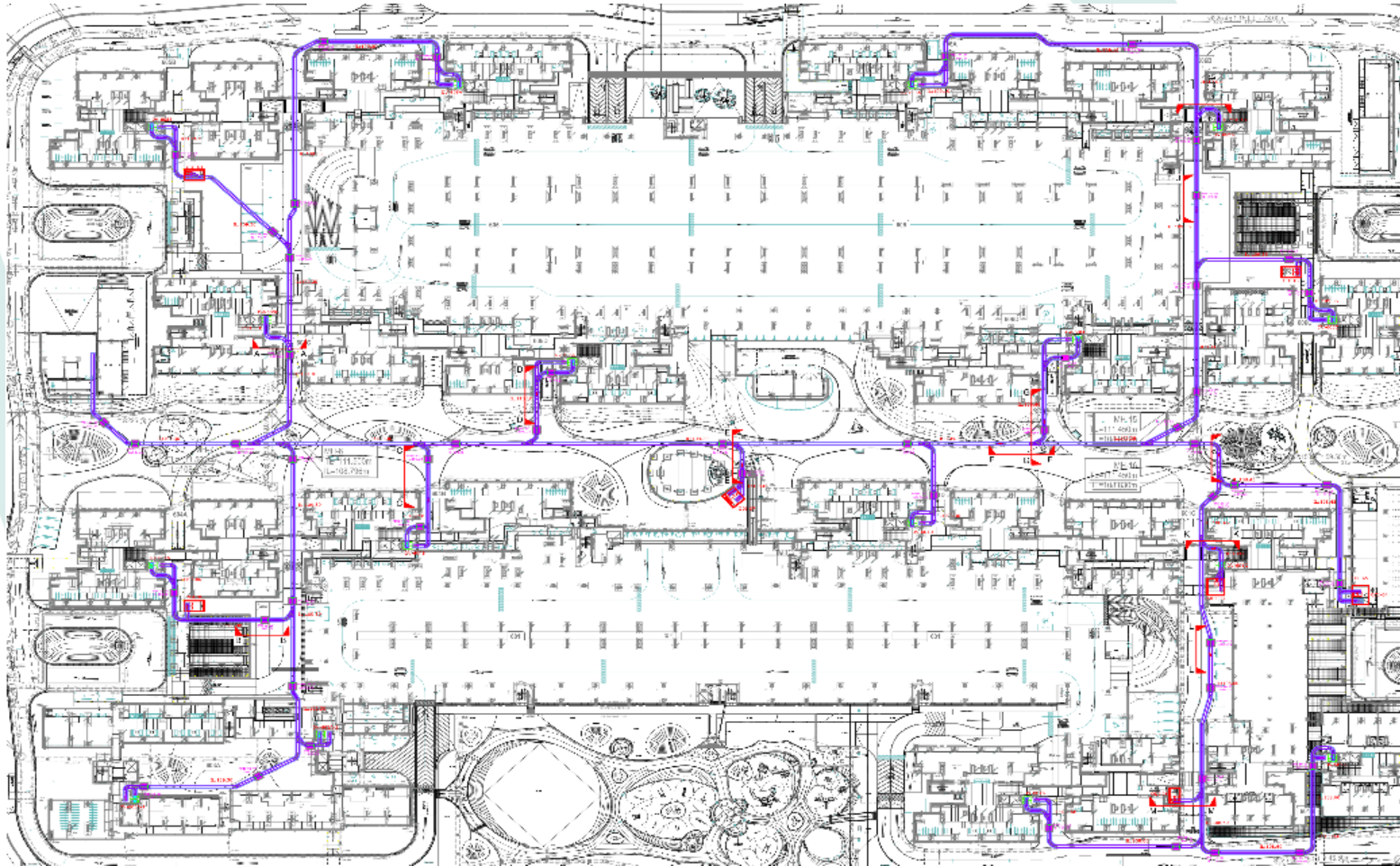
**3 GENERATION / SPORT FACILITIES**

- EFS ELDERLY FITNESS STATION
- AFS ADULT FITNESS STATION
- PG CHILDREN PLAYGROUND
- CG COMMUNITY GARDEN
- HC HARD COURT

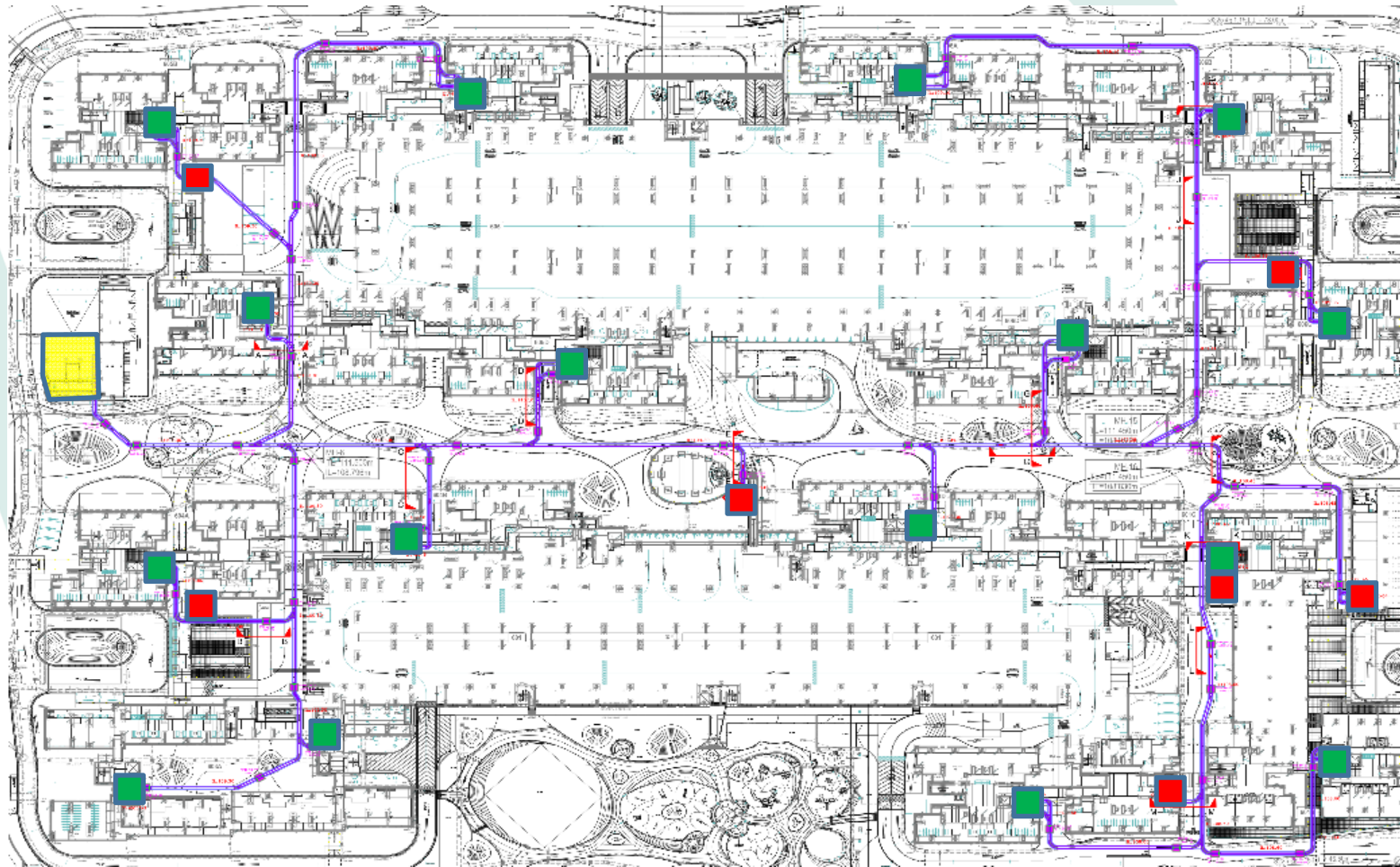




# CASE STUDY 4: OVERALL PIPING LAYOUT



# CASE STUDY 4: AWCS FEEDER POINTS



Legend:

- DV Room  
– 16 Nos
- ODI Bunker  
– 7 nos



## CASE STUDY 4: LOAD STATIONS (GW & RW)



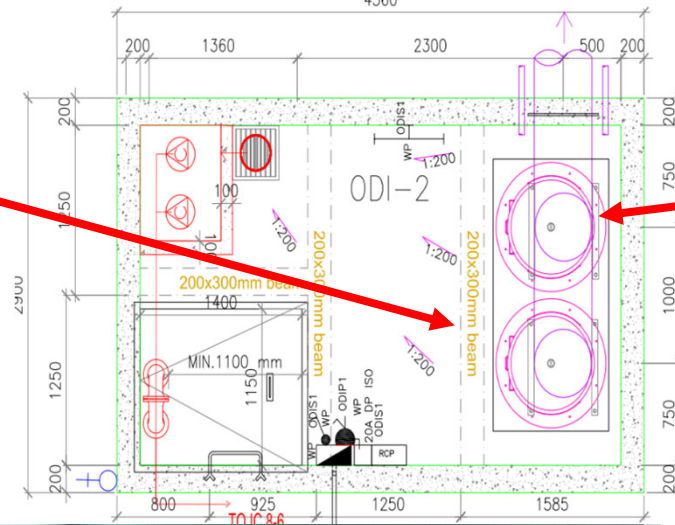
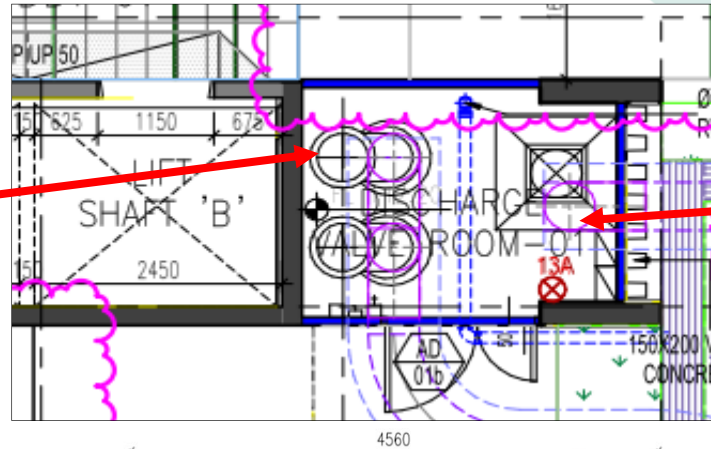
**Gravity Vacuum Load Station  
on every floor of residential units**



**Outdoor Load Station**

- **Every location of throw point will have 2 load stations (1 for recyclable waste, 1 for non-recyclable waste)**

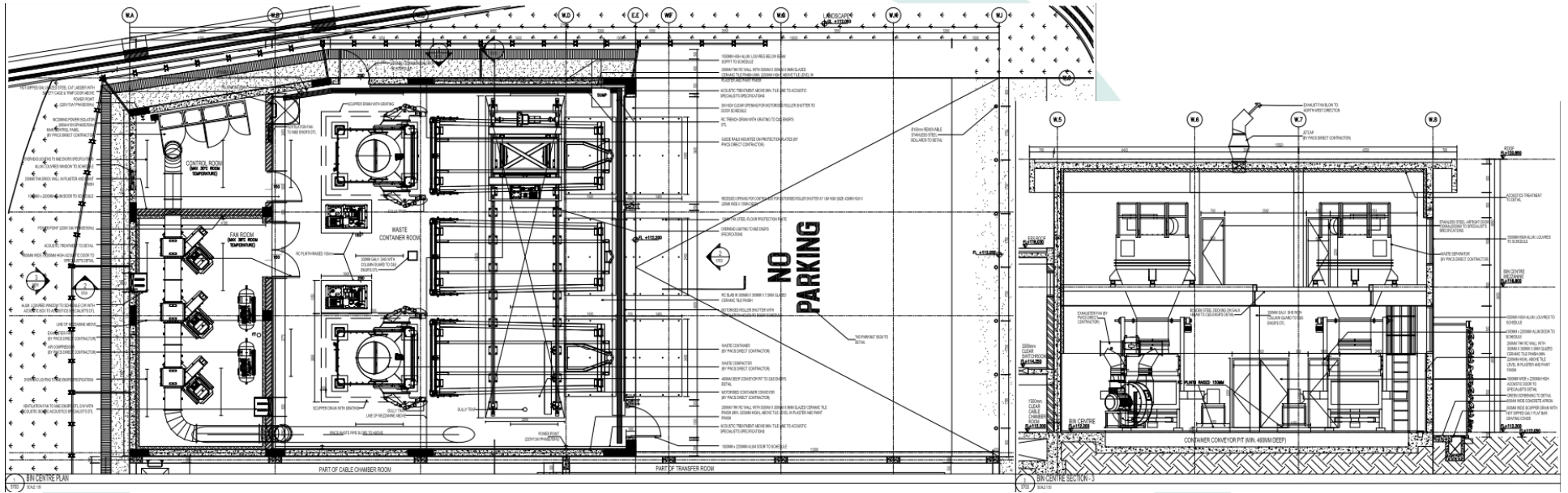
# CASE STUDY 4: DISCHARGE VALVE ROOM







# CASE STUDY 4: CENTRAL WASTE HANDLING FACILITY (CWHF)





# CASE STUDY 4: CENTRAL WASTE HANDLING FACILITY (CWHF)



## Project-5: AL RAHA BEACH ABU DHABI

### Project Information

- ▶ **Country** : United Arab Emirates
- ▶ **City** : Abu Dhabi
- ▶ **Developer** : Aldar Properties
- ▶ **Project Startup** : 2009
- ▶ **Project Completed** : 2011
- ▶ **Application** : Mixed Development
- ▶ **Area of development** : **556 ha**
- ▶

### STREAM Automated Waste Collection System

- ▶ **Type of System** : Gravity Vacuum + Full Vacuum + Screw Feeder  
– District Wide System
- ▶ **Total Pipe Length** : >16,000m
- ▶ **AVWCS Capacity** : 200 metric ton/day





## Project-5: AL RAHA BEACH ABU DHABI



**Al-Raha Beach,  
Abu Dhabi, UAE.**



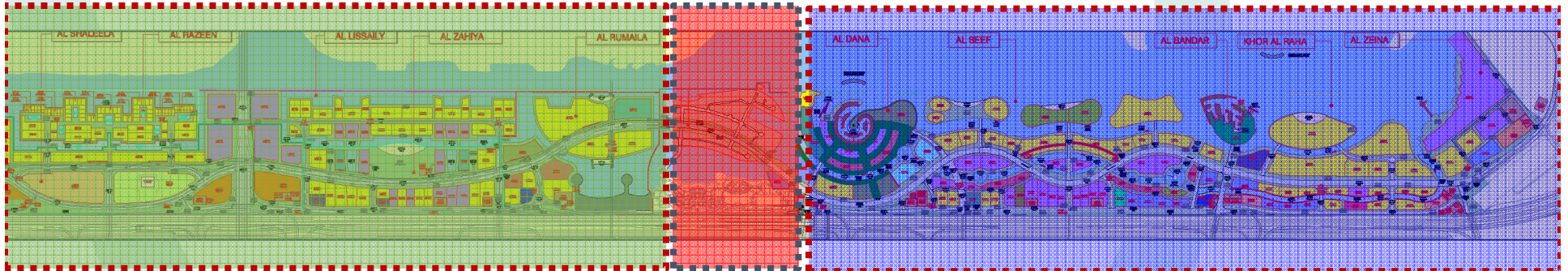
# Project-5: AL RAHA BEACH ABU DHABI

AL RAHA BEACH DEVELOPMENT – East & Western Precinct and Lu'Luat Island

**ARB Western Precinct  
(Design/Planning Stage)**

**Lu'Luat Island (Awarded  
in 2015)**

**ARB Eastern Precinct  
(Awarded in 2009)**



~12km

AUTOMATED WASTE COLLECTION SYSTEM

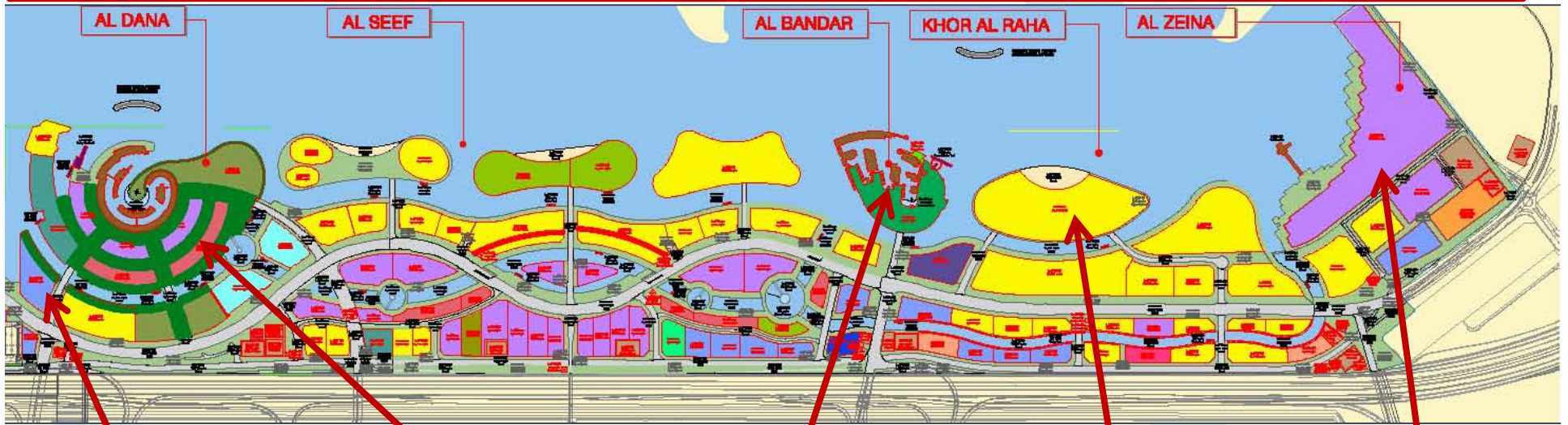




# Project-5: AL RAHA BEACH ABU DHABI

AL RAHA BEACH DEVELOPMENT – East Precinct

Project Awarded in Year 2009, Completed in Year 2011. More than 120 Plots completed and operation for ~5 years. Balance ~80 'in-Plots' construction in Progress.



ALDAR HQ



AL DANA



AL BANDAR



AL MUEERA



AL ZEINA

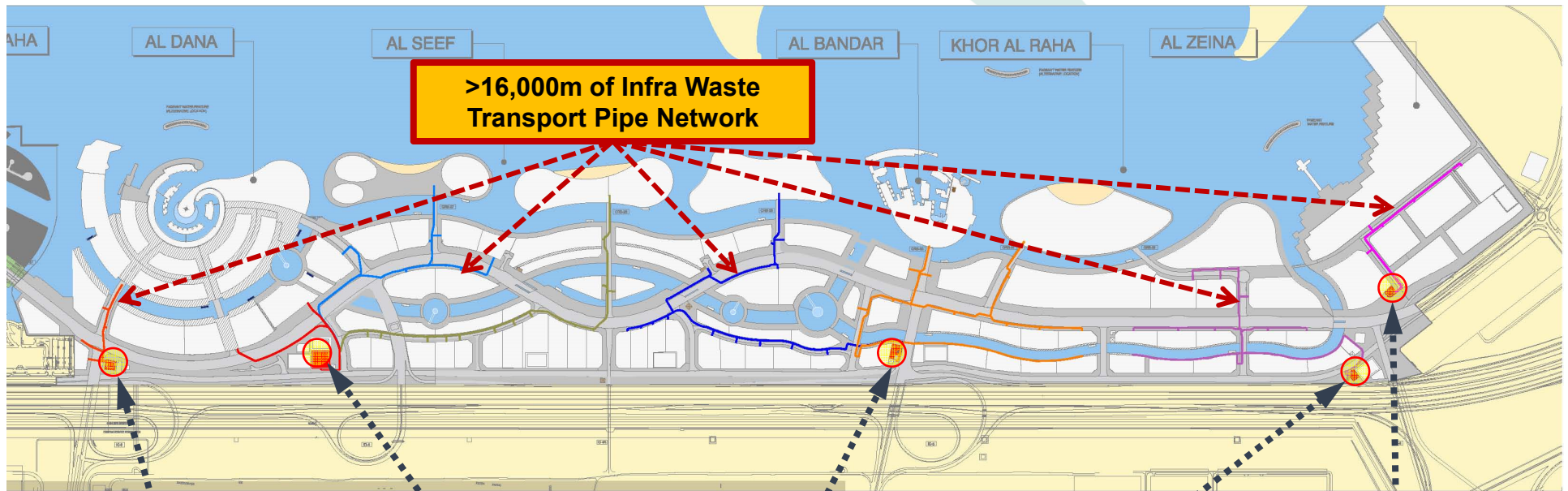
AUTOMATED WASTE COLLECTION SYSTEM





# Project-5: AL RAHA BEACH ABU DHABI

AUTOMATED WASTE PIPES – 8 MODULES (EASTERN PRECINCT)



CWHF No.1

Module 1

CWHF No.2

Module 2A, 2B & 2C

CWHF No.3

Module 3A & 3B

CWHF No.4

Module 4

CWHF No.5

Module 5

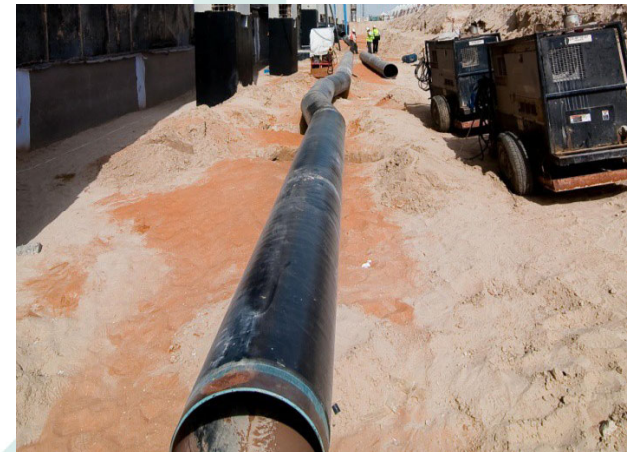
Project Awarded in Year 2009,  
Completed in Year 2011.

AUTOMATED WASTE COLLECTION SYSTEM





## Project-5: AL RAHA BEACH ABU DHABI



# Project-5: AL RAHA BEACH ABU DHABI

AUTOMATED WASTE PIPES – 8 MODULES (EASTERN PRECINCT)





## Project-6: AL-REEM ISLAND\_ ABU DHABI

### Project Information

- ▶ Country : United Arab Emirates
- ▶ City : Abu Dhabi
- ▶ Developer : Tamouh Investments
- ▶ Project Startup : 2008
- ▶ Completed : 2010
- ▶ Application : Mixed Development
- ▶ Area of development : 66 Acres

### STREAM Automated Waste Collection System

- ▶ Type of System : Gravity Vacuum  
– District Wide System
- ▶ Total Pipe Length : >4,000m
- ▶ AVWCS Capacity : 90 metric ton/day



## Project-6: AL-REEM ISLAND ABU DHABI



**Al-Reem Island,  
Abu Dhabi, UAE.**

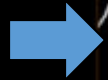


## Project-6: AL-REEM ISLAND ABU DHABI



# Project-6: AL-REEM ISLAND ABU DHABI

Marina Square





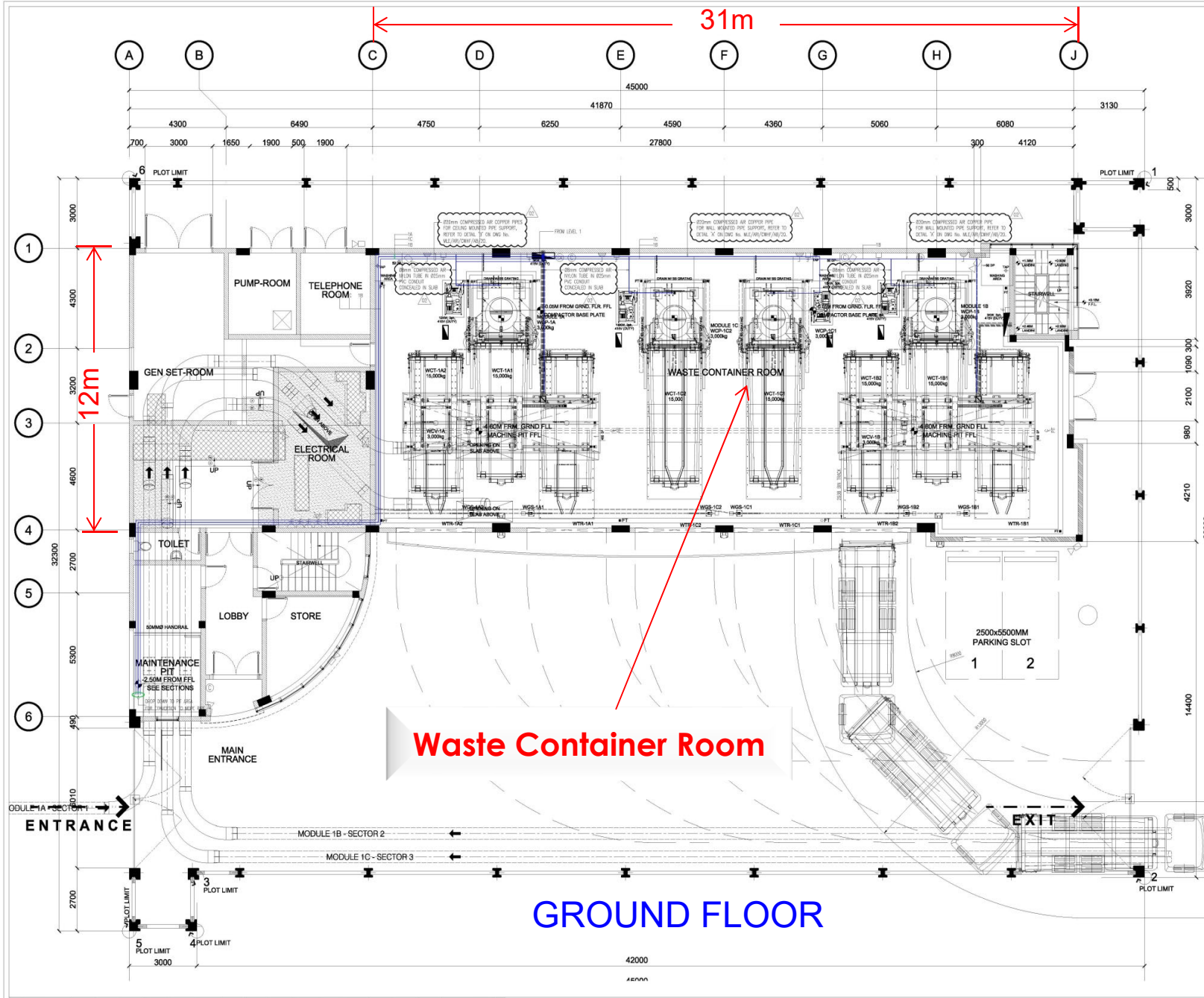
## Project-6: AL-REEM ISLAND ABU DHABI


### AERIAL VIEW OF MARINA SQUARE



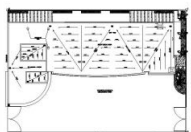
**Central Waste Handling Facility**

# Project-6: AL-REEM ISLAND ABU DHABI





KEY PLAN



NOTE  
THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ENG 166. ALL DIMENSIONS ARE TO CENTER UNLESS SPECIFIED OTHERWISE.

LEGEND

- 20mm COMPRESSED AIR PIPE COPPER
- WCP WASTE COMPACTOR
- WCT WASTE CONTAINER
- WCV WASTE CONTAINER CONVERTER
- WGS WASTE GATE SENSOR
- WTR WASTE CONTAINER FLOOR TRACK

**AS-BUILT**

REVISION NO.	DATE	BY	CHKD	APPD
01	16/05/11	CS	TDH	TDH
02	16/05/11	CS	TDH	TDH
03	16/05/11	CS	TDH	TDH

CLIENT NAME

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**UB** UNITED DESIGN BUREAU  
P.O. Box 117269, Abu Dhabi, UAE  
Tel: +971 2 6326988 Fax: +971 2 6326986  
Eng. Abdul Fattah Al Nohri

AWCS CONTRACTOR

**STREAM** SPECIALIZED WASTE COLLECTION SYSTEMS  
Multi Link Environmental Services LLC (A subsidiary of MWM Delta)  
P.O. Box 48120, Abu Dhabi, UAE  
Tel: +971 2 8348 128 Fax: +971 2 8348 129

DRAWING TITLE  
CENTRAL WASTE HANDLING FACILITY  
AUTOMATED VACUUM WASTE COLLECTION SYSTEM  
COMPRESSED AIR PIPE ROUTING GROUND FLOOR PLAN

Date: 28 October 2010 SCALE @ SHEET: 1/75@A1  
DRAWING NUMBER: MLE/ARI/CWHF/AB/17-02



## Project-6: AL-REEM ISLAND ABU DHABI



### CENTRE WASTE HANDLING FACILITY (CWHF)

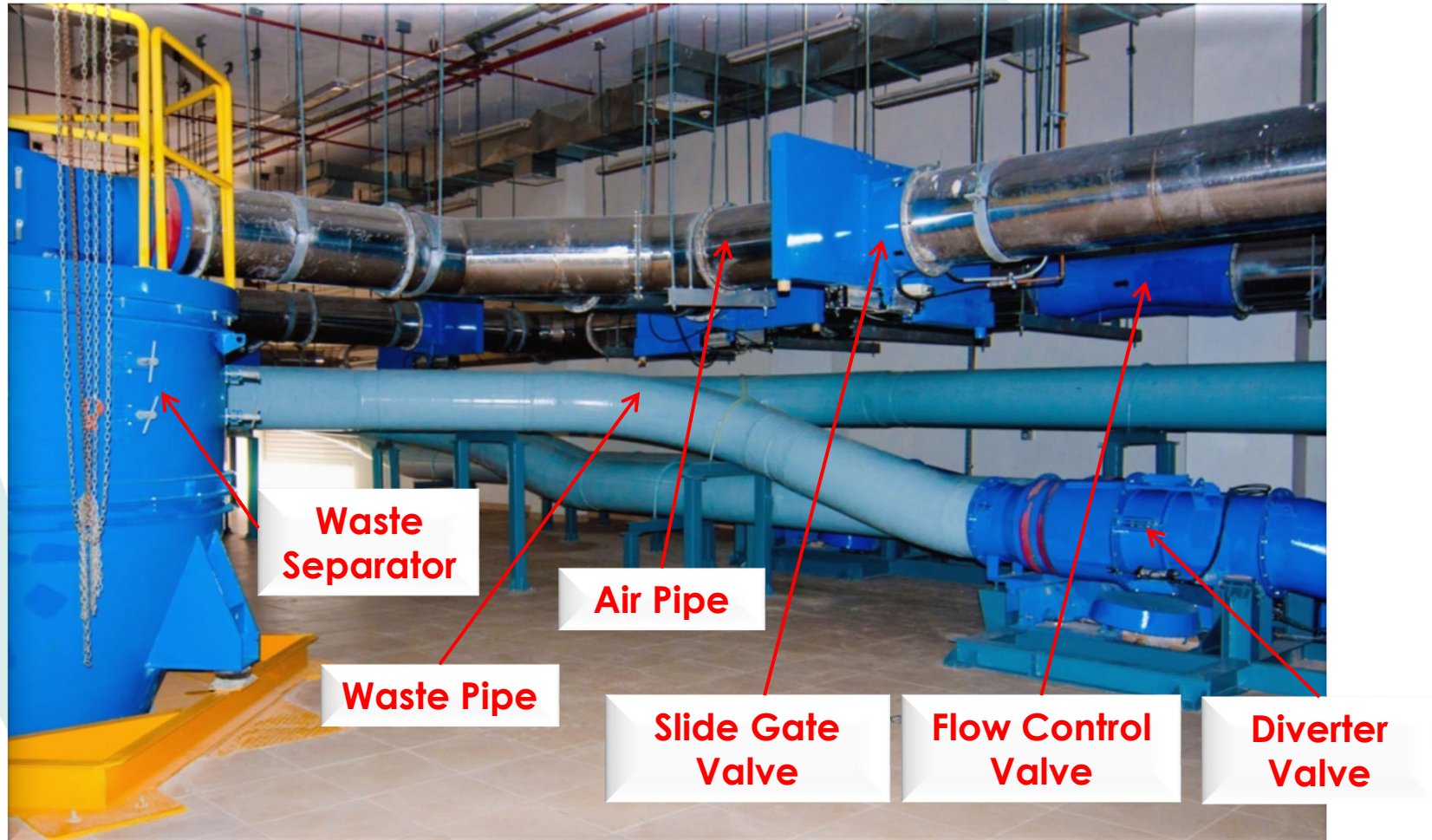
**Project Awarded in Year 2008,  
Completed in Year 2010.**



**STREAM**™

## Project-6: AL-REEM ISLAND ABU DHABI

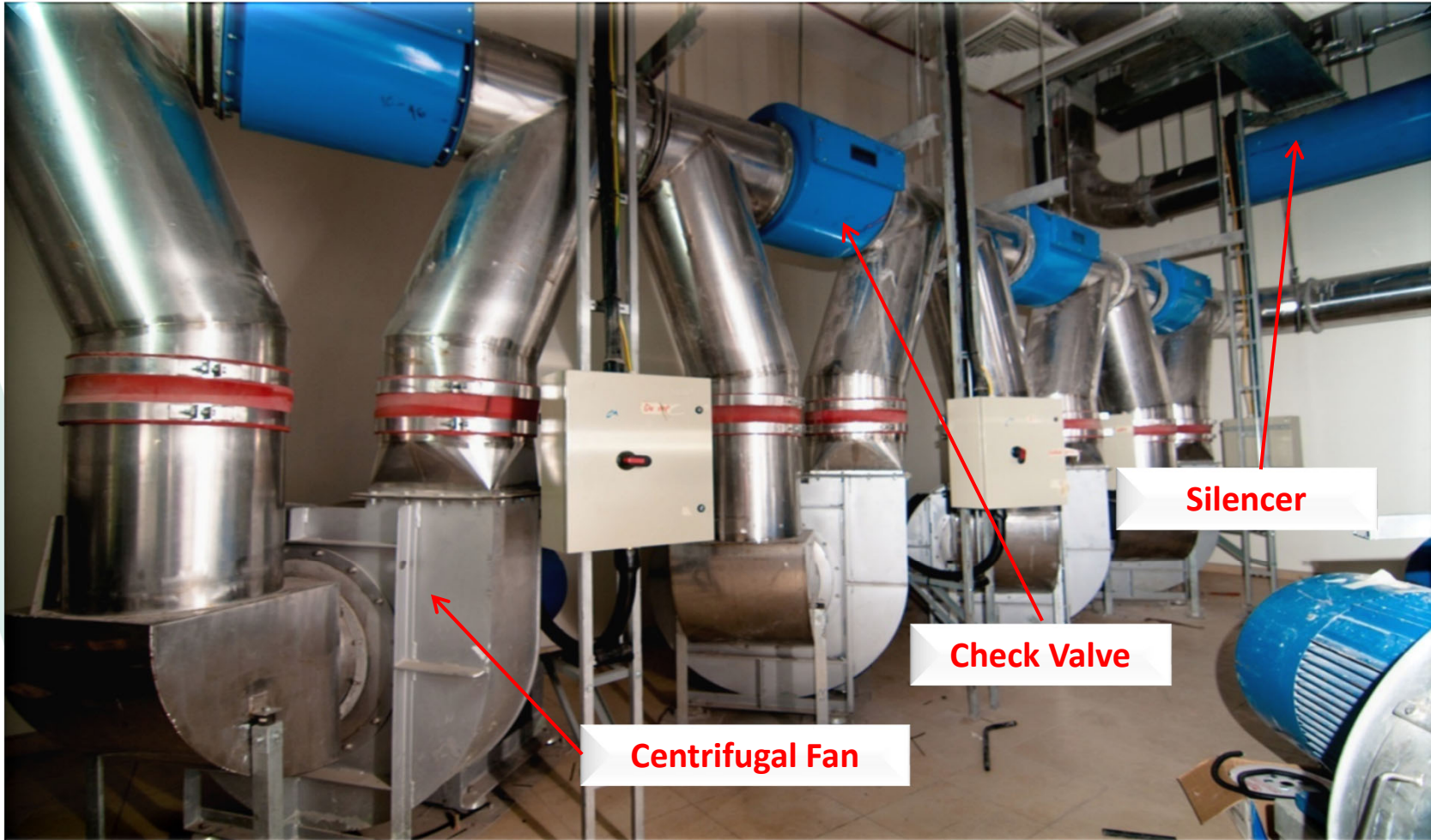
### CENTRE WASTE HANDLING FACILITY – WASTE SEPARATOR ROOM





## Project-6: AL-REEM ISLAND ABU DHABI

### **CENTRE WASTE HANDLING FACILITY – CENTRIFUGAL FAN ROOM**



# Project-6: AL-REEM ISLAND ABU DHABI

## CENTRE WASTE HANDLING FACILITY



**Waste Compactor**



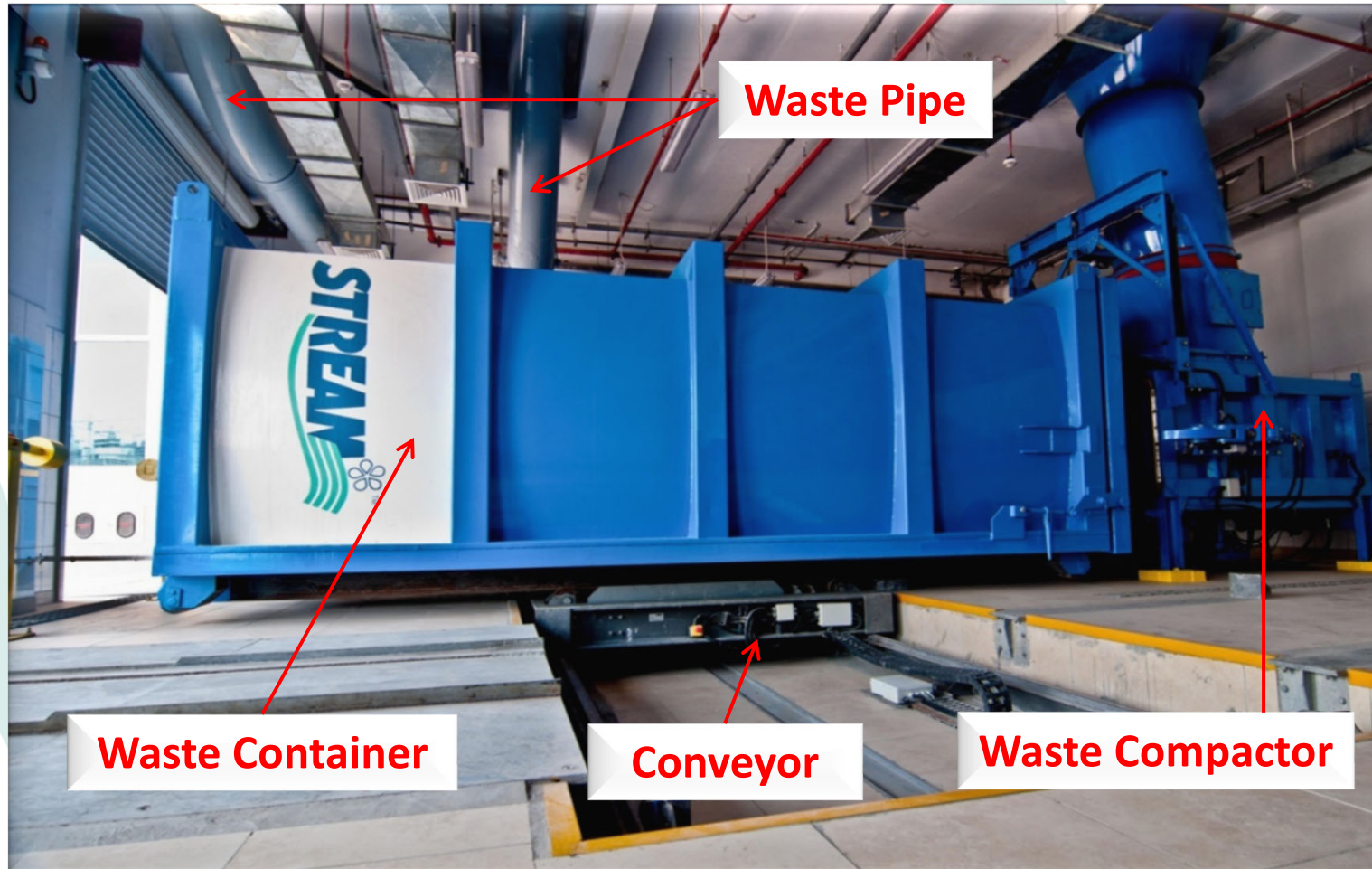
**Main Control Centre**



**Pressure Differential Gauges**



# CENTRE WASTE HANDLING FACILITY – WASTE CONTAINER BAY



## Project-7: Hospital, Singapore

### Project Information

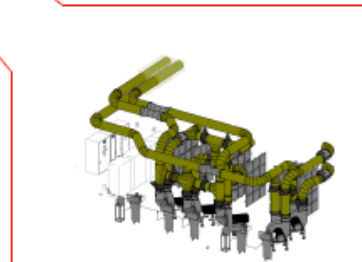
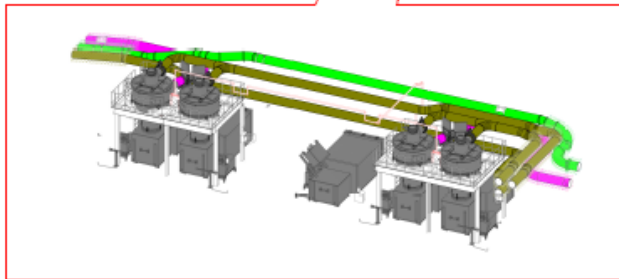
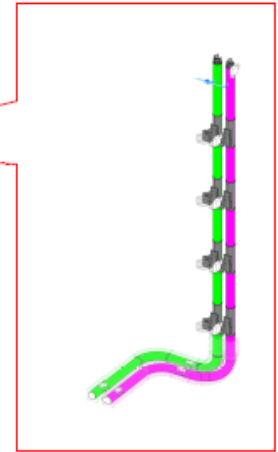
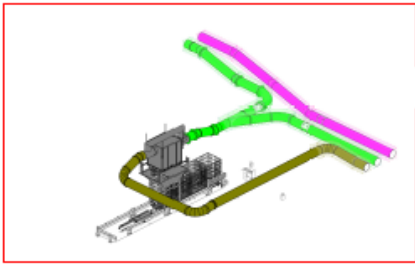
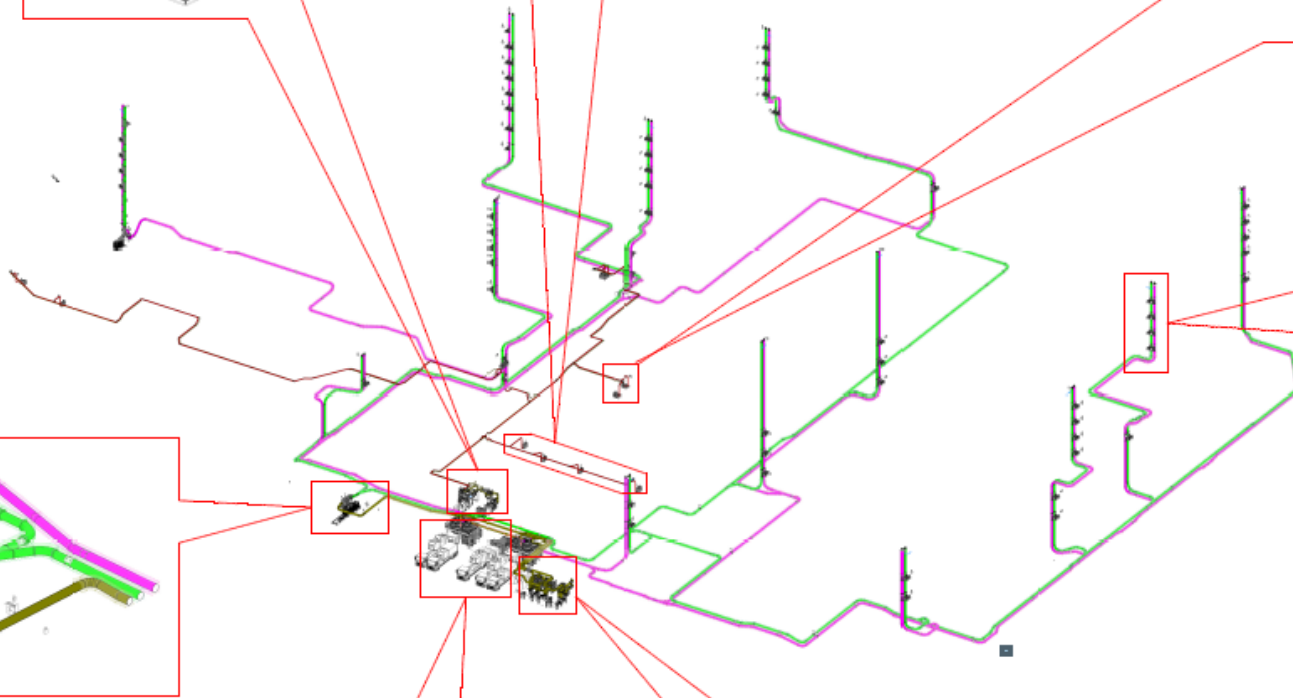
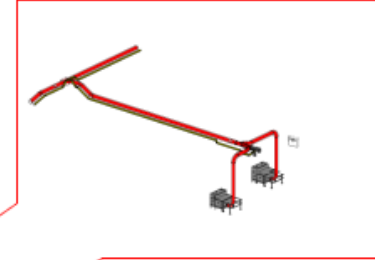
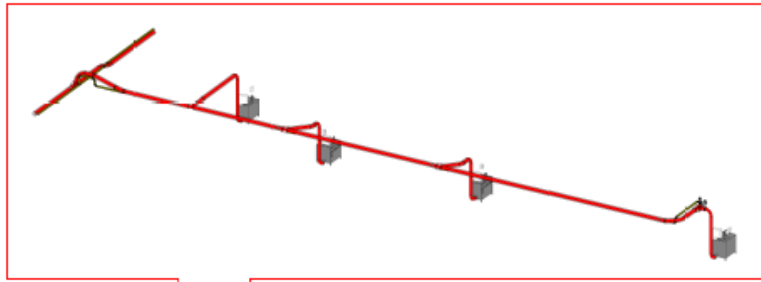
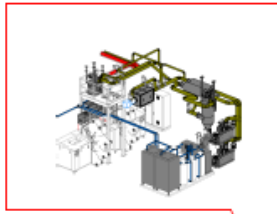
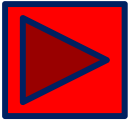
- ▶ Country : SINGAPORE
- ▶ City : SINGAPORE
- ▶ Developer : MOH, Singapore
- ▶ Project Startup : 2019
- ▶ Completed : 2023
- ▶ Application : Hospital, Soiled Linen, Food Waste and General Waste
- ▶ Size of Development : 800 beds

### STREAM Automated Waste Collection System

- ▶ Type of System : Full Vacuum
- ▶ Total Pipe Length : >1,500m
- ▶ AVWCS Capacity : >15 metric ton/day, 2 Fractions + Soiled Linen







# CASE STUDY 6: HOW THE SYSTEM WORKS

## FULL VACUUM SYSTEM



*Full Vacuum Load Stations  
Linen waste collection, and General waste collection*



*Full Vacuum Load Station's  
Swing Door & Inner Door*

In OCH, the system covers for 2 different types of wastes:-

1. Linen Waste
2. General Waste

The overall waste collection process is as follow:

- User to activate Load Station (LS) switch key, Main Control Centre (MCC) will trigger the Centrifugal Fan (CF) and the Primary Air Intake (PAI).
- Once system is ready to use, the Inner-Door of Load Station will open for linen/waste transportation.
- Linen/waste will then be transported via piping network to the Central Waste Handling Facility.
- It only runs whenever the Full Vacuum key is plug into the ignition.



## CASE STUDY 6: CENTRAL WASTE HANDLING FACILITY (CWHF)



Linen Collection 'Cage'



General Waste Container

### **LINEN**

- For Linen system, the used/soiled linen will be transported from load station all the way to the collection point (as shown above).

### **GENERAL WASTE**

- For general waste, the refuse will be transported from load station to a SEALED and ENCLOSED container via network of piping.
- When the container is filled up, it can be hauled up by arm-roll truck to its designated dumpsite or material recovery facility

## Project-7: Evergreen Sky Catering, Taiwan

### Project Information

- ▶ Country/Province : TAIWAN
- ▶ City : Taoyuan
- ▶ Developer : EGSC, Taiwan
- ▶ Project Startup : 2016
- ▶ Completed : 2018
- ▶ Application : In Flight Catering
- ▶ Size of Development : 60,000 meals/ day

### STREAM Automated Waste Collection System

- ▶ Type of System : Full Vacuum
- ▶ Total Pipe Length : >270m
- ▶ AVWCS Capacity : >15 metric ton/day, Food + General Waste





# EVERGREEN SKY CATERING

Evergreen Sky Catering Corporation  
(Expansion)

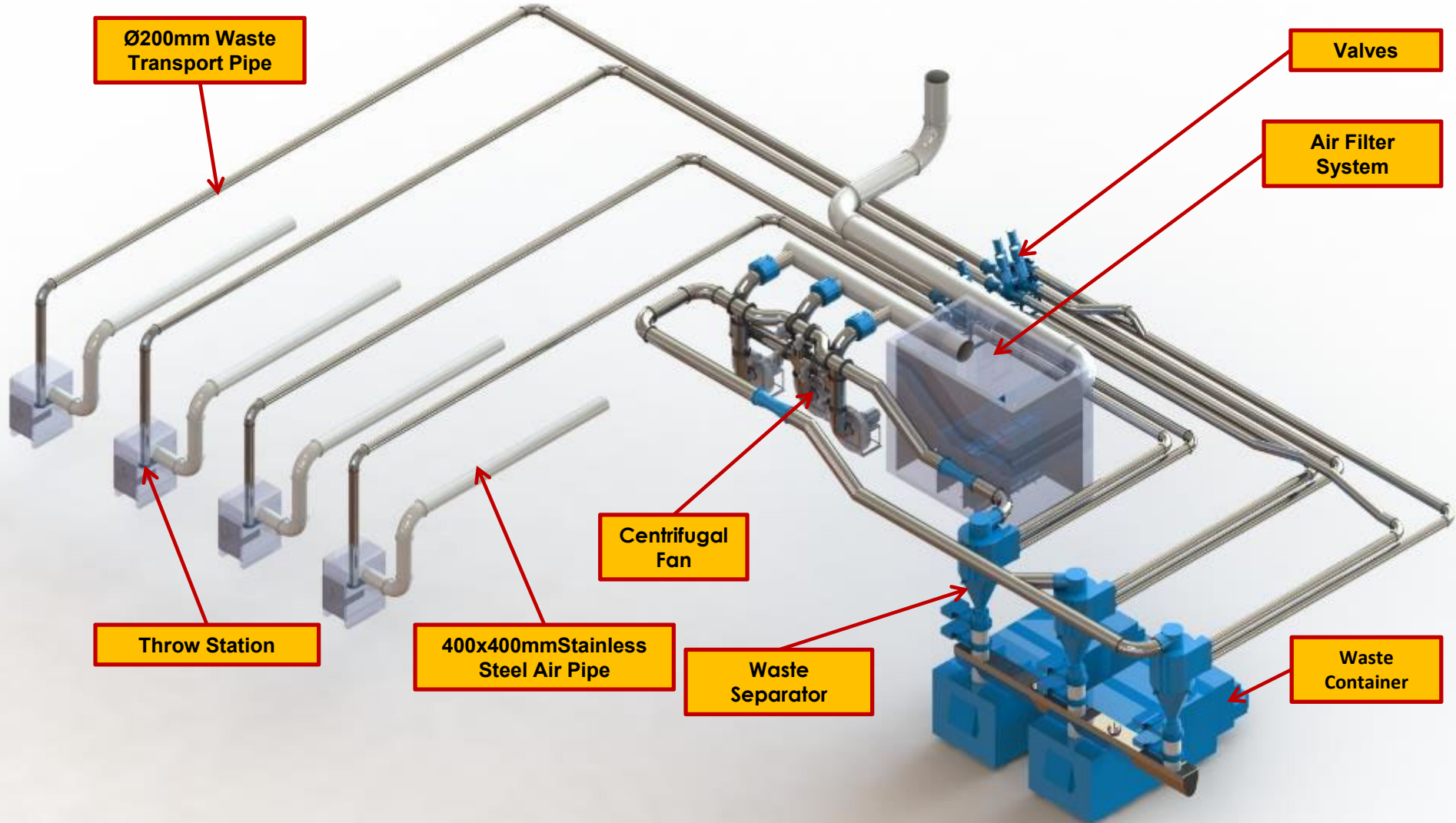


## PROJECT INFORMATION

Country: Taiwan  
Project Startup: 2016  
Project Completion: 2018  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 270m  
Number of Fractions: 1  
Estimated Waste per Day: 17 metric tons



# EVERGREEN SKY CATERING

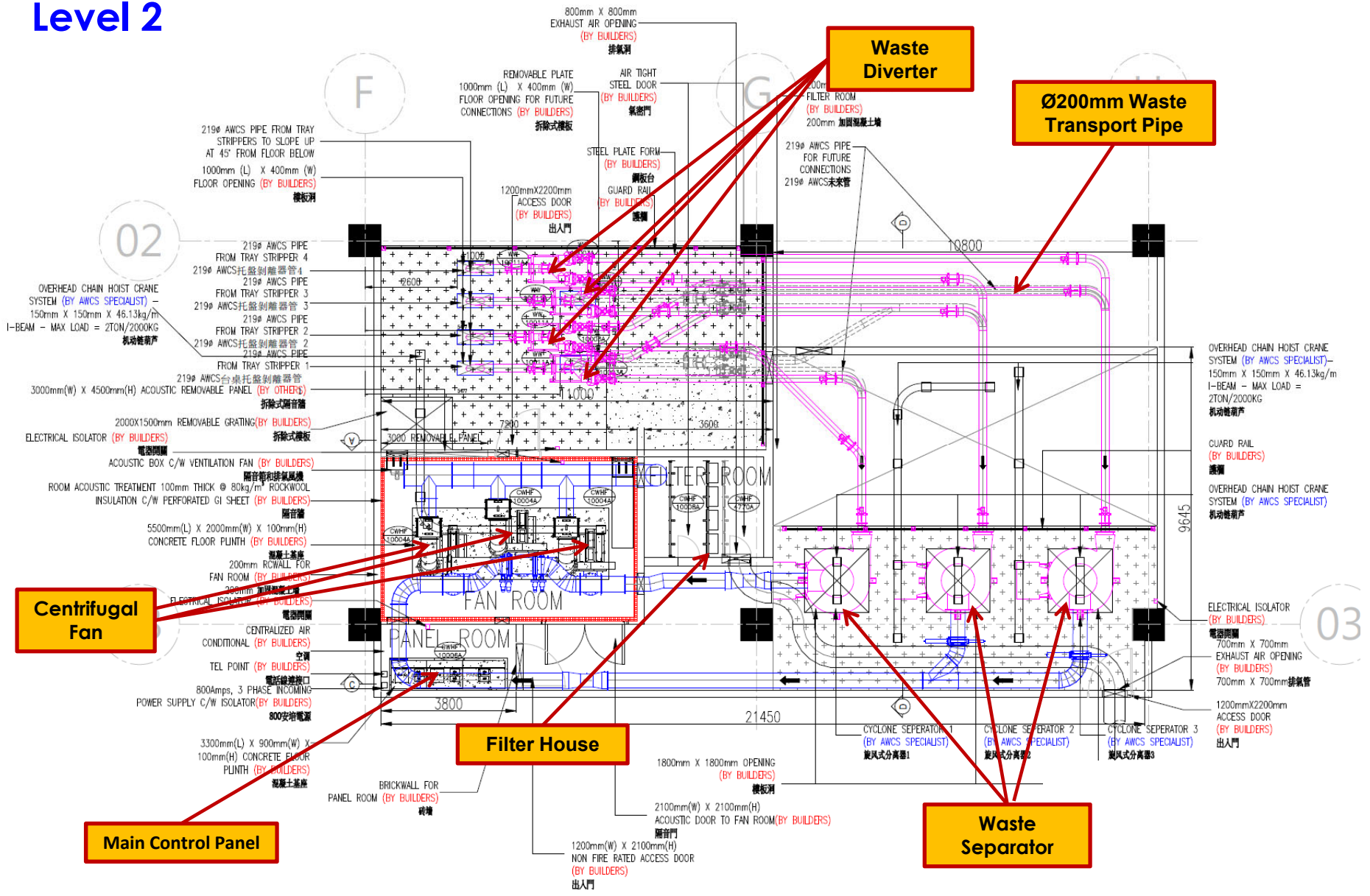






# EVERGREEN SKY CATERING

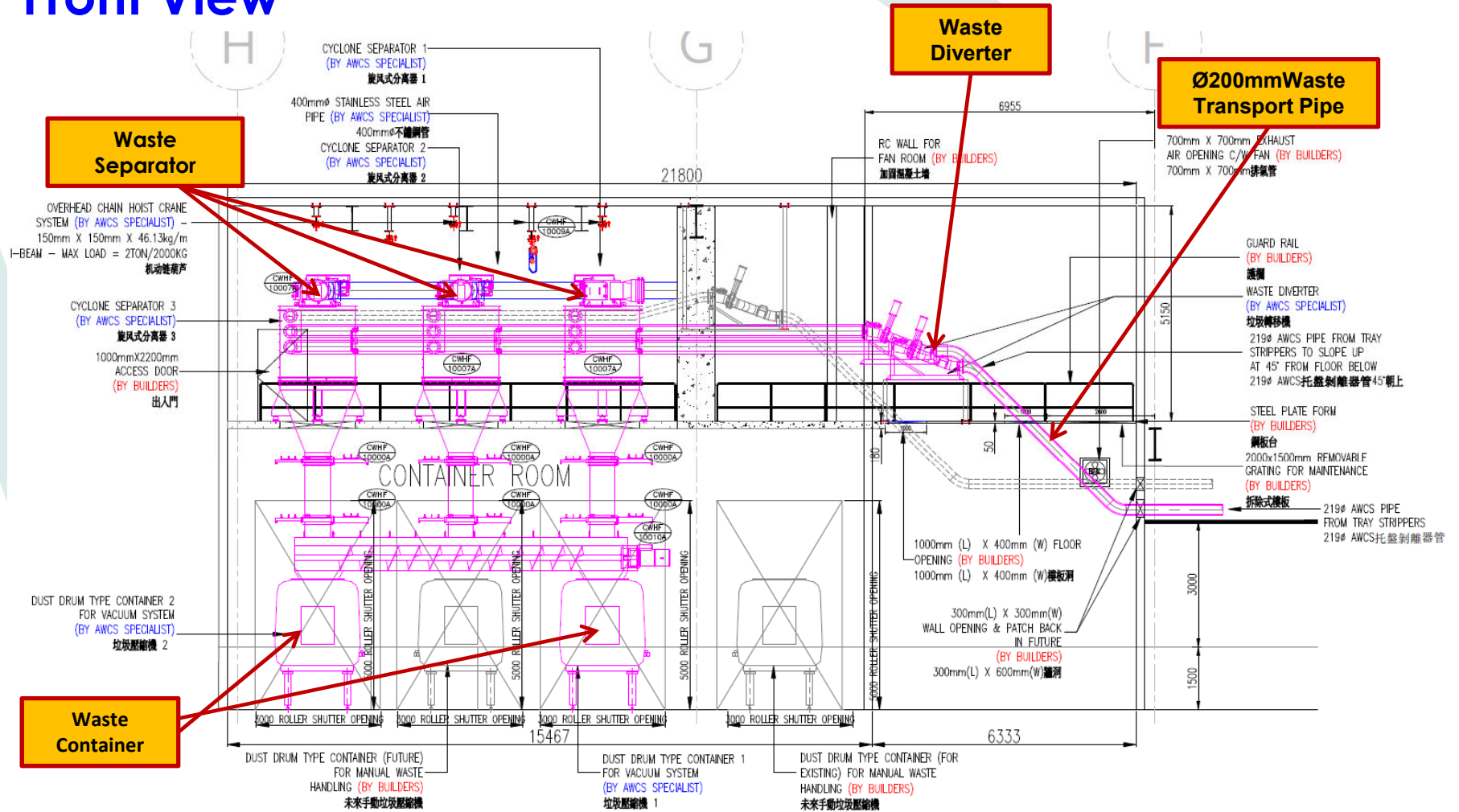
## Level 2





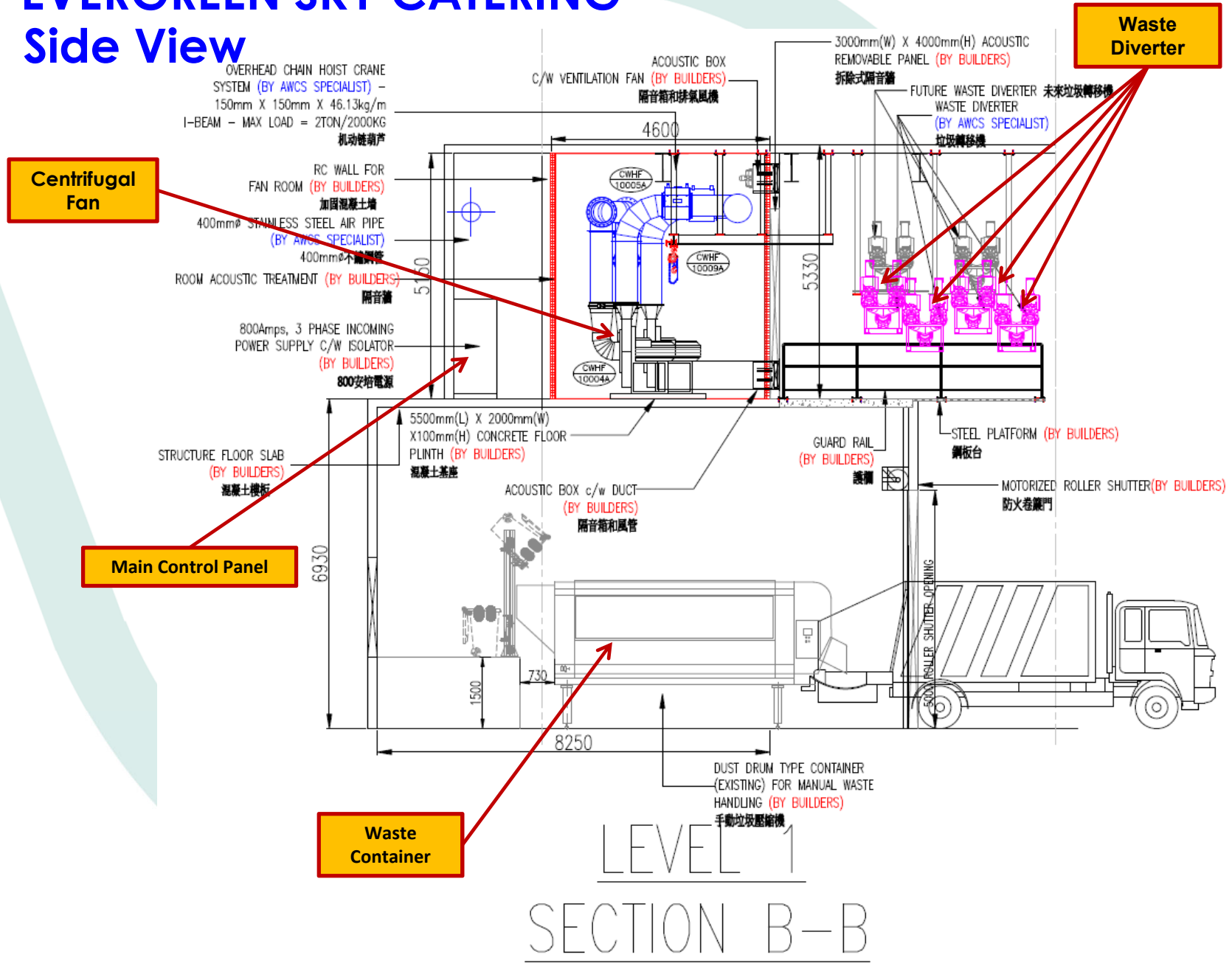
# EVERGREEN SKY CATERING

## Front View



# EVERGREEN SKY CATERING

## Side View





# EVERGREEN SKY CATERING



# EVERGREEN SKY CATERING

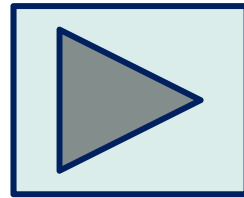




# EVERGREEN SKY CATERING



# EVERGREEN SKY CATERING





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- [Blank bar]
- [Blank bar]
- [Blank bar]
- Project References & Our Customers



# MALAYSIA REFERENCES



**M Suites Ampang**  
Mah Sing



**PROJECT INFORMATION**

City: Kuala Lumpur  
Country: Malaysia  
Project Startup: 2011  
Project Completion: 2013  
Type of AWCS: Hybrid System  
Total Pipe Length: 200m  
Number of Fractions: 1  
Estimated Waste/Day: 1.4 metric tons



**M-City**  
Mah Sing



**PROJECT INFORMATION**

City: Kuala Lumpur  
Country: Malaysia  
Project Startup: 2012  
Project Completion: 2015  
Type of AWCS: Hybrid System  
Total Pipe Length: 450m  
Number of Fractions: 1  
Estimated Waste/Day: 3.47 metric tons



**ICON City**  
Mah Sing



Petaling Jaya

**PROJECT INFORMATION**

City: Selangor  
Country: Malaysia  
Project Startup: 2013  
Project Completion: 2015  
Type of AWCS: Hybrid System  
Total Pipe Length: 345m  
Number of Fractions: 1  
Estimated Waste/Day: 4.44 metric tons





# MALAYSIA REFERENCES



**ICON Residence**  
Mah Sing



icon residence  
Mah Sing

## PROJECT INFORMATION

**City:** Kuala Lumpur  
**Country:** Malaysia  
**Project Startup:** 2012  
**Project Completion:** 2014  
**Type of AWCS:** Gravity Vacuum System  
**Total Pipe Length:** 125m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 1.3 metric tons



**D'sara Sentral**  
Mah Sing



## PROJECT INFORMATION

**City:** Selangor  
**Country:** Malaysia  
**Project Startup:** 2015  
**Project Completion:** 2017  
**Type of AWCS:** Hybrid System  
**Total Pipe Length:** 487m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 3.5 metric tons



**Lakeville Residence**  
Mah Sing



## PROJECT INFORMATION

**City:** Kuala Lumpur  
**Country:** Malaysia  
**Project Startup:** 2015  
**Project Completion:** 2017  
**Type of AWCS:** Gravity Vacuum System  
**Total Pipe Length:** 685m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 7.14 metric tons



# MALAYSIA REFERENCES



**The Loft @ Southbay City**  
Mah Sing



## PROJECT INFORMATION

City: Penang  
Country: Malaysia  
Project Startup: 2015  
Project Completion: 2017  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 105m  
Number of Fractions: 1  
Estimated Waste/Day: 0.59 metric tons



**Ferringhi Residence 2**  
Mah Sing



## PROJECT INFORMATION

City: Pulau Pinang  
Country: Malaysia  
Project Startup: 2017  
Project Completion: 2020  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 409m  
Number of Fractions: 1  
Estimated Waste/Day: 2.3 metric tons



**M Centura**  
Mah Sing



## PROJECT INFORMATION

City: Kuala Lumpur  
Country: Malaysia  
Project Startup: 2018  
Project Completion: 2020  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 207m  
Number of Fractions: 1  
Estimated Waste/Day: 5.3 metric tons





# MALAYSIA REFERENCES



**M Vertica**  
Mah Sing



**PROJECT INFORMATION**

City: Kuala Lumpur  
 Country: Malaysia  
 Project Startup: 2018  
 Project Completion: 2021  
 Type of AWCS: Hybrid System  
 Total Pipe Length: 454m  
 Number of Fractions: 1  
 Estimated Waste/Day: 15.2 metric tons



**M Arisa**  
Mah Sing



**PROJECT INFORMATION**

City: Kuala Lumpur  
 Country: Malaysia  
 Project Startup: 2020  
 Project Completion: 2023  
 Type of AWCS: Shuttle System  
 Total Pipe Length: 170m  
 Number of Fractions: 1  
 Estimated Waste/Day: 5.99 metric tons



**M Adora**  
Mah Sing



**PROJECT INFORMATION**

City: Kuala Lumpur  
 Country: Malaysia  
 Project Startup: 2020  
 Project Completion: 2023  
 Type of AWCS: Shuttle System  
 Total Pipe Length: 133m  
 Number of Fractions: 1  
 Estimated Waste/Day: 2.54 metric tons



# MALAYSIA REFERENCES



**M Oscar**  
Mah Sing



**PROJECT INFORMATION**

City: Kuala Lumpur  
 Country: Malaysia  
 Project Startup: 2020  
 Project Completion: 2023  
 Type of AWCS: Shuttle System  
 Total Pipe Length: 191m  
 Number of Fractions: 1  
 Estimated Waste/Day: 3.48 metric tons



**M Luna**  
Mah Sing



**PROJECT INFORMATION**

City: Kuala Lumpur  
 Country: Malaysia  
 Project Startup: 2021  
 Project Completion: 2024  
 Type of AWCS: Shuttle System  
 Total Pipe Length: 214m  
 Number of Fractions: 1  
 Estimated Waste/Day: 6.27 metric tons



**The Manor**  
Desaria Property



**PROJECT INFORMATION**

City: Kuala Lumpur  
 Country: Malaysia  
 Project Startup: 2018  
 Project Completion: 2019  
 Type of AWCS: Hybrid System  
 Total Pipe Length: 167m  
 Number of Fractions: 1  
 Estimated Waste/Day: 0.7 metric tons





# MALAYSIA REFERENCES



**Trion**  
Binastra Land

TRION@KL

**PROJECT INFORMATION**

City: Kuala Lumpur  
 Country: Malaysia  
 Project Startup: 2019  
 Project Completion: 2022  
 Type of AWCS: Gravity Vacuum System  
 Total Pipe Length: 711m  
 Number of Fractions: 1  
 Estimated Waste/Day: 6.98 metric tons



**Trion 2**  
Binastra Land

TRION 2@KL  
by BINASTRALAND

**PROJECT INFORMATION**

City: Kuala Lumpur  
 Country: Malaysia  
 Project Startup: 2020  
 Project Completion: 2023  
 Type of AWCS: Shuttle System  
 Total Pipe Length: 71m  
 Number of Fractions: 1  
 Estimated Waste/Day: 2.25 metric tons



**Duta Park**  
Malton Development Sdn Bhd

*duta Park*  
RESIDENCES  
KUALA LUMPUR

**PROJECT INFORMATION**

City: Kuala Lumpur  
 Country: Malaysia  
 Project Startup: 2020  
 Project Completion: 2023  
 Type of AWCS: Gravity Vacuum System  
 Total Pipe Length: 131m  
 Number of Fractions: 1  
 Estimated Waste/Day: 5.16 metric tons



# MALAYSIA REFERENCES



**Anggun Residences**  
UDA Holdings



### PROJECT INFORMATION

City: Kuala Lumpur  
Country: Malaysia  
Project Startup: 2015  
Project Completion: 2017  
Type of AWCS: Hybrid System  
Total Pipe Length: 157 m  
Number of Fractions: 1  
Estimated Waste per Day: 1.7 metric tons



**KNU Bangsar**  
UDA Holdings

### PROJECT INFORMATION

City: Kuala Lumpur  
Country: Malaysia  
Project Startup: 2021  
Project Completion: 2024  
Type of AWCS: Hybrid System  
Total Pipe Length: 103m  
Number of Fractions: 1  
Estimated Waste/Day: 1.37 metric tons



**South Point**  
UOA Development Bhd

### PROJECT INFORMATION

City: Kuala Lumpur  
Country: Malaysia  
Project Startup: 2017  
Project Completion: 2019  
Type of AWCS: Shuttle System  
Total Pipe Length: 90.5m  
Number of Fractions: 1  
Estimated Waste/Day: 1.3 metric tons





# MALAYSIA REFERENCES



**KL118**  
PNB Merdeka Ventures Sdn Bhd

### PROJECT INFORMATION

City: Kuala Lumpur  
Country: Malaysia  
Project Startup: 2016  
Project Completion: 2019  
Type of AWCS: Hybrid System  
Total Pipe Length: 576m  
Number of Fractions: 3 (Waste, Food & Paper)  
Estimated Waste/Day: 27.4 metric tons



**PNB Hotel**  
Permodalan Nasional Berhad

### PROJECT INFORMATION

City: Kuala Lumpur  
Country: Malaysia  
Project Startup: 2016  
Project Completion: 2018  
Type of AWCS: Full Vacuum System  
Total Pipe Length: 168m  
Number of Fractions: 1  
Estimated Waste/Day: 1.4 metric tons



**Datum Jelatek**  
Datum Corp International



### PROJECT INFORMATION

City: Kuala Lumpur  
Country: Malaysia  
Project Startup: 2017  
Project Completion: 2018  
Type of AWCS: Hybrid System  
Total Pipe Length: 683m  
Number of Fractions: 1  
Estimated Waste/Day: 5.3 metric tons



# MALAYSIA REFERENCES



**Four Seasons Place Kuala Lumpur**  
Venus Assets Sdn Bhd



**FOUR SEASONS**  
PLACE  
KUALA LUMPUR

**PROJECT INFORMATION**

**City:** Kuala Lumpur  
**Country:** Malaysia  
**Project Startup:** 2015  
**Project Completion:** 2017  
**Type of AWCS:** Hybrid System  
**Total Pipe Length:** 796m  
**Number of Fractions:** 2 (Waste & Linen)  
**Estimated Waste/Day:** 3.9 metric tons



**Coral Bay**  
GSH Corporation



**PROJECT INFORMATION**

**City:** Sabah  
**Country:** Malaysia  
**Project Startup:** 2018  
**Project Completion:** 2021  
**Type of AWCS:** Hybrid System  
**Total Pipe Length:** 793m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 11.5 metric tons



**Eaton Residences**  
GSH Corporation



**PROJECT INFORMATION**

**City:** Kuala Lumpur  
**Country:** Malaysia  
**Project Startup:** 2017  
**Project Completion:** 2020  
**Type of AWCS:** Shuttle System  
**Total Pipe Length:** 68.5m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 2.0 metric tons





# MALAYSIA REFERENCES



**KL Eco City Residential Tower 1**  
SP Setia (a JV with DBKL)



**PROJECT INFORMATION**

KLECO CITY

**City:** Kuala Lumpur  
**Country:** Malaysia  
**Project Startup:** 2014  
**Project Completion:** 2016  
**Type of AWCS:** Hybrid Vacuum System  
**Total Pipe Length:** 160m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 3 metric tons



**KL Eco City Office Tower 2 (Setia Tower)**  
SP Setia (a JV with DBKL)



**PROJECT INFORMATION**

KLECO CITY

**City:** Kuala Lumpur  
**Country:** Malaysia  
**Project Startup:** 2015  
**Project Completion:** 2017  
**Type of AWCS:** Full Vacuum System  
**Total Pipe Length:** 163m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 3.8 metric tons



**KL Eco City Boutique Office (The Pillar)**  
SP Setia (a JV with DBKL)



**PROJECT INFORMATION**

KLECO CITY

**City:** Kuala Lumpur  
**Country:** Malaysia  
**Project Startup:** 2015  
**Project Completion:** 2016  
**Type of AWCS:** Full Vacuum System  
**Total Pipe Length:** 891m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 6.3 metric tons





# MALAYSIA REFERENCES



**KL Eco City Strata Office Suites**  
SP Setia (a JV with DBKL)



**PROJECT INFORMATION**

City: Kuala Lumpur  
Country: Malaysia  
Project Startup: 2015  
Project Completion: 2016  
Type of AWCS: Full Vacuum System  
Total Pipe Length: 64m  
Number of Fractions: 1  
Estimated Waste/Day: 1.9 metric tons



**KL Eco City Office Parcel B**  
SP Setia (a JV with DBKL)



**PROJECT INFORMATION**

City: Kuala Lumpur  
Country: Malaysia  
Project Startup: 2016  
Project Completion: 2019  
Type of AWCS: Hybrid System  
Total Pipe Length: 312m  
Number of Fractions: 1  
Estimated Waste/Day: 8.6 metric tons



**The Pano**  
OCR Land Holdings



**PROJECT INFORMATION**

City: Kuala Lumpur  
Country: Malaysia  
Project Startup: 2018  
Project Completion: 2020  
Type of AWCS: Hybrid System  
Total Pipe Length: 106m  
Number of Fractions: 1  
Estimated Waste/Day: 1.13 metric tons



# MALAYSIA REFERENCES



**Bennington Residence**  
SkyWorld Development Sdn Bhd

**PROJECT INFORMATION**

**City:** Kuala Lumpur  
**Country:** Malaysia  
**Project Startup:** 2017  
**Project Completion:** 2019  
**Type of AWCS:** Gravity Vacuum System  
**Total Pipe Length:** 267m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 2.2 metric tons



**SkyLuxe on the Park**  
SkyWorld Development Sdn Bhd

**PROJECT INFORMATION**

**City:** Kuala Lumpur  
**Country:** Malaysia  
**Project Startup:** 2017  
**Project Completion:** 2019  
**Type of AWCS:** Gravity Vacuum System  
**Total Pipe Length:** 272m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 1.8 metric tons



**EdgeWood Residences @ SkySanctuary**  
SkyWorld Development Sdn Bhd

**PROJECT INFORMATION**

**City:** Kuala Lumpur  
**Country:** Malaysia  
**Project Startup:** 2022  
**Project Completion:** 2024  
**Type of AWCS:** Shuttle System  
**Total Pipe Length:** 159m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 24.0 metric tons





# MALAYSIA REFERENCES



**Plaza Arcadia**  
Perdana Parkcity



## PROJECT INFORMATION

**City:** Kuala Lumpur  
**Country:** Malaysia  
**Project Startup:** 2014  
**Project Completion:** 2016  
**Type of AWCS:** Hybrid System  
**Total Pipe Length:** 1200m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 14 metric tons



**One Central Park**  
Perdana Parkcity **ONE CENTRAL PARK**  
DESA PARKCITY

## PROJECT INFORMATION

**City:** Kuala Lumpur  
**Country:** Malaysia  
**Project Startup:** 2014  
**Project Completion:** 2016  
**Type of AWCS:** Gravity Vacuum System  
**Total Pipe Length:** 165m  
**Number of Fractions:** 2  
**Estimated Waste/Day:** 1.08 metric tons



**The RUMA**  
Ireka Corp & Aseana Properties



**THE RUMA**  
HOTEL AND RESIDENCES

## PROJECT INFORMATION

**City:** Kuala Lumpur  
**Country:** Malaysia  
**Project Startup:** 2014  
**Project Completion:** 2017  
**Type of AWCS:** Hybrid System  
**Total Pipe Length:** 59 m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 0.67 metric tons





# MALAYSIA REFERENCES



**Maju Linq**  
Maju Properties



**PROJECT INFORMATION**

City: Kuala Lumpur  
 Country: Malaysia  
 Project Startup: 2013  
 Project Completion: 2015  
 Type of AWCS: Shuttle System  
 Total Pipe Length: 370m  
 Number of Fractions: 1  
 Estimated Waste/Day: 1.77 metric tons



**Maju Junction Shopping Complex**  
Maju Properties



**PROJECT INFORMATION**

City: Kuala Lumpur  
 Country: Malaysia  
 Project Startup: 2000  
 Project Completion: 2002  
 Type of AWCS: Full Vacuum System  
 Total Pipe Length: 300m  
 Number of Fractions: 1  
 Estimated Waste/Day: 6 metric tons



**Senada Residences @ KLGCC**  
Brunsfield **SENADA**  
RESIDENCES

**PROJECT INFORMATION**

City: Kuala Lumpur  
 Country: Malaysia  
 Project Startup: 2019  
 Project Completion: 2020  
 Type of AWCS: Hybrid System  
 Total Pipe Length: 316m  
 Number of Fractions: 1  
 Estimated Waste/Day: 7.0 metric tons



# MALAYSIA REFERENCES



**NU Sentral (KL Sentral Lot G)**  
MRCB



**PROJECT INFORMATION**

City: Kuala Lumpur  
 Country: Malaysia  
 Project Startup: 2011  
 Project Completion: 2013  
 Type of AWCS: Gravity Vacuum System  
 Total Pipe Length: 320  
 Number of Fractions: 1  
 Estimated Waste/Day: 4.8 metric tons



**KL Sentral Park Lot E**  
MRCB

**PROJECT INFORMATION**

City: Kuala Lumpur  
 Country: Malaysia  
 Project Startup: 2010  
 Project Completion: 2011  
 Type of AWCS: Full Vacuum System  
 Total Pipe Length: 460m  
 Number of Fractions: 1  
 Estimated Waste/Day: 1.1 metric tons



**Damansara Uptown**  
See Hoy Chan



**PROJECT INFORMATION**

City: Selangor  
 Country: Malaysia  
 Project Startup: 2014  
 Project Completion:  
 Type of AWCS: Hybrid System  
 Total Pipe Length: 1103m  
 Number of Fractions: 1  
 Estimated Waste/Day: 12.7 metric tons



SEE HOY CHAN SDN. BERHAD  
(2244-V)





# MALAYSIA REFERENCES



**Platinum Park Phase 3  
(Naza Tower and Tabung Haji Tower)**  
Naza TTDI

**PROJECT INFORMATION**

**City:** Kuala Lumpur  
**Country:** Malaysia  
**Project Startup:** 2012  
**Project Completion:** 2014  
**Type of AWCS:** Full Vacuum System  
**Total Pipe Length:** 60m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 1.36 metric tons



Platinum Park



NAZA TTDI



**Platinum Park Phase 4  
(Felda Tower)**  
Naza TTDI

**PROJECT INFORMATION**

**City:** Kuala Lumpur  
**Country:** Malaysia  
**Project Startup:** 2010  
**Project Completion:** 2012  
**Type of AWCS:** Full Vacuum System  
**Total Pipe Length:** 120m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 1 metric tons



Platinum Park



NAZA TTDI



**The Glades, Putra Heights**  
Sime Darby



**PROJECT INFORMATION**

**City:** Selangor  
**Country:** Malaysia  
**Project Startup:** 2011  
**Project Completion:** 2014  
**Type of AWCS:** Hybrid System  
**Total Pipe Length:** 2,100m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 1.2 metric tons



# MALAYSIA REFERENCES



**Jendela Residences @ KLGCC**  
Sime Darby

**PROJECT INFORMATION**

City: Kuala Lumpur  
 Country: Malaysia  
 Project Startup: 2023  
 Project Completion: 2024  
 Type of AWCS: Gravity Vacuum System  
 Total Pipe Length: 174m  
 Number of Fractions: 1  
 Estimated Waste/Day: 2.06 metric tons



**Kimpton Hotel @ TRX**  
TRX Lendlease

**PROJECT INFORMATION**

City: Kuala Lumpur  
 Country: Malaysia  
 Project Startup: 2022  
 Project Completion: 2023  
 Type of AWCS: Gravity Vacuum System  
 Total Pipe Length: 50m  
 Number of Fractions: 1  
 Estimated Waste/Day: 958 linens



**St Regis, (KL Sentral Lot C)**  
One IFC

**PROJECT INFORMATION**

City: Kuala Lumpur  
 Country: Malaysia  
 Project Startup: 2012  
 Project Completion: 2014  
 Type of AWCS: Gravity Vacuum System  
 Total Pipe Length: 60m  
 Number of Fractions: 1  
 Estimated Waste/Day: 0.4 metric tons





# MALAYSIA REFERENCES



**Crowne Plaza & Royce Hotel**  
Yuk Tung Properties Sdn Bhd

**PROJECT INFORMATION**

City: Kuala Lumpur  
Country: Malaysia  
Project Startup: 2019  
Project Completion: 2021  
Type of AWCS: Shuttle System  
Total Pipe Length: 72m  
Number of Fractions: 1  
Estimated Waste/Day: 8.5 metric tons



**Skyline Residences**  
LTS Skyline Sdn Bhd

**PROJECT INFORMATION**

City: Kuala Lumpur  
Country: Malaysia  
Project Startup: 2022  
Project Completion: 2025  
Type of AWCS: Shuttle System  
Total Pipe Length: 262m  
Number of Fractions: 1  
Estimated Waste/Day: 56.15 metric tons



**One Cochrane Residences**  
Mutiara Rini

**PROJECT INFORMATION**

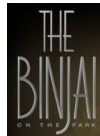
City: Kuala Lumpur  
Country: Malaysia  
Project Startup: 2018  
Project Completion: 2022  
Type of AWCS: Shuttle System  
Total Pipe Length: 356m  
Number of Fractions: 1  
Estimated Waste per Day: 11.2 metric tons



# MALAYSIA REFERENCES



**The Binjai on The Park**  
KLCC Properties



**PROJECT INFORMATION**

City: Kuala Lumpur  
 Country: Malaysia  
 Project Startup: 2005  
 Project Completion: 2008  
 Type of AWCS: Hybrid System  
 Total Pipe Length: 300m  
 Number of Fractions: 1  
 Estimated Waste per Day: 0.5 metric tons



**Kia Peng Condominium**  
Twelve Kia Peng

**PROJECT INFORMATION**

City: Kuala Lumpur  
 Country: Malaysia  
 Project Startup: 2009  
 Project Completion: 2010  
 Type of AWCS: Gravity Vacuum System  
 Total Pipe Length: 120m  
 Number of Fractions: 1  
 Estimated Waste per Day: 0.5 metric tons



**City of Green**  
BJ Homes Development Sdn Bhd



**PROJECT INFORMATION**

City: Selangor  
 Country: Malaysia  
 Project Startup: 2015  
 Project Completion: 2017  
 Type of AWCS: Hybrid System  
 Total Pipe Length: 292m  
 Number of Fractions: 1  
 Estimated Waste/Day: 4.1 metric tons





# MALAYSIA REFERENCES



Royal Malaysian Customs Office & Residential Complex Kelana Jaya  
Royal Malaysian Customs

## PROJECT INFORMATION

City: Petaling Jaya  
Country: Malaysia  
Project Startup: 2002  
Project Completion: 2004  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 800m  
Number of Fractions: 1  
Estimated Waste/Day: 1.5 metric tons



Royal Malaysian Customs Residential Complex Prai  
Royal Malaysian Customs

## PROJECT INFORMATION

City: Penang  
Country: Malaysia  
Project Startup: 2004  
Project Completion: 2006  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 800m  
Number of Fractions: 1  
Estimated Waste per Day: 1 metric tons



Royal Malaysian Customs Residential Complex Bukit Gelugor  
Royal Malaysian Customs

## PROJECT INFORMATION

City: Penang  
Country: Malaysia  
Project Startup: 2004  
Project Completion: 2007  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 800m  
Number of Fractions: 1  
Estimated Waste/Day: 1 metric tons



# MALAYSIA REFERENCES



**KLIA2 Main Terminal Building**  
Malaysia Airport Holding Berhad

**PROJECT INFORMATION**



**City:** Selangor  
**Country:** Malaysia  
**Project Startup:** 2011  
**Project Completion:** 2014  
**Type of AWCS:** Full Vacuum System  
**Total Pipe Length:** 4000m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 30 metric tons



**KLIA Integrated Complex**  
Malaysia Airport Holding Berhad

**PROJECT INFORMATION**



**City:** Selangor  
**Country:** Malaysia  
**Project Startup:** 2011  
**Project Completion:** 2014  
**Type of AWCS:** Full Vacuum System  
**Total Pipe Length:** 580m  
**Number of Fractions:** 2  
**Estimated Waste/Day:** 5.28 metric tons



**Johor State New Administrative Centre**  
Government of Johor



**PROJECT INFORMATION**

**City:** Johor  
**Country:** Malaysia  
**Project Startup:** 2006  
**Project Completion:** 2008  
**Type of AWCS:** Hybrid System  
**Total Pipe Length:** 2100m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 10 metric tons





# MALAYSIA REFERENCES



**Integrated Transport Terminal-  
Southern Sector**  
Ministry of Transport Malaysia

### PROJECT INFORMATION



**City: Kuala Lumpur**  
**Country: Malaysia**  
**Project Startup: 2009**  
**Project Completion: 2010**  
**Type of AWCS: Full Vacuum System**  
**Total Pipe Length: 420m**  
**Number of Fractions: 1**  
**Estimated Waste/Day: 1.2 metric tons**



**Integrated Transport Terminal  
Gombak**  
Ministry of Transport Malaysia

### PROJECT INFORMATION

**City: Kuala Lumpur**  
**Country: Malaysia**  
**Project Startup: 2017**  
**Project Completion: 2019**  
**Type of AWCS: Full Vacuum System**  
**Total Pipe Length: 485m**  
**Number of Fractions: 1**  
**Estimated Waste/Day: 3.7 metric tons**



**TNB HQ**  
Tenaga Nasional Berhad

### PROJECT INFORMATION

**City: Kuala Lumpur**  
**Country: Malaysia**  
**Project Startup: 2019**  
**Project Completion: 2021**  
**Type of AWCS: Hybrid System**  
**Total Pipe Length: 620m**  
**Number of Fractions: 1**  
**Estimated Waste/Day: 5.4 metric tons**



# MALAYSIA REFERENCES



**Vertu Resort @ Aspen Vision City**  
Aspen Vision City Sdn Bhd



**PROJECT INFORMATION**

**City:** Pulau Pinang  
**Country:** Malaysia  
**Project Startup:** 2017  
**Project Completion:** 2020  
**Type of AWCS:** Gravity Vacuum System  
**Total Pipe Length:** 395m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 4.8 metric tons



**Vervea @ Aspen Vision City**  
Aspen Vision City Sdn Bhd



**PROJECT INFORMATION**

**City:** Pulau Pinang  
**Country:** Malaysia  
**Project Startup:** 2017  
**Project Completion:** 2018  
**Type of AWCS:** Gravity Vacuum System  
**Total Pipe Length:** 18m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 12.0 metric tons



**Aspen Vivo**  
Aspen Vision City Sdn Bhd



**PROJECT INFORMATION**

**City:** Pulau Pinang  
**Country:** Malaysia  
**Project Startup:** 2020  
**Project Completion:** 2023  
**Type of AWCS:** Shuttle System  
**Total Pipe Length:** 195m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 5.88 metric tons





# MALAYSIA REFERENCES



**Viluxe @ Aspen Vision City**  
Aspen Vision City Sdn Bhd



**PROJECT INFORMATION**

**City:** Pulau Pinang  
**Country:** Malaysia  
**Project Startup:** 2022  
**Project Completion:** 2023  
**Type of AWCS:** Gravity System  
**Total Pipe Length:** 10m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 8.9 metric tons



**Utropolis Batu Kawan Plot 1**  
Paramount Property



**PROJECT INFORMATION**

**City:** Pulau Pinang  
**Country:** Malaysia  
**Project Startup:** 2017  
**Project Completion:** 2018  
**Type of AWCS:** Hybrid System  
**Total Pipe Length:** 407m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 4.2 metric tons



**Suasana @ Utropolis**  
Paramount Property



**PROJECT INFORMATION**

**City:** Pulau Pinang  
**Country:** Malaysia  
**Project Startup:** 2018  
**Project Completion:** 2020  
**Type of AWCS:** Hybrid System  
**Total Pipe Length:** 163m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 1.8 metric tons



# MALAYSIA REFERENCES



**Anggun Residences @ Design Village**  
PE Land



**PROJECT INFORMATION**

**City:** Pulau Pinang  
**Country:** Malaysia  
**Project Startup:** 2022  
**Project Completion:** 2024  
**Type of AWCS:** Shuttle System  
**Total Pipe Length:** 93m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 12.1 metric tons



**PE LAND**  
PENANG



**One Tebrau**  
Distinctive Properties



**PROJECT INFORMATION**

**City:** Johor  
**Country:** Malaysia  
**Project Startup:** 2013  
**Project Completion:** 2015  
**Type of AWCS:** Hybrid System  
**Total Pipe Length:** 430m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 3.37 metric tons



**Distinctive**  
Group of Companies



**Iskandar Residences**  
Distinctive Properties



**ISKANDAR**  
residences

**PROJECT INFORMATION**

**City:** Johor  
**Country:** Malaysia  
**Project Startup:** 2014  
**Project Completion:** 2017  
**Type of AWCS:** Gravity Vacuum System  
**Total Pipe Length:** 615m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 5.65 metric tons



**Distinctive**  
Group of Companies





# MALAYSIA REFERENCES



**Suasana Iskandar**  
UM Land



## PROJECT INFORMATION

**City:** Johor  
**Country:** Malaysia  
**Project Startup:** 2014  
**Project Completion:** 2016  
**Type of AWCS:** Hybrid System  
**Total Pipe Length:** 128m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 15.6 metric tons



**UM City Medini Lakeside**  
UM Land



## PROJECT INFORMATION

**City:** Johor  
**Country:** Malaysia  
**Project Startup:** 2016  
**Project Completion:** 2018  
**Type of AWCS:** Hybrid System  
**Total Pipe Length:** 607m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 3.4 metric tons



**Star Residences**  
Alpine Return Sdn Bhd



## PROJECT INFORMATION

**City:** Kuala Lumpur  
**Country:** Malaysia  
**Project Startup:** 2016  
**Project Completion:** 2019  
**Type of AWCS:** Hybrid System  
**Total Pipe Length:**  
**Number of Fractions:** 1  
**Estimated Waste per Day:** metric tons



# MALAYSIA REFERENCES



**Paragon Suites**  
Joland Group



**PROJECT INFORMATION**

**City:** Johor  
**Country:** Malaysia  
**Project Startup:** 2014  
**Project Completion:** 2016  
**Type of AWCS:** Gravity Vacuum System  
**Total Pipe Length:** 257m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 2.6 metric tons



**Paragon Residences**  
Joland Group



**PROJECT INFORMATION**

**City:** Johor  
**Country:** Malaysia  
**Project Startup:** 2013  
**Project Completion:** 2015  
**Type of AWCS:** Hybrid System  
**Total Pipe Length:** 120m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 1.28 metric tons



**Imperia Puteri Harbour**  
UEM Land



**PROJECT INFORMATION**

**City:** Johor  
**Country:** Malaysia  
**Project Startup:** 2012  
**Project Completion:** 2014  
**Type of AWCS:** Hybrid System  
**Total Pipe Length:** 200m  
**Number of Fractions:** 1  
**Estimated Waste per Day:** 0.7 metric tons





# MALAYSIA REFERENCES



**Tropez Residences**  
Tropicana Danga Bay



## PROJECT INFORMATION

City: Johor  
Country: Malaysia  
Project Startup: 2012  
Project Completion: 2014  
Type of AWCS: Hybrid System  
Total Pipe Length: 350m  
Number of Fractions: 1  
Estimated Waste/Day: 2.84 metric tons



TROPICANA  
DANGA BAY  
ISKANDAR MALAYSIA



**Hatten City**  
Hatten Group



## PROJECT INFORMATION

City: Melaka  
Country: Malaysia  
Project Startup: 2013  
Project Completion: 2014  
Type of AWCS: Hybrid System  
Total Pipe Length: 360m  
Number of Fractions: 1  
Estimated Waste/Day: 2.38 metric tons



**Atlantis Residences**  
Asal Harta Sdn Bhd



## PROJECT INFORMATION

City: Melaka  
Country: Malaysia  
Project Startup: 2015  
Project Completion: 2018  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 326m  
Number of Fractions: 1  
Estimated Waste/Day: 5.1 metric tons



Building up your assets  
TELADAN SETIA SDN. BHD.



# MALAYSIA REFERENCES



**The Green**  
 Jaya Mapan Sdn Bhd 

**PROJECT INFORMATION**

**City:** Melaka  
**Country:** Malaysia  
**Project Startup:** 2015  
**Project Completion:** 2017  
**Type of AWCS:** Hybrid System  
**Total Pipe Length:** 311m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 2.6metric tons



**Bali Residences**  
 Teladan Setia 

**PROJECT INFORMATION**

**City:** Melaka  
**Country:** Malaysia  
**Project Startup:** 2019  
**Project Completion:** 2021  
**Type of AWCS:** Hybrid System  
**Total Pipe Length:** 300m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 3.31 metric tons



**Curvo Residences**  
 Skyworld Property Sdn Bhd

**PROJECT INFORMATION**

**City:** Setapak  
**Country:** Malaysia  
**Project Startup:** 2023  
**Project Completion:** 2026  
**Type of AWCS:** Shuttle System  
**Total Pipe Length:** 174 m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 3.11 metric tons





# MALAYSIA REFERENCES



**Savana @ Ultropolis**  
Paramount Property Sdn Bhd

## PROJECT INFORMATION

**City: Penang**

**Country: Malaysia**

**Project Startup: 2023**

**Project Completion: 2025**

**Type of AWCS: Gravity Vacuum System**

**Total Pipe Length: 118 m**

**Number of Fractions: 1**

**Estimated Waste/Day: 1.96 metric tons**

**PARAMOUNT**  
PROPERTY

**STREAM** 

# SINGAPORE REFERENCES



**Changi Airport Terminal 4**  
Changi Airport Group

### PROJECT INFORMATION

Country: Singapore  
Project Startup: 2014  
Project Completion: 2016  
Type of AWCS: Full Vacuum System  
Total Pipe Length: 1000m  
Number of Fractions: 1  
Estimated Waste per Day: 8 metric tons



**Changi Airport Terminal 3**  
Changi Airport Group

### PROJECT INFORMATION

Country: Singapore  
Project Startup: 2004  
Project Completion: 2007  
Type of AWCS: Full Vacuum System  
Total Pipe Length: 2000m  
Number of Fractions: 1  
Estimated Waste per Day: 10 metric tons



**Singapore In-Flight Catering Centre 2**  
SATS Catering

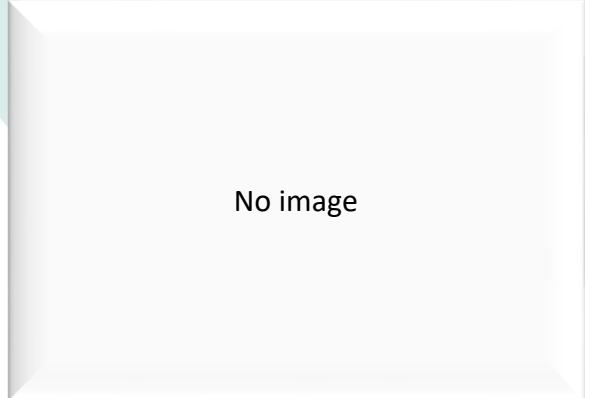
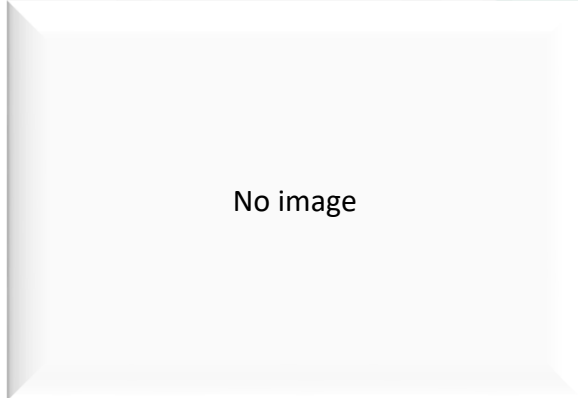
### PROJECT INFORMATION

Country: Singapore  
Project Startup: 2010  
Project Completion: 2010  
Type of AWCS: Full Vacuum System  
Total Pipe Length: 200m  
Number of Fractions: 1  
Estimated Waste/Day: 6 metric tons





# SINGAPORE REFERENCES



**Singapore In-Flight Catering Centre 1**  
SATS Catering Pte Ltd

**Ministry of Home Affairs**  
Government of Singapore

**National Service Hub**  
MINDEF

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2022  
Project Completion: 2023  
Type of AWCS: Full Vacuum System  
Total Pipe Length: 250m  
Number of Fraction: 1  
Estimated Waste / Day: 6.4 metric tons

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 1999  
Project Completion: 2001  
Type of AWCS: Full Vacuum System  
Total Pipe Length: 980m  
Number of Fractions: 1  
Estimated Waste/Day: 1 metric tons

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2022  
Project Completion: 2023  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 550m  
Number of Fraction: 1  
Estimated Waste / Day: 5.3 metric tons



# SINGAPORE REFERENCES



**Changi General Hospital  
(Medical Centre)**  
Singapore Ministry of Health

**PROJECT INFORMATION**

Country: Singapore  
 Project Startup: 2014  
 Project Completion: 2017  
 Type of AWCS: Gravity Vacuum System  
 Total Pipe Length: 200m  
 Number of Fractions: 1  
 Estimated Waste/Day: 12 metric tons



**Changi General Hospital  
(Integrated Building)**  
Singapore Ministry of Health

**PROJECT INFORMATION**

Country: Singapore  
 Project Startup: 2013  
 Project Completion: 2017  
 Type of AWCS: Full Vacuum System  
 Total Pipe Length: 500m  
 Number of Fractions: 2  
 Estimated Waste/Day: 2 metric tons  
 Estimated Linen/day : 2,390pcs



**Singapore General Hospital  
(Outram Community Hospital)**  
Singapore Ministry of Health

**PROJECT INFORMATION**

Country: Singapore  
 Project Startup: 2016  
 Project Completion: 2019  
 Type of AWCS: Gravity Vacuum System  
 Total Pipe Length: 300m  
 Number of Fractions: 2  
 Estimated Waste/Day: 5 metric tons





# SINGAPORE REFERENCES



**Singapore National Cancer Centre**  
Singapore Ministry of Health

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2017  
Project Completion: 2020  
Type of AWCS: Full Vacuum System  
Total Pipe Length: 140m  
Number of Fractions: 2  
Estimated Waste/Day: 2 metric tons



**Integrated Care Hub**  
Singapore Ministry of Health

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2017  
Project Completion: 2021  
Type of AWCS: Full Vacuum System  
Total Pipe Length: 260m  
Number of Fractions: 2  
Estimated Waste/Day: 5 metric tons



**Woodlands Health Campus**  
Singapore Ministry of Health

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2018  
Project Completion: 2021  
Type of AWCS: Full Vacuum System  
Total Pipe Length: 2,200m  
Number of Fractions: 3  
Estimated Waste/Day: 17 metric tons



# SINGAPORE REFERENCES



**Mount Elizabeth Novena Hospital**  
Parkway Group Healthcare

## PROJECT INFORMATION

Country: Singapore  
 Project Startup: 2010  
 Project Completion: 2012  
 Type of AWCS: Gravity Vacuum System  
 Total Pipe Length: 250m  
 Number of Fractions: 1  
 Estimated Waste/Day: 1.5 metric tons



**West Plain**  
Housing & Development Board (HDB Singapore)

## PROJECT INFORMATION

Country: Singapore  
 Project Startup: 2016  
 Project Completion: 2019  
 Type of AWCS: Gravity Vacuum System  
 Total Pipe Length: 1200m  
 Number of Fractions: 2  
 Estimated Waste/Day: 8 metric tons



**Tampines Green Ridges**  
Housing & Development Board (HDB Singapore)

## PROJECT INFORMATION

Country: Singapore  
 Project Startup: 2015  
 Project Completion: 2017  
 Type of AWCS: Gravity Vacuum System  
 Total Pipe Length: 2000m  
 Number of Fractions: 2  
 Estimated Waste/Day: 5.8 metric tons



# SINGAPORE REFERENCES



**Resort World, Sentosa**  
Genting International

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2008  
Project Completion: 2009  
Type of AWCS: Full Vacuum System  
Total Pipe Length: 1900m  
Number of Fractions: 1  
Estimated Waste/Day: 30 metric tons



**Biopolis Phase 3**  
Crescendas Bionix

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2009  
Project Completion: 2010  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 200m  
Number of Fractions: 1  
Estimated Waste/Day: 1.2 metric tons



**Bulim Square**  
JTC Corporation

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2019  
Project Completion: 2022  
Type of AWCS: Shuttle System  
Total Pipe Length: 600m  
Number of Fraction: 1  
Estimated Waste / Day: 2.0 metric tons





# SINGAPORE REFERENCES



**Wallich Residence (Tanjung Pagar Centre)**  
Guocoland

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2013  
Project Completion: 2016  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 280m  
Number of Fractions: 2  
Estimated Waste/Day: 0.5 metric tons



**Martin Modern**  
Guocoland

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2017  
Project Completion: 2019  
Type of AWCS: Shuttle System  
Total Pipe Length: 200m  
Number of Fractions: 2  
Estimated Waste/Day: 1.5/0.5 metric tons



**Meyer Mansion**  
Guocoland Ltd

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2019  
Project Completion: 2022  
Type of AWCS: Shuttle System  
Total Pipe Length: 200m  
Number of Fraction: 2  
Estimated Waste / Day: 0.6/0.2 metric tons



# SINGAPORE REFERENCES



**Midtown Bay**  
Guocoland

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2019  
Project Completion: 2022  
Type of AWCS: Shuttle System  
Total Pipe Length: 100m  
Number of Fraction: 2  
Estimated Waste / Day: 0.7/0.2 metric tons



**Midtown Modern**  
Guocoland

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2020  
Project Completion: 2023  
Type of AWCS: Gravity Vacuum  
Total Pipe Length: 400m  
Number of Fraction: 2  
Estimated Waste / Day: 1.5/0.5 metric tons



**Lentor Modern**  
Guocoland Limited

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2022  
Project Completion: 2025  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 260m  
Number of Fraction: 2  
Estimated Waste / Day: TBC metric tons



# SINGAPORE REFERENCES



**The Garden Residences**  
Keppel Land

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2018  
Project Completion: 2021  
Type of AWCS: Shuttle System  
Total Pipe Length: 350m  
Number of Fraction: 1  
Estimated Waste / Day: 1.8 metric tons



**19 Nassim**  
Keppel Land

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2019  
Project Completion: 2022  
Type of AWCS: Shuttle System  
Total Pipe Length: 100m  
Number of Fraction: 2  
Estimated Waste / Day: 0.3/0.1 metric tons



**Eden Residences**  
Capitol Retail Development

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2012  
Project Completion: 2014  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 120m  
Number of Fractions: 1  
Estimated Waste/Day: 0.1 metric tons





# SINGAPORE REFERENCES



**North Gaia**  
Sing Holdings Pte Ltd

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2022  
Project Completion: 2024  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 600m  
Number of Fraction: 2  
Estimated Waste / Day: 4.4/1.4 metric tons



**High Park Residences**  
CEL Development Pte Ltd

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2015  
Project Completion: 2018  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 400m  
Number of Fractions: 1  
Estimated Waste/Day: 4.2 metric tons



**Grandeur Park Residences**  
CEL Development Pte Ltd

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2017  
Project Completion: 2019  
Type of AWCS: Shuttle System  
Total Pipe Length: 430m  
Number of Fractions: 1  
Estimated Waste/Day: 2.2 metric tons



# SINGAPORE REFERENCES



**Cairnhill Nine**  
CH Residential

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2013  
Project Completion: 2016  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 150m  
Number of Fractions: 1  
Estimated Waste/Day: 1.1 metric tons



**Sky Vue**  
Capital Land

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2013  
Project Completion: 2016  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 380m  
Number of Fractions: 1  
Estimated Waste/Day: 2.1 metric tons



**One Pearl Bank**  
Capitaland Ltd

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2019  
Project Completion: 2023  
Type of AWCS: Shuttle System  
Total Pipe Length 150m  
Number of Fraction: 2  
Estimated Waste / Day: 2.5/0.8 metric tons



# SINGAPORE REFERENCES



**Amber 45**  
UOL Group

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2017  
Project Completion: 2019  
Type of AWCS: Shuttle System  
Total Pipe Length: 70m  
Number of Fractions: 1  
Estimated Waste/Day: 0.5 metric tons



**The Clement Canopy**  
UOL Group

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2017  
Project Completion: 2019  
Type of AWCS: Shuttle System  
Total Pipe Length: 160m  
Number of Fractions: 1  
Estimated Waste/Day: 1.5 metric tons



**Katong Regency**  
UOL Group

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2012  
Project Completion: 2015  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 350m  
Number of Fractions: 1  
Estimated Waste/Day: 1 metric tons





# SINGAPORE REFERENCES



**Meyer House**  
UOL Group Ltd

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2018  
Project Completion: 2021  
Type of AWCS: Shuttle System  
Total Pipe Length: 400m  
Number of Fraction: 1  
Estimated Waste / Day: 0.2 metric tons



**Avenue South Residence**  
UOL Group Ltd

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2019  
Project Completion: 2022  
Type of AWCS: Shuttle System  
Total Pipe Length: 150m  
Number of Fraction: 2  
Estimated Waste / Day: 3.0/1.0 metric tons



**Clavon**  
UOL Group Ltd / United Industrial Corporation

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2020  
Project Completion: 2023  
Type of AWCS: Shuttle System  
Total Pipe Length: 250m  
Number of Fraction: 2  
Estimated Waste / Day: 2.0/0.6 metric tons



# SINGAPORE REFERENCES



**Queens Peak**  
MCC Land

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2017  
Project Completion: 2019  
Type of AWCS: Shuttle System  
Total Pipe Length: 220m  
Number of Fractions: 1  
Estimated Waste/Day: 2.2 metric tons



MCC LAND (SINGAPORE) PTE LTD  
中治地產(新加坡)有限公司



**The Poiz Residence**  
MCC Land

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2016  
Project Completion: 2018  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 580m  
Number of Fractions: 1  
Estimated Waste/Day: 2.2 metric tons



MCC LAND (SINGAPORE) PTE LTD  
中治地產(新加坡)有限公司



**H<sub>2</sub>O Residences**  
City Development Limited

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2011  
Project Completion: 2015  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 550m  
Number of Fractions: 2  
Estimated Waste/Day: 2.0 metric tons



CITY  
DEVELOPMENTS  
LIMITED



# SINGAPORE REFERENCES



**UP @ Robertson Quay**  
City Development Limited

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2012  
Project Completion: 2014  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 100m  
Number of Fractions: 2  
Estimated Waste/Day: 0.3 metric tons



**Blossom Residences**  
City Development Limited

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2012  
Project Completion: 2014  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 420m  
Number of Fractions: 1  
Estimated Waste/Day: 1.8 metric tons



**The Rainforest Condominium**  
City Development Limited

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2012  
Project Completion: 2015  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 450m  
Number of Fractions: 1  
Estimated Waste/Day: 1.4 metric tons





# SINGAPORE REFERENCES



**Gramercy Park**  
City Development Limited

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2012  
Project Completion: 2016  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 250m  
Number of Fractions: 2  
Estimated Waste/Day: 0.5 metric tons



**The Brownstone**  
City Development Limited

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2014  
Project Completion: 2017  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 600m  
Number of Fractions: 1  
Estimated Waste/Day: 2.0 metric tons



**Venue Residences**  
City Development Limited

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2014  
Project Completion: 2017  
Type of AWCS: Shuttle System  
Total Pipe Length: 200m  
Number of Fractions: 1  
Estimated Waste/Day: 0.8 metric tons



# SINGAPORE REFERENCES



**Orchard Boulevard Mixed Development**  
City Development Limited

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2017  
Project Completion: 2021  
Type of AWCS: Shuttle System  
Total Pipe Length: 120m  
Number of Fractions: 2  
Estimated Waste/Day: 0.6 metric tons



**Piermount Grand**  
City Developments Ltd

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2019  
Project Completion: 2022  
Type of AWCS: Shuttle System  
Total Pipe Length: 700m  
Number of Fraction: 2  
Estimated Waste / Day: 2.5/0.8 metric tons



**Amber Park**  
City Developments Ltd

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2019  
Project Completion: 2022  
Type of AWCS: Shuttle System  
Total Pipe Length: 550m  
Number of Fraction: 2  
Estimated Waste / Day: 2.0/0.5 metric tons



# SINGAPORE REFERENCES



## Bartley Residences

Hong Leong Group / City Development Limited

### PROJECT INFORMATION

Country: Singapore  
Project Startup: 2012  
Project Completion: 2015  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 540m  
Number of Fractions: 1  
Estimated Waste/Day: 2.1 metric tons



## The Avenir

Hong Leong Group / City Development Limited

### PROJECT INFORMATION

Country: Singapore  
Project Startup: 2020  
Project Completion: 2022  
Type of AWCS: Shuttle System  
Total Pipe Length: 250m  
Number of Fraction: 2  
Estimated Waste / Day: 1.0/0.3 metric tons



## Penrose

City Developments Ltd / Hong Leong Holdings Ltd

### PROJECT INFORMATION

Country: Singapore  
Project Startup: 2020  
Project Completion: 2023  
Type of AWCS: Shuttle System  
Total Pipe Length: 300m  
Number of Fraction: 2  
Estimated Waste / Day: 1.7/0.5 metric tons





# SINGAPORE REFERENCES



**Aalto Condominium**  
Hong Leong Group

### PROJECT INFORMATION

Country: Singapore  
Project Startup: 2008  
Project Completion: 2010  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 200m  
Number of Fractions: 1  
Estimated Waste/Day: 0.6 metric tons



**One Balmoral**  
Hong Leong Group

### PROJECT INFORMATION

Country: Singapore  
Project Startup: 2012  
Project Completion: 2014  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 230m  
Number of Fractions: 1  
Estimated Waste/Day: 1 metric tons



**Meyer Rise Condominium**  
Hong Leong Group

### PROJECT INFORMATION

Country: Singapore  
Project Startup: 2011  
Project Completion: 2014  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 240m  
Number of Fractions: 1  
Estimated Waste/Day: 0.7 metric tons



# SINGAPORE REFERENCES



**The Jovell**  
Hong Leong Holdings Ltd.

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2018  
Project Completion: 2021  
Type of AWCS: Shuttle System  
Total Pipe Length: 550m  
Number of Fraction: 1  
Estimated Waste / Day: 1.5 metric tons



**J-Gateway**  
MCL Land

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2013  
Project Completion: 2015  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 220m  
Number of Fractions: 1  
Estimated Waste/Day: 2.2 metric tons



**Lake Grande**  
MCL Land

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2016  
Project Completion: 2019  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 350m  
Number of Fractions: 1  
Estimated Waste/Day: 2.1 metric tons



# SINGAPORE REFERENCES



**Margaret Ville**  
MCL Land

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2018  
Project Completion: 2021  
Type of AWCS: Shuttle System  
Total Pipe Length: 150m  
Number of Fraction: 1  
Estimated Waste / Day: 1 metric ton



**Parc Esta**  
MCL Land

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2018  
Project Completion: 2021  
Type of AWCS: Shuttle System  
Total Pipe Length: 700m  
Number of Fraction: 1  
Estimated Waste / Day: 4.5 metric tons



**Parvis Condominium**  
MCL Land / Ho Bee

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2009  
Project Completion: 2013  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 500m  
Number of Fractions: 1  
Estimated Waste/Day: 0.6 metric tons





# SINGAPORE REFERENCES



**Leedon Green**  
MCL Land Ltd / Yanlord Land Group Ltd

**PROJECT INFORMATION**

Country: Singapore  
 Project Startup: 2020  
 Project Completion: 2022  
 Type of AWCS: Gravity Vacuum  
 Total Pipe Length: 600m  
 Number of Fraction: 2  
 Estimated Waste / Day: 2.0/0.6 metric tons



**Dakota Residences**  
Ho Bee / ChoiceHomes

**PROJECT INFORMATION**

Country: Singapore  
 Project Startup: 2008  
 Project Completion: 2010  
 Type of AWCS: Gravity Vacuum System  
 Total Pipe Length: 240m  
 Number of Fractions: 1  
 Estimated Waste/Day: 0.9 metric tons



**Alex Residences**  
Singland

**PROJECT INFORMATION**

Country: Singapore  
 Project Startup: 2014  
 Project Completion: 2017  
 Type of AWCS: Gravity Vacuum System  
 Total Pipe Length: 120m  
 Number of Fractions: 1  
 Estimated Waste per Day: 1.3 metric tons



# SINGAPORE REFERENCES



**Le Quest**  
Qingjian Realty Pte Ltd

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2017  
Project Completion: 2019  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 350m  
Number of Fractions: 1  
Estimated Waste/Day: 1.5 metric tons



**Jade Scape**  
Qingjian Realty Pte Ltd

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2018  
Project Completion: 2021  
Type of AWCS: Shuttle System  
Total Pipe Length: 650m  
Number of Fraction: 1  
Estimated Waste / Day: 3.6 metric tons



**Forett at Bukit Timah**  
Qingjian Realty Pte Ltd

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2020  
Project Completion: 2023  
Type of AWCS: Shuttle System  
Total Pipe Length: 950m  
Number of Fraction: 2  
Estimated Waste / Day: 2.0/0.6 metric tons



# SINGAPORE REFERENCES



**The Gazania**  
SingHaiyi Group Ltd

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2019  
Project Completion: 2022  
Type of AWCS: Shuttle System  
Total Pipe Length: 400m  
Number of Fraction: 1  
Estimated Waste / Day: 0.8 metric tons



**Parc Clematis**  
SingHaiyi Group Ltd

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2020  
Project Completion: 2022  
Type of AWCS: Shuttle System  
Total Pipe Length: 1,250m  
Number of Fraction: 2  
Estimated Waste / Day: 4.5/1.5 metric tons



**Parc Central Residences**  
Hoi Hup Realty Pte Ltd / Sunway Group

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2019  
Project Completion: 2022  
Type of AWCS: Shuttle System  
Total Pipe Length: 750m  
Number of Fraction: 2  
Estimated Waste / Day: 2.0/0.6 metric tons





# SINGAPORE REFERENCES



## Stirling Residences

Nanshan Group / Logan Property Holdings

### PROJECT INFORMATION

Country: Singapore  
Project Startup: 2018  
Project Completion: 2021  
Type of AWCS: Shuttle System  
Total Pipe Length: 350m  
Number of Fractions: 1  
Estimated Waste/Day: 3.8 metric tons



## The Florence Residences

Logan Property Holdings

### PROJECT INFORMATION

Country: Singapore  
Project Startup: 2019  
Project Completion: 2022  
Type of AWCS: Shuttle System  
Total Pipe Length: 700m  
Number of Fraction: 1  
Estimated Waste / Day: 4.5 metric tons



## Sky Everton

Sustained Land Pte Ltd

### PROJECT INFORMATION

Country: Singapore  
Project Startup: 2020  
Project Completion: 2022  
Type of AWCS: Shuttle System  
Total Pipe Length: 100m  
Number of Fraction: 2  
Estimated Waste / Day: 1.0/0.3 metric tons



# SINGAPORE REFERENCES



**Twin View**  
CSC Land Group

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2018  
Project Completion: 2021  
Type of AWCS: Shuttle System  
Total Pipe Length: 150m  
Number of Fraction: 1  
Estimated Waste / Day: 1.6 metric tons



**Riverfront Residences**  
Oxley Holdings Group

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2018  
Project Completion: 2022  
Type of AWCS: Shuttle System  
Total Pipe Length: 1,000m  
Number of Fraction: 1  
Estimated Waste / Day: 4.5 metric tons



**One Normanton Park**  
Kingsford Development Pte Ltd

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2019  
Project Completion: 2022  
Type of AWCS: Shuttle System  
Total Pipe Length: 1,200m  
Number of Fraction: 2  
Estimated Waste / Day: 5.6/1.7 metric tons



# SINGAPORE REFERENCES



**Pullman Residences**  
EL Development Pte Ltd

## PROJECT INFORMATION

Country: Singapore  
 Project Startup: 2020  
 Project Completion: 2022  
 Type of AWCS: Shuttle System  
 Total Pipe Length: 100m  
 Number of Fraction: 2  
 Estimated Waste / Day: 1.0/0.3 metric tons



**Artra Condo**  
FEC Skyline Pte Ltd

## PROJECT INFORMATION

Country: Singapore  
 Project Startup: 2017  
 Project Completion: 2019  
 Type of AWCS: Shuttle System  
 Total Pipe Length: 120m  
 Number of Fractions: 1  
 Estimated Waste/Day: 1.2 metric tons



**Hyll on Holland**  
Far East Consortium / Koh Brothers

## PROJECT INFORMATION

Country: Singapore  
 Project Startup: 2020  
 Project Completion: 2022  
 Type of AWCS: Shuttle System  
 Total Pipe Length: 500m  
 Number of Fraction: 2  
 Estimated Waste / Day: 1.0/0.3 metric tons



遠東發展有限公司  
 Far East Consortium International Limited



KOH BROTHERS  
 DEVELOPMENT  
 PTE LTD





# SINGAPORE REFERENCES



**Dairy Farm Residences**  
United Engineers Limited

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2020  
Project Completion: 2022  
Type of AWCS: Shuttle System  
Total Pipe Length: 250m  
Number of Fraction: 2  
Estimated Waste / Day: 1.5/0.5 metric tons



**Kopar at Newton**  
Chip Eng Seng Corporation Ltd

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2019  
Project Completion: 2022  
Type of AWCS: Shuttle System  
Total Pipe Length: 200m  
Number of Fraction: 2  
Estimated Waste / Day: 1.0/0.3 metric tons



**Park Nova**  
Shun Tak Holdings

## PROJECT INFORMATION

Country: Singapore  
Project Startup: 2021  
Project Completion: 2023  
Type of AWCS: Shuttle System  
Total Pipe Length: 100m  
Number of Fraction: 2  
Estimated Waste / Day: 0.2/0.1 metric tons



# SINGAPORE REFERENCES



**The Crest**  
Wing Crown Investment

**PROJECT INFORMATION**

Country: Singapore  
 Project Startup: 2013  
 Project Completion: 2015  
 Type of AWCS: Gravity Vacuum System  
 Total Pipe Length: 680m  
 Number of Fractions: 1  
 Estimated Waste/Day: 1.4 metric tons



**The M**  
Wing Charm Investment Pte Ltd

**PROJECT INFORMATION**

Country: Singapore  
 Project Startup: 2020  
 Project Completion: 2022  
 Type of AWCS: Shuttle System  
 Total Pipe Length: 250m  
 Number of Fraction: 2  
 Estimated Waste / Day: 1.6/0.5 metric tons



**Canning Hill Piers**  
City Developments Limited /  
CapitaLand Limited

**PROJECT INFORMATION**

Country: Singapore  
 Project Startup: TBC  
 Project Completion: TBC  
 Type of AWCS: Shuttle System  
 Total Pipe Length: 150m  
 Number of Fraction: 1  
 Estimated Waste / Day: TBC metric tons



# SINGAPORE REFERENCES



## Piccadilly Grand

City Developments Limited / MCL Land Limited

### PROJECT INFORMATION

Country: Singapore

Project Startup: 2021

Project Completion: 2025

Type of AWCS: Shuttle System

Total Pipe Length: 200m

Number of Fraction: 2

Estimated Waste / Day: 3.7/1.2 metric tons



## AMO Residences

United Venture Development (2021) Pte Ltd

### PROJECT INFORMATION

Country: Singapore

Project Startup: 2022

Project Completion: 2025

Type of AWCS: Shuttle System

Total Pipe Length: 220m

Number of Fraction: 2

Estimated Waste / Day: 2.7/0.9 metric tons



**MCL Land**  
A Hongkong Land company





## MIDDLE EAST REFERENCES



**Al Dana Island, Al Raha Beach**  
ALDAR PJSC

### PROJECT INFORMATION

City: Abu Dhabi  
Country: United Arab Emirates  
Project Startup: 2015  
Project Completion: 2016  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 2500m  
Number of Fractions: 2  
Estimated Waste/Day: 15.3 metric tons



**Plot RBW4-12, Al Raha Beach Development**  
ALDAR PJSC

### PROJECT INFORMATION

City: Abu Dhabi  
Country: United Arab Emirates  
Project Startup: 2015  
Project Completion: 2016  
Type of AWCS: Hybrid System  
Total Pipe Length: 70m  
Number of Fractions: 2  
Estimated Waste/Day: 0.7 metric tons



**Al Raha Beach Development, Phase II**  
ALDAR PJSC

### PROJECT INFORMATION

City: Abu Dhabi  
Country: United Arab Emirates  
Project Startup: 2015  
Project Completion: 2017  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 6500m  
Number of Fractions: 2  
Estimated Waste/Day: 115 metric tons



# MIDDLE EAST REFERENCES



**YAS Mall**  
ALDAR PJSC

**PROJECT INFORMATION**

City: Abu Dhabi  
 Country: United Arab Emirates  
 Project Startup: 2011  
 Project Completion: 2014  
 Type of AWCS: Gravity Vacuum System  
 Total Pipe Length: 1900m  
 Number of Fractions: 2  
 Estimated Waste/Day: 21 metric tons



**ALDAR Headquarters Al Raha Beach**  
ALDAR PJSC

**PROJECT INFORMATION**

City: Abu Dhabi  
 Country: United Arab Emirates  
 Project Startup: 2009  
 Project Completion: 2011  
 Type of AWCS: Gravity Vacuum System  
 Total Pipe Length: 400m  
 Number of Fractions: 2  
 Estimated Waste/Day: 3.4 metric tons



**Al Zeina Al Raha Beach**  
ALDAR PJSC

**PROJECT INFORMATION**

City: Abu Dhabi  
 Country: United Arab Emirates  
 Project Startup: 2009  
 Project Completion: 2011  
 Type of AWCS: Gravity Vacuum System  
 Total Pipe Length: 2800m  
 Number of Fractions: 2  
 Estimated Waste/Day: 19 metric tons





## MIDDLE EAST REFERENCES



**Al Bandar Al Raha Beach**  
ALDAR PJSC

### PROJECT INFORMATION

City: Abu Dhabi  
Country: United Arab Emirates  
Project Startup: 2009  
Project Completion: 2011  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 1100m  
Number of Fractions: 2  
Estimated Waste/Day: 3.1 metric tons



**Al Muneera Al Raha Beach**  
ALDAR PJSC

### PROJECT INFORMATION

City: Abu Dhabi  
Country: United Arab Emirates  
Project Startup: 2009  
Project Completion: 2011  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 2000m  
Number of Fractions: 2  
Estimated Waste/Day: 8 metric tons



**Residential Development Plot RBW6-10**  
AABAR

### PROJECT INFORMATION

City: Abu Dhabi  
Country: United Arab Emirates  
Project Startup: 2014  
Project Completion: 2015  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 441m  
Number of Fractions: 2  
Estimated Waste/Day: 2.09 metric tons

**aabar**





## MIDDLE EAST REFERENCES



**ADNIC Residential Plot**  
ADNIC

### PROJECT INFORMATION

City: Abu Dhabi  
Country: United Arab Emirates  
Project Startup: 2013  
Project Completion: 2013  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 174m  
Number of Fractions: 2  
Estimated Waste/Day: 0.84 metric tons



**ADNIC Commercial Plot**  
ADNIC

### PROJECT INFORMATION

City: Abu Dhabi  
Country: United Arab Emirates  
Project Startup: 2014  
Project Completion: 2014  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 28m  
Number of Fractions: 2  
Estimated Waste/Day: 0.49 metric tons



**Plot RBW3-20**  
Flourish Land Holdings Ltd

### PROJECT INFORMATION

City: Abu Dhabi  
Country: United Arab Emirates  
Project Startup: 2019  
Project Completion: 2020  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 46m  
Number of Fractions: 2  
Estimated Waste/Day: 0.58 metric tons



## MIDDLE EAST REFERENCES



**RBW8-C10**  
Links Investment

### PROJECT INFORMATION

City: Abu Dhabi  
Country: United Arab Emirates  
Project Startup: 2020  
Project Completion: 2021  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 80m  
Number of Fractions: 2  
Estimated Waste/Day: 0.75 metric tons



**RBW8-C15**  
Links Investment

### PROJECT INFORMATION

City: Abu Dhabi  
Country: United Arab Emirates  
Project Startup: 2020  
Project Completion: 2021  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 89m  
Number of Fractions: 2  
Estimated Waste/Day: 0.75 metric tons



**Marina Square Reem Island**  
Al Tamouh Investments LLC

### PROJECT INFORMATION

City: Abu Dhabi  
Country: United Arab Emirates  
Project Startup: 2008  
Project Completion: 2010  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 4000m  
Number of Fractions: 1  
Estimated Waste/Day: 27 metric tons

TAMOUH



## MIDDLE EAST REFERENCES



**Lu'aluat Island**  
National Projects & Construction LLC

### PROJECT INFORMATION

**City:** Abu Dhabi  
**Country:** United Arab Emirates  
**Project Startup:** 2015  
**Project Completion:** 2018  
**Type of AWCS:** Gravity Vacuum System  
**Total Pipe Length:** 1000m  
**Number of Fractions:** 2  
**Estimated Waste/Day:** 20 metric tons



**Qatar Petroleum District**  
Barwa

### PROJECT INFORMATION

**City:** Doha  
**Country:** Qatar  
**Project Startup:** 2010  
**Project Completion:** 2012  
**Type of AWCS:** Gravity Vacuum System  
**Total Pipe Length:** 800m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 12 metric tons



## INDIA



**Smart City India**  
DMIC IITGNL

### PROJECT INFORMATION

**City:** Noida  
**Country:** India  
**Project Startup:** 2016  
**Project Completion:** 2019  
**Type of AWCS:** Hybrid System  
**Total Pipe Length:** 10,000m  
**Number of Fractions:** 1  
**Estimated Waste/Day:** 60 metric tons





## HONG KONG



Hong Kong Cathay Pacific Catering Services (Expansion)  
Cathay Pacific Catering Services

### PROJECT INFORMATION

Country: China  
Project Startup: 2014  
Project Completion: 2016  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 120m  
Number of Fractions: 1  
Estimated Waste/Day: 17.3 metric tons

CATHAY PACIFIC  
CATERING SERVICES

## TAIWAN



Evergreen Sky Catering Corporation (Expansion)  
Evergreen Group

### PROJECT INFORMATION

Country: Taiwan  
Project Startup: 2016  
Project Completion: 2018  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 270m  
Number of Fractions: 1  
Estimated Waste/Day: 17 metric tons



長榮集團  
EVERGREEN GROUP

## AUSTRALIA



The Star Gold Coast  
The Star Entertainment Group

### PROJECT INFORMATION

Country: Australia  
Project Startup: 2019  
Project Completion: 2021  
Type of AWCS: Hybrid System  
Total Pipe Length: 180m  
Number of Fractions: 2  
Estimated Waste/Day: 14.4 metric tons



THE STAR

STREAM™

## AUSTRALIA



Queen's Wharf, Brisbane  
Destination Brisbane Consortium

### PROJECT INFORMATION

Country: Australia  
Project Startup: 2021  
Project Completion: 2023  
Type of AWCS: Hybrid System  
Total Pipe Length: 460m  
Number of Fractions: 2  
Estimated Waste/Day: 28 metric tons



DESTINATION  
BRISBANE  
CONSORTIUM

## CHINA



Cangzhou Hospital of Integrated  
Traditional Chinese and Western  
Medicine  
Ministry of Health P. R. China

### PROJECT INFORMATION

Country: China  
Project Startup: 2019  
Project Completion: 2022  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 605m  
Number of Beds: 1,200  
Number of Fractions: 2 (Waste & Linen)  
Estimated Waste/Day: 3.3 metric tons



Nantong Central Medical Complex  
Ministry of Health P. R. China

### PROJECT INFORMATION

Country: China  
Project Startup: 2019  
Project Completion: 2022  
Type of AWCS: Gravity Vacuum System  
Total Pipe Length: 926m  
Number of Beds: 2,000  
Number of Fractions: 2 (Waste & Linen)  
Estimated Waste/Day: 7.5 metric tons



# CHINA



**Gansu Province Women and Children  
Medical Centre**  
Ministry of Health P. R. China

## PROJECT INFORMATION

**Country: China**

**Project Startup: 2021**

**Project Completion: 2023**

**Type of AWCS: Hybrid System**

**Total Pipe Length: 1,270m**

**Number of Beds: 2,300**

**Number of Fractions: 2 (Waste & Linen)**

**Estimated Waste/Day: 8.2 metric tons**





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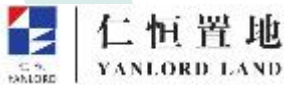
SEE HOY CHAN SDN. BERHAD  
(2244-V)



Alpine Return Sdn Bhd



# OUR CLIENTS (SINGAPORE):



## OUR CLIENTS (MIDDLE EAST):



## (CHINA):



## (HONG KONG):



## (TAIWAN):



## (INDIA):



## (AUSTRALIA):





# THANK YOU

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