PT. HANAZONO Engineering Indonesia We are always partner with you	PROJECT PROPOSAL PR 3000023262 OLEFIN PLANT PT. CHANDRA ASRI

PR 3000023262 OLEFIN PLANT

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PT. HANAZONO ENGINEERING INDONESIA

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Revision History

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0	March 22, 2024	For Bidding

1. Introduction

This is a project held by PT Chandra Asri PP Plant (CAP-1) in the context of repairing and replacing process pipes that have been damaged or pipes in a rusty state that must be replaced. The implementation of this work will be carried out in PR 3000023262 OLEFIN PLANT Area.

The implementation of pipe changes is carried out partially on the damaged (rusty) part, so no changes are made per line. This aims to save costs and at the same time speed up the factory smoothing time, so that loss time can be minimized.

To support the implementation of the work to run well and smoothly, Pt Hanazono Engineering Indonesia (HEI) will carry out several work plans so that it will be produced in accordance with the purpose of pipe replacement work in quality and timeliness of completion.

2. Project Scope

2.1. Material

The scope of work to be carried out by Pt Hanazono Engineering Indonesia (HEI) is the replacement work of damaged or rusty pipes on the instructions of the employer in this case is Pt Chandra Asri PR 3000023262 OLEFIN PLANT (CAP-1).

Things that need to be changed are Pipes, Valves, Gasket including bolt nut, as need in work load CAP-1. All of these materials are provided by Pt Chandra Asri Plant-1, and the CAP-1 will send to the HEI work shop. Also Special welding rod prepared by CAP-1, this special welding rod material will be used for work in workshops and at CAP-1 sites.

2.2. Fabrication and Installation

Pt Hanazono Engineering Indonesia will carry out fabrication work at the hanazono shop, such as marking, fit up welding, with all manpower, consumable, tools prepared by HEI. If the fabrication has been completed, then NDE RT and PT are carried out at the weld joint.

Then Hydrotest is carried out, for this work HEI uses equipment rental and services at other sub-vendors. For sand blast and painting work, in its implementation, HEI will use the services of other vendors as applicators of this work. Sand blast and painting are performed at Hanazono's workshop.

If it is completed it will be sent to the CAP-1 site for installation in a predetermined area. Piping and Steel Structure will be lowered in the laydown area by the HEI. But

before HEI sends piping, Stee Structure, Warehouse to CAP-1 as well as tools and manpower for unloading materials from Hanazono. Warehouse, Lifting equipment, Lifting device, and all tools will be back to HEI after project finished

Likewise for all manpower, consumable, all equipment for work on site are provided by Pt Hanazono Engineering Indonesia. During the process of installing pipes on site, HEI uses a power source from a diesel-fueled generator in each work area. To refuel diesel fuel to each equipment follows the time rules set by the CAP-1.
Before the pipe installation process, it is necessary to dismantle existing pipe, steel structure on site, and all pipes used gaskets and bolt nut will be placed in the waste area.

2.3. Supporting Facility

Some facilities are needed to smooth the work on site, it is necessary to provide pipe replacement shelters coming from HEI, and waste storage areas for pipe demolition and parts of it.
To support this work, CAP-1 provides a Laydown Area and a waste collection area to accommodate used materials. In addition, Industrial Water, Pressure Water for Leak Test and Toilet at site are prepared by CAP-1.

2.4. Installation Scaffolding

A scaffold is a temporary structure erected to support access or working platforms. Scaffolds are commonly used in construction work so workers have a safe, stable work platform when work cannot be done at ground level or on a finished floor.

Scaffolding in this Guide means the individual components, for example tubes, couplers or frames and materials that when assembled form a scaffold. Scaffolding is classified as plant under Work Health and Safety (WHS) Act.
Scaffolding work is erecting, altering or dismantling a temporary structure erected to support a platform and from which a person or object could fall more than 4 meters from the platform or the structure. Scaffolding work must be undertaken by a person holding the appropriate class of high risk work license.

2.4.1 Here is a step-by-step guide for the dismantling of scaffolding:

1. Planning: Before dismantling the scaffolding, you should plan the dismantling process to ensure that it is done safely and efficiently. This includes determining the

order in which the components will be removed and the location where they will be stored.

2. Removing the Scaffold Deck: The scaffold deck should be removed first. Make sure to remove any debris or materials that may have accumulated on the deck.
3. Removing the Guardrails and Toe boards: The guardrails and toe boards should be removed next. Make sure to store them in a safe location where they will not be damaged.
4. Removing the Transoms: The transoms should be removed next. Make sure to store them in a safe location where they will not be damaged.
5. Removing the Ledgers: The ledgers should be removed next. Make sure to store them in a safe location where they will not be damaged.
6. Removing the Standards: The standards should be removed last. Make sure to store them in a safe location where they will not be damaged.
7. Removing the Base Plates: The base plates should be removed last. Make sure to store them in a safe location where they will not be damaged.
8. Cleaning the Site: Once the scaffolding has been removed, make sure to clean the site and remove any debris or materials that may have accumulated during the installation and use of the scaffold.

2.5. Installation Insulation Hot and Cold

2.5.1 Insulation Procedure

- All materials shall be stored, mixed, thinned and applied in accordance with the manufacturer's printed instructions.
- All conflicts between the method statement and manufacturer's instructions shall be brought to the attention of Contractor for resolution.
- Insulation shall not be applied over wet surfaces.
- Insulation section shall be trimmed as required to achieve tight fit without voids.
- Fabricated or preformed insulation shall fit curvature of the surface to be insulated.
- If applying single layer insulation other than hinged pipe covering the circumferential butt joints of each half section shall be staggered.
- If applying multi layer insulation each layer shall be staggered to the longitudinal and circumferential joint of the layer beneath.
- Each layer of insulation shall be held in place separately.
- Insulation shall be applied as single layer for thickness less than 90mm.
- All insulation shall be free from cracks, voids and gaps. All cracks, voids etc greater than 3mm shall be refitted not filled.
- Vessels and tanks shall be insulated with blanket insulation.
- Installed insulation shall have the required permanent or temporary protection applied before the conclusion of days work.

2.5.2 Hot Insulation

The Hot insulation installation will cover the following two major categories in this Project

Hot Insulation for Piping & Hot Insulation for Equipment

- Hot Insulation Procedure for Piping

The hot insulation of piping shall have mainly 6 activities which are stated in Section 9.1 of this Method Statement.

- All insulation materials shall be protected from rain and moisture.
- Insulation sections shall be trimmed as required to achieve close fit to avoid major void and gaps.
- All hot piping insulation shall be done with mineral fibber (blanket/section)
- All piping insulation with single layer less than or equal to 8” shall be installed by preformed pipe section.
- Sectional insulation shall be sized to eliminate gaps and voids between surfaces and the insulation.
- Sectional insulation shall be applied so all end joints are staggered.
- Insulation shall be secured with SS wire or Bands spaced at max. 250mm.
- For vertical piping insulation the support ring will install directly above all elbows, flanges or flanged valves. Additional support will install at every 6425mm of uninterrupted length.
- Elbow 4” and over shall be insulate with mitered cut.
- Insulation shall be terminate at a distance of (bolt length+25mm) flanges and valves occur.

- Hot Insulation Procedure for Equipment:

The hot insulation of piping shall have mainly 6 activities which are stated in Section 9.1 of this Method Statement.

- All insulation materials shall be protected from rain and moisture.
- Equipment insulation support ring, pins, clips and accessories shall be compatible with equipment material.
- All hot equipment insulation shall be done with mineral fibber blanket.
- Insulation on both the inside and the outside of skirts shall be equal to the shell insulation thickness.
- Insulation shall be sized to eliminate gaps and voids between Surfaces and the insulation.

- Insulation materials shall be secured with bands on every 250 mm maximum Centers.
- For vertical equipment with skirts, insulation on bottom heads only shall be held in place by bands.
- Insulation for instrument shall be applied in a way so that there is no interference with either the operation or function of instrument and allow all gauges.
- Expansion joints shall not be applied on equipment's having temperature up to 650◦ C.
- Insulation shall be terminate at a distance of (bolt length+25mm) flanges and valves occur.

2.5.3 Cold Insulation:

The Cold insulation installation will cover the following two major categories in this Method statement Cold Insulation for Piping & Cold Insulation for Equipment

➢ Cold Insulation Procedure for Piping:

The cold insulation of piping shall have mainly 8 activities which are stated in Section 9.2 of this Method Statement.

- All insulation materials shall be protected from rain and moisture.
- The thickness greater than 76mm will be install by multi-layer insulation.
- All cold piping insulation shall be done with cellular glass.
- Insulation Up to 12" OD will secure by fiberglass reinforced tape.
- Insulation shall be sized to eliminate gaps and voids between Surfaces and the insulation.
- Insulation Up to 36" OD from 12" will secure by 12mm band.
- Insulation over 36" OD will secure by 20mm band.
- Insulation securement shall be spaced on a maximum of 250mm.
- Protrusion through insulation on piping will insulated for a minimum distance equal to 4 times of adjacent insulation thickness.
- Insulation thickness on protrusions shall be half of adjacent insulation thickness.
- Insulation thickness on protrusions shall be 38 mm, if the half value of adjacent insulation comes less than 38mm.
- Vapor stops that seal the insulation to pipe shall be installed at all insulation terminations.
- Vapor stop shall extend a minimum of 50mm from insulation termination point.

➢ Vapor Barrier Installation.

- Before the application of jacketing all insulated surface shall be sealed with vapor barrier sheet.
- Vapor barrier sheet shall be installed without gaps or folds with 50mm overlap.

➢ 11.2.2 Cold Insulation Procedure for Equipment:

The cold insulation of equipment shall have mainly 8 activities which are stated in Section 9.2 of this Method Statement.

- All insulation materials shall be protected from rain and moisture.
- The thickness greater than 76mm will install by multi-layer.
- All cold equipment insulation shall be done with cellular glass.
- Insulation Up to 12” OD will secure by fiberglass reinforced tape.
- Insulation shall be sized to eliminate gaps and voids between Surfaces and the insulation.
- Insulation Up to 36” OD from 12” will secure by 12mm band.
- Insulation over 36” OD will secure by 20mm band.
- Insulation securement shall be spaced on a maximum of 250mm.
- Protrusion through insulation on equipment will insulated for a minimum distance equal to 4 times of adjacent insulation thickness.
- Insulation thickness on protrusions shall be half of adjacent insulation thickness.
- Insulation thickness on protrusions shall be 38 mm, if the half value of adjacent insulation comes less than 38mm.
- Vapor stops that seal the insulation to equipment shall be installed at all insulation terminations.
- Vapor stop shall extend a minimum of 50mm from insulation termination point.

2.5.4 Vapor Barrier Installation.

- Before the application of jacketing all insulated surface shall be sealed with vapor barrier sheet.
- Vapor barrier sheet shall be installed without gaps or folds with 50mm overlap.

2.5.5 Weatherproofing Installation (INSULATION JACKETING):

- All external surface of insulation shall have a weather barrier finish to keep Insulation dry and provide mechanical protection.
- All joints shall be fabricated with proper overlap and to prevent moisture penetration.
- All joints shall be caulked with silicone sealant to stop moisture entry.
- Screws if used shall not penetrate the vapor barrier in cold insulation.

2.5.6 Jacketing Procedure for Piping

- Jacketing for horizontal and vertical cylindrical piping shall have minimum 50mm circumferential and longitudinal laps
- The longitudinal lap on horizontal piping shall be between four o’clock and eight o’clock position to shed rain water.
- On vertical piping, the upper course of jacketing shall overlap the lower.
- On vertical pipes, upper course shall be supported by “S” clips.
- Jacketing shall be secured with stainless steel bands on approx. 300 mm center.
- Smooth sheet of 0.4~0.6 mm shall be used for boxes.

- Two pieces elbow shall be installed up to 3”.
- The jacketing shall be secured with self-tapping screws.

2.5.7 Jacketing Procedure for Equipment

- Jacketing shall be applied with 50mm overlap on all seams.
- On vertical vessels, provide a minimum of two corrugations overlap.
- On vertical vessels, the upper course of jacketing shall be supported by S-clips, on max. 450mm centers.
- Jacketing shall be secured with bands on 450mm centers and one in each Circumferential lap (Preventing sliding “U” clip shall be applied on max.1220mm distance).
- Jacketing shall be secured with stainless steel bands on approx. 300 mm centers.
- Smooth sheet of 0.4~0.6 mm shall be used for boxes.
- Sheet metal screws shall be installed on longitudinal joints at 150mm centers (not required in circumferential laps).
- The jacketing shall be secured with self-tapping screws.

2.5.8 TML Plug Installation

- The use of inspection plugs is applicable only for hot insulated surface of Piping/Equipment
- Removable insulation plug shall be provided to permit on-stream ultrasonic inspection when required by the operating proponent.
- The inspection plugs shall be vapor tight.
- The material for removable insulation plug shall be NDT Inspection Plug (Aluminum / EPDM) OR equivalent.
- All hot piping insulation up to 6” shall be installed by 1.5” inspection plug.
- All hot piping insulation 6” and more shall be installed by 2.5” inspection plug.
- All hot equipment insulation shall be installed by 5” inspection plug.
- Removable insulation plug shall be provided to permit on-stream ultrasonic inspection when required by the operating proponent.
- Subcontractor will make the inspection window only after finishing the markings of contractor representative.

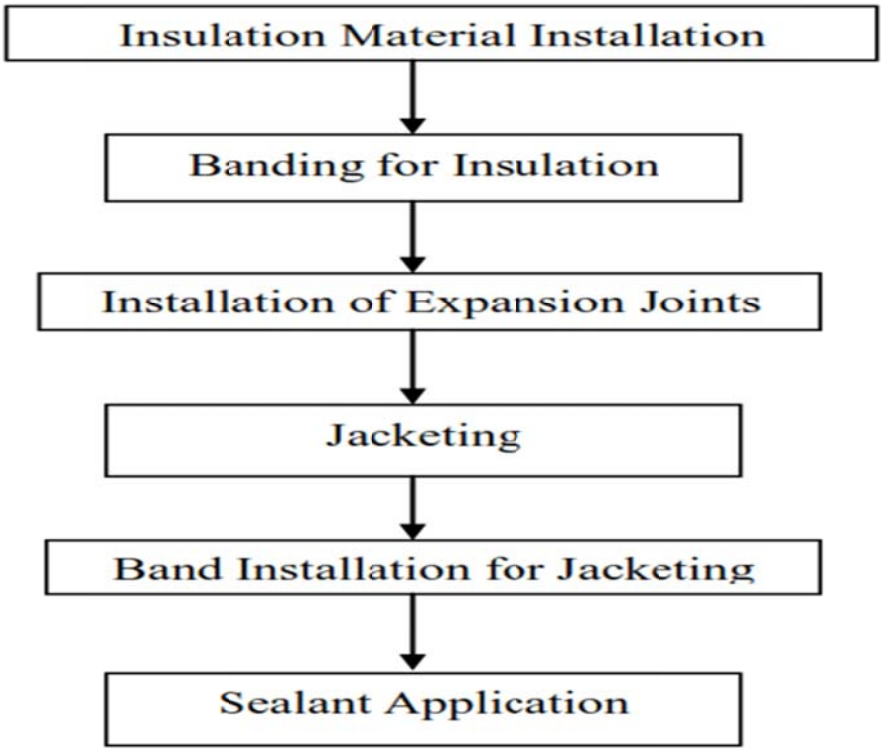
2.5.9 Dress up Insulation Work

- Prior to the actual dress-up insulation work schedule, insulation subcontract should prepare and deliver on site all required insulation materials including ancillaries and sealants.
- Properly store all said materials on a pallet near the equipment(s) and cover with tarpaulins. If required, secure using tie-wires on nylon rope.

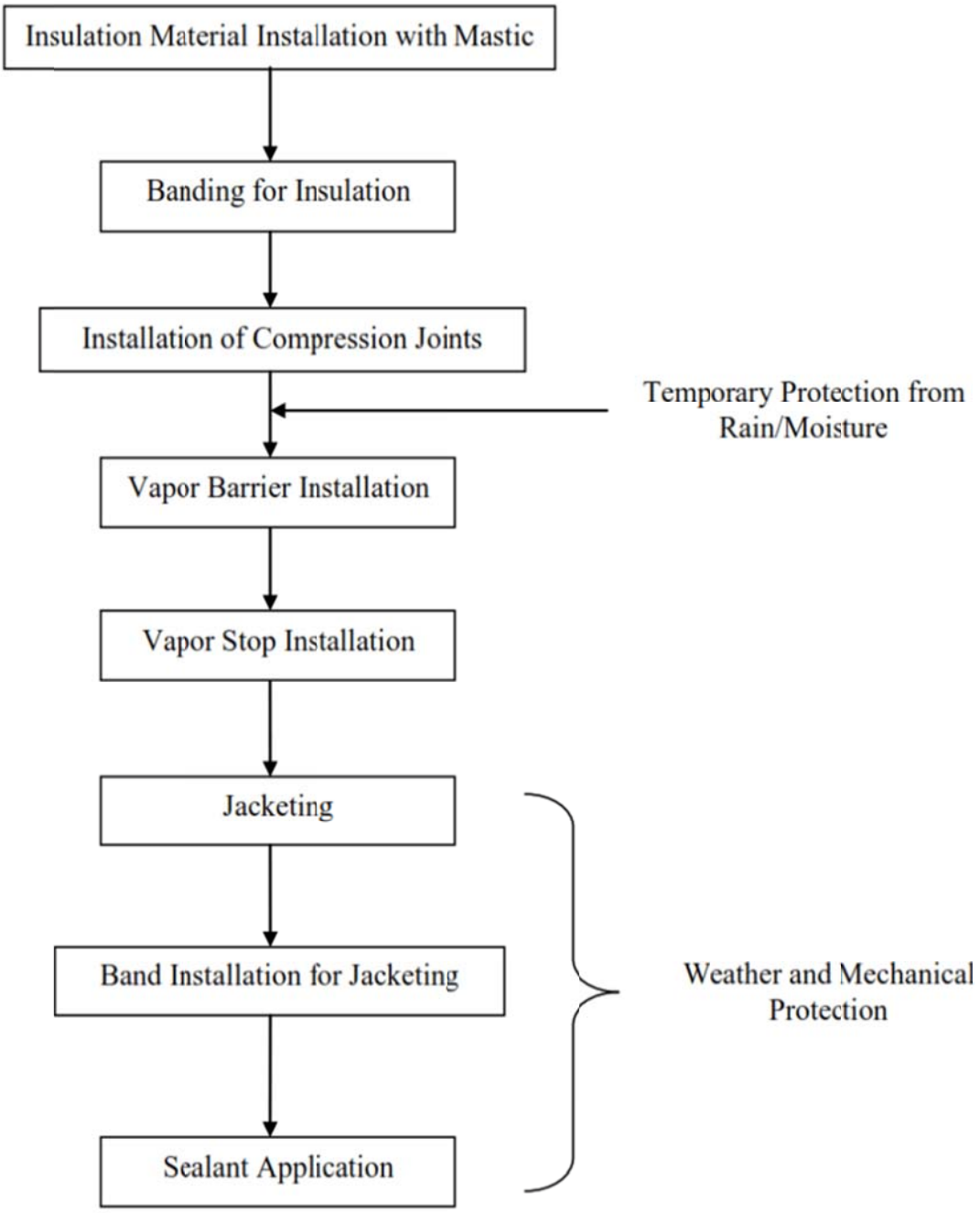
2.5.10 Repair Work procedure

- Damage to insulation weather jacketing shall be repaired immediately if the damage can result in additional damage to the insulation due to water leakage into the system.
- If permanent repair is not immediately practical, temporary repair of damaged weather jacketing shall be required.
- Damaged insulation shall be replaced if the nature of the will adversely affect the thermal performance of the system.

HOT INSULATION WORK SEQUENCE SECTION 9.1



COLD INSULATION WORK SEQUENCE SECTION 9.2



2.6. Summary Scope of Supply

As an illustration can be seen in the following table:

Description	Scope CAP-1	Scope HEI
Material Pipe, Flange, Flexible Hose, Gasket include bolt nut, Special Welding Rod.	X	
Material Scaffolding		X
Installation of Scaffolding		X
Temporary Area, Waste storage Area, site toilet, minimum steam, Industrial Water for Leak Test, Pressure Air.	X	
Manpower, Tool, Welding Rod Common, Lifting device, Lifting Equipment, Warehouse		X
Work Procedure, Isometric drawing for report, Final Report, QC report		X
Fabrication on Work Shop, installation at CAP-1 site		X
NDT at Vendor Work Shop 100% PT and 10% RT (from Total Joint)		X
NDT at site Work (PT 100%) and 10% RT (from Total Joint)		X
JSA/JOHAN/Work Methode	X	X

3. Project Schedule

Project detail schedule as per attached -1

4. Quality Standard

Quality is the most important aspect in pipe fabrication and installation, for that it is necessary to carry out structured checks so that good results are obtained according to the target plan. In the inspection of fabrication and installation results will produce good products if previously carried out several stages before carrying out physical work on pipes and other components.

Material checking standards and fabrication and installation refer to international codes such as:

ASTM for American standard guidance material
ASME IX for guidance on welding application
ASME B 31.3 for process pipe design
ASTM C-547 TYPE II or TYPE III for Insulation
JIS if material code Japan
SSPC-SP for sand blasting and painting.

Before starting physical work, HEI will make procedures such as:

Description	Explanation
- ITP Inspection and Test Procedure - (See attachment-2)	Is the scope of inspection between CAP-1 and HEI in the implementation of checking matters related to documents, work procedures, test work in the shop and installation in the field. Here can be seen the portion of the CAP inspection as the employer and HEI as the contrator. Thus, each scope of work will be obtained and does not overlap each other.
- Fabrication Procedure - (See attachment-3)	It is a procedure to check the material before processing or after fabrication. In this procedure, the terms of acceptance will be given visually, dimensionally and tolerance. So that this will be able to provide more targeted inspection results with better quality.
- Statement Method for Installation Replacement Piping at site. - (See Attachment-4)	Is a procedure that must be applied when installing pipes on site. In this procedure, all components of manpower, tools, consumables must refer to the provisions written in this procedure, so that good quality will be obtained with the level of manpower work safety, tools, and the environment maintained. This Procedural Reference also refers to the SHE Regulation CAP.
- HSE Plan - (See Attachment-5)	It is the procedure and its requirements for implementation that must be met by the main components of the pipe replacement work on site. The main components include labor, tools / equipment, consumables and the area around the workplace. Thus will be obtained a healthy working condition, safe and avoid the danger

	of accidents. SHE Regulation CAP reference
- QA / QC Plan - (See Attachment-6)	QA is an abbreviation for Quality Assurance, which means the process of checking product quality requirements carried out by businesses and companies. Meanwhile, QC or the abbreviation for Quality Control is more about product quality.

5. Goal Statement

By working in a structured manner, results will be obtained according to the delivery on time target with the best quality, without disruptin[g or hampering the operation of the CAP-1 plant so that the CAP-1 plant will succeed in increasing production capacity according to the targets implemented by stakeholders.

6. Resource Alocation Loading Plan

In implementing the pipe replacement project at CAP-1, HEI mobilizes manpower, equipment, and cost resources PR 3000023262 OLEFIN PLANT Area
In this case we will display the manpower resources and the main equipment required.

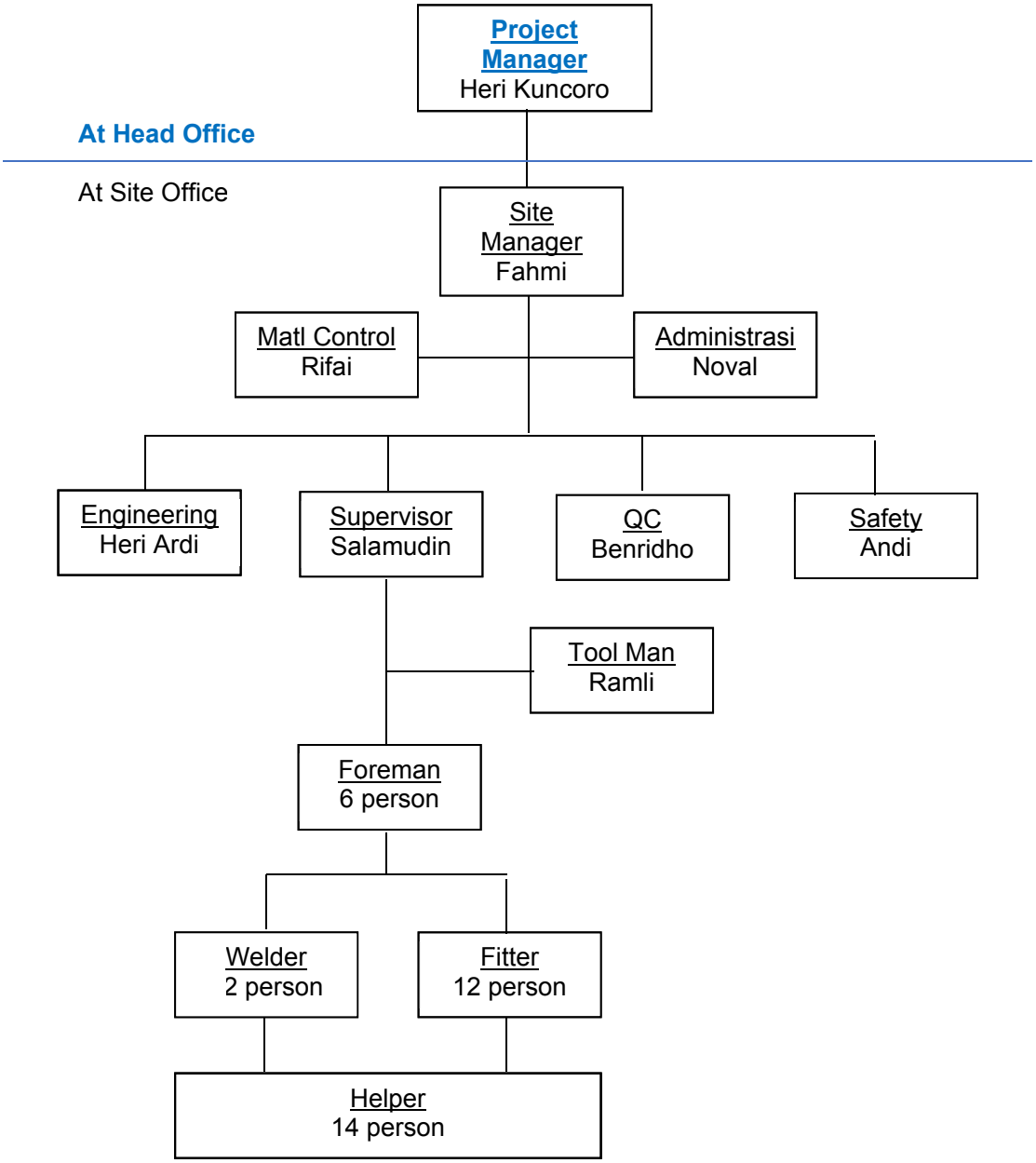
No	Loading Area	Function	Qty	Unit
	Olefin Plant Area			
		Manpower		
		Site Manager	1	Person
		Supervisor	1	Person
		Inspector	5	Person
		Engineer	1	Person
		Foreman	6	Person
		Administration	1	Person
		Tool Man	1	Person
		Safety	6	Person
		Welder	12	Person
		Fitter	12	Person

		Helper	14	Person
		Rigger	-	Person
		Scaffolder	1	Person
		Painter	1	Person
		Equipment & Tools		
		Engine Welding Machine	13	Unit
		Cubical (Fire Blanket)	-	Roll
		Lifting Equipment		
		Crane 50 Ton	-	Units
		Crane 100 Ton	-	Unit
		Unit Crane 10 Ton	1	Units
		Pick Up Capacity 1 Ton	-	Unit
		Forklif Capacity 5 Ton	1	Unit
		Scaffolding	308	M3
		Insulation	-	M2
		Site Office / Ware house from Container 20 ft	-	Unit
		Genset (220/380 V, AC) 15 KVA include Cable and control panel.	1	Unit
		Tool		
		Grinding Machine	13	Unit
		Trafo Inverter	13	Unit
		Cutting Torch	13	Pcs
		Lifting Device Include Chain Block	13	Set
		Tools for Digging	-	Pcs

		Hand Tools		
		Hammer (1/2 kg)	5	Pcs
		Torque Wrench	1	Pcs
		Electrical Tools (Lighting)	3	Set
		Control Panel & Cable	3	Set
		Water pass	10	pcs
		Roll Meter (5 meter)	10	Pcs
		Webing Sling (1 ton)	10	Set
		Small / Common Tool (Box)	1	Set
		HSE Requirement	1	Lot

7. Organization Component

7.1. Organization Chart Project



7.2. Key Person

Location : Area PR 3000023262 OLEFIN PLANT at CAP Site

No	Name	Position	Area Allocation
1	Heri Kuncoro	Project Manager	Head Office
2	Fahmi	Site Manager	Site Area
3	Heri Ardi	Engineering	Site Area
4	Salamudin	Supervisor	Site Area
5	Benridho	QC	Site Area
6	Andi	Safety	Site Area
7	Rifai	Material Control	Site Area