Biorefinery Pilot Plant Installation at EECi Project

Project Brief Forum for EPC

Worley
energy | chemicals | resources

23 July 2020

This document is part of the Preliminary Study conducted by Worley for NSTDA Project - Biorefinery EPC at EECi. All finalized information will be provided in the Official TOR which will be announced later by NSTDA.

Forum Purpose

- To briefly give the overview of the Biorefinery Project to whom are interested in participating in the selection of the EPC contractor.
- To provide NSTDA procurement regulation and procedure for the selection of the EPC contractor

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Agenda

- Introduction
- Project Overview
- Scope of Work
- Project Key Milestone Plan
- Procurement Regulation and Procedure
- Pre-Qualification
- Selection Criteria
- Q&A

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INTRODUCTION

Project Background

- Thailand has high potential to push the development of the biorefinery industry as an important mechanism for the economic growth by using the key advantage, i.e. abundant availability of raw materials.

- The Biorefinery Industry is one of the strategic industries in accordance with the BCG Economy policy of the country.

- The development of EECi is responsible by the National Science and Technology Development Agency (NSTDA). NSTDA has established BIOPOLIS to support research and innovation development for bio-based industry.

More EECi information : https://www.eeci.or.th/

EECi Master Plan

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Building Construction Progress

INNOVATION ZONE 1 : EECi BIOPOLIS

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Project Progress

COMMISSIONING & START UP

BASIC DESIGN

- GMP
- Non-GMP
- Process Utility System
- Laboratory

EPC PHASE

- EPC period: 2 years
- Commencement of EPC work is within Q1 2021

CONCEPTUAL STUDY

Conceptual Study has been done by NSTDA consultant

EPC BIDDING

- Issue of EOI
- Meeting with interested groups
- Call for Pre-Qualification
- Preparation of TOR
- NSTDA bidding process

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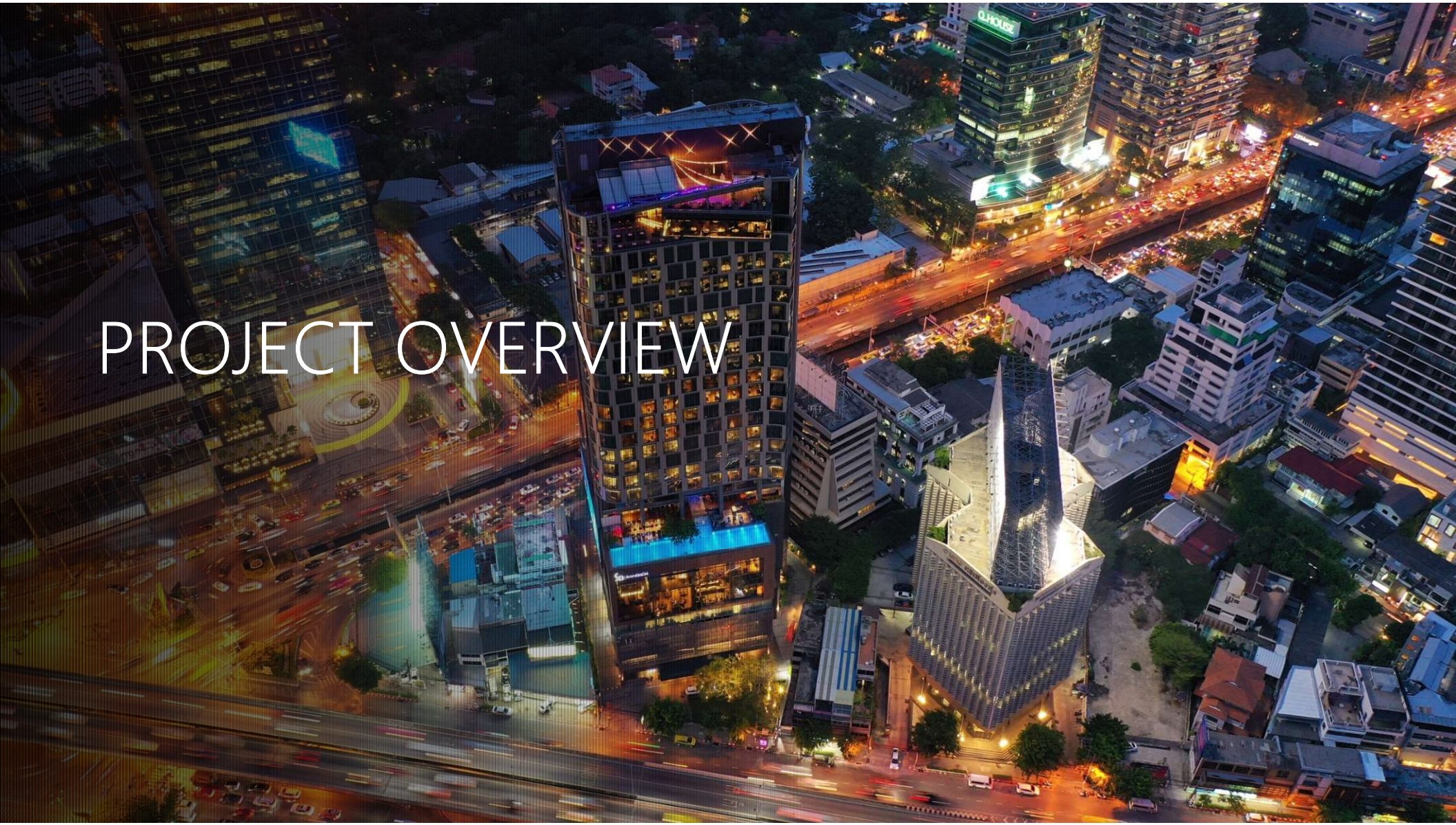

PROJECT OVERVIEW

Scope Overview : EPC Phase

NSTDA is seeking a contractor to conduct a lump sum EPC (Engineering, Procurement, Construction) project for the Biorefinery Pilot Plant at EECi.

- Perform Detailed Engineering, Procurement, Construction & Construction Management, Commissioning and Start Up.
- The project covers the followings:
  - *GMP Process Facility*
  - *Non-GMP Process Facility*
  - *Process Utilities*
  - *Laboratory Analytical Equipment*
  - *Laboratory Furniture and Utilities*
  - *Office, Meeting Room Furniture and Accessories*
- The detail of project requirements will be indicated in TOR which will be sent to EPC who interested for bidding this project.

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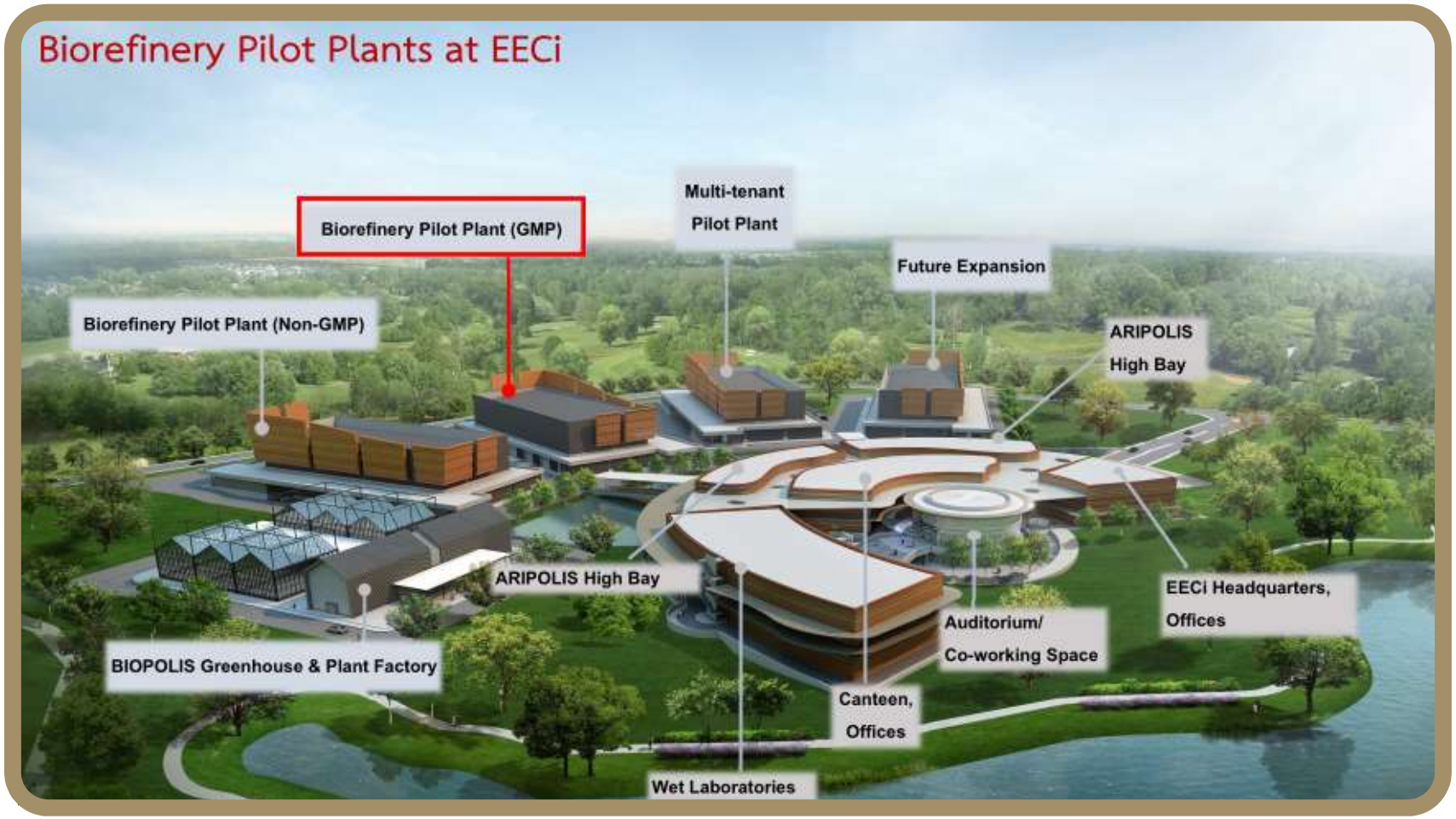
Biorefinery Pilot Plant (GMP)



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GMP Biorefinery Pilot Plant: Objective

- The main objective for the development of the GMP Biorefinery Pilot Plant at EECi is to provide a "non-proprietary (generic) equipment" platform for private and public organizations, as well as local and international universities to multi-purpose scaling up and validating their laboratory prototypes and perform the techno-economic feasibility study before investing on a specific production line.

- Thus, this Biorefinery platform must be designed in such a way that it allows users to reconfigure the unit operation line-up arrangement ("Lego box" concept), adjust process parameters to the extreme values in order to find the optimized process conditions ("Flexible process window for optimization"), and customize or scale the equipment for larger production scale with freedom to operate without any IP violation ("Generic design").

- In addition, the design of the facility must allow proprietary equipment which is not a part of the original GMP Biorefinery Pilot Plant investment to co-locate and plug in to meet expanding demand.

- The following diagram in next slide is depicts the concept of generic design platform described above.

GMP Biorefinery Pilot Plant: Concept of EECi GMP Biorefinery Pilot Plant

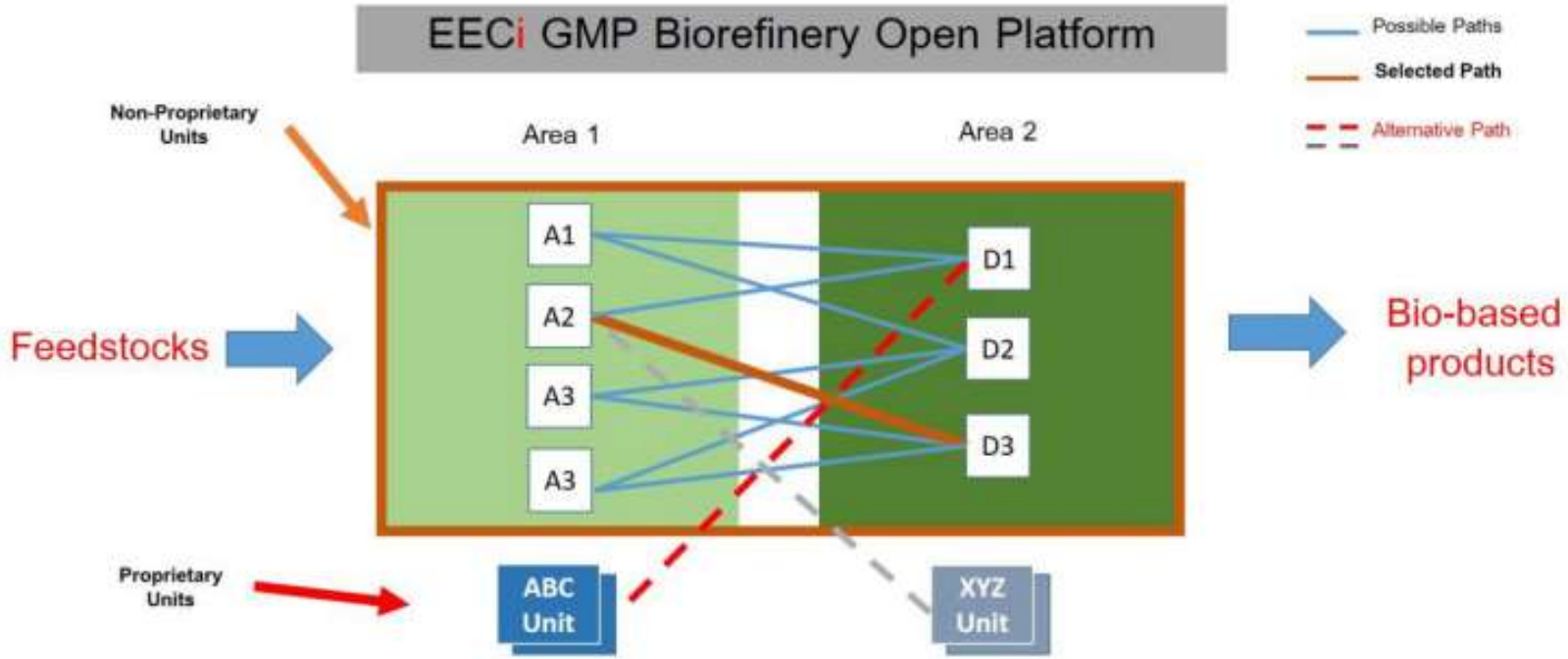

Fig 2. Concept of EECi GMP Biorefinery Pilot Plant
(number of units in each module are for illustrations only)

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GMP Biorefinery Pilot Plant: 2 Process Area (Modules)

Process Area 1: Microbial Production Process.

- The function of this area mainly involves in fermentation by bacteria, yeasts and fungi for production of functional ingredients and high-value bioproducts with applications for food, feed, cosmetic and other bio-based segments.

- These microbial strains can be wild type, mutant and genetically modified microorganism (GMM), which are excluded from the risk group, or are categorized into the risk group 1 (ref: NIH guidelines for Research Involving Recombinant DNA Molecules).

- Feedstocks used are sugar-based, starch-based, agricultural and agro-industrial materials as well as defined chemical/biological agents.

- Through fermentation and lite downstream process, the products can be whole-cell (i.e., probiotic), extracellular metabolites (i.e., enzymes & organic acids) and intracellular metabolites (i.e., omega-3 & omega-6 fatty acids, prebiotic and recombinant peptides/proteins).

- GMM-free intermediates are the products exported from this area. Physical containment for protecting GMM leakage at large amount as well as the GMM transport and storage lines, and disposing of waste materials, particularly in deactivation of DNA and GMM-cells, should be taken into consideration for plant design.

GMP Biorefinery Pilot Plant: 2 Process Area (Modules)

Process Area 2: Downstream Process (DSP) and Bioconversion.

- The function of this area involves in flexible downstream processing in relevant to the tailored-made or customized end products (i.e., extraction, separation, concentration, purification, polishing, formulation, encapsulation, and drying & finishing).

- Feedstocks for DSP and bioconversion are derived from fermentation production stream (microbe-based), agroindustrial-based materials, and plant products.

GMP Biorefinery Pilot Plant : List of Products

Products derived from 2 main areas are listed as follows:

1. Probiotics, e.g. lactobacilli, bifidobacterial, …
2. Enzymes
3. Amino acids
4. Organic acids
5. Essential fatty acids & lipid-based products, e.g. fatty alcohols
6. Carotenoids/biopigments
7. Sugar and starch derivatives
8. Oligosaccharides and other specialty carbohydrates, e.g. xylo-oligosaccharides, arabino-xylo-oligosaccharides, maltose-based oligosaccharides, etc, typically with degree of polymerization of 3-10
9. Protein/peptide hydrolysate
10. Encapsulated products of plant and other biological extracts
11. etc.

Note: this list is only indicative to give a better view on which products will likely be produced in the GMP Pilot Plant.

GMP Biorefinery Pilot Plant: List of Unit Operation

List of Main and Supporting Unit Operation GMP pilot plant facility	
Module	Unit operation
Microbial Production Process Area	Microbial fermentation (largest size approx. 15,000 L)
	Buffer/medium preparation
	Storage/holding
	Cell separation for primary clarification
	Cell disruption
	Sterile filtration
	Peripherals
Downstream process & Bioconversion Area	Separation for secondary clarification & concentration
	Bioconversion
	Extraction
	Purification
	Evaporation
	Drying
	Crystallization and chemical conversion
	Formulation
	Encapsulation
	Filling
Supporting System	Utilities
	Waste disposal

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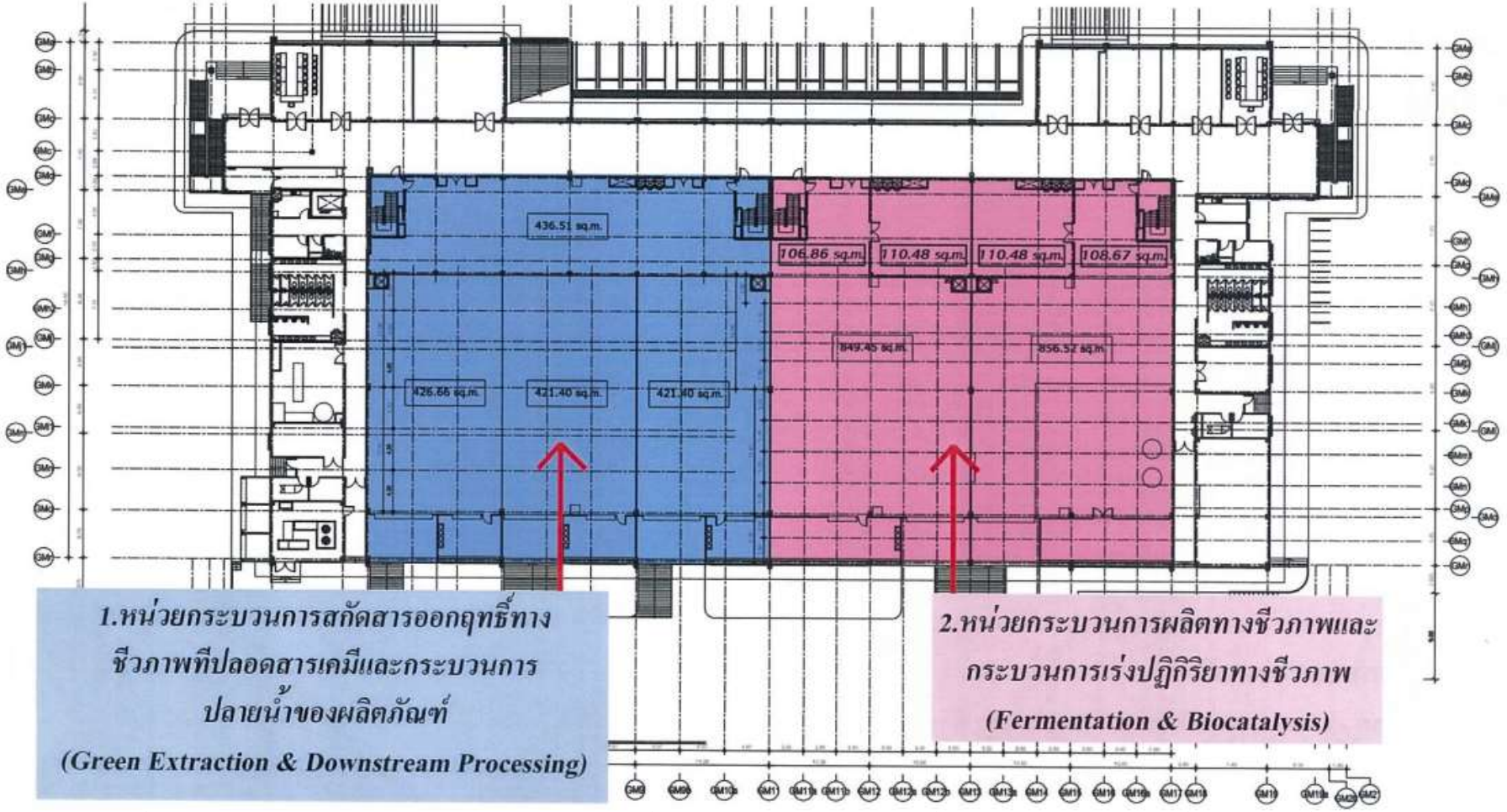
GMP Biorefinery Pilot Plant: 2 Process Area (Modules)



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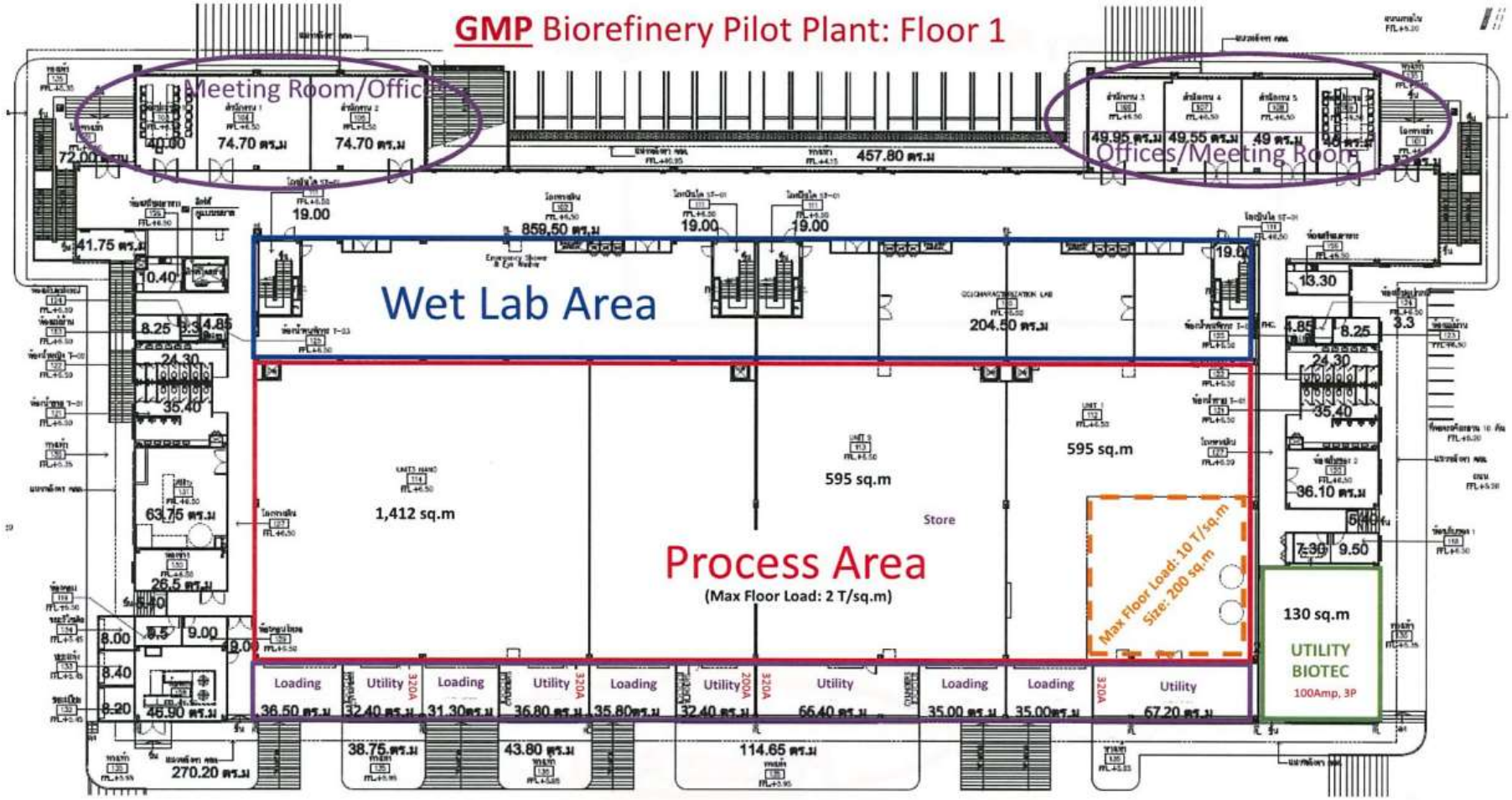
GMP Biorefinery Pilot Plant : Plant Floor 1



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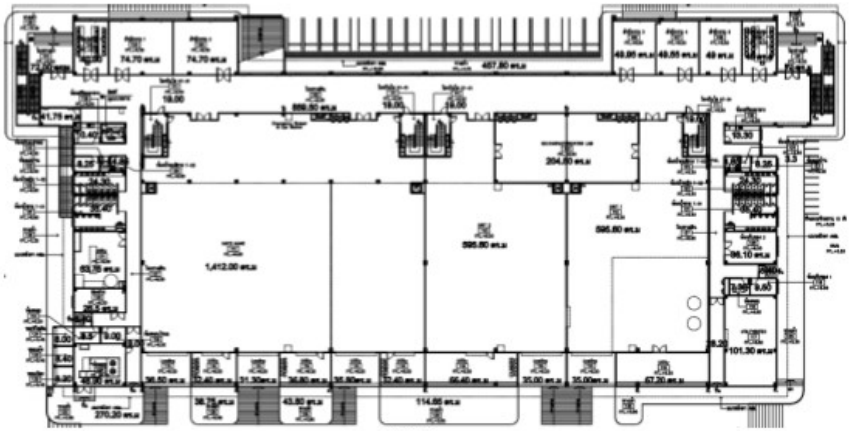
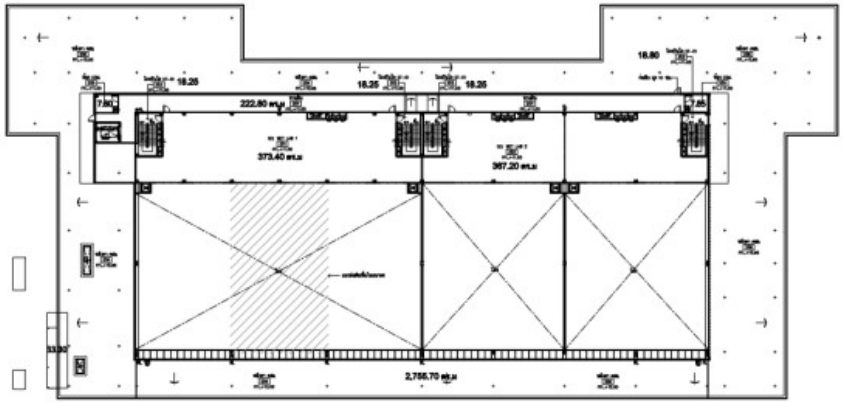
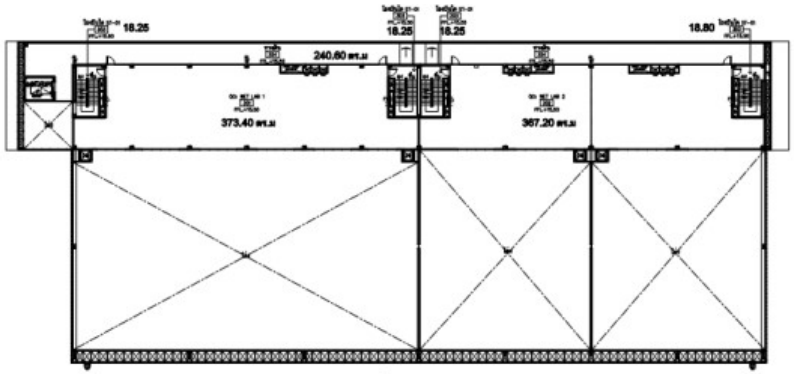
GMP Biorefinery Pilot Plant : Floor Plan and Maximum Live Floor Load



1st Floor



2nd Floor



3rd Floor

Maximum Live Floor Load					
Building	Floor 1 (kg/m^2)		Floor 2 (kg/m^2)	Floor 3 (kg/m^2)	Floor 4 (Terrace above Wet Lab) (kg/m^2)
	PILOT PLANT	WET LAB			
BIOPOLIS Pilot Plant 1 - GMP	2,000 / 10,000	500	500	500	200

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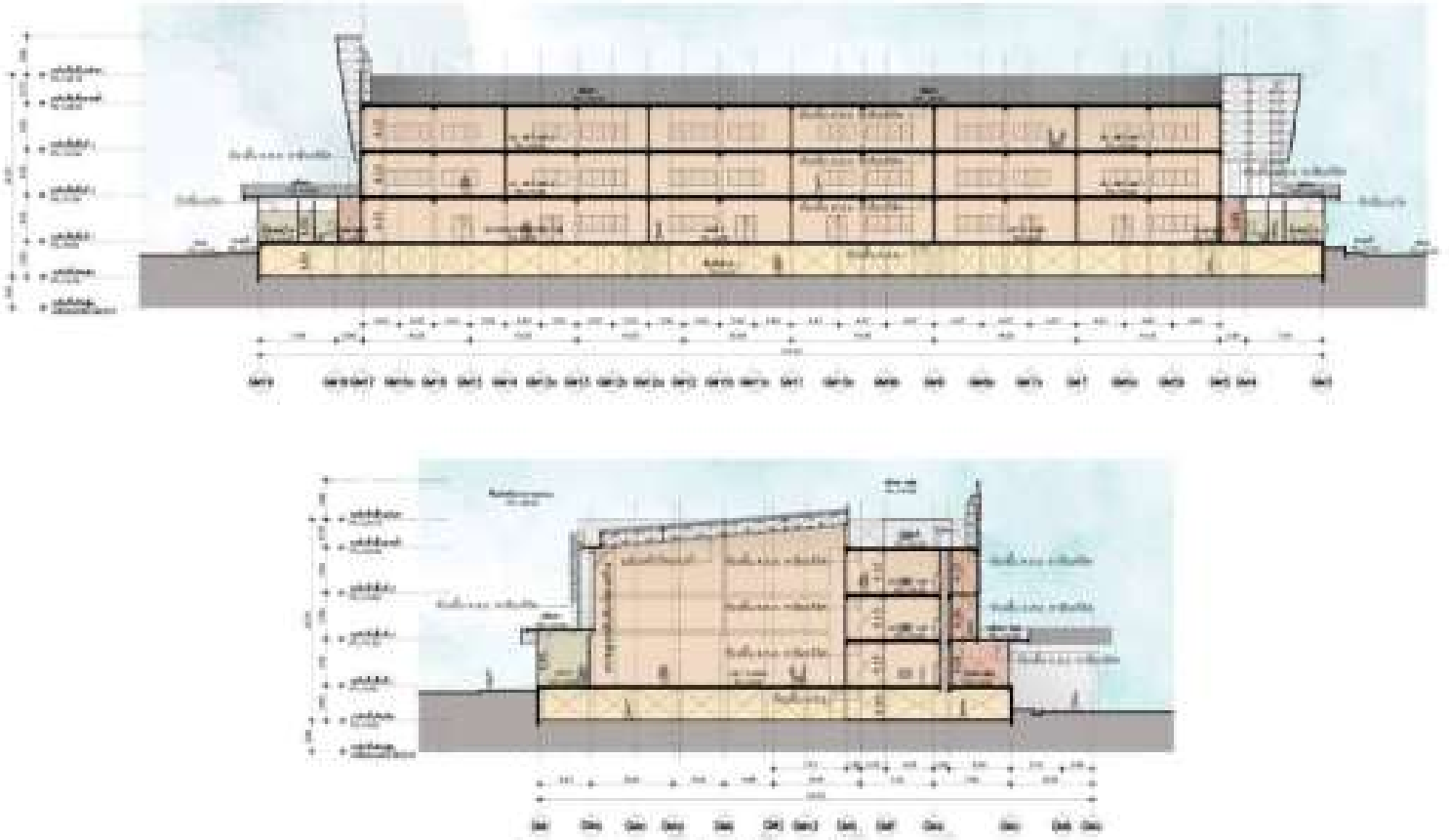
GMP Biorefinery Pilot Plant : Section View



Front and side views

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GMP Biorefinery Pilot Plant : Working space Main Area and wet laboratory

- Each module is separated into **2 areas**,
- The front part is designated for **Wet Laboratory Area** which has 3 stories for each module.
- There is a large open space in the rear part of the **Main Area** designed for large-size process equipment. Details of the total floor area for each type of the space are listed in the table below.

BIOPOLIS pilot plant		Main Area (m^2)	Area of wet laboratory (m^2)
GMP Biorefinery System	Floor 1	2,063.2	240.5
	Floor 2		740.6
	Floor 3		740.6
	Total	2,063.2	1,685.7

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GMP Biorefinery Pilot Plant : General Information

- **Floor Height**
  - Wet Lab (front part) = 4.15m (max)
  - Pilot Plant (rear part)= 13.5m (min) - 16.25m (max) *[NOTE: Roof is tapered.]*
- **Max floor loading** =
  - Main Area: 10 ton/sq.m for installing fermentation tanks, 2 ton/sq.m (rest of main area)
  - Wet Laboratory: 500 kg/sq.m
- **Max current** prepared for each module is 200-320 Amp., 3 phase

  [NOTE: Additional 200-320 Amp. is available for each module upon request]
- **Available Utility System** in all areas: fire pump system + sprinkler
- **Available Utility System** from headers in the Utility Room: cool-water, water, compressed air & air dryer,
- **Unavailable Utility System**: steam, waste water system, lighting, gas pipeline, power outlets, ventilation system.

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Biorefinery Pilot Plant (Non-GMP)

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Non-GMP Biorefinery Pilot Plant : Objective

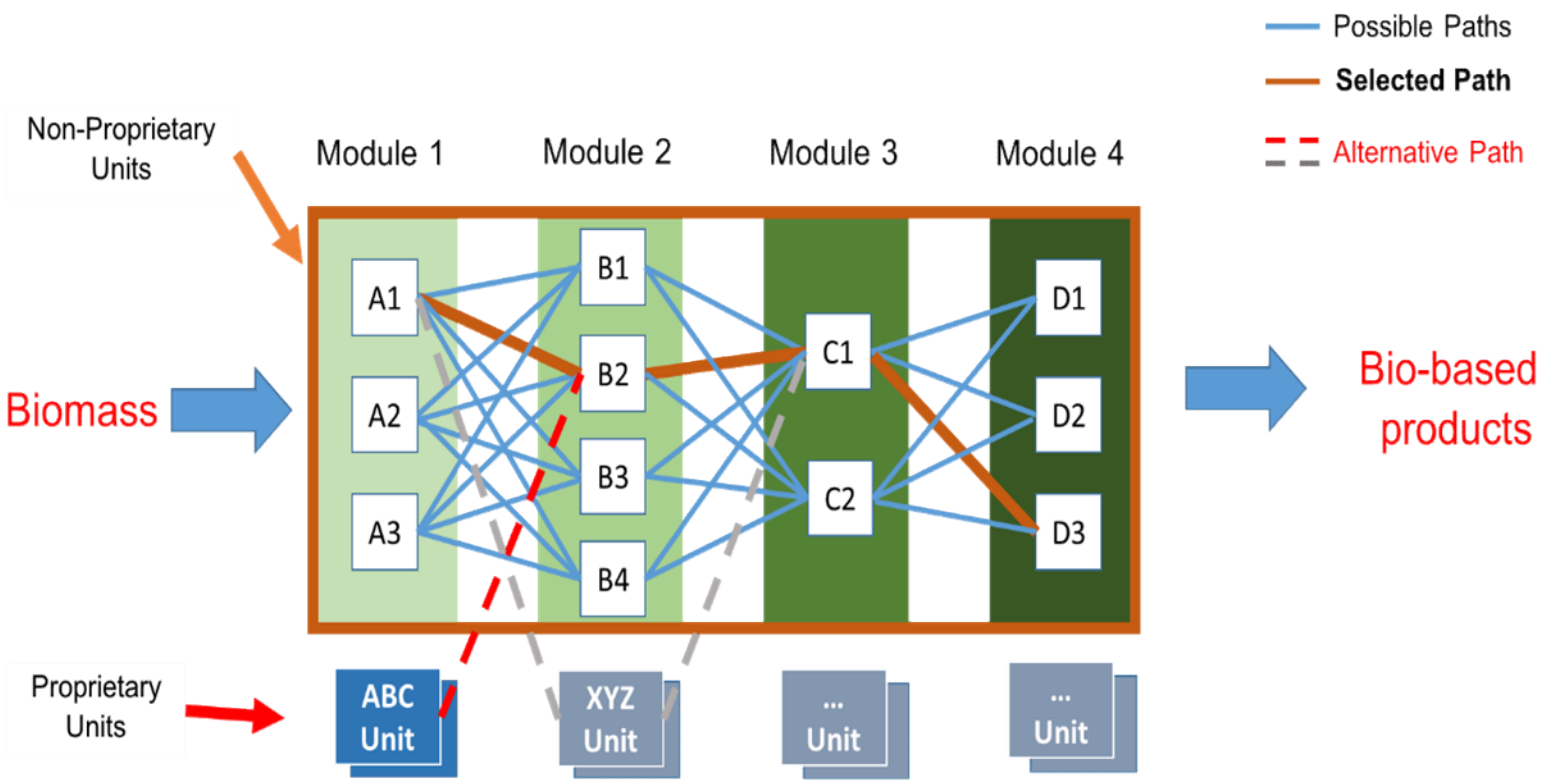
- The main objective for the development of the Non-GMP Biorefinery Pilot Plant at EECi is to provide a "non-proprietary (generic) equipment" platform for private and public organizations, as well as local and international universities to scale up and validate their laboratory prototype and perform the techno-economic feasibility study before investing on a specific production line.

- Thus, this Biorefinery platform must be designed in such a way that allows users to reconfigure the equipment line-up arrangement ("Lego box" concept), adjust process parameters to the extreme values in order to find the optimize process conditions ("Flexible process window for optimization"), and customize or scale the equipment for larger production scale with freedom to operate without any IP violation ("Generic design").

- In addition, the design of the facility must allow proprietary equipment which is not a part of the original Non-GMP Biorefinery Pilot Plant investment to co-locate and plug in.

- The following diagram depicts the concept of generic design platform discussed above.

Non-GMP Biorefinery Pilot Plant : Concept of EECi Non-GMP Biorefinery Pilot Plant



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Non-GMP Biorefinery Pilot Plant : 4 Modules + 1 Future Expansion

The Non-GMP Biorefinery Pilot Plant at EECi consists of

1. **Conversion process**: which can be separated into 2 major processes
   a) **Biological conversion** uses biocatalysts, including enzymes and microorganisms (wild type, mutant and genetically modified microorganism – GMM), to convert biomass into an intermediate substance or end product using biological process such as fermentation, enzyme conversion, consolidated bioprocessing (CBP) biocatalyst, anaerobic digestion, etc
   b) **Chemical conversion** uses chemical catalysis to convert substrate into an intermediate substance or end product.
2. **Downstream process (DSP):** a process of isolation and purification as well as utilization of waste from the desired products. The downstream process, usually based on physical, chemical and biological forms of the initial substance, consists of the product isolation process to isolate the desired substance from the production process, and the purification process.

The Non-GMP Pilot Facility consisting of 4 modules:

1. **Module 1**: Biomass Pretreatment and Cellulosic Production
2. **Module 2**: Bioprocess, Fermentation and Downstream Process
3. **Module 3**: Catalyst and Fine Chemical Production
4. **Module 4**: Functional Additives for Compound and Masterbatch

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Non GMP Biorefinery Pilot Plant : List of Product from Non GMP Process

Products from these 4 modules are listed as follows:

Bioprocess:

1. Enzymes
2. Organic acids/ keto-acid derived chemicals
3. Fatty acids, esters
4. Sugar derivatives
4. Biopolymers
5. Bioactive compounds
6. Cell-based biocontrol products

Chemical process:

1. Sugar derivatives, e.g. HMF / FDCA / PEF / Furfuryl alcohol / Lactic acid / Levulinic acid
2. Cellulose derivatives, e.g. CMC, CNF
3. Lignin and lignin-based products
4. Carbon-based products
5. Oil-based oleochemicals, e.g. fatty acids, esters, Polyol
6. Biopolymers, such as PEF
7. Catalysts (heterogeneous catalysts: powders, granule, tablet)

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Non-GMP Biorefinery Pilot Plant : List of Unit Operation

List of Unit Operation of Non GMP pilot plant facility	
Non-GMP Module 1: Biomass Pretreatment and Cellulosic Production	**Unit operation**
Upstream Process	Biomass preparation
	Mixing tank (high temperature/ high pressure)
	Continuous Reactor
Downstream process	Refining, Extraction, Purification, Drying
	Utilities
Non-GMP Module 2: Bioprocess, Fermentation and Downstream Process	**Unit operation**
	Fermentation line 1 (Non-spore forming)
	Fermentation line 2 (Spore forming)
	Hydrolysis/Mixing tank
	Accessory unit with fermenters
	Downstream processing units
	Kill tank & waste processing
	Utilities

List of Unit Operation of Non GMP pilot plant facility	
Non-GMP Module 3: Catalyst and Fine Chemical Production	**Unit operation**
Upstream Process	Chemical storage unit
	Bench Scale Batch Reactor
	CSTR reactor 50 L
	CSTR reactor 500 L
	Catalyst Synthesis Unit
Downstream process	Refining, Extraction, Purification, Drying
	Utilities
Non-GMP Module 4: Functional Additives for Compound and Masterbatch	**Unit operation**
	Automated Polymerization Line
	Automated Surface Functionalization Line

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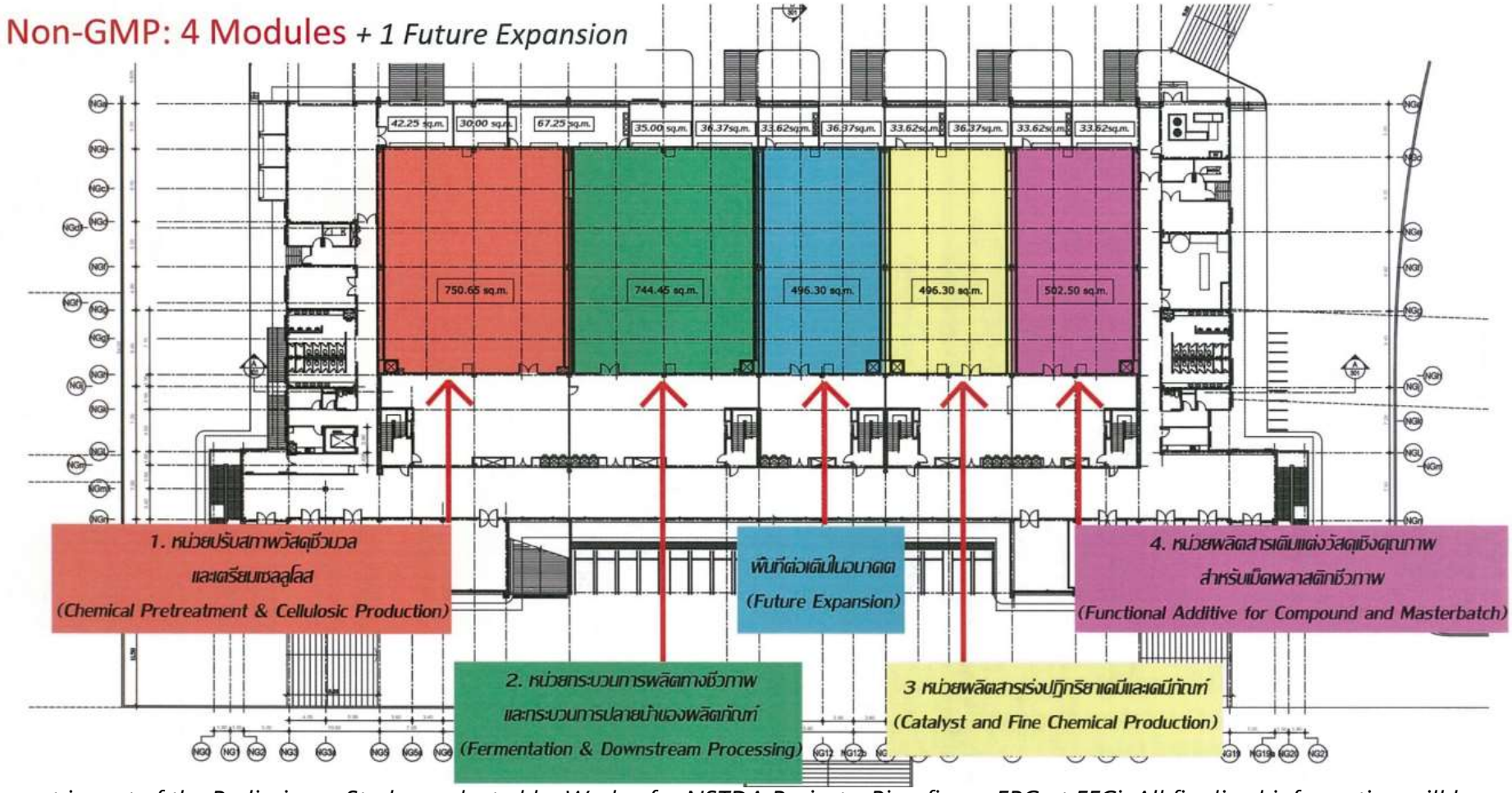
Non-GMP Biorefinery Pilot Plant : 4 Modules + 1 Future Expansion



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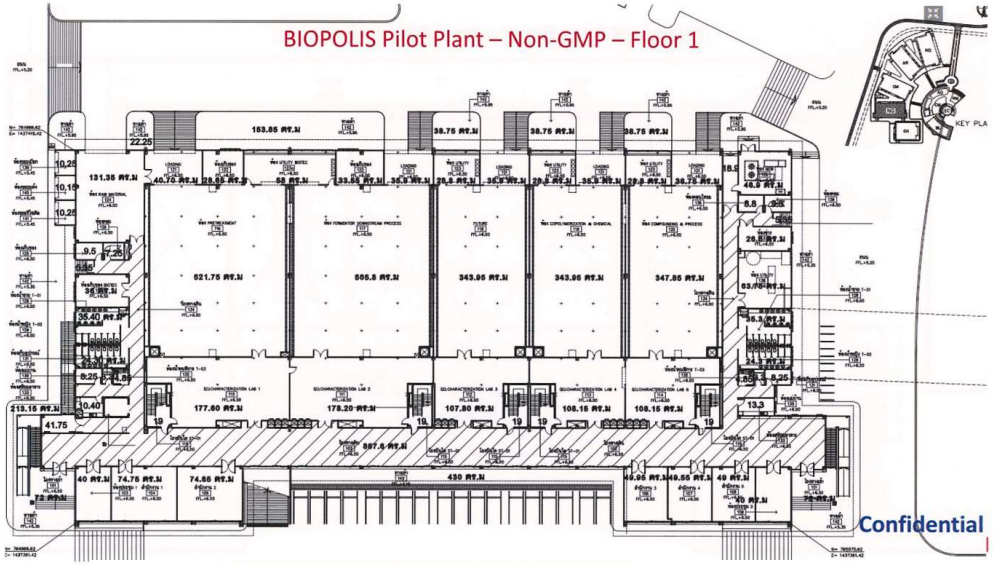
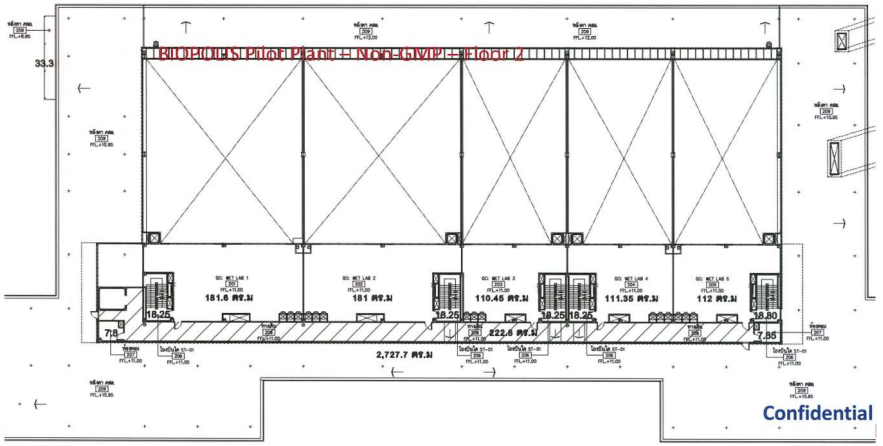
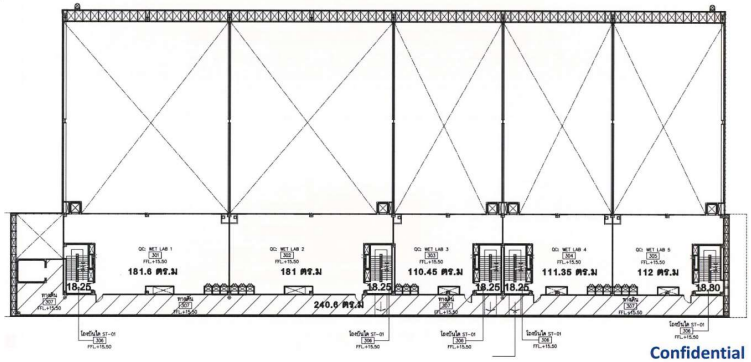
Non-GMP Biorefinery Pilot Plant





Biorefinery Pilot Plant Non-GMP : Floor 2



Biorefinery Pilot Plant Non-GMP : Floor 3

Maximum Live Floor Load				
Building	Floor 1 (kg/m^2)		Floor 2 (kg/m^2)	Floor 3 (kg/m^2)
	PILOT PLANT	WET LAB		
BIOPOLIS Pilot Plant 2 – NON-GMP	2,000	500	500	500

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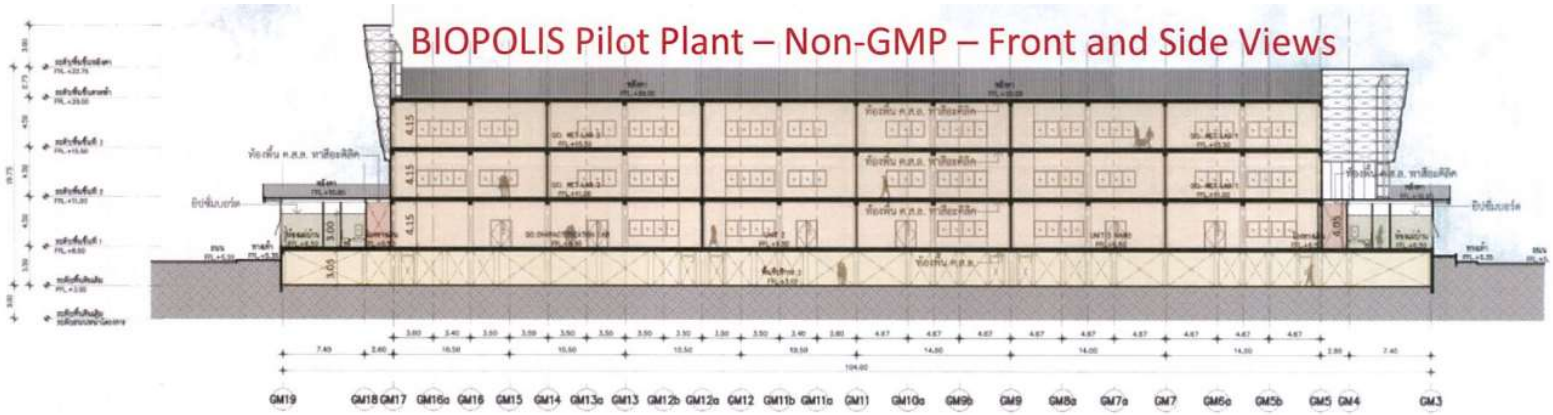
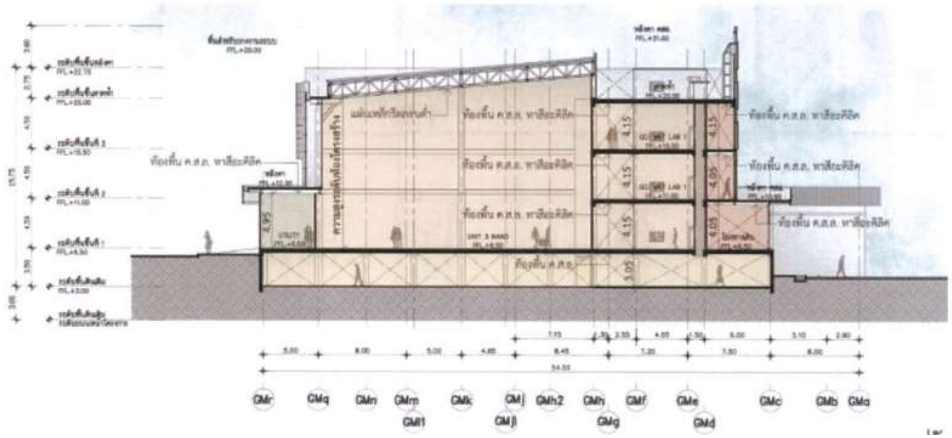
Non-GMP Biorefinery Pilot Plant





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Non-GMP Biorefinery Pilot Plant : Working Space Modules and Wet Laboratory

- Each module is separated into **2 areas**,
- The front part is designated for **Wet Lab Area** which has 3 stories for each module.
- There is a large open space in the rear part of the **Module** designed for large-size process equipment. Details of the total floor area for each type of the space are listed in the table below.

BIOPOLIS pilot plant		Area of modules (m^2)	Area of wet laboratory (m^2)
Non-GMP pilot facility	Floor 1	2,063	680
	Floor 2		696
	Floor 3		686
	Total	2,063	2,073

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Non-GMP Biorefinery Pilot Plant : General Information

- **Floor Height**
  - Wet Lab (front part) = 4.15m (max)
  - Pilot Plant (rear part)= 13.5m (min) - 16.25m (max) *[NOTE: Roof is tapered.]*
- **Max floor loading** = 2 ton/sq.m (in all Module Space), 500 kg./sq.m (Wet Lab Area)
- **Max current** prepared for each module is 200Amp

  [NOTE: Additional 200Amp is available for each module upon request]
- **Available Utility System** in all areas: fire pump system + sprinkler
- **Available Utility System** from headers in the Utility Room: cool-water, water, compressed air & air dryer,
- **Unavailable Utility System**: steam, waste water system, lighting, gas pipeline, power outlets, ventilation system.

Biorefinery Plant : Site work status

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FURNITURE & LABORATORY EQUIPMENT AND ACCESSORIES

Office Decoration and Furniture

For GMP and non-GMP Pilot Plant

1. Office, Working Space and Meeting Room Design

2. Office Furniture and Accessory Supply

- *Desk, stool and chair etc.*
- *Cabinet*

3. Meeting Room

- *Display, LCD projector and video conference system*

Laboratory (Furniture, Decoration and Equipment & Utilities)

For GMP and non-GMP Pilot Plant

1. *Chemicals resistant Floor*
2. *Laboratory Bench*
3. *Sink with supply and drainage*
4. *Balance table*
5. *Cabinet and wall cabinet / shelves*
6. *Chemicals storage cabinet with ventilation system*
7. *Stools and chairs*
8. *Fume Hood with scrubber system*
9. *Canopy / Spot exhaust / Mobile arm exhaust*
10. *Clean room system*
11. *Emergency shower & eye wash*
12. *Chemical spill kits and tray*
13. *Gas piping and control system*
14. *Gas detector with control panel system*
15. *HVAC system*

Laboratory Analytical and Characterization Instrument
for both GMP and non-GMP Pilot Plant

General

1. *Analytical Balance, Refrigerator and freezer*
2. *Hot air/Vacuum oven and Furnace (Muffle and Tube)*
3. *DI water generator system (Type I, II and III) and ultrapure water generator system*
4. *Refrigerator & freezer, Shaker, Water bath, Vortex and Hot Plate*
5. *Vacuum and Vacuum filtration system*
6. *Incubator, Ultrasonic, Centrifuge, Rotary Evaporator and Autoclave*
7. *pH, Conductivity, Density, Viscosity and Colour measurement*
8. *Pump (vacuum and peristaltic) and Solvent extraction*

Laboratory Analytical and Characterization Instrument

Cover for both GMP and non-GMP Pilot Plant (cont.)

Advanced

1. Spectroscopy
- *FT-IR*
- *UV-VIS-NIR*
- *XRD and XRF*

2. Chromatography
- *GC- FID/TCD/MS*
- *HPLC – DAD/ELSD*
- *GPC*

3. Elemental Analysis
- *CHNO Analyzer*
- *TOC analyzer*

4. Thermal Analysis
- *TGA- MS*
- *DSC*

5. Particle size analysis
- *Mastersizer*
- *DLS*

6. Gel Doc and Thermocyler

7. Fluorescent and light microscope

8. Gel Electrophoresis

9. Gas adsorption analysis (Chemi/Physisorption)

10. Continuous tubular and Multiple batch reactor system

11. High pressure homogenizer, Spray and Freeze dryer

12. Bench scale Fermenter, Multiparallel Bioreactor and concentrator

Plant Machinery, Storage & Handling Equipment and Accessories

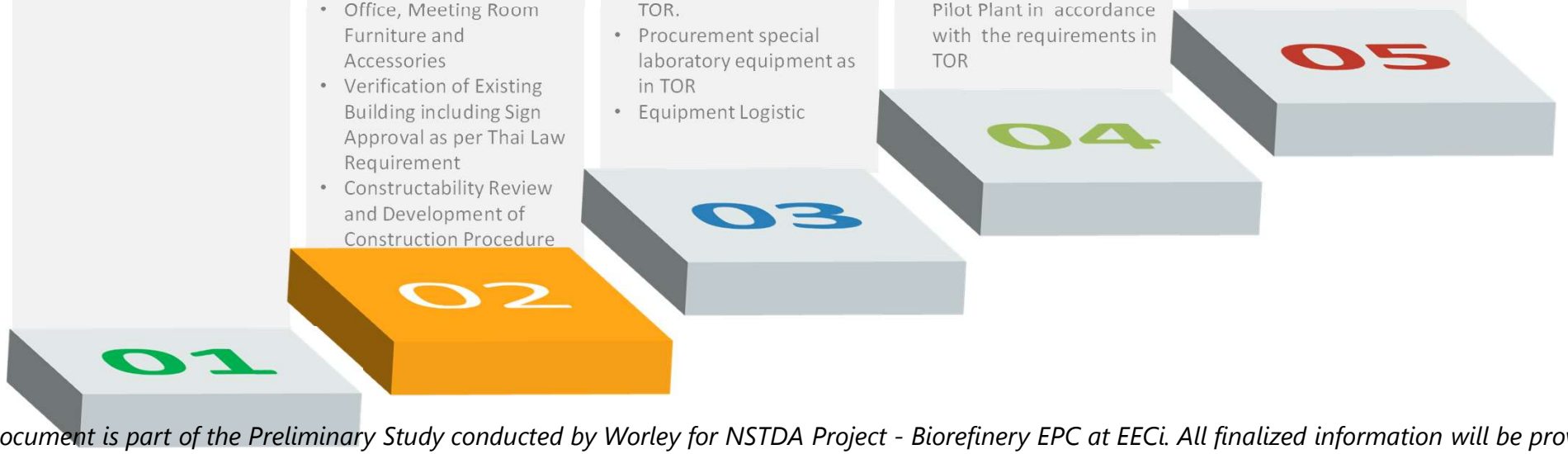
for both GMP and non-GMP Pilot Plant

1. *General / Advanced Tool kits and box*
2. *Welding, Grinding and Mini Lathe machine*
3. *Pallet / Stacking / Stapel rack*
4. *Hand-lift, Hand stacker, trolley and drum runner*
5. *Forklift trucks (Electrical) with charging station*
6. *Pallet & Reach trucks (Electrical)*
7. *Articulated Boom Lifts / Scissor Lifts*
8. *Backhoe/ Pay loader*


SCOPE OF WORK

EPC Scope of work

PROJECT MANAGEMENT	ENGINEERING DETAIL DESIGN	PROCUREMENT SERVICE AND SUPPLY	CONSTRUCTION	COMPLETION
• effectively plan, schedule, • monitor, control, • co-ordinate and • manage the performance • Implementation of the WORK and all interfaces	• GMP Plant and Utilities System • Non-GMP Plant and Utilities System • Process Utility • Laboratory Analytical Equipment • Laboratory Furniture and Utility • Office, Meeting Room Furniture and Accessories • Verification of Existing Building including Sign Approval as per Thai Law Requirement • Constructability Review and Development of Construction Procedure	• perform all required and necessary procurement services • shall supply all required and necessary CONTRACTOR ITEMS in a correct and timely manner in accordance with the requirements in TOR. • Procurement special laboratory equipment as in TOR • Equipment Logistic	• The construction including but not limited to • fabrication, assembly, construction, testing, pre-commissioning and commissioning, preservation, Loadout of the new Biorefinery Pilot Plant in accordance with the requirements in TOR	• Precommissioning • Commissioning • Project Start up • Project Hand over



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PROJECT KEY MILESTONE PLAN

Project Key Milestone Plan

1. Project Bidding Timeline Plan

2. Overall project time frame: 2 years after the contract award date.

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PROCUREMENT REGULATION AND PROCEDURE

Procurement Regulation and Procedure

1. • **Issue of Invitation Letter / Announcement of Invitation to Bid on eGP**
   The committee issues invitation letters to EPC
2. • **Issue of TOR**
3. • **Bid clarification session**
4. • **Bid Submission**
   • The EPC contractors submit proposal within specified date and time
5. • **Bid selection**
   • The committee opens the proposal envelope and chooses the bid winner based on the selection criteria
6. • **Bid award**
   • Announcement of the bid winner
7. • **Contract signing**
   • Sign the contract after the appeal period has elapsed

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EXPRESSION OF INTEREST

EPC Project Experience Required

The criteria on this slide are GENERAL GUIDELINE for consortium formation and are subject to change based on final decision of the selection committee which will be informed in the TOR. :

1. Experience in EPC Chemical process or Bioprocess plant, min. in one contract at least 1,200 MB.
2. Experience in Chemical process plant, min. in one contract at least 200 MB.
3. Experience in Bioprocess plant, min. in one contract at least 100 MB.
4. Experience in GMP plant, min. in one contract at least 100 MB.

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BIDDER EXPERIENCES IN EPC PROCESS PLANT IN LAST 5 YEARS

Project Name	Employer name and location (& other information – if any)	Contract Amount (USD)	Award date and Period of performance(month)	Brief Description of Work Scope

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ORGANIZATION, MANPOWER AND WORKLOAD

- **Please specify Bidder or Bidder's branch or subsidiary to be assigned for services in case that the job is not performed by Bidder's headquarters.**

- **The Organization chart of the team to be assigned for services if awarded the Contract.**

- **A manhour histogram reflecting the existing secured work, future expected works (Q3-2020 to Q4-2021) and this scope of work. The manhour histogram demonstrates that Bidder has adequate resources, either in-house or external, to complete the work.**

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PERSONNEL AVAILABILITY

- **Please confirm the availability of the proposed personnel at the start of the services**

- **Please confirm that the proposed personnel are either currently employed by the Bidder or will be employed by the Bidder prior to the start of services.**

ENGINEERING PARTNERSHIP/ JOINT VENTURE / CONSORTIUM

- **Please confirm that bidder will execute the scope of work in his own right without recourse to subcontracts, alliances or other joint ventures or consortium.;**

- **Please confirm that bidder will execute this scope of work under Joint Venture Agreement or Consortium Agreement.**

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No Subcontractor allowed. (**งานนี้จะไม่มีการรับเหมาช่วงจากผู้รับเหมาหลัก**)

Sub-contracting (การจ้างช่วง)

- **The EPC Contractor shall not sub-contract all or part of the Services without written consent from the Client. The EPC's consent for such sub-contracting does not relieve the Consultant from liabilities or obligations under this Agreement. The EPC shall be liable for all defaults and negligence of the sub-contractor or sub-contractor's agents or employees.**

(EPC จะต้องไม่เอางานทั้งหมดหรือแต่บางส่วนแห่งสัญญานี้ไปจ้างช่วงอีกทอดหนึ่งเว้นแต่การจ้างช่วงงานแต่บางส่วนที่ได้รับอนุญาตเป็นหนังสือจากผู้ว่าจ้างก่อน การที่ผู้ว่าจ้างได้อนุญาตให้จ้างช่วงงานแต่บางส่วนดังกล่าวนั้น ไม่เป็นเหตุให้ EPC หลุดพ้นจากความรับผิดหรือพันธะหน้าที่ตามสัญญานี้และ EPC จะยังคงต้องรับผิดในความผิดและความประมาทเลินเล่อของผู้รับช่วงงาน หรือของตัวแทนหรือลูกจ้างของผู้รับช่วงงานนั้นทุกประการ)

- **The sub-contracting in violation of the provision of the first paragraph shall be subject to a penalty at the rate of 10% (Ten Percent) of the sub-contracted amount. However, this shall not abridge the right of the Client in terminating this Agreement.**

(กรณีที่ **EPC** ไปจ้างช่วงงานแต่บางส่วนโดยฝ่าฝืนความในวรรคหนึ่ง **EPC** ต้องชำระค่าปรับให้แก่ผู้ว่าจ้างเป็นจำนวนเงินในอัตราร้อยละ **10** ของวงเงินของงานที่จ้างช่วงตามสัญญา ทั้งนี้ ไม่ตัดสิทธิผู้ว่าจ้างในการบอกเลิกสัญญา)


SELECTION CRITERIA

Selection Criteria

- **The Selection Criteria will be based on:**

  - Technical Criteria
  - Price Criteria

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COVID-19

Worley is committed to providing the proposed services to you in a timely and professional manner. Worley is also committed to ensuring the health and safety of everyone, including our people and our clients. In some cases, the COVID-19 pandemic has caused us to modify our working practices. Worley employees and collaborators may therefore provide some or all of the proposed services from offices within their homes. In addition, the ability to travel for attendance to business meetings or site may be affected.

Worley will take reasonable steps to mitigate any delays associated with the measures necessary to keep everyone safe and comply with all government regulations and proclamations regarding the COVID-19 pandemic. Clients will be informed if there is any foreseeable impact on providing the proposed services.

PRIVACY NOTICE

Worley is subject to various privacy laws. Worley's Privacy Notice is included in this document.

The information you provide as part of Worley's business relationship with you will be used by or on behalf of Worley and its affiliated companies and subsidiaries as part of the Worley Group (Group):

- To carry out due diligence on you and/or your company as a prospective counterparty to Worley. This includes assessing financial standing, HSSE profile, technical and quality standards, and corruption/money laundering risk.
- If necessary, to enter into or perform our contract with you.
- To manage our services.

Worley consults private risk intelligence databases and publicly available sources of information, such as sanction lists, on an ongoing basis in order to comply with its internal anti-money laundering, and bribery and corruption prevention processes, and to prevent, detect or investigate dishonesty, malpractice or seriously improper conduct.

If you choose to provide Worley with personal information on directors, officers, employees and/or owners of your company or any third party's personal information (such as name, email or phone number), you represent that you have the relevant person's permission to do so.

We may share your information:

- With our third party service providers who perform business operations on our behalf.
- As part of a sale of a Group subsidiary or brand to another company.
- To protect and defend Worley.
- When required by law and/or government authorities.

Given the global nature of Worley and the Group's business, personal information may be transferred internationally for these purposes (but remains protected by the Group's Privacy Policy).

We retain your information:

- Only as long as is necessary for the purpose for which we obtained it and any other permitted linked purposes (for example, where relevant to the defense of a claim against us). So, if information is used for two purposes, we will retain it until the purpose with the latest period expires; but we will stop using it for the purpose with a shorter period once that period expires.
- In relation to your information used to perform any contractual obligation with you, we may retain that data whilst the contract remains in force plus seven (7) years to deal with any queries or claims thereafter.
- In relation to any information where we reasonably believe it will be necessary to defend or prosecute or make a claim against you, us or a third party, we may retain that data for as long as that claim could be pursued.

Our retention periods are based on business needs and your information that is no longer needed is either irreversibly anonymised (and the anonymised information may be retained) or securely destroyed.

If you do not wish to provide your personal information to us, we may not be able to proceed with a business relationship with you.

For further information on how your personal information is processed, please visit our website at www.worley.com for further details on the Group's Privacy Policy.

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Q & A

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