Commodore Aluminium Industries Co. L.L.C.
TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 -
Abu Dhabi - United Arab Emirates

METHOD STATEMENT

(Incorporating the Risk Assessments)

FOR THE DESIGN, FABRICATION and INSTALLATION OF

Aluminium Unitized Curtain Wall

at

"Creek Tower"

SARAYA RESIDENTIAL BUILDING

Sector E12 – Plot C33

Abu Dhabi

Developer:

MAAM PROPERTY INVESTMENT COMPANY LLC

Consultant:

etanconsult
architecture . urban design

Issued by : A2CP SOLUTION JLT
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CONTENTS

SECTION 1
General Description – Information

1.1 GENERAL

The following Method Statement covers all the steps involved in the design, production and installation of the unitized curtain wall and glazing works for the following project:

CREEK TOWER
SARAYA Residence Building
Sector E12 – Plot C33
Abu Dhabi - UAE

This document details how the process of the works will be carried out in order to meet the contract's specifications and drawings.
It will also detail and evaluate the possible dangers/risks associated with the works included in the scope and the control methods to be established to explain how the works will be managed safely.

Additionally, this method statement is written to be in compliance with the requirements of the municipality authorities of Abu Dhabi and especially following the requirements of the Environment, Health and Safety, Management System (EHSMS) for the building and construction industry as required by the decree N°42 of 2009.

1.2 RESPONSIBILITIES

The works described in this document will be carried out and place under the legal liability of:

Commodore Aluminium Industries Co. LLC
Tel: 02-555 4510, Fax: 02-555 9863
P.O. BOX 35605
Abu Dhabi – UAE

All information or further requirements relevant to this document should be reported to:

Name:	Gilles Vandevoorde
Function:	Operations Manager
Name:	Salah Abu Aram
Function:	Construction Manager

1.3 BRIEF PROJECT DESCRIPTION

The present document describes all steps, from the design to the installation of an aluminum unitized curtain wall which will cover the main tower of the project above mentioned.
Unitized curtain walls are assembled, glazed and sealed off-site (factory) and erected as units (Figure 1.1). The units shall cover the width of one or two modules (corner areas) and will be one floor in height divided into a spandrel part and a vision part including one or several fixed fields and eventual opening shutters (Figure 1.2). The units are assembled under controlled shop conditions, where the work process can be carefully inspected, and it enables fairly quick enclosure of the building envelope with a minimum of field labor required and almost none on site sealant. This is making it less reliant on the site workmanship. The units are supported on the slab edge and are subject to live load deflections, which are easily accommodated, in the mating horizontal mullions (stacking joint). The attachment of the unitized curtain wall (anchor/brackets) will be design for the wall to either tilt or translate. Movements are accommodated in the mating joints (stacking joint) around the perimeter of each panel.

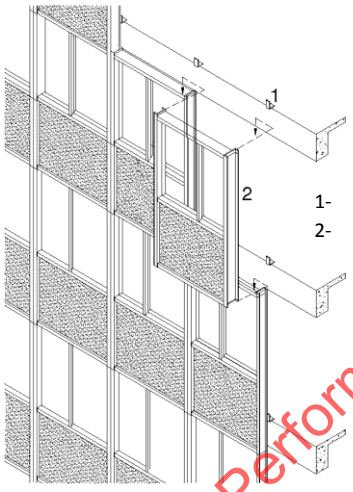


Figure 1.1

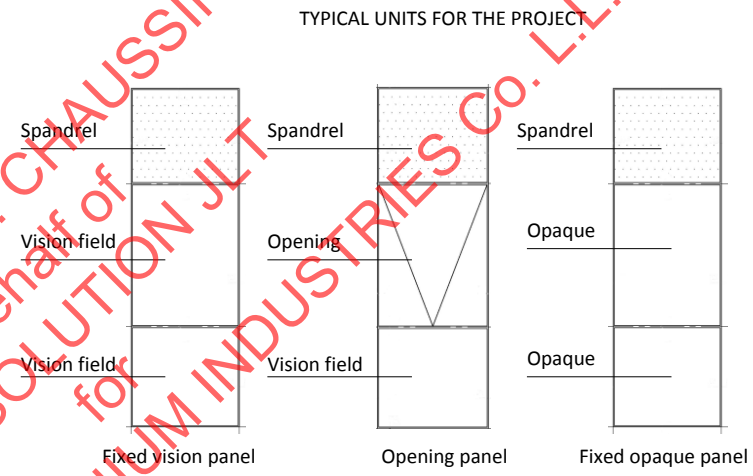


Figure 1.2

From a technical point of view, this system is more suitable than stick traditional curtain walls system when the building movements or deflections are important and it easily absorbs the floors drift, which usually is more present on tall buildings. Consequently, this system increases the durability performances of tall buildings' envelopes and contributes to ensure sustainability and environment protection.

On the other hand, if the dispositions of installation defined in section 6 are respected, the unitized curtain wall improves the efforts and measurements to obtain high standards of HSE for the project in order to protect people, assets and environment by reducing the installation time, minimizing the works from outside, and increasing the COSHH level (very few on site sealant).
COSHH = Control of Substances Hazardous to Health.

1.4 CODES and STANDARD

The codes and standard used to achieve the works are defined by the specifications of the contract, which form part of this method statement. Additionally, in case of missing information in the specifications above mentioned, the below standards will be used with the following priority order:

- AAMA: American Architectural Manufacturers Association.
- ASTM: American Society of Testing and Materials.
- BSI: British Standards Institution.
- CEN: European Committee for Standardization.
- ASCE: American Society of Civil Engineers.
- NFPA: National Fire Protection Association.
- NFRC: National Fenestration Rating Council.
- ASHRAE: American Society of Heating, Refrigerating and Air-Conditioning Engineers.
- ISO: International Organization for Standardization.
- ANSI: American Standard Institute.
- DIN: Deutsches Institute für Normung.
- CPSC. U.S. Consumer Products Safety Commission.
- OSHA: Occupational Safety and Health Administration.

A list of the main Codes and Standards used to achieve the works is enclosed under the Appendix A, Section 10.

1.5 HEALTH, SAFETY AND ENVIRONMENT

The works will be carried out in accordance with UAE labor law, the relevant health and safety requirements and as our policies, especially with:

- The federal law N°8 of 1980 and all subsequent amendments.
- OSHA regulations (standards-29 CFR / PART 1926: safety and health regulation for construction) subject the content is not in opposition to the provisions or rules enacted by the Environment Agency-Abu Dhabi (EAD), the Municipality of Abu Dhabi, or another authority of United Arab Emirates.
- Commodore Aluminium Industries Co L.L.C. health and safety policy statement.
- Commodore Aluminium Industries Co L.L.C environmental policy.

1.6 QUALITY CONTROL PLAN

Commodore Aluminium Industries Co L.L.C. operates a quality control plan management to meet the quality and performances criteria required by the project. The provisions and control points are enclosed in Section 7.

1.7 METHOD STATEMENT LAYOUT

This Method Statement will be divided according to the following parts:

- Section 02: Health, Safety Policy Statement – Environmental Policy.
- Section 03: Management.
- Section 04: Design.
- Section 05: Fabrication.
- Section 06: Installation.
- Section 07: Quality Control System.
- Section 08: Risk Assessment.
- Section 09: COSHH.
- Section 10: Appendix.
-

Sections 4, 5, and 6 will detail the process of work for each step, the risk associated and the method of control to manage the work safely and in accordance with the quality requested.

1.8 TEST CERTIFICATE

Test certificates for any relevant plant and/or equipment (if any) will be made available one (1) month before the works requiring the use of such plant and/or equipment. This Method Statement will be amended to add these test certificates (if any) in Section 10.

1.9 CERTIFICATE OF COMPETENCE

Certificates of competence (if any) will be made available one (1) month before the works requiring such Certificates. This method statement will be amended to add these certificates of competence (if any) in Section 10.

SECTION 2
HEALTH AND SAFETY POLICY STATEMENT
ENVIRONMENTAL POLICY

2.1 HEALTH AND SAFETY POLICY STATEMENT

Commodore Aluminium Industries Co L.L.C is committed to the promotion of Health and Safety. Our General Manager, our Deputy General Manager, our Operations Manager and all the managers involved in this project will provide, as far as reasonably practicable, the necessary leadership and resources required to maintain health and safety. The company recognizes that Health and Safety is a business function and must therefore continually progress and evolve in changes. Our approach to safety is based upon the risk identifications and control. The company believes in constantly improving Health and Safety standards and performances. To such extent, we will endeavor to ensure that all relevant statutes, regulations and codes of Practice are complied with. The minimum standards that will be adopted by the company are those required by law, although the company will always seek to exceed these standards where there is a demonstrable benefit.

The company recognizes that safety is the responsibility of everyone and not just a function of management. Managers have specific duties and responsibilities to comply with the company policy. However, the health and safety of our employees and staff working in any areas are based on a clear policy that ALL employees have obligations and responsibilities regarding HSE. The company actively promotes the involvement of all employees in the safety management program.

In accordance with the provisions of the Standard 29-CFR PART1926, the company will:

- Provide:
  - Safe and sanitary places of work (factory and jobsite)
  - Safe plant, equipment and PPE
  - Safe work procedures
  - Adequate supervision, training, education, instruction and information
  - Emergency action plans and procedures
- Eliminate:
  - Hazardous or dangerous conditions of work for the health or safety reasons
- Carry out:
  - Suitable and sufficient risk assessments
  - First aid services and provisions for medical care
  - Fire protection and prevention (if any)
  - Housekeeping
- Record, report and investigate:
  - Injuries, accidents and near miss in order to determine their cause and take preventive actions to avoid any recurring incidents or accidents

To ensure that this policy is implemented, the company shall:

- Review the policies annually, or on significant changes in our business
- Make any changes known to our entire staff and workforce
- Maintain procedures for communication and consultation between all staff levels on health and safety matters

2.2 ENVIRONMENTAL POLICY

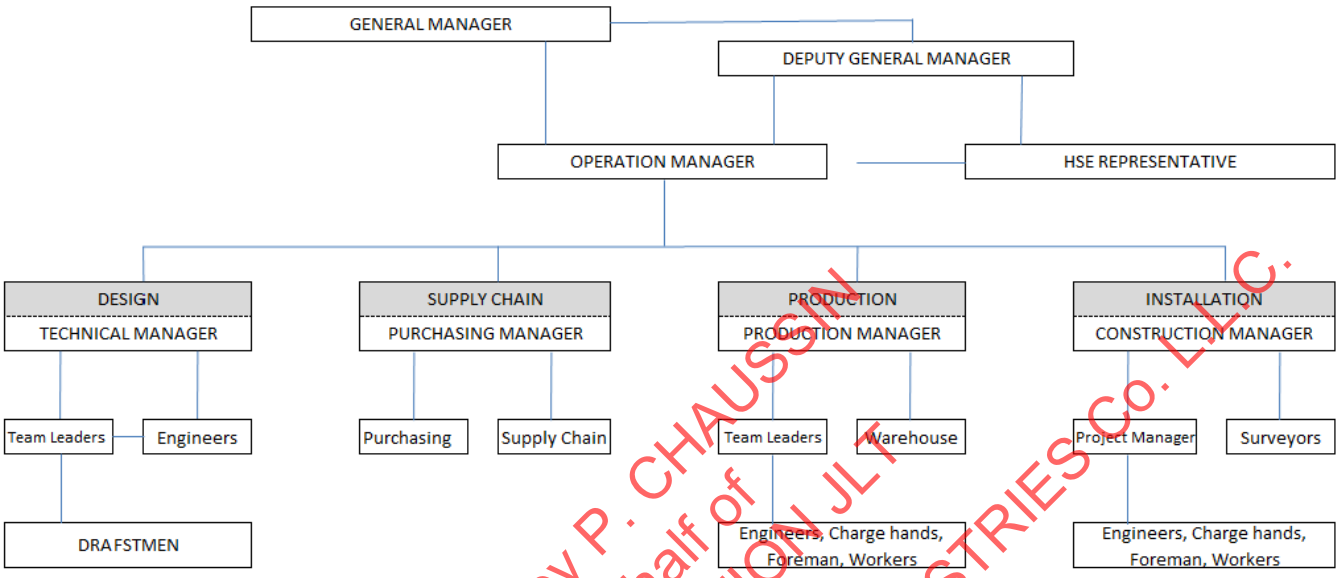
Commodore Aluminium Industries Co L.L.C. recognizes the concerns of environmental issues are fundamental to the way we conduct business. Commodore Aluminium Industries L.L.C. is committed to promote awareness and responsible attitude amongst its employees. The company believes in constantly improving the goals of advanced principles for protecting the environment and ensuring sustainability. Therefore, our company will follow, as far as reasonably practicable without affecting the commitments, the schedule, the technical, financial and any performances criteria of the project, the specifications enacted by Emirates Green Building Council.

In accordance with the local order of the municipality of Abu Dhabi concerning environmental protection regulations, or default with the local order 61 of Dubai Municipality, and/or the green building regulations and specifications of the government of Dubai in lines with the Dubai strategic plan 2015. The company will:

- Comply with legal requirements, including code of practice and other guidelines; obtain licenses (if any) and other authorizations as required in order to comply with appropriate regulations.
- Make efficient use of energy and natural resources.
- Minimize waste and where practicable, ensure that waste products are recycled.
- Restrict the use of packaging to a minimum and where practicable, maximize the use of re-cycled material.
- Control air, water and noise pollution by adapted working methods and best available techniques not entailing excessive costs.
- Encourage the efficient and economical use of transport.
- Maintain the condition and appearance of Company premises.
- Design, develop, supply and provide products and services that help to conserve energy resources and, have no adverse effect on the environment.
- Promote awareness amongst all employees of company environmental policy and ensure their co-operation in implementing these standards and procedures.
- Encourage suppliers to increase their awareness and improve environmental standards.
- Regularly review our environmental standard and procedures, and strive for continuous improvement in our performance, towards a standard which greater than more regulatory compliance.

SECTION 3
MANAGEMENT

3.1 GENERAL MANAGEMENT STRUCTURE



Production teams are organized according the following tasks:

- Logistic, loading, unloading, packaging, storage, housekeeping
- Cutting, Milling, Notching, Frames Assembly
- Folded sheets, steel items and composite panels
- Infill panels, glazing, glass bounding
- Finishing, Control

Installation teams are organized according the following tasks:

- Logistic, unloading, dispatching, protection, housekeeping
- Surveying
- Brackets installation
- Panel erections
- Flashing, finishing, smoke barriers
- Quality control, HSE

3.2 HSE PERSONAL ROLES AND RESPONSIBILITIES

The company recognizes that safety is the responsibility of everyone and not just a function of Management. Managers have specific duties and responsibilities to comply with the company policy. The personal role and responsibility of the Managers will be detailed with the tasks described in the activities sequence from Sections 4 to Section 6.

SECTION 4
SEQUENCE OF ACTIVITY:
DESIGN

4.1 GENERAL

Our company recognizes the major role of this activity to meet the performances criteria and quality in the achievement of the works. Special attention will be given to control to ensure the compliance of the design with the architectural and technical criteria and specifications. To respect the project's specifications, the materials used for the works will be chosen for their qualities and, for their sustainability and to be in accordance with the best levels of the environment policy described in section 2.2.

Additionally, and according to our health and safety policy statement, the Technical Manager and the team leaders involved in this sequence of activity will pay a particular attention to the impact of design for production and installation to eliminate any hazardous or dangerous activities and to ensure safe working conditions during workshop production and site installation.

4.2 ROLES AND RESPONSIBILITIES

Technical Manager:

- Reports to: Operations Manager
- Supervise: Team leaders, Engineers
- Scope: Organize, control and advise all steps of the design. Ensure that the work is in compliance with specifications and standards. Approve products and materials for submittal. Approve drawings for submittal.
- With the Production, Purchasing, Construction and Project Manager, the Technical Manager participates actively in the project coordination lead by the Operations Manager.
- Spread HSE information to his team leaders through periodic meetings and information notices.

Team Leaders:

- Report to: Technical Manager
- Supervise: Draftsmen
- Scope: Responsible for the design. Support, control all steps of the design and organize draftsmen works. Coordinate Engineers information, advices and specifications.
- Spread HSE information to draftsmen and control the correct understanding and application of the rules.

Engineers:

- Report to: Technical Manager
- Scope: Responsible of Calculation notes, define the characteristic of the products and/or materials proposed to meet the specifications and performances criteria.

4.3 SPECIAL DISPOSITION FOR HSE

The risk for employees during this sequence of activity are very low [Probability (P) =Rare, Severity(S) = insignificant] and do not require special disposition or further action. However, the design can affect the conditions of work in the factory and/or at site. Therefore, to involve all employees to improve and ensure the better HSE standard, the following dispositions will be used:

For:

- The workshop drawings where it is required
- The fabrication manuals and fabrication sheets
- Installation manual and installation instruction

The company will:

- Use a symbol system (pictograms) to describe and focus the actions required by the technical information dispatched on drawings and/or technical data.
- Insert in all documentations a table of the pictograms used for the drawings and/or technical data, explaining the action related to the symbols, the risk assessment of this action, the precaution and/or PPE to adopt and the precaution to limit the impact of Environment (if any).

In Section 10, Appendix B, a table of this pictogram system is enclosed to present the eventual actions required by the fabrication and erection of the unitized system and the related HSE provisions.
In case of action required by the works and not described in this document, new pictograms will be inserted in an amendment of the present document.

4.4 SYSTEM APPROVAL

According to the brief project description of article 1.3 and the custom design proposed by Commodore Aluminium Industries Co L.L.C for the project, prior to carrying out the workshop drawings, the company will submit to the main contractor (and copies for the consultant and/or client technical representative) some typical sections to explain the system design. These drawings do not replace workshop drawings. They are only use to give an overview of the proposed system with the general dimensions (sightlines, construction depth, etc.).

Additionally, structural calculation notes and thermal calculation will be submitted to demonstrate that the proposal meets the specifications and performances criteria of the contract.

The approval of all parties will be requested before the achievement of the workshop drawings. By definition, “approval” means agreement about the architectural criteria of the system (dimensions, geometry, etc…). However, Commodore Aluminium industries Co L.L.C. ensures the responsibility to meet functionalities and performance criteria of the system until the handing over of the aluminium scope of works.

4.5 WORKSHOP DRAWINGS

These drawings show:

- The exact measurements and location for each panel with the reference system
- The detailed sectional drawings for every item type
- The connection details with other works like smoke barriers, flashing, etc.
- The disposition to ensure the weather tightness, pressure equalization, drainage and ventilated provisions for the spandrel areas (if any) of the system
- The disposition to fix the façade to the slab and the details about the anchors (brackets)
- All details and information about glazing, bounding and finishing
- Particular details and dispositions for corner, sub-sill, parapet, jamb mullions, etc.
- All others information request for a clear understanding of the work and about the product used with technical data sheet enclosed (if any)

Additionally, Commodore Aluminium Industries Co L.L.C will provide all data sheets, information and calculation notes (glazing, bounding, brackets, fixing, etc…) required to demonstrate that the works meet the technical requirements of the contract and respect the dispositions of work defined by the Section 2. These drawings, calculation notes and technical data sheets will be submitted to the main contractor (with copies for the consultant and/or the technical client representative). The approval of all parties will be requested. These drawings are subject to modifications and adjustments as per comments and/or requirements of the parties.

4.6 DIES DRAWINGS

Subsequent to the approval of workshop drawings, the dies drawings of new customized profiles, gaskets and/or other items will be made. This work will be implemented in co-operation with our suppliers.

Production of samples with several control tests will be carry out to ensure the quality of the product, the functionality of these items and the respect of the specifications request. All this process control is managed under standards with reports and approval forms.

These controls are carried out in compliance with our quality control policy. Usually, the forms and/or reports related to this sequence are only dispatched to the quality control management of our company. However, in case of doubts or weakness of one or more items, by written request by the main contractor, this information shall be presented to control the full application of the quality control plan and the conformity of any problematic item(s) with the specifications.

4.7 FABRICATION MANUAL/FABRICATION LISTS

Based on approved workshop drawings, Commodore Aluminium Industries Co. L.L.C. will write the fabrication manual and the fabrication sheets to provide the necessary information to the factory for mass production.

Fabrication manual represents all information required to fabricate the panels without need of any external support and include the following information to allow the production of the panels:

- General information and special cautions about the system
- Limitation use of the system and its various components
- General cutting list for profiles and gaskets
- Milling for each kind of profiles used in the system (indicating drainage path, ventilation, etc.)
- General order list for accessories
- Technical information and recommendations to assemble the system and to comply with the weather tightness, structural and thermal performances, noise reduction, etc.
- Fitting of accessories and hardware
- Precaution for infill panels installation
- Technical matters requiring special caution during the manufacturing process
- General information about packing, storage and loading

According to the dispositions of article 4.3, the fabrication manual will also include all information about HSE provisions suggested by the design department for the production of the unitized curtain wall.

Fabrication sheets represent the detail documents for the production of each panel. These data are based on the fabrication manual and include the additional following information:

- Elevation of panels with dimensions and sections related
- All identification information such as coating type, color, glazing, quantity, references, locations, etc.
- All information for infill panels including glazing type, bounding, back pan, insulation, etc.
- All information about material, items and quantity needed to fabricate the panels
- Information about packing, storage and workshop loading
- All other information required for production
- Schedule of production

4.8 INSTALLATION MANUAL

Based on identical principles than the fabrication manual described on article 4.7 Commodore Aluminium Industries Co. L.L.C will write the installation manual. This document will provide all information required to install the unitized curtain wall according to specifications, performances criteria and workshop drawings. Moreover, according to the dispositions of Article 4.3, this installation

manual will also include all information about HSE provisions suggested by the design department for the installation of the unitized curtain wall.

This document will highlight the following sequences:

- Unloading, on site storage and levels dispatching
- Brackets installation with quality control policy
- Plants and material information for panel erection
- Information for panel erection (lifting, panel mating, adjustment, gasket installation, etc.)
- Information about Quality Control of panel erection
- Information and provisions about all particular points like smoke barriers, corners, mullions jambs, parapet, flashing, etc.
- Reparation procedure for broken glass
- All other information requires for the Installation of the unitized curtain wall

4.9 MOCK-UP DEFINITION

Commodore Aluminium Industries will erect one (or two) mock-up(s) to ensure to the parties that the proposed system meets the technical criteria and contract specifications. The first mock-up shall be a visual mock-up and will be installed at site at an agreed location to control that the final aesthetics of the erected system meets the architectural criteria and expectation. The second mock-up represents the performances mock-up and will be installed in a laboratory test center approved by the parties and authorities to control that the proposed system meets the performances criteria required by the contract.

The documents related to this (these) mock-up(s) will be carried out in accordance with the previous documents above mentioned and especially:

- The workshop drawings described in article 4.5
- The Fabrication Manual described in article 4.7
- The installation Manual described in article 4.8

The HSE provisions suggested by the design department to produce and install this (these) mock-up(s) will also be in compliance with the previous documents and extracted from the same. According to the disposition of article 1.6 and the Section 7, the quality control plan applies (apply) for this (these) mock-up(s) will be based on the same quality control plan used for the mass production and installation.

4.10 TESTING

According to the previous article, the tests will be carried out by a laboratory test center approved by the parties and UAE authorities. The tests will be conducted according to the specifications of the contract and the documents written in article 4.9.

Based on the fact that the condition of works of the laboratory test centers are different than real working conditions at site, a special HSE provision will be written for this sequence in co-operation with the Laboratory. These documents will be submitted to the laboratory test center for approval and forwarded to the different parties involved for information. The quality control plan adopted for this

testing sequence will be the same than the quality control plan used for the mass production and installation of the project.

SECTION 5
SEQUENCE OF ACTIVITY:
FABRICATION

5.1 GENERAL

In accordance with the definition of the Unitized Curtain Wall described in article 1.3, our company recognizes the major role of the fabrication sequences to meet with performances criteria and quality during the works. The full workshop production allows a careful inspection of the panels and reduces significantly the risk of hazardous works for field labor. Consequently, a special attention will be given to the control to ensure the compliance of the design with the architectural and technical criteria and specifications. The process used to control the production quality will be detailed in Section 7.

Additionally, and according to our health and safety policy statement, the Production Manager and the team leaders involved in this sequence of activity will pay a particular attention to the HSE rules promoted by the company in order to eliminate hazardous activities and to ensure safe conditions of works.

5.2 ROLES AND RESPONSIBILITIES

Production Manager:

- Reports to: Operations Manager
- Supervise: Team leaders
- Scope: Organize, schedule advice and control all steps of the production. Ensure that the work is in compliance with specifications. With the Technical, Purchasing, Construction and Project Manager, the Production Manager participates actively in project coordination lead by the Operations Manager.
- Spread HSE information to team leaders through periodic meetings, information notices and control in the factory

Team Leaders:

- Report to: Production Manager
- Supervise: Workers
- Scope: Responsible for the task production (sequence of fabrication) defined by the Production Manager. Support and control all steps of the task and organize the team's work. Coordinate the works with the adjacent team (previous and next tasks).
- Spread HSE information to workers and control the correct understanding and application of the rules
- Control the quality of the task according to the control quality plan

Production teams are organized according the following tasks:

- Logistics, loading, unloading, packaging, storing, housekeeping
- Cutting, milling, notching, frame assembling
- Sheet folding, manufacturing of steel items and composite panels
- Infill panels, glazing, bonding
- Finishing, final controlling

5.3 PROCUREMENT LISTS

This work is not carried out by the production department but is closely connected to its activity. The design department, under the responsibility of the Technical Manager, achieves this work, which is forwarded to the purchasing department. However, the Production Manager controls that all products, materials defined in the procurement lists are in compliance with HSE provisions and authorities' regulations about the conditions of work applicable in the factory. After this control, the procurement lists are forwarded to the purchasing department. No other special actions are required by this task for HSE provisions or the quality control plan.

5.4 PURCHASING/SUPPLY CHAIN

This work is not carried out by the production department but is closely related to its activity.
The purchasing department, under the responsibility of the Purchasing Manager, achieves this task.
However, the purchasing department informs the Production Manager about the delivery time of the various orders to allow the production organization according to the general schedule of the project.
No special actions are required by this task for the HSE provisions or the Quality Control Plan.
However, the Purchasing Manager will control that the suppliers are in accordance with our HSE policy Statement and the Environmental Policy respectively described in article 2.1 and 2.2.

5.5 MATERIAL STORAGE

For each order delivery, the leader of the logistic and storage team will organize the unloading, the control and the storage of the products according to the safety and precaution rules required by the products. In any case, the team will control that the products are not prescribed by the relevant HSE standard of the factory, and by the COSHH of this document.

The storage will be achieved in accordance with the relevant HSE standard of the factory. In case of products requiring storage provisions not described in the HSE standard of the company, the rules defined by the OSHA regulations (Standard-29 CFR / PART 1910: Occupational Safety and Health Standard, subpart F to N, P and Z) will be applied; subject that the content is not in opposition with the provisions or rules enacted by the Environment Agency-Abu Dhabi (EAD), the Municipality of Abu Dhabi, or another authority of United Arab Emirates.

5.6 UNITS FABRICATION

By definition in unitized curtain wall, “unit” and “panel” are similar words and represent the same item. By this term, we understand the fabrication of a frame fully assembled in the factory in compliance with the instructions defined by the fabrication manual and the fabrication sheets described in section 4, article 4.7.

The followings tasks are included in this sequence of work:

- Control of items required for the unit fabrication (surface quality, compliance with documents, etc.) and application of protection tapes
- Cutting of profiles
- Milling, notching of profiles and accessories (if any)
- Connection between profiles according to fabrication manual including weather tightness provisions
- Cutting, fitting of gaskets
- Installation of all accessories required by the system (glass holders, lifting pieces, hooks, hardware, etc.)
- Installation of back-pans and vapor barriers
- Installation of insulation in spandrel fields (if any)
- Cleaning, storage

All these tasks are carried out by experienced manpower, supervised by the team leaders in charge, using all the necessary CNC machines and punching tools, in order to ensure a final product that complies with the project specifications and meets with international criteria for performance and quality enacted by AAMA, ASTM, BSI, CWCT or all other organization mentioned in article 1.4.

Additionally, these tasks are also achieved in full respect of:

- The information provided by the suppliers
- The HSE Standard and the quality control plan of the factory, which defines the general production policy of Commodore Aluminium Industries Co L.L.C
- The technical information and HSE provisions (if any) provided in the workshop drawings
- The technical information and HSE provisions included in the fabrication manual

5.7 GLAZING/INFILLS

By “glazing”, and “infill panels”, we do not mean the products but also the installation of these items in the fabricated units described in the previous article, and all the tasks related.

The following tasks are included in this sequence of work:

- Controls of infill panels (surface quality, color, reference, dimensions, compliance with all documents, etc.)
- Cleaning before fitting

- Control of the fabricated unit (surface quality, reference, dimensions, installation of glass holders, etc.)
- Installation of spacers and/or thermal bond material before bonding (if any)
- Bonding (if any) and cleaning
- Installation of other infill panels (non-bonded glass, aluminium sheets, louvers, etc.)
- Installation of transportation spacers for non-bonded infill panels
- Installation of finishing (cover caps, fins, etc.)
- Cleaning

All these tasks are carried out by experienced manpower, supervised by the team leaders in charge, using all the necessary machinery in order to ensure a final product in compliance with the project specification and meet the international criteria for performance and quality enacted by AAMA, ASTM, BSI, CWCT or all other organization mentioned in article 1.4. Moreover, the bonding is carried out in protected area, to ensure that the final product is in compliance with the structural glazing international codes. An additional test process is carried out during the bonding sequences according to the requirements of suppliers and international codes.

Additionally, these tasks are also achieved mindful of:

- The information provided by the suppliers
- The HSE standard and the quality control plan of the factory, which define the general production policy of Commodore Aluminium Industries Co L.L.C
- The technical information and HSE provisions (if any) provided in the workshop drawings
- The technical information and HSE provisions included in the fabrication manual

5.8 PROTECTION, PACKING, STORAGE

After completion of the panel fabrication and infill panels' installation, each panel will be submitted to the following sequence of work:

- Control of the panel according to the Quality Control Plan
- Cleaning on the panel, where required
- Storage of panel in appropriate racks (horizontal position of the panels)
- Protection of the panels against dust and scratching (figure 5.1)
- Storage of the panels in an appropriate area until transportation to jobsite.(figure 5.2)

All these tasks are carried out by the storage and logistic team, using the appropriate plants, tools and handling systems to provide a work in compliance with the policy defined by Commodore Aluminium Industries Co L.L.C, and the HSE provision enacted for the factory.

For this project, a vertical storage could eventually be chosen for the panels. If this solution is adopted, special provisions will be defined to avoid shear moment of the bonding areas of infill panels due to the dead load of the glass, and Safety rules will be amended to avoid any risk of falling panels.

Figure 5.1

Figure 5.2

5.9 LOADING

This task is also conducted by the logistic and storage team in full compliance with the HSE Standard defined by Commodore Aluminium Industries Co L.L.C for loading and in accordance with OSHA regulations (Standard 29-CFR/PART 1910-1926) and articles related.

SECTION 6
SEQUENCE OF ACTIVITY:
INSTALLATION

6.1 GENERAL

In accordance with the definition of the Unitized Curtain Wall described in article 1.3, the suggested system allows our company to minimize the field labor and the hazardous or dangerous works to meet the performances criteria and quality expected by the client. Moreover, the system reduces the installation from outside and allow, with full respect of installation information, to provide safe conditions for the workers. However, due to the weight of each pane and the handling and lifting of these items, the erection of the system can only be carried out by a skilled manpower, supervised by the team leaders who shall continuously control the full respect of safe working conditions. Commodore Aluminium Industries Co L.L.C and the main contractor will coordinate to avoid workers' circulation and create a safe space for the facade erection.

Consequently and according to our health and safety policy statement, the Project Manager and the team leaders involved in this sequence of activity will pay a particular attention about the HSE rules promoted by the company to eliminate hazardous activities and to ensure safe conditions for any workers on site.

6.2 ROLES AND RESPONSIBILITIES

Construction Manager:

- Reports to: Operations Manager
- Supervise: Project Managers
- Scope: Organize and control all steps of the installation. Ensure that the work is in compliance with specifications. With the Technical, Purchasing, Production Manager, the Construction Manager participates actively in the project coordination lead by the Operation Manager.
- Spread HSE information to team leaders through periodic meetings before the beginning of each new sequence of work and continuously control the respect of HSE rules

Project Manager and team:

- Reports to: Construction Manager
- Supervise: team Workers and staff
- Scope: responsible of the installation task (sequence of installation) defined by the Construction and Project Managers. Support, control all steps of the task and organize the teamwork. Coordinate the works with the adjacent teams (previous and next tasks) or workers.
- Spread HSE information to workers and control the correct understanding and application of the rules

- Control the quality of a task according to the quality control plan

Installation teams are organized according the following tasks:

- Building measurement, quantity surveying, implementation of axis, installation references
- Logistic, unloading, dispatching, housekeeping
- Brackets installation
- Panel erection
- Indoor finishing installation (smoke barriers, flashing, etc.)
- Quality control
- Other tasks

6.3 COMPANY'S INSTALLATION ON JOBSITE

Prior to the beginning of work on jobsite, Commodore Aluminium Industries Co L.L.C. will define the minimum areas on jobsite that the Main Contractor needs to provide. The main contractor must ensure signage and provisions to avoid circulation or attendance of unskilled workers in these areas. By "unskilled workers" we define all workers or persons present on the jobsite who do not belong to our installation teams. Additionally, according with the erection process, Commodore Aluminium Industries Co L.L.C will define the floors location for the mini cranes and the dispatching areas of the panels to install the façade. This information is respectively included in articles 6.5 and 6.6.

The main contractor shall provide safe conditions for building access (hoist, staircases with hand rails, lighting, etc.) and provisions to avoid any falls from the floors (railings, barriers, nets for protection against falling objects, etc.).

6.4 BUILDING MEASUREMENT

Although the unitized curtain wall is less reliant on the standard of site workmanship than a stick system curtain wall, once the site conditions enable the façade installation, our surveyors; will control the dimension of the building prior the brackets installation. In addition to this task, the team will mark the reference axis required to begin the installation, and to "open correction areas" absorbing the tolerances of the concrete. This task represents only few risks [Probability (P) = Rare, Severity (S) = Insignificant] and does not require special provisions other than compliance with the provisions enacted for the site and to wear appropriate PPE for this task (hard helmet, protection boots, high visibility jackets, gloves, hearing protection in case of noisy environment).

The Surveyors will control the task and forward the result to the Project and Construction Managers. In case of oversize tolerances, the Construction Manager will inform our Technical Manager, our Operation Manager and the Main Contractor for corrective provisions before the brackets installation.

6.5 BRACKETS INSTALLATION

Our company recognizes the major role of this task in the façade erection and the direct impact of this sequence on the final performance criteria and safety of the building. Consequently, Commodore

Aluminium Industries Co L.L.C will take a particular attention in the control of this task to ensure the compliance of the work with the technical criteria and the safety of the façade. The provisions used to control the brackets installation will be detailed in Section 7.

Additionally, and according to our health and safety policy statement, the Project Manager and the team leaders involved in this sequence of activity will pay a particular attention about the HSE rules promoted by the company to eliminate hazardous activities and to ensure safe conditions of works.

The brackets used for this project will be either aluminum or steel depending on the calculation notes and material definition carried out by the design department. To minimize the risks, where possible, the mechanical assemblies will be made to avoid welding on site. In case of welding system, a control process will be proposed to ensure the quality and the safety of the brackets. The brackets will be installed from inside directly on the slab edge as suggested by figure 6.1. The risk assessment related to this task is detailed in Section 08.

Figure 6.1

6.6 PANELS UNLOADING - DISPATCHING

The Logistic and Storage Team will carry out this task according to the information received from their leader. Trucks will be unloaded with the tower cranes and the panels will be stored on the storage area defined in Article 6.3 prior to be dispatched on the floors in compliance with the drawings enclosed on Appendix C, Section 10 and according to the followings areas:

- Area 1:
  - Storage on Podium roof.
  - Panels to cover floor 7th to floor 13th.
- Area 2:
  - Storage on Floor 21st.
  - Panels to cover floor 14th to floor 20th.
- Area 3:
  - Storage on Floor 28th.
  - Panels to cover floor 21st to floor 27th.
- Area 4:
  - Storage on Floor 35th.
  - Panels to cover floor 28th to floor 34th.
- Area 5:
  - Storage on Floor 42th.
  - Panels to cover floor 35th to floor 41st.
- Area 6:
  - Storage on Floor 48th.
  - Panels to cover floor 42th to floor 47th.
- Area 7:
  - Storage on Top Roof.

- Panels to cover floor 48th and 49th (installation with tower crane).

Platforms will be installed by the Main Contractor on the storage floors above-mentioned to allow the arrival of the panels. (Figure 6.2) All provisions will be provided by the Main Contractor to ensure safe conditions of work for our teams.

To install the platforms, the Main Contractor will make decisions according to the following information (figure 6.3):

- Maximum Size of a panel rack: 4m80 (floor 28th) and 3m60 (typical floor)
- Width of the panel rack: 1m80
- Distance between the supports of the rack: 2m50
- Maximum weight of the rack: 1500 kg (panels included)
- Number of Workers on the platform to handle the rack: 6
- Additional tools used to move the rack: Pallet lift device

Figure 6.2

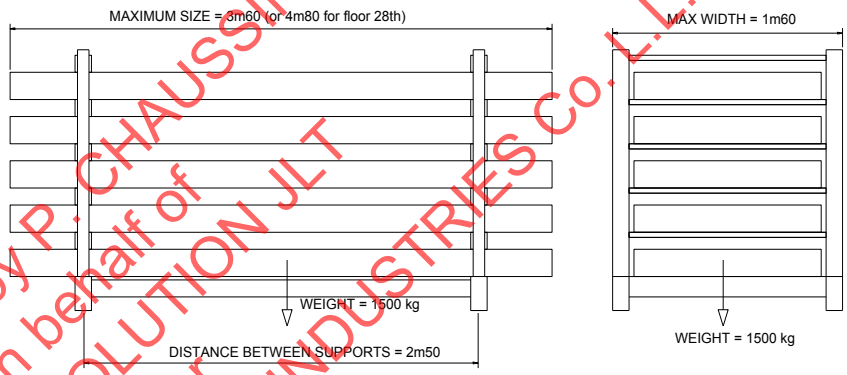


Figure 6.3

The racks will be dispatched on the storage floors, close from the façade to allow their handlings with a mini-crane during the installation process. (Figure 6.4)

Commodore Aluminium Industries Co L.L.C will use proper signage at the storage areas and the Main Contractor shall inform the other workers from other subcontractors about the provisions for circulation on the mentioned floors to avoid any injuries and/or any panel damages.

To allow safe conditions of work for our installation teams and a sufficient place to handle the panels, all masonry blocks in the storage areas of these levels will be implemented after the panels' installation. The risk assessment related to this task is detailed in Section 08.

Figure 6.4

6.7 MINICRANE INSTALLATION

The installation of panels will be carried out with mini-cranes installed and moved on several floors. The mini-cranes will be moved on the floors in compliance with the drawings enclosed on Appendix D and according to the following areas:

- Area 1 : Floor 15th
- Area 2 : Floor 22nd
- Area 3 : Floor 29th
- Area 4 : Floor 36th
- Area 5 : Floor 43rd
- Area 6 : Floor 49th

It is important to note that the mini cranes installed on Floor 49th will allow erecting the panels from level 42nd to level 47th. The installation of panels for levels 48th and 49th will be carried out with the tower crane and will require special provisions.

The mini cranes placed on floors will move several times to ensure the enclosure of each floor. The drawings enclosed in Appendix E shows the location of the mini cranes on a typical floor. The positions 1 and 2 (figure 6.5) require the mini cranes to be moved with the tower crane after the installation of the panels. The positions 4 will be implemented in the continuity of the position 3 (figure 6.5).

To ensure safe conditions of work, the mini-cranes will require a minimum free circulation way of 900 mm around to allow a safe access to the façade or to other parts of the building.

The drawings enclosed in Appendix F Section 10 show the circulation ways on the floors with the mini-cranes location.

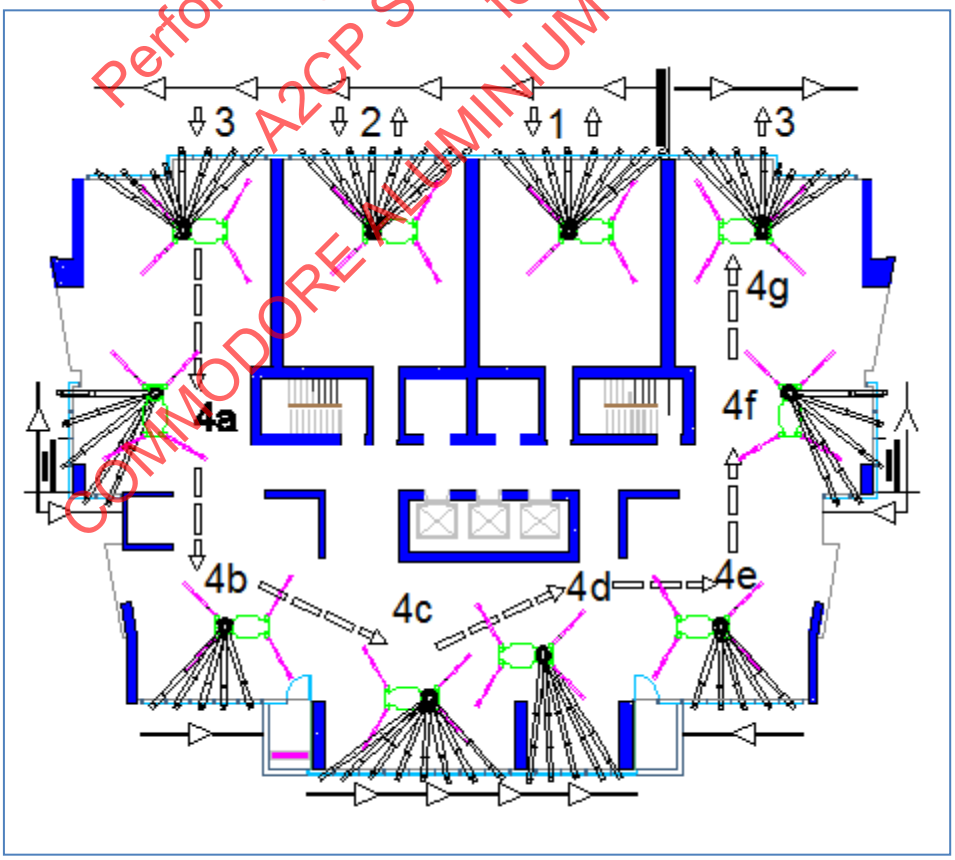


Figure 6.5: overview of Appendix E, Section 10

For safety reasons, during operation of the mini crane, the unskilled workers, as defined in article 6.3, will not be allowed to use the circulation paths previously defined nor to penetrate into the operation areas of the crane. The drawings enclosed in Appendix G, Section 10 shows the prohibited areas during the crane operations. To avoid any circulation and/or penetration in the working area of the mini cranes during operation, Commodore Aluminium Industries Co L.L.C will restrict these areas to skilled personal only. Additionally, the Main Contractor will inform the other workers about the provisions for circulation on the concerned floors to avoid any injuries.

To allow safety conditions of work for our installation teams and a sufficient place to operate the mini cranes, all masonry blocks in the levels above mentioned will the implemented after the panel installation.

The mini-cranes used for the project are defined according to the followings factors:

- Maximum weight of panels = 250kg
- Boom required for installation = 5m10
- Plant size, maneuverability, dimensions with outriggers at maximum position

Subject to availability and suppliers advices, MAEDA Mini Cranes MC 174 and MC 285 will be used. We reserve our right to use other type of mini crane for any kind of reasons. All technical information about this is included in Appendix H, section 10.

The operation of these cranes will be carried out in compliance with supplier specifications. All certificates required to operate these devices will be forwarded according to the provisions defined in article 1.8

The risk assessment related to the mini cranes installation is detailed in Section 08.

6.8 PANEL INSTALLATION

The panel installation sequence will be carried out by skilled manpower supervised by the team leader. The team is divided 3 groups:

- A group to operate the mini-cranes
- A group to handle the unit on the storage level
- A group to install the panels on the erection level

The following tasks are included in this sequence of work:

- Remove protection of the rack and control the panel (reference, location, surface or other damages, etc.) (second group)
- Handling of the panels from rack to turntable trolley (second group)
- Moving panels along the facade, at the edge of the slab, and in front of the area of the panel installation (second group)
- Connection of the panels with the crane hook with appropriated slings (second group)

- Lifting the panels by the mini- crane with manual support (to its upright position) to prevent swing.(second group)
- Reversal of panels (Inside/outside) for installation (second group)
- Vertical movement of panel with mini crane support to the installation area (first group)
- Mating of the panels with other frames (third installation group)
- Control of the correct placing, adjustment of panel and removal of slings (first group)
- Installation of weather tightness set, continuous horizontal gaskets.(first group)

Additionally, for each interruption of work, the top of each panel will be protected to avoid dust or sand penetration, which is able to damage the drainage system. These protections will be installed each evening to protect the façade of the weather conditions during the night.

To prevent any risk of accident, workers are not allowed to circulate and/or penetrate on the podium roof level overlooked by the installation area during the implementation of this sequence of work. Consequently, the main contractor will inform the "unskilled workers", as defined on article 6.3, about the provisions of circulation in the areas above mentioned and will protect these areas to minimize the risk of entry of restricted area.

Prior each task, our team leaders will check that all safety conditions and rules are respected. In case of dangerous conditions, our team leader will inform our Project Manager. The main contractor will be informed to enforce corrective actions. The risk assessment related to this sequence of work is detailed in section 08.

Commodore Aluminium Industries Co L.L.C will take a particular attention in the control of this task to ensure the compliance of the work with the technical criteria and the safety of the façade. In particular, the correct application of the weather tightness set of accessories will be controlled to ensure that the mass production is in compliance with the results of the testing process described on article 4.10. The provisions used to control the panels' installation will be detailed in Section 7.

6.9 PARTICULAR INSTALLATION

By "particular installation" we mean all works not previously described and without a recurrent aspect. Under this sequence of activity, we define, without limitation of tasks, the following works:

- Installation of sub-sill profiles to begin the first row of panel for the façade
- Installation of the finishing sheet on the parapet
- Installation of flashing in connection between concrete wall and jamb mullions
- Installation of finishing sheets on corner frame (if any)
- Installation of smoke barriers
- Installation of junction profiles with ceiling (if any)

All these tasks are carried out by our skilled teams. These works can significantly affect the visual result of the façade independently of the performances criteria. Consequently, a particular attention is paid to the quality of work for this sequence and the Team Leader will continuously control the final result of each task.

The tasks are divided in three groups:

- Outside works with cradle access (tending to be inexistent situation)
- Outside works with practicable access
- Inside works

The first group of tasks, carried out with a cradle, will follow the same HSE provisions as the provisions used for cladding in front of blind walls (tending to be inexistent situation). For more information about the HSE provisions for these tasks please refer to the method statement used for the cladding with composite panels.

The second group is assimilated to the same working conditions than the Inside works. The working conditions differ only according to the weather conditions and the lack of risks related to confined areas. Therefore, all rules according related to the safety for outside works, and especially the rules related to the use of machinery or hand tools in case of rain, and the safety standards in case of rain or wind will be applied according to the Standard 29/ART 1926. Moreover, all specifications of the devices suppliers will be applied in such conditions.

The last group of tasks will apply the conventional rules in the construction according to Standard 29-CFR/PART 1926, subject that the content is not in opposition to the provisions or rules enacted by the Environment Agency-Abu Dhabi (EAD), the Municipality of Abu Dhabi, or another authority of United Arab Emirates.

The Team leader will particularly control the following actions and precautions related:

- Handling Standards with appropriate equipment
- Wear of appropriate PPE with the minimum requirements in any case (high visibility jackets, safety boots, hard helmet and gloves, when required)
- Wear additional PPE when required by the task or environment (eyes protection, hearing protection, dust mask (if required), safety harness, face shield, etc.)
- Safety conditions for working at height (installation of junction profiles with ceiling for example)
- Conformity of the machinery and hand tools
- Compatibility of the products with the COSHH (sealant, cleaners, tagging paint, etc.)
- Waste/elimination/housekeeping

Additionally and independently of tasks groups previously described, all the works carried out for this sequence of work will be in full compliance with our safety and health policy statement, our environment policy respectively described in article 2.1 and 2.2, and in full compliance with our quality control plan described in article 1.6.

6.10 REPARATION PROCEDURE

As defined in article 6.3, Commodore Aluminium Industries Co L.L.C. will require a specified area to install a small workshop to carry out the reparation procedure in case of damage on jobsite. This area defined by the main contractor will be signaled and protected from any circulations or any tasks from “unskilled workers” according to the definition included in article 6.3.

The rules applied for HSE management and quality process by the team in charge of these tasks will be the same than the rules applied in the factory. According to the reparation required, please refer to the

article defined in Section 4. Eventual hazardous products as defined by the COSHH regulations will be stored only on the factory and will be delivered only if required. If any, the products will be stored in our warehouse required in the article 6.3 with provisions in full appliance with the OSHA regulations (29-Standard/PART 1926, and 1910 if required). Waste coming from this sequence of work, and elimination of waste related to it, will be carried out by our factory. The management team will ensure that all waste and unused products related to aluminium scope of works will be loaded on a truck once per week to return to the factory.

6.10 OTHER TASKS

Despite all the precautions taken to write this method statement, Commodore Aluminium Industries Co L.L.C recognizes the difficulty to define all information for the works related to the unitized curtain wall. Moreover, the design department can significantly impact on this written document and, each manager can require modifications to this document to increase the quality of work, the safety or a faster enclosure of the building envelope. Therefore, if any, other tasks will be described and this document will be amended to be in compliance with the works carried out for the project.

SECTION 7
QUALITY CONTROL PLAN

7.1 GENERAL

According to the dispositions of article 1.6, Commodore Aluminium Industries Co L.L.C. operates a quality control plan management to meet the quality and performances criteria required by the project. This quality control plan for this project is extracted from the general quality control plan management of our company. Independently of other documents submitted by our company for the eventual quality control plan required by the main contractor, and subject that the information spread in this documents are not in opposition with other rules enacted by Commodore Aluminium Industries Co L.L.C with a higher degree of priority, the followings articles will give information about the control quality plan applied for the unitized curtain wall.

7.2 ROLES AND RESPONSIBILITIES

The company recognizes that safety is the responsibility of everyone and not just a function of management. Managers have specific duties and responsibilities to comply with the company policy. However, quality is an area in which ALL employees have obligations and responsibilities. The company actively promotes the involvement of all employees in quality control.

Quality Supervisor:

- Reports to: Operations Manager
- Supervise: quality report of each department (design, production, installation).
- Scope: define the quality control process, organize and control all steps of the tasks. Ensure that the work is in compliance with specifications. With the Technical, Purchasing and Production and Construction Manager, the Quality Supervisor participates actively to the quality coordination lead by the Operation Manager.
- Spreads quality information to department managers through periodic meetings

Department Managers:

- Report to: Operations Manager
- Supervise: application of the Quality Control Plan carried out by the team leaders
- Scope: responsible of the application of the quality control plan defined for their tasks. Support, and collect the report from team leaders

Team Leaders:

- Report to: Department Manager
- Supervise: the workers
- Scopes: responsible of the control of the task. Collect and forward each quality control sheet.

7.3 ORGANIZATION

The quality control plan is applied according to the following sequences:

- Material input, delivery
- Fabrication
- Installation

For each sequence and according to technical criteria of the unitized curtain wall of the projects, each sequence includes one or several control phases described in the following pages:

7.4 SEQUENCES

Refer to the following tables.

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates	ALUMINIUM PROFILE INPUT CONTROL PLAN					Ref: SRB-E12-C33/QCM-IN 01 Rev: 000 Date: --/--/----
Process	**Equipment (input)**	**Control Method**	**Responsible**	**Control Frequency**	**Performance Standards / Sample Intervals**	**Documentations (output)**
Quantity Control	Delivery Note	Visual	Warehouse Responsible	At each input of materials	Same as per Delivery Note	Stamp on Delivery Note
Dimension Control	Technical Drawing Catalogue	Steel tape meter Caliper Visual	Warehouse Responsible	Min. 1 product on each track	Dimensions of min. 1 profile is verified on each group as per catalogue.	Stamp on Delivery Note
Surface Control		Visual	Warehouse Responsible	Min. 1 product on each track	There should not be any blow or crush on the surface. There should not be any sign of deep scratches or appearent extrusion.	Stamp on Delivery Note
Surface Coating Control (Eloxal/Paint)	Color Pallette Coating Thickness Measurement Device	Visual	Warehouse Responsible	Min. 1 product on each track	Colors should be verified as per Color Pallette. Coating thickness should be checked as per value defined on the project	Stamp on Delivery Note

Prepared by:	Approved by:

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates	ALUMINIUM ACCESSORIES INPUT CONTROL PLAN					Ref: SRB-E12-C33/QCM-IN 02 Rev: 000 Date: --/--/----
Process	**Equipment (input)**	**Control Method**	**Responsible**	**Control Frequency**	**Performance Standards / Sample Intervals**	**Documentations (output)**
Brand/Model Control	Order List	Visual	Warehouse Responsible	At each input of materials	Model will be as per the order list	Stamp on Delivery Note
Quantity Control	Delivery Note	Visual	Warehouse Responsible	At each input of materials	Will be as per the delivery note	Stamp on Delivery Note
Grouping Control	Catalogue	Visual	Warehouse Responsible	Each Product	Same as defined in the catalogue	Stamp on Delivery Note
Dimension Control	Catalogue	Steel tapemeter Caliper Visual	Warehouse Responsible	Each Product	Same as defined in the catalogue	Stamp on Delivery Note
Surface Control		Visual	Warehouse Responsible	Each Product	There should not be any blow or crush on the surface. There should not be any sign	Stamp on Delivery Note
Surface Coating Control	Color Pallette	Visual	Warehouse Responsible	Each Product	Colors should be verified as per Color Pallette. Coating thickness should be checked as per value defined on the project.	Stamp on Delivery Note

Prepared by:	Approved by:

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates	ALUMINIUM SHEET INPUT CONTROL PLAN					Ref: SRB-E12-C33/QCM-IN 03 Rev: 000 Date: --/--/----
Process	**Equipment (input)**	**Control Method**	**Responsible**	**Control Frequency**	**Performance Standards / Sample Intervals**	**Documentations (output)**
Quantity Control	Delivery Note	Visual	Warehouse Responsible	At each input of materials	Will be as per delivery note	Stamp on Delivery Note
Dimension Control	Catalogue	Steel tapemeter Caliper Visual	Warehouse Responsible	Min. 1 unit on each track	Same dimensions as defined in the catalogue	Stamp on Delivery Note
Surface Control		Visual	Warehouse Responsible	Min. 1 unit on each track	There should not be any blow or crush on the surface. There should not be any sign of deep scratches.	Stamp on Delivery Note
Surface Coating Control	Color Pallette	Visual	Warehouse Responsible	Min. 1 unit on each track	Colors should be verified as per Color Pallette. Coating thickness should be checked as per value defined on the project.	Stamp on Delivery Note
Prepared by:				Approved by:		

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates	BRACKET INPUT CONTROL PLAN					Ref: SRB-E12-C33/QCM-IN 04 Rev: 000 Date: --/--/----
Process	**Equipment (input)**	**Control Method**	**Responsible**	**Control Frequency**	**Performance Standards / Sample Intervals**	**Documentations (output)**
Quantity Control	Delivery Note	Visual	Warehouse Responsible	At each input of materials	Will be as per delivery note	Stamp on Delivery Note
Dimension Control	Technical Drawings	Steel tape meter Caliper Visual	Warehouse Responsible	Min. %10 of each Product input	Evaluated as per tolerence level of ± 5 mm is not differently stated	Stamp on Delivery Note
Welding Control	Technical Drawings	Visual	Warehouse Responsible	Each Product	Welding should be sew welding..	Stamp on Delivery Note
Surface Control		Visual	Warehouse Responsible	Each Product	There should not be any blow or crush on the surface.	Stamp on Delivery Note

Prepared by:	Approved by:

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates		BONDED GLAZING FRAME CONTROL PLAN				Ref: SRB-E12-C33/QCM-IN 05 Rev: 000 Date: --/--/----
Process	**Equipment (input)**	**Control Method**	**Responsible**	**Control Frequency**	**Performance Standards / Sample Intervals**	**Documentations (output)**
Quantity Control	Delivery Note	VISUAL	Warehouse Responsible	At each input of materials	Will be as per delivery note	Stamp on Delivery Note
Butterfly Test	Supplier's Test Report	VISUAL	Warehouse Responsible	At each input of materials	Approved as per Supplier's Test Report	Stamp on Delivery Note
Fitting Test	Supplier's Test Report	VISUAL	Warehouse Responsible	At each input of materials	Approved as per Supplier's Test Report	Stamp on Delivery Note
Surface Control	Technical Drawings	VISUAL	Warehouse Responsible	Each Product	Bonded face is checked for a smooth surface, not to have open areas, smoke remnants or air bubbles	Stamp on Delivery Note

Prepared by:	Approved by:

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates	GLASS INPUT CONTROL PLAN					Ref: SRB-E12-C33/QCM-IN 06 Rev: 000 Date: --/--/----
Process	**Equipment (input)**	**Control Method**	**Responsible**	**Control Frequency**	**Performance Standards / Sample Intervals**	**Documentations (output)**
Quantity Control	Delivery Note Order List	VISUAL	Warehouse Responsible	At each input of materials	Will be as per delivery note	Stamp on Delivery Note
Dimension Control	Delivery Note Order List	Steel Tape Meter Visual	Warehouse Responsible	Min. 1 unit of each product	The tolerences for width and length measurement; for dimensions smaller than 1200 mm: + 3/-1mm, for dimensions bigger than 1200 mm: Tolerence level of Nominal thickness ; 12-18mm: ±1,4mm 19-22mm: ±1,6mm 23-28mm: ±1,8mm 28-32mm: ±2,2mm	Stamp on Delivery Note
Glass Specifications Control	Delivery Note Order List	VISUAL	Warehouse Responsible	Min. 1 unit of each product	Verified as per the sticker on the glazing	Stamp on Delivery Note
Combination Verification	Delivery Note Order List	VISUAL	Warehouse Responsible	Min. 1 unit of each product	Will be as per delivery note	
Surface Control		VISUAL	Warehouse Responsible	Each Product	No wavy or similar defects observed visually on double glazing units. The space between the glass plates forming the double glazing unit should be clean of nation. The intermadiate bar for double glazing units should be the required color and material.No defect should be seen when observed from a distance of 700 mm (arm length) for 3 secs period . There should not be any intervals on butyl applications, continious at the corners. The distance of the profile's internally looking side to the glazing should be max. 15mm. Insulating mastic should not move into the unit from sides of the profile. Should not be any holes. Insulating mastic space should be min.3 mm.	Stamp on Delivery Note

Prepared by:	Approved by:

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates	STEEL PROFILE (BOX , CORNERCLEAT, PIPE) CONTROL PLAN					Ref: SRB-E12-C33/QCM-IN 07 Rev: 000 Date: --/--/----
Process	**Equipment (input)**	**Control Method**	**Responsible**	**Control Frequency**	**Performance Standards / Sample Intervals**	**Documentations (output)**
Quantity Control	Delivery Note Order List	VISUAL	Warehouse Responsible	At each input of materials	Will be as per delivery note	Stamp on Delivery Note
Dimension Control	Delivery Note Order List	Steel Tape Meter Visual	Warehouse Responsible	Min. 1 unit of each product	Tolerance level for dimensions will be ±0,50 mm if not stated otherwise. For length will be ±10,0 mm.	Stamp on Delivery Note
Thickness Control	Delivery Note Order List	VISUAL	Warehouse Responsible	Min. 1 unit of each product	Tolerence Level for, if less than 1,5mm : e ±0,15 mm if more than 1,5mm': ±0,35 mm	Stamp on Delivery Note
Surface Control	Delivery Note Order List	VISUAL	Warehouse Responsible	Min. 1 unit of each product	There should not be any blow or crush on the surface. Should be as per specifications and colors of the Order List	Stamp on Delivery Note

Prepared by:	Approved by:

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates	GASKET INPUT CONTROL PLAN					Ref: SRB-E12-C33/QCM-IN 08 Rev: 000 Date: --/--/----
Process	**Equipment (input)**	**Control Method**	**Responsible**	**Control Frequency**	**Performance Standards / Sample Intervals**	**Documentations (output)**
Quantity Control	Delivery Note Order List	VISUAL	Warehouse Responsible	At each input of materials	Will be as per delivery note	Stamp on Delivery Note
Dimension Control	Delivery Note Order List	Steel Tape Meter Visual	Warehouse Responsible	Min. 1 unit of each product	Tolerence level will be evaluated in ± 1 mm.	Stamp on Delivery Note
Color Control	Delivery Note Order List	VISUAL	Warehouse Responsible	Min. 1 unit of each product	Color of the gasket should be as defined in Order List	Stamp on Delivery Note
Application Control		VISUAL	Warehouse Responsible	Min. 1 unit of each product	The applicability of the gaskets are verified after assembling the gaskets in their utility location.	Stamp on Delivery Note

Prepared by:	Approved by:

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates	GALVANIZED SHEET INPUT CONTROL PLAN					Ref: SRB-E12-C33/QCM-IN 09 Rev: 000 Date: --/--/----
Process	**Equipment (input)**	**Control Method**	**Responsible**	**Control Frequency**	**Performance Standards / Sample Intervals**	**Documentations (output)**
Quantity Control	Delivery Note Order List	VISUAL	Warehouse Responsible	At each input of materials	Will be as per delivery note	Stamp on Delivery Note
Dimension Control	Delivery Note Order List	Steel Tape Meter Visual	Warehouse Responsible	Min. 1 unit of each product	Dimensions should be as defined in the Order List	Stamp on Delivery Note
Thickness Control	Delivery Note Order List	VISUAL	Warehouse Responsible	Min. 1 unit of each product	Thickness should be as defined in the Order List	Stamp on Delivery Note
Surface Control	Delivery Note Order List	VISUAL	Warehouse Responsible	Min. 1 unit of each product	There should not be any blow or crush on the surface.	Stamp on Delivery Note
Prepared by:				Approved by:		

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates	ELOXAL / COATING WORKMANSHIP CONTROL PLAN					Ref: SRB-E12-C33/QCM-IN 010 Rev: 000 Date: --/--/----
Process	**Equipment (input)**	**Control Method**	**Responsible**	**Control Frequency**	**Performance Standards / Sample Intervals**	**Documentations (output)**
Quantity Control	Delivery Note Order List	VISUAL	Warehouse Responsible	At each input of materials	Will be as per delivery note	Stamp on Delivery Note
Surface Control	Delivery Note Order List	Steel Tape Meter Visual	Warehouse Responsible	Min. % 10 of each product	There should not be any orange effect on coating. There should not be any blow or crush or deep scratch.	Stamp on Delivery Note
Color/Tone Control	Delivery Note Order List	VISUAL	Warehouse Responsible	Min. % 10 of each product	No color or tone differences as per color pallette or sample should be observed at 60° angle checks under sunshine from distance 3 m for the external surfaces and 1 m for the internal surfaces defined in the Order List	Stamp on Delivery Note
Surface Thickness Control	Delivery Note Order List	VISUAL		Min. % 10 of each product	Min. 5 measures will be taken and if not otherwise stated thickness will not be less than the stated on the project.	Stamp on Delivery Note
Surface Adhesion Control	Delivery Note Order List	VISUAL	Warehouse Responsible	Min. % 10 of each product	There are deep cuts applied at 2 mm intervals vertically and horizontally at a hidden surface area. the coating should not move when the cuts are sealed by tape. blow or crush on the	Stamp on Delivery Note
Prepared by:				Approved by:		

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates		COMPOSITE SHEET INPUT CONTROL PLAN				Ref: SRB-E12-C33/QCM-IN 011 Rev: 000 Date: --/--/----
Process	**Equipment (input)**	**Control Method**	**Responsible**	**Control Frequency**	**Performance Standards / Sample Intervals**	**Documentations (output)**
Brand/Model Control	Delivery Note Order List	VISUAL	Warehouse Responsible	At each input of materials	Model will be as per the order list	Stamp on Delivery Note
Quantity Control	Delivery Note Order List	VISUAL	Warehouse Responsible	At each input of materials	Will be as per the delivery note	Stamp on Delivery Note
Dimension Control	Delivery Note Order List	Steel Tape Meter Visual	Warehouse Responsible	Each Product	Dimemsional Tolerence Levels Thickness ±0,2 mm Width +2,0 mm Length +4,0 mm Diagonal difference max. 3,0mm	Stamp on Delivery Note
Surface Control		VISUAL		Each Product	There should not be any blow or crush on the surface.There should not be any sign of deep scratches or appearent extrusion.	Stamp on Delivery Note
Surface Coating Control (Eloxal/Paint)	Color Pallette	VISUAL	Warehouse Responsible	Each Product	Colors should be verified as per Visual Color Pallette.	Stamp on Delivery Note

Prepared by:	Approved by:

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates	PROFILE-SHEET CUTTING-BENDING WORKMANSHIP CONTROL PLAN					Ref: SRB-E12-C33/QCM-IN 012 Rev: 000 Date: --/--/----
Process	**Equipment (input)**	**Control Method**	**Responsible**	**Control Frequency**	**Performance Standards / Sample Intervals**	**Documentations (output)**
Quantity Control	Delivery Note Order List	VISUAL	Warehouse Responsible	At each input of materials	Will be as per delivery note	Stamp on Delivery Note
Surface Control	Delivery Note Order List	VISUAL	Warehouse Responsible	Min. %10 of each product	There should not be any blow, crush or deformation on the surface. If the surface is coated, surface adhesion test will be applied.	Stamp on Delivery Note
Dimension Control	Technical Drawings	Steel tape meter Caliper	Warehouse Responsible	Min. %10 of each product	Bending should be as per technical drawings. The cutting and bending results should be in ±1mm tolerence level if not otherwise stated.	Stamp on Delivery Note

Prepared by:	Approved by:

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates		SILICONE INPUT CONTROL PLAN				Ref: SRB-E12-C33/QCM-IN 013 Rev: 000 Date: --/--/----
Process	**Equipment (input)**	**Control Method**	**Responsible**	**Control Frequency**	**Performance Standards / Sample Intervals**	**Documentations (output)**
Quantity Control	Delivery Note Order List	VISUAL	Warehouse Responsible	At each input of materials	Will be as per delivery note	Stamp on Delivery Note
Color Control	Delivery Note Order List	VISUAL	Warehouse Responsible	At each input of materials	Color should be as defined in the order list	Stamp on Delivery Note
Brand/Model Control	Technical Drawing	VISUAL	Warehouse Responsible	At each input of materials	Model will be as defined in the order list	Stamp on Delivery Note
Expiry Date	Technical Drawings	VISUAL	Warehouse Responsible	At each input of materials	Expiry dates remaining less than 3 months are not accepted.	Stamp on Delivery Note
Prepared by:				Approved by:		

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates	PANEL CUTTING PROCESS CONTROL PLAN					Ref: SRB-E12-C33/QCM-FA 01 Rev: 000 Date: --/--/----
Process	**Equipment (input)**	**Method of control**	**Responsible**	**Control Frequency**	**Performance Standards /Sample Intervals**	**Documentations (output)**
Dimensional and Angular Control	Technical Drawing	BY TAPE MEASURE	Quality Control	100%	+/-1 mm AND +/- 0,5°	Panel Control Form
Quality of Cut Surface	Technical Drawing	VISUAL	Quality Control	100%	There should not be any roughness and burrs	

Prepared by:	Approved by:

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates	PANEL MILLING PROCESS CONTROL PLAN					Ref: SRB-E12-C33/QCM-FA 02 Rev: 000 Date: --/--/----
Process	**Equipment (input)**	**Method of control**	**Responsible**	**Control Frequency**	**Performance Standards /Sample Intervals**	**Documentations (output)**
Dimensional and Angular control	Technical Drawing	BY TAPE MEASURE	Quality Control	100%	according to tolerances of the Fabrication manual	Panel Control Form
Quality of Cut Surface	Technical Drawing	VISUAL	Quality Control	100%	There should not be any roughness and burrs	

Prepared by: Quality Management Responsible	Approved by: General Manager

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates	PANEL PROFILE ADJUSTMENT PROCESS CONTROL PLAN					Ref: SRB-E12-C33/QCM-FA 03 Rev: 000 Date: --/--/----
Process	**Equipment (input)**	**Method of control**	**Responsible**	**Control Frequency**	**Performance Standards /Sample Intervals**	**Documentations (output)**
Dimensional and Angular control	Technical Drawing	BY TAPE MEASURE	Quality Control	100%	+/-0,5 mm and+/- 0,5°	Panel Control Form
Quality of Cut Surface	Technical Drawing	VISUAL	Quality Control	100%	There should not be any roughness and burrs	

Prepared by:	Approved by:

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates	PANEL FRAME ASSEMBLY PROCESS CONTROL PLAN	Ref: SRB-E12-C33/QCM-FA 04 000 -/---- Rev: Date: --/-

Process	Equipment (input)	Method of control	Responsible	Control Frequency	Performance Standards /Sample Intervals	Documentations (output)
Control of the area to be wedged	Technical Drawing	VISUAL	Quality Control	100%	Protective Band will be Removed	Panel Control Form
Weathertightness on connection area	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Foam applied prior to assemble	
Mullion and Transom Connection Wedge	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Will be fixed by screw in accordance with the Fabrication manual	
Control of mullion and transom assembly	Technical /Detailled Drawing	VISUAL	Quality Control	100%	There must no be any gap and dimensional difference on the inner facade connections	
Inpermeability process of transom and mullion connection	Technical /Detailled Drawing	VISUAL	Quality Control	100%	There will not be any opening on the application surface.	
Surface Cleaning further to impermeability process	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Cut the exceeding foam from profiles, clean the bonding application surface,	
Hook Installation	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Reinforcements provisions to be applied in profiles according to fabrication Manual	
Hook Fixture	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Must be screwed at the proper torque adjustment	
Additional defined reinforcements on mullion fabrications and details	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Defined reinforcements (steel, sound insulation...etc) must be applied according to Fabrication Sheets	
Corner Joint Process (opening)	Technical /Detailled Drawing	VISUAL	Quality Control	100%	sealant will be applied on the joint surfaces according to fabrication manual	
Corner cleats will be applied on corner joint details	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Corner cleats will be applied on corner joint details	
Fixture of corners	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Must be fixed by defined pin/crimping according to tthe fabrication manual	
Inpermeability process on the corners	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Follow the Fabrication Manual provisions	
Weather tightness set prosse to install the panels	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Insert the upper and lower pieces according to Fabrication Manual	
Control of Weather tightness set	Technical/Detailled drawings	VISUAL	Quality Control	100%	Control the position of wether tightness set and the correct posture in the groove,	
External dimensional control	Technical /Detailled Drawing	BY TAPE MEASURE	Quality Control	100%	+/_1mm	
Dimensional control from outside to axis	Technical /Detailled Drawing	BY TAPE MEASURE	Quality Control	100%	+/_1mm	
Lifting system process	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Will be fixed by screw in accordance with the Fabrication manual	

Prepared by:	Approved by:

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates	PANEL ADAPTOR AND INSIDE GLAZING GASKET PROCESS CONTROL PLAN					Ref: SRB-E12-C33/QCM-FA 05 Rev: 000 Date: --/--/----
Process	**Equipment (input)**	**Method of control**	**Responsible**	**Control Frequency**	**Performance Standards /Sample Intervals**	**Documentations (output)**
The corners of adaptor profiles will be cut 90°	Technical Drawing	BY TAPE MEASURE	Quality Control	100%	+/-0,5 mm and +/- 0,5°	Panel Control Form
Adaptor corner section surface control	Technical /Detailled Drawing	VISUAL	Quality Control	100%	There should not be any roughness and burrs	
Impermeability process for adaptor	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Sealant will be applied according to Fabrication Manual	
Adaptor connection with Frame	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Will be screwed in accordance with fabrication Manual and fabrication sheets	
Inside glazing gaskets will be cut 90° and 1cm longer than the adaptor/frame (if any)	Technical /Detailled Drawing	BY TAPE MEASURE	Quality Control	100%	+/- 3 mm	
Assembly of gasket under glass to adaptor/frame (if any)	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Sealant will be applied on profile corners and gasket corner connection according to Fabrication Manual	
Impermeability process after installation	Technical /Detailled Drawing	VISUAL	Quality Control	100%	There will not be any opening space on the gasket connectionon the application surface.	
opening gaskets will be cut 90° and 1cm longer tha the frame (if any)	Technical /Detailled Drawing	VISUAL	Quality Control	100%	+/- 3 mm	
Assembly of gasket with the frame	Technical /Detailled Drawing	VISUAL	Quality Control	100%	conntrol the corerect posture and connection of gasket according to the Fabrication manual	

Prepared by:	Approved by:

Process	Equipment (input)	Method of control	Responsible	Control Frequency	Performance Standards /Sample Intervals	Documentations (output)
Surface control of the frame assembly in connection with galvanized sheet	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Protective Band will be Removed before assembly	Panel control Form
Assembly of frame with galvaznized sheet	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Sealant must be applied to frame corners to maintain impermeability after installation.	
Assembly of galvanized sheet to Frame	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Screws must be applied perpendicularly and in defined intervals. There shouldn't be any trace of bending	
Vapor barrier application	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Seal the panel sheet/back pan around the frame according to the Fabrication Manual	
Rockwool process	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Rockwool must be applied to complete area, leaving max 5mm margin.	
Back pan installation	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Screws must be applied perpendicularly and in defined intervals. There shouldn't be any trace of bending	
impermeability process	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Sealant must be applied around the sheet without any space remaining and then smeared.	
Inside Glazing gasket control prior to glazing (if any)	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Sealant must be applied on the corners of glazing gaskets prior to glazing. The gasket must have fit the adaptors.	
Glazing	Technical /Detailled Drawing	VISUAL	Quality Control	100%	The glass labels must be looking inward. The valve will be on the upper side. The glasses defined on the fabrication drawings must be used.	
Color control of glazing beads (if any)	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Glasses with bronz colored double glazing beads on black panels natural colored beads on white panels and bronz colored ones on parapet will be installed.	
Installation of glass shims (if any)	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Glass shims must be on four sides of the glazing, sealed with sealant and the carriers shouldn't cause bulging on the division bars.	
Glass load; 2 pieces on the bottom must be 100 mm and PP glass spacer must be placed	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Control the correct posture of the spacer to support correctlly the both layers of IGU	
Opening window vents to be installed in accordance with proper detail on the project and process	Technical /Detailled Drawing	VISUAL	Quality Control	100%	There must not be any space on the connection points of the division bars(profiles) in accordance with the tehcnical drawing. There must be defined fixture on the details.	
The sides of the individual external connectors must be covered	Technical /Detailled Drawing	VISUAL	Quality Control	100%	The sections of the profiles must'nt be seen	
The correlation of sprandel glass and visional glass	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Must be in accordance with the defined details on technical drawing.	

Prepared by:	Approved by:

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates	PANEL BONDING CONTROL PLAN					Ref: SRB-E12-C33/QCM-FA 07 Rev: 000 Date: --/--/----
Process	**Equipment (input)**	**Method of control**	**Responsible**	**Control Frequency**	**Performance Standards /Sample Intervals**	**Documentations (output)**
BUTTERFLY TEST	MIXTURE OF PAPER AND SILICONE CATALYZER	VISUAL	Quality Control	MORNING AND AFTERNOON,AFTER START OF THE PROCESS IN EVERY HALF AN HOUR, 3 TIMES	THERE SHOULD NOT BE WHITE LINES,PIECES,AND WHITE SPOTS	Bonding Test Form
FAILURE-TIME TEST	PLASTİC GLASS AND ALUMINIUM BAR	VISUAL	Quality Control	ONCE IN THE MORNING AND IN THE AFTERNOON	THE TIME TO FAILURE POINT AFTER IT IS SAMPLED	Bonding Test Form
EXTRUSION TEST	ALUMINIUM, GLASS, WOOD,TENSILE TEST MECHANISM	WEIGHT, VISIUAL	Quality Control	MORNING AND AFTERNOON,AFTER START OF THE PROCESS IN EVERY HALF AN HOUR,2 TIMES	AT LEAST ONE SAMPLE UNDER 42 KG WEIGHT KEEPS UNDETACHED FOR 10 SEC, BREAKING IS COHESIVE	
STACK	ALUMINIUM PANEL, GLASS, WOODEN WEDGE	VISUAL	Quality Control	AT EACH STORAGE GROUP	TO PUT THE FIRST PANEL WITH NORTON BAND AS THE LAST TO BE BONDED FROM THE BOTTOM OF THE	
STACK	BONDED PANELS	VISUAL	Quality Control	AT EACH STORAGE GROUP	THE FİRST PANEL WITH NORTON BAND IS THE FIRST TO BE SILICONED AND SHIPPED.	

Prepared by:	Approved by:

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates	PANEL INSTALLATION OF COVER CAP, FINISHING AND SHIPMENT PROCESS CONTROL PLAN					Ref: SRB-E12-C33/QCM-FA 08 Rev: 000 Date: --/--/----
Process	**Equipment (input)**	**Method of control**	**Responsible**	**Control Frequency**	**Performance Standards /Sample Intervals**	**Documentations (output)**
cover caps profiles90° control of dimensions	Technical /Detailled Drawing	BY TAPE MEASURE	Quality Control	100%	± 1 mm / ± 0.5°	Panel control Form
Sectional Surface Control	Technical /Detailled Drawing	VISUAL	Quality Control	100%	There mustn't be any roughness and burrs	
Control of drainage holes (if any)	Technical /Detailled Drawing	VISUAL	Quality Control	100%	There must be 2 drainage holes on the adaptors facing the bottom of the panel	
Gasket Application on cover caps	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Gasket corners will be 90° The gaskets must fit to all the surfaces	
Assembly cover cap to frame	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Cover caps will be installed according to fabrication manual	
Security pin	Technical /Detailled Drawing	VISUAL	Quality Control	100%	insert security pin in one end of the cover cap	
Close end of the cover cap (if any)	Technical /Detailled Drawing	VISUAL	Quality Control	100%	Close cover caps end according to fabrication manual	
Cleaning of Panels	Technical /Detailled Drawing	VISUAL	Quality Control	100%	There must be no label and/or stain on the external facade of the panel.	
Order and List of Shipments	Job Order Shipment Requisition Form	VISUAL	Quality Control	100%	Shipments must be realized with reference to the fabrication program	
Compatibility in Shipment	Shipment Requisition Form	VISUAL	Quality Control	100%	Load-beraing profiles and drawers defined for the panels will also be shipped. The panels will be packaged prior to shipment.	

Prepared by:	Approved by:

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates	BRACKETS CONTROL PLAN					Ref: SRB-E12-C33/QCM-AN 01 Rev: 000 Date: --/--/----
Process	**Equipment (input)**	**Method of control**	**Responsible**	**Control Frequency**	**Performance Standards /Sample Intervals**	**Documentations (output)**
Brackets Design Control	Technical Drawing	VISUAL	Quality Control	At every material shipment		Bracket external process control form
Measurement Control	Technical Drawing	By Tape Measure	Quality Control	At every material shipment		Bracket external process control form
Surface Control	Technical Drawing	Measuring instrument of thickness of surface covering	Quality Control	At every material shipment		Bracket external process control form
Welding Quality Control (if any)	Technical Drawing	Visiual	Quality Control	At every material shipment		Bracket external process control form
Quantitiy Control	Order List Shipment Requisition Form	Visiual	Quality Control	At every material shipment		Bracket external process control form

Prepared by:	Approved by:

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates	INSTALLATION CONTROL PLAN					Ref: SRB-E12-C33/QCM-INS 01 Rev: 000 Date: --/--/----
Process	**Equipment (input)**	**Method of control**	**Responsible**	**Control Frequency**	**Performance Standards /Sample Intervals**	**Documentations (output)**
Compatibility of the type of anchorages	Technical Drawing	VISUAL	SITE MANAGER	100%	The anchorages defined at the project must be used	
Control of anchorage connections	Technical/Detailed Drawing	VISUAL	SITE MANAGER	100%	Screw nuts must be screwed at the right torque adjustment. Must be 100mm inside and fit on washer surface.	
Installation of horizontal gasket	Technical/Detailed Drawing	VISUAL	SITE MANAGER	100%	Horizontal gaskets (membrane gasket and inner sheet bar) must be one single line and notching must be applied in accordance with the detail	
Installation of vertical gasket	Technical/Detailed Drawing	VISUAL	SITE MANAGER	100%	Vertical gaskets must be glued on one side from top,middle and bottom parts of the panel by super glue. Notching must be applied in accordance with the detail	
Verification of panel position	Technical Drawing	VISUAL	SITE MANAGER	100%	the insttalled panel must be appropriate with the position	
Dimensional Control	Technical Drawing	By Tape Measure	SITE MANAGER	100%	Panels must be at the center according to the application wire, joint space must be 10mm.	
Panel Surface Control	Technical Drawing	VISUAL	SITE MANAGER	100%	There mustn't be any blow, deformation, improper gasket and insufficient silicone on the surface of the panel	

Prepared by:	Approved by:

SECTION 8
RISK ASSESMENT

8.1. GENERAL

This section brings together the risk assessment related to the sequences of work described in Section 5 and 6. However, all employees, subject to conditions of works where the following risk assessment are applied, shall have also to respect the precautions provide by the following sheets.

These sheets have been enacted by priority in accordance with:

- Guidelines for Developing HSE plan for building and construction sector – Municipality of Abu Dhabi
- OSHA regulations (Standard 29-CFR/PART 1926) about the safety and health in construction
- OSHA regulations (Standard 29-CFR/PART 1910) about occupational safety and health standards

8.2 LIMIT OF ASSESMENT

According to the content of article 6.10, Commodore Aluminium Industry Co L.L.C recognizes the difficulty to define all assessment risks for the works related to the unitized curtain wall. Therefore, if any, other tasks will be later described, our company will make decision to carry out the new risk assessment and the precautions related and all our employees will be informed and trained for a correct understanding and application of the new rules. Additionally, this method statement will be amended with the new sheets about the task and the risk assessment related.

8.3 DATA SHEETS

Refer to the following data sheets

SARAYA RESIDENTIAL BUILDING - E12-C33 - ABU DHABI - UAE,

RISK MATRIX RATING

PROBALIBILTY	SEVERITY				
	INSIGNIFIANT(1)	Minor (2)	Moderate(3)	Major(4)	Catastrophic (5)
Rare (1)	**1**	**2**	**3**	**4**	**5**
Possible (2)	**2**	**4**	**6**	**8**	**10**
Likely (3)	**3**	**6**	**9**	**12**	**15**
Often (4)	**4**	**8**	**12**	**16**	**20**
Frequent/Almost Certain (5)	**5**	**10**	**15**	**20**	**25**

15-25	**Extremely Risk**	Absolutely unacceptable High- Activity should not proceed in current form
8-12	**High Risk**	Unaceptable High - Activity should be modified to include remedial planning and action and be subject to detail HSE assesment
4-6	**Moderate risk**	Acceptable but must be managed at ALARP, Activity can operate subject to management and/or modification
1-3	**Low risk**	Acceptable without required further action, No action required unless escalation of risk is possible

HIERARCHY OF CONTROL

Elimination	Eliminate the Harzard
Substitution	Provide an alternative that is capable of performing the same task and is safer to use
Engineering Controls	Provide ou construct a physical barrier or guard
Administrative Controls	Develop policies, procedures practices and guidelines, in consultation with employees, to migrate the risk, provide training; instruction and supervision about the hazard
Personal Protective Equipment	Personal equipment designed to protect the individual from the hazard,

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SARAYA RESIDENTIAL BUILDING - E12-C33 - ABU DHABI - UAE,

Unitized Curtain Wall - Fabrication/Installation

PERSONAL PROTECTIVE EQUIPMENT

Permanent for any tasks and all workers			According to the tasks, Please refer to the Installation Manual for additional information		
Precautions	**Symbols**	**Comments**	**Precautions**	**Symbols**	**Comments**
Wear safety boots		To access on the jobsite	Wear eyes protection		Please refer to the installation Manuel
Wear Hard helmet		To access on the jobsite	Wear hearing protection		In case of Noisy environment
Wear High Visibility jacket		For all tasks outside the building	Wear Face Shield		Please refer to the installation Manuel
Wear gloves		To protect the hand, Please pay attention to gloves type according to the task	Wear Dust Mask		Please refer to the installation Manuel/in case of dusty Environment
			Wear harness		For all working at heights

Nota:other PPE provisions can be adopted for any tasks, please refer to the Installation Manual to follow eventual instructions

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SARAYA RESIDENTIAL BUILDING - E12-C33 - ABU DHABI - UAE,

Unitized Curtain Wall - Fabrication/Installation

BUILDING MEASUREMENT

N	Activity	Hazard	Potential Harm/Damages	Risk Rating			Control measure (refer to hierarchy control)	Residual Risk			Risk Acceptable	
				Probability (p)	Severity (S)	Rating (PxS)		H	M	L	Yes	No

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SARAYA RESIDENTIAL BUILDING - E12-C33 - ABU DHABI - UAE,

Unitized Curtain Wall - Fabrication/Installation

BRACKETS INSTALLATION

N	Activity	Hazard	Potential Harm/Damages	Risk Rating			Control measure (refer to hierarchy control)	Residual Risk			Risk Acceptable	
				Probability (p)	Severity (S)	Rating (PxS)		H	M	L	Yes	No

Document prepared by: ---------- Approved by : ---------- Date ----------

SARAYA RESIDENTIAL BUILDING - E12-C33 - ABU DHABI - UAE,

Unitized Curtain Wall - Fabrication/Installation

PANEL UNLOADING-DISPATCHING

N	Activity	Hazard	Potential Harm/Damages	Risk Rating			Control measure (refer to hierarchy control)	Residual Risk			Risk Acceptable	
				Probability (p)	Severity (S)	Rating (PxS)		H	M	L	Yes	No

Document prepared by: ---------- Approved by : ---------- Date ----------

SARAYA RESIDENTIAL BUILDING - E12-C33 - ABU DHABI - UAE,

Unitized Curtain Wall - Fabrication/Installation

MINI CRANE INSTALLATION

N	Activity	Hazard	Potential Harm/Damages	Risk Rating			Control measure (refer to hierarchy control)	Residual Risk			Risk Acceptable	
				Probability (p)	Severity (S)	Rating (PxS)		H	M	L	Yes	No

Document prepared by: ---------- Approved by : ---------- Date ----------

SARAYA RESIDENTIAL BUILDING - E12-C33 - ABU DHABI - UAE,

Unitized Curtain Wall - Fabrication/Installation

PANEL INSTALLATION

N	Activity	Hazard	Potential Harm/Damages	Risk Rating			Control measure (refer to hierarchy control)	Residual Risk			Risk Acceptable	
				Probability (p)	Severity (S)	Rating (PxS)		H	M	L	Yes	No

Document prepared by: ---------- Approved by : ---------- Date ----------

SARAYA RESIDENTIAL BUILDING - E12-C33 - ABU DHABI - UAE,

Unitized Curtain Wall - Fabrication/Installation

PARTICULAR INSTALLATION

N	Activity	Hazard	Potential Harm/Damages	Risk Rating			Control measure (refer to hierarchy control)	Residual Risk			Risk Acceptable	
				Probability (p)	Severity (S)	Rating (PxS)		H	M	L	Yes	No

Document prepared by: ---------- Approved by : ---------- Date ----------

SARAYA RESIDENTIAL BUILDING - E12-C33 - ABU DHABI - UAE,

Unitized Curtain Wall - Fabrication/Installation

REPARATION PROCEDURE

N	Activity	Hazard	Potential Harm/Damages	Risk Rating			Control measure (refer to hierarchy control)	Residual Risk			Risk Acceptable	
				Probability (p)	Severity (S)	Rating (PxS)		H	M	L	Yes	No

Document prepared by: ---------- Approved by : ---------- Date ----------

Commodore Aluminium Industries Co. L.L.C. TEL. 02-555 4510, FAX. 02-555 9863, P.O. Box 35605 - Abu Dhabi - United Arab Emirates	**RISK ASSESSMENT**	ref N° SRB-E12-C33/MS-RAXX Date ----/----/20---- Rev 001

SARAYA RESIDENTIAL BUILDING - E12-C33 - ABU DHABI - UAE,

Unitized Curtain Wall - Fabrication/Installation

N	Activity	Hazard	Potential Harm/Damages	Risk Rating			Control measure (refer to hierarchy control)	Residual Risk			Risk Acceptable	
				Probability (p)	Severity (S)	Rating (PxS)		H	M	L	Yes	No

Document prepared by: ---------- Approved by : ---------- Date ----------

SECTION 9
CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH (COSHH)

9.1 GENERAL

Commodore Aluminium Industries Co L.L.C. is a façade contractor, manufacturer of aluminum façade, windows, and doors, manufacturer of all steel items connected to these activities. Glass, Aluminum and Steel are not substance hazardous to health ad defined in the COSHH regulation. However, some processes and materials used with aluminum, steel or glass require controls.

It is important to note that our company is not involved in the fabrication process of these products, neither in their transformation as coating, galvanizing or others chemical application on these materials. We receive the product "ready for fabrication" from our suppliers. Aluminum, steel and glass are hard and amorphous materials and do not represent any hazard for the health.

The others products used by our company are (if any):

- Rockwool
- Gaskets
- Sealants
- Cleaners

All these products are subject to provisions according to the COSHH regulation, and health and safety executive guidance notes enacted. Consequently, after definition of the products used by our company, according to the previous categories, to ensure the fabrication and the installation of the unitized curtain wall in compliance with the performances criteria, the data sheet of each product will be amended to this method statement with the COSHH assessment and the precautions related.

9.2 DATA SHEETS

Will be amended at a later date.

SECTION 10
APPENDIX

APPENDIX A

US STANDARDS

AAMA/NWWDA 101/I.S.2 Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors

AAMA 501 Methods of Test for Exterior Walls

AAMA 502 Voluntary Specifications for Field Testing of Windows and Sliding Glass Doors

AAMA 503 Voluntary Specifications for Field Testing of Metal Storefronts, Curtain Walls and Sloped Glazing Systems

AAMA 507 Standard Practice for Determining the Thermal Performance Characteristics of Fenestration Systems Installed in Commercial Buildings

AAMA 510 Voluntary Guide Specifications for Blast Hazard Mitigation for Fenestration Systems

AAMA 800 Series of publications on sealant specifications

AAMA 850 Fenestration Sealants Guide Manual

AAMA 1503.1 Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections

AAMA 1504 Voluntary Standard for Thermal Performance of Windows, Doors and Glazed Walls

AAMA 1600 Voluntary Specification for Skylights

AAMA AFPA Anodic Finishes/Painted Aluminum

AAMA CW-DG-1 Aluminum Curtain Wall Design Guide Manual

AAMA CW-RS-1 Rain Screen Principle and Pressure Equalization

AAMA FSCOM-1 Fire Safety in High Rise Curtain Walls

AAMA JS-1 Joint Sealants

AAMA GDSG-1 Glass Design for Sloped Glazing

AAMA CW-11 Design Wind Loads and Boundary Layer Wind Tunnel Testing

AAMA CW-12 Structural Properties of Glass

AAMA CW-13 Structural Sealant Glazing Systems

AAMA CWG-1 Installation of Aluminum Curtain Walls

AAMA GAG-1 Glass and Glazing

AAMA MCWM-1 Metal Curtain Wall Manual

AAMA SDGS-1 Structural Design Guidelines for Aluminum Framed Skylights

AAMA SFM-1 Aluminum Store Front and Entrance Manual

AAMA SHDG-2 The Skylight Handbook Design Guidelines

AAMA TSGG Two-Sided Structural Glazing Guidelines for Aluminum Framed Skylights

AAMA TIR-A7 Sloped Glazing Guidelines

AAMA TIR-A9 Metal Curtain Wall Fasteners

AAMA TIR-A11 Maximum Allowable Deflection of Framing Systems for Building Cladding Components at Design Wind Loads

AAMA WSG.1 Window Selection Guide

AIA MASTERSPEC®

ANSI Z97.1 Performance Specifications and Methods of Test for Safety Glazing Materials Used in Buildings

ASCE 7 Minimum Design Loads for Buildings and Other Structures

ASTM C 509 Standard Specifications for Elastomeric Cellular Preformed Gasket and Sealing Material

ASTM C 510 Standard Test Method for Staining and Color Change of Single- or Multicomponent Joint Sealants

ASTM C 542 Standard Specifications for Lock-Strip Gaskets

ASTM STP 552 C. J. Parise, "Window and Wall Testing," pp. 44-46, American Society for Testing and Materials, 1974.

ASTM STP 606 J. A. Dallen & P. Paulus, "Lock-Strip Glazing Gaskets," pp. 223-266, **ASTM**, 1976.

ASTM C 162 Standard Terminologies of Glass and Glass Products

ASTM C 716 Standard Specification for Installing Lock-Strip Gaskets and Infill Glazing Materials

ASTM C 717 Standard Terminologies of Building Seals and Sealants

ASTM C 793 Standard Test Method for the Effects of Accelerated Weathering on Elastomeric Joint Sealants

ASTM C 794 Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants

ASTM C 864 Standard Specifications for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers

ASTM C 920 Standard Specifications for Elastomeric Joint Sealants

ASTM C 964 Standard Guides for Lock-Strip Gasket Glazing

ASTM C 1036 Standard Specification for Flat Glass

ASTM C 1048 Standard Specification for Heat-Treated Flat Glass—Kind HS, Kind FT Coated and Uncoated

ASTM C 1087 Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems

ASTM C 1115 Standard Specification for Dense Elastomeric Silicone Rubber Gaskets and Accessories

ASTM C 1135 Standard Test Method for Determining Tensile Adhesion Properties of Structural Sealants

ASTM C 1172 Standard Specification for Laminated Architectural Flat Glass

ASTM C 1184 Standard Specification for Structural Silicone Sealants

ASTM C 1193 Standard Guide for Use of Joint Sealants

ASTM C 1249 Standard Guide for Secondary Seal for Sealed Insulating Glass Units for Structural Sealant Glazing Applications

ASTM C 1265 Standard Test Method for Determining the Tensile Properties of an Insulating Glass Edge Seal for Structural Glazing Applications

ASTM C 1279 Standard Test Method for Non-Destructive Photo-elastic Measurement of Edge and Surface Stresses in Annealed, Heat-Strengthened, and Fully Tempered Flat Glass

ASTM C 1281 Standard Specification for Preformed Tape Sealants for Glazing Applications

ASTM C 1294 Standard Test Method for Compatibility of Insulating Glass Edge Sealants with Liquid-Applied Glazing Materials

ASTM C 1349 Standard Specification for Architectural Flat Glass Clad Polycarbonate

ASTM C 1369 Standard Specification for Secondary Edge Sealants for Structurally Glazed Insulating Glass Units

ASTM C 1375 Standard Guide for Substrates Used in Testing Building Seals and Sealants

ASTM C 1376 Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass

ASTM C 1377 Standard Test Method for Calibration of Surface/Stress Measuring Devices

ASTM C 1392 Standard Guide for Evaluating Failure of Structural Sealant Glazing

ASTM C 1394 Standard Guide for In-Situ Structural Silicone Glazing Evaluation

ASTM C 1401 Standard Guide for Structural Sealant Glazing

ASTM C 1422 Standard Specification for Chemically Strengthened Flat Glass

ASTM C 1464 Standard Specification for Bent Glass

ASTM C 1472 Standard Guide for Calculating Movement and Other Effects When Establishing Sealant Joint Width

ASTM C 1487 Standard Guide for Remedying Structural Silicone Glazing

ASTM C 1503 Standard Specification for Silvered Flat Glass Mirror

ASTM C 1564 Standard Guide for Use of Silicone Sealants for Protective Glazing Systems

ASTM E 90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

ASTM E 119 Standard Test Methods for Fire Tests of Building Construction and Materials

ASTM E 283 Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

ASTM E 330 Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference

ASTM E 331 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference

ASTM E 336 Standard Test Method for Measurement of Airborne Sound Insulation in Buildings

ASTM E 413 Classifications for Rating Sound Insulation

ASTM E 488 Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements

ASTM E 514 Standard Test Method for Water Penetration and Leakage through Masonry

ASTM E 546 Standard Test Method for Frost Point of Sealed Insulating Glass Units

ASTM E 547 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Cyclic Static Air Pressure Differential

ASTM E 576 Standard Test Method for Frost Point of Sealed Insulating Glass Units in the Vertical Position

ASTM E 631 Standard Terminologies of Building Constructions

ASTM E 754 Standard Test Method for Pullout Resistance of Ties and Anchors Embedded in Masonry Mortar Joints

ASTM E 773 Standard Test Method for Accelerated Weathering of Sealed Insulating Glass Units

ASTM E 774 Standard Specification for Classification of the Durability of Sealed Insulating Glass Units

ASTM E 783 Standard Method for Field Measurement of Air Leakage through Installed Exterior Windows and Doors

ASTM E 894 Standard Test Method for Anchorage of Permanent Metal Railing Systems and Rails for Buildings

ASTM E 966 Standard Guides for Field Measurement of Airborne Sound Insulation of Building Facades and Facade Elements

ASTM E 987 Standard Test Methods for Deglazing Force of Fenestration Products

ASTM E 997 Standard Test Method for Structural Performance of Glass in Exterior Windows, Curtain Walls, and Doors under the Influence of Uniform Static Loads by Destructive Methods

ASTM E 998 Standard Test Method for Structural Performance of Glass in Windows, Curtain Walls, and Doors under the Influence of Uniform Static Loads by Nondestructive Method

ASTM E 1105 Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors and Curtain Walls by Uniform or Cyclic Static Air Pressure Difference

ASTM E 1233 Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls by Cyclic Air Pressure Differential

ASTM E 1300 Standard Practice for Determining Load Resistance of Glass in Buildings

ASTM E 1332 Standard Classification for Determination of Outdoor-Indoor Transmission Class

ASTM C 1399 Standard Test Method for Cyclic Movement and Measuring the Minimum and Maximum Joint Widths of Architectural Joint Systems

ASTM E 1423 Standard Practice for Determining the Steady State Thermal Transmittance of Fenestration Systems

ASTM E 1424 Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure and Temperature Differences Across the Specimen

ASTM E 1425 Standard Practice for Determining the Acoustical Performance of Exterior Windows and Doors

ASTM E 1825 Standard Guide for Evaluation of Exterior Building Wall Materials, Products, and Systems

ASTM E 1886 Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missiles and Exposed to Cyclic Pressure Differentials

ASTM E 1996 Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes

ASTM E 2010 Standard Test Method for Positive Pressure Fire Tests of Window Assemblies

ASTM E 2074 Standard Test Method for Fire Tests of Door Assemblies, Including Positive Pressure Testing of Side- Hinged and Pivoted Swinging Door Assemblies

ASTM E 2094 Standard Practice for Evaluating the Service Life of Chromogenic Glazings

ASTM E 2099 Standard Practice for the Specification and Evaluation of Pre-Construction Laboratory Mockups of Exterior Wall Systems

ASTM E 2112 Standard Practice for Installation of Exterior Windows, Doors and Skylights

ASTM E 2128 Standard Guide for Evaluating Water Leakage of Building Walls

ASTM E 2141 Standard Test Methods for Assessing the Durability of Absorptive Electrochromic Coatings on Sealed Insulating Glass Units

ASTM E 2188 Standard Test Method for Insulating Glass Unit Performance

ASTM E 2189 Standard Test Method for Testing Resistance to Fogging in Insulating Glass Units

ASTM E 2190 Standard Specification for Insulating Glass Unit Performance and Evaluation

ASTM E 2268 Standard Test Method for Water Penetration of Exterior Windows, Skylights, and Doors by Rapid Pulsed Air Pressure Difference

ASTM E 2269 Standard Test Method for Determining Argon Concentration in Sealed Insulating Glass Units using Gas Chromatography

ASTM E 2270 Standard Practice for Periodic Inspection of Building Facades for Unsafe Conditions

ASTM E 2319 Standard Test Method for Determining Air Flow through the Face and Sides of Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen

ASTM E 2353 Standard Test Method for the Performance of Glass in Permanent Glass Railing Systems, Guards and Balusters

ASTM E 2395 Standard Specification for Voluntary Security Performance of Windows and Door Assemblies with and without Glazing Impact

ASTM F 1233 Standard Test Method for Security Glazing Materials and Systems

ASTM F 1641 Standard Test Method for Measuring Penetration Resistance of Security Glazing Using a Pendulum Impactor

ASTM F 1642 Standard Test Method for Glazing and Glazing Systems Subject to Airblast Loadings

ASTM F 1915 Standard Test Methods for Glazing for Detention Facilities

ASTM F 2248 Standard Practice for Specifying an Equivalent 3-Second Duration Design Loading for Blast Resistant Glazing Fabricated with Laminated Glass

ASTM STP 1054 Technology of Glazing Systems

CPSC 16 CFR 1201 Safety Standard for Architectural Glazing Materials

NFPA 80 Standards for Fire Doors and Fire Windows

NFPA 251 Standard Methods of Tests of Fire Endurance of Building Construction and Materials

NFPA 252 Standard Methods of Fire Test of Door Assemblies

NFPA 257 Standard on Fire Test for Window and Glass Block Assemblies

NFRC 100 Procedure for Determining Fenestration Product U-factors

NFRC 200 Procedures for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence

NFRC 300 Standard Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems

NFRC 302 Verification Program for Optical Spectral Data

NFRC 400 Procedures for Determining Fenestration Product Air Leakage

UL 9 Standard for Fire Tests of Window Assemblies

UL 10c Standard for Positive Pressure Fire Tests of Door Assemblies

BS-EN STANDARDS

TS EN 179 Building hardware - Emergency exit devices operated by a Lever handles or push pad, for use on escape routes - Requirements and test methods

TS 3736 EN 10051
Continuously hot- rolled uncoated plate sheet and strip of non alloy and alloy steels- Tolerances on dimensions and shape

TS 2163 EN 10029 Hot rolled steel plates 3mm thick or above tolerances on Dimensions, shape and mass

TS 2716 EN 1600 Welding consumables - Covered electrodes for manual arc Welding of stainless and heat resisting steels – Classification

TS 347 EN 572–4 Glass in building - Basic soda lime silicate glass products - Part 4: Drawn sheet glass

TS 3539 EN 1279 Glass in building – Insulating glass units – Part 1: Generalities, Dimensional tolerances and rules for the system description

TS 3736 EN 10051 Continuously hot- rolled uncoated plate sheet and strip of Non alloy and alloy steels- Tolerances on dimensions and shape

TS 4644 EN 12211 Windows and doors - Resistance to wind load - Test method

TS 498 Design Loads for Buildings

TS 914 EN ISO 1461 Hot dip galvanized coatings on fabricated iron and steel Articles - specification and test methods

TS EN 10021 General technical delivery conditions for steel products

TS EN 10025 Hot rolled products of structural steels

TS EN 10029 Hot rolled steel plates 3mm thick or above; tolerances on Dimensions, shape and mass; amendment

TS EN 10048 Hot rolled narrow steel strip- Tolerances on dimensions and Shape

TS EN 10084 Case hardening steels - Technical delivery conditions

TS EN 10088 Stainless steels

TS EN 10095 Heat resisting steels and nickel alloys

TS EN 1011 Welding - Recommendations for welding of metallic materials

TS EN 10210 Hot finished structural hollow sections of non-alloy and fine grain steel

TS EN 10250 Open die steel forgings for general engineering purposes

TS EN 1026 Windows and doors - Air permeability - Test method

TS EN 1027 Windows and doors – Water tightness - Test method

TS EN 1096 Glass in building- Coated glass

TS EN 1096-4 Glass in building - Coated glass - Part 4: Evaluation of Conformity/Product standard

TS EN 12020 Aluminium and aluminium alloys - Extruded precision sections in alloys EN AW-6060 and EN AW-6063

TS EN 12150-1 Glass in building- Thermally toughened soda lime silicate safety glass- Part 1: Definition and description

TS EN 12150-2
Glass in building - Thermally toughened soda lime silicate safety glass - Part 2: Evaluation of conformity/Product standard

TS EN 12155 Curtain walling – Water tightness - Laboratory test under static pressure

TS EN 12207 Windows and doors-Air permeability-Classification

TS EN 12208 Windows and doors-Water tightness-Classification

TS EN 12211 Sectional specification: Radio frequency coaxial connectors, series SMA

TS EN 12373 Aluminium and aluminium alloys – Anodizing

TS EN 1125
Building hardware - Panic exit devices operated by a horizontal bar, for use on escape routes - Requirements and test methods

TS EN 1279 Glass in building - Insulating glass units

TS EN 13947 Thermal performance of curtain walling - Calculation of Thermal transmittance

TS EN 14024 Metal sections with thermal barrier - Mechanical performance - Requirements, proof and tests for assessment

TS EN 14179–1 Glass in building - Heat soaked thermally toughened soda lime Silicate safety glass - Part 1: Definition and description

TS EN 14179–2
Glass in building - Heat soaked thermally toughened soda lime Silicate safety glass - Part 2: Evaluation of conformity/Product Standard

TS EN 1863 Glass in building- Heat strengthened soda lime silicate glass

TS EN 13830 Curtain walling – Product Standard

TS EN 485 Aluminium and aluminium alloys - Sheet, strip and plate

TS EN 515 Aluminium, magnesium and their alloys; Temper designations

TS EN 572 Glass in building - Basic soda lime silicate glass products

TS EN 572–1
Glass in building - Basic soda lime silicate glass products – Part 1: Definitions and general physical and mechanical Properties

TS EN 572–9 Glass in building - Basic soda lime silicate glass products – Part 9: Evaluation of conformity/Product standard

TS EN 573 Aluminium and aluminium alloys - Chemical composition and form of wrought products

TS EN 62305 Protection against lightning

TS EN 754 Aluminium and aluminium alloys - Cold drawn rod/bar and tube

TS EN 755 Aluminium and aluminium alloys - Extruded rod/bar, tube and Sections

TS EN 14351-1
Windows and doors - Product standard, performance Characteristics - Part 1: Windows and external pedestrian Door sets without resistance to fire and/or smoke leakage Characteristics

TS EN ISO 11600 Building construction - Jointing products - Classification and Requirements for sealants

TS EN ISO 12543 Glass in building- Laminated glass and laminated safety glass

TS EN ISO 12944
Paints and varnishes- Corrosion protection of steel structures
By protective paint systems

TS EN ISO 1461
Plastics – Heat shrinkable films of polyethylene, ethylene
Copolymers and their mixtures - Determination of shrinkage
Stress and contraction stress Agglomerated stone - Test
Methods - Part 2: Determination of flexural strength (bending)

TS EN ISO 1463 Metallic and oxide coatings - Measurement of coating thickness
- Microscopic method

TS EN ISO 14713 Protection against corrosion of iron and steel in structures-
Zinc and aluminium coatings- Guidelines

TS EN ISO 3506 Mechanical properties of corrosion-resistant stainless-steel
Fasteners

TS EN ISO 8503
Preparation of steel substrates before application of paints and
Related products-Surface roughness characteristics of blast cleaned steel substrates

TS EN ISO 8504 Preparation of steel substrates before application of paints and
Related products - Surface preparation methods

TS EN ISO 9000 Quality management system- Fundamentals and vocabulary

TS EN ISO 9001 Quality Management Systems-Requirements (EN ISO9001:2008)
BS 1202 Specification for nails. Steel nails

BS 1243
Specification for metal ties for cavity wall construction

BS 3100 Specification for steel castings for general engineering.Purposes

BS 3146
BS EN 3146:2001 Aerospace series. Round bars, hot rolled in
Steel. Close tolerances. Diameter 6mm ≤ D ≤ 250mm.Dimensions

BS 3830 Specification for vitreous enameled steel building components

BS 3987 Specification for anodic oxidation coatings on wrought aluminium for external architectural applications

BS 4078 BS EN 4078:2009 Aerospace series. Inserts, threaded, thin
Wall, locked and self-locking, in heat resisting steel, MoS2

Lubricated. Classification: 1100 MPa (at ambient temperature)/ 315° C

BS 4255 Rubber used in preformed gaskets for weather exclusion from Buildings. Specification for non-cellular gaskets

BS 476 Fire tests on building materials and structures.

BS 4842
Specification for liquid organic coatings for application to Aluminium alloy extrusions, sheet and preformed sections for External architectural purposes, and for the finish on Aluminium alloy extrusions, sheet and preformed sections coated

BS 499 Welding terms and symbols.

BS 5080 Structural fixings in concrete and masonry.

BS 5212 Cold applied joint sealant systems for concrete pavements.

BS 5516 Patent glazing and sloping glazing for buildings.

BS 5628 Code of practice for use of masonry.

BS 5713 Specification for hermetically sealed flat double glazing units

BS 5839 Fire detection and fire alarm systems for buildings.

BS 5950 Structural use of steelwork in building.

BS 6001 Sampling procedures for inspection by attributes.

BS 6093 Design of joints and jointing in building construction. Guide

BS 6161 Methods of test for anodic oxidation coatings on aluminium and its alloys.

BS 6180 Barriers in and about buildings. Code of practice

BS 6206 Specification for impact performance requirements for flat safety glass and safety plastics for use in buildings

BS 6213 Selection of construction sealants. Guide

BS 6262 Glazing for buildings.

BS 6375 Performance of windows and doors.

BS 6399 Loading for buildings.

BS 6651 Code of practice for protection of structures against lightning

BS 7079 General introduction to standards for preparation of steel substrates before application of paints and related products

BS 7430 Code of practice for earthing.

BS 7543 Guide to durability of buildings and building members, products and components

BS 7668 Weldable structural steels. Hot finished structural hollow sections in weather resistant steels. Specification

BS 8000 Workmanship on building sites.

BS 8110 Structural use of concrete.

BS 8118 Structural use of aluminium.

BS 8200 Code of practice for design of non-loadbearing external vertical enclosures of buildings

BS 8298 Code of practice for design and installation of natural stone cladding and lining

BS 952 Glass for glazing.

BS EN 10029 Specification for tolerances on dimensions, shape and mass for hot rolled steel plates 3mm thick or above

BS EN 10263 Steel rod, bars and wire for cold heading and cold extrusion.

BS EN 10283 Corrosion resistant steel castings

BS EN 12150 Glass in building.

BS EN 20140 Acoustics. Measurement of sound insulation in buildings and of building members.

BS EN 515 Aluminium and aluminium alloys. Wrought products. Temper Designations

BS EN 572 Glass in building. Basic soda lime silicate glass products.

BS EN 573 Aluminium and aluminium alloys. Chemical composition and form of wrought products.

BS EN ISO 12944 Paints and varnishes. Corrosion protection of steel structures by protective paint systems.

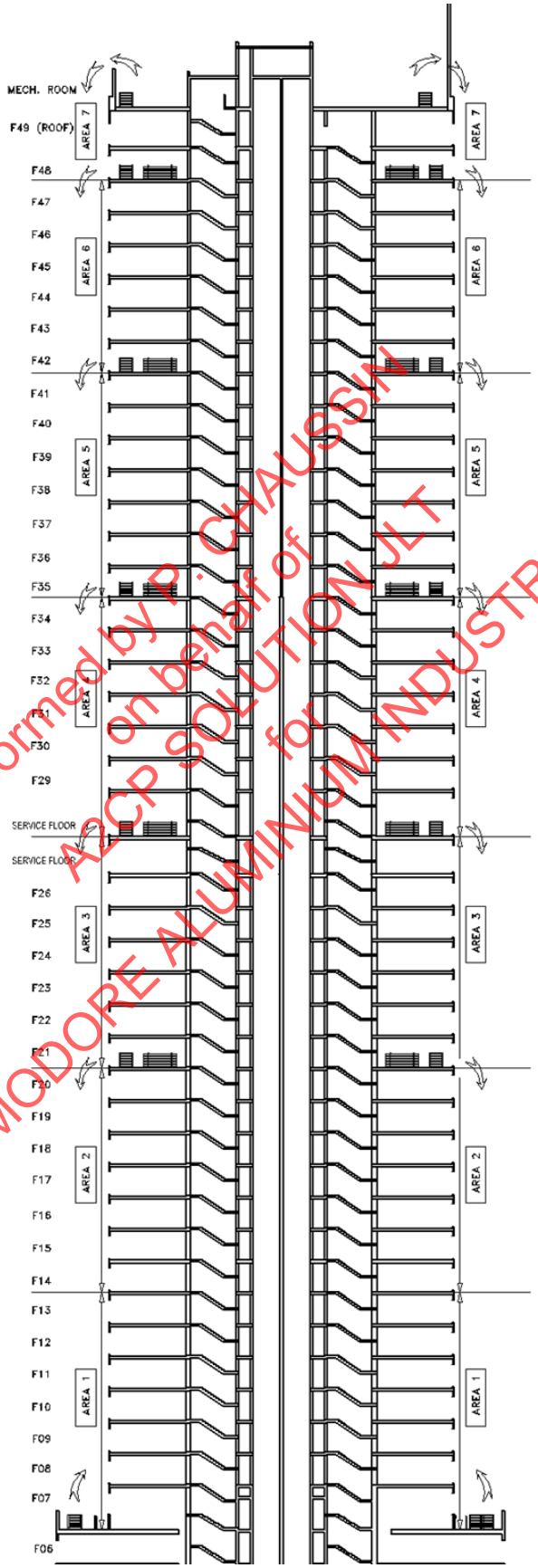
BS EN ISO 1461 Hot dip galvanized coatings on fabricated iron and steel articles. Specifications and test methods

BS EN ISO 14713 Zinc coatings. Guidelines and recommendations for the protection against corrosion of iron and steel in structures.

BS EN ISO 717 Acoustics. Rating of sound insulation in buildings and of building members.

BS EN ISO 9000 Quality management systems. Fundamentals and vocabulary

APPENDIX C



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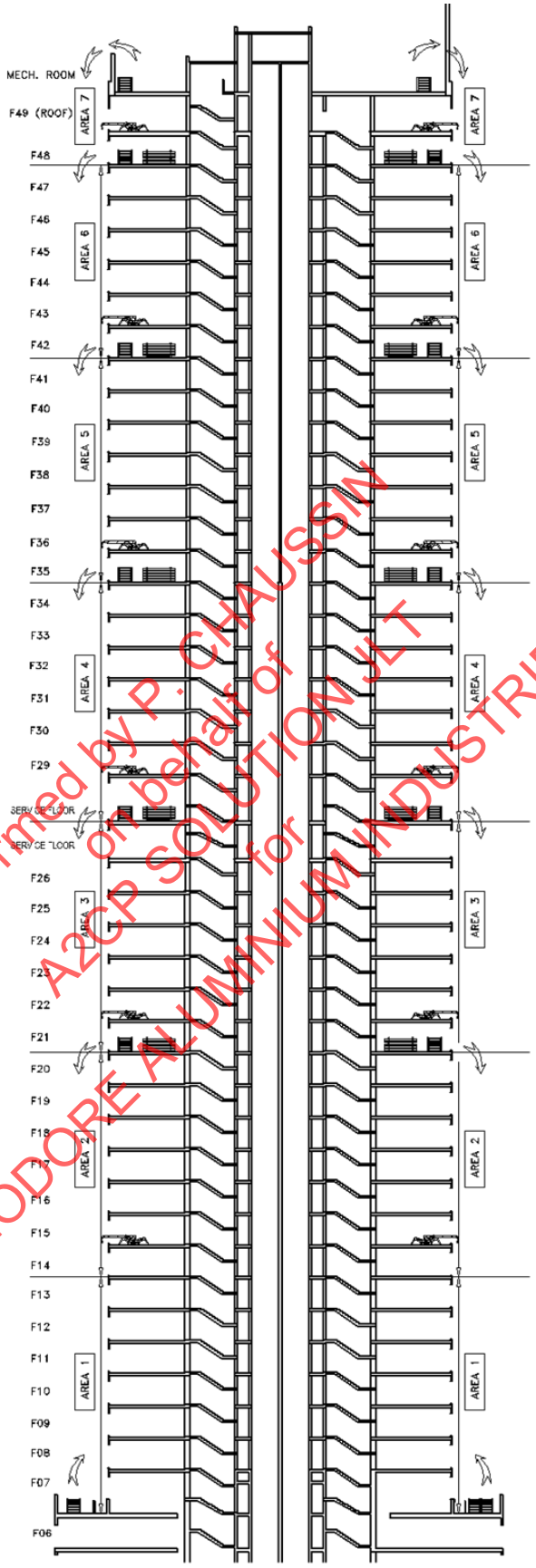

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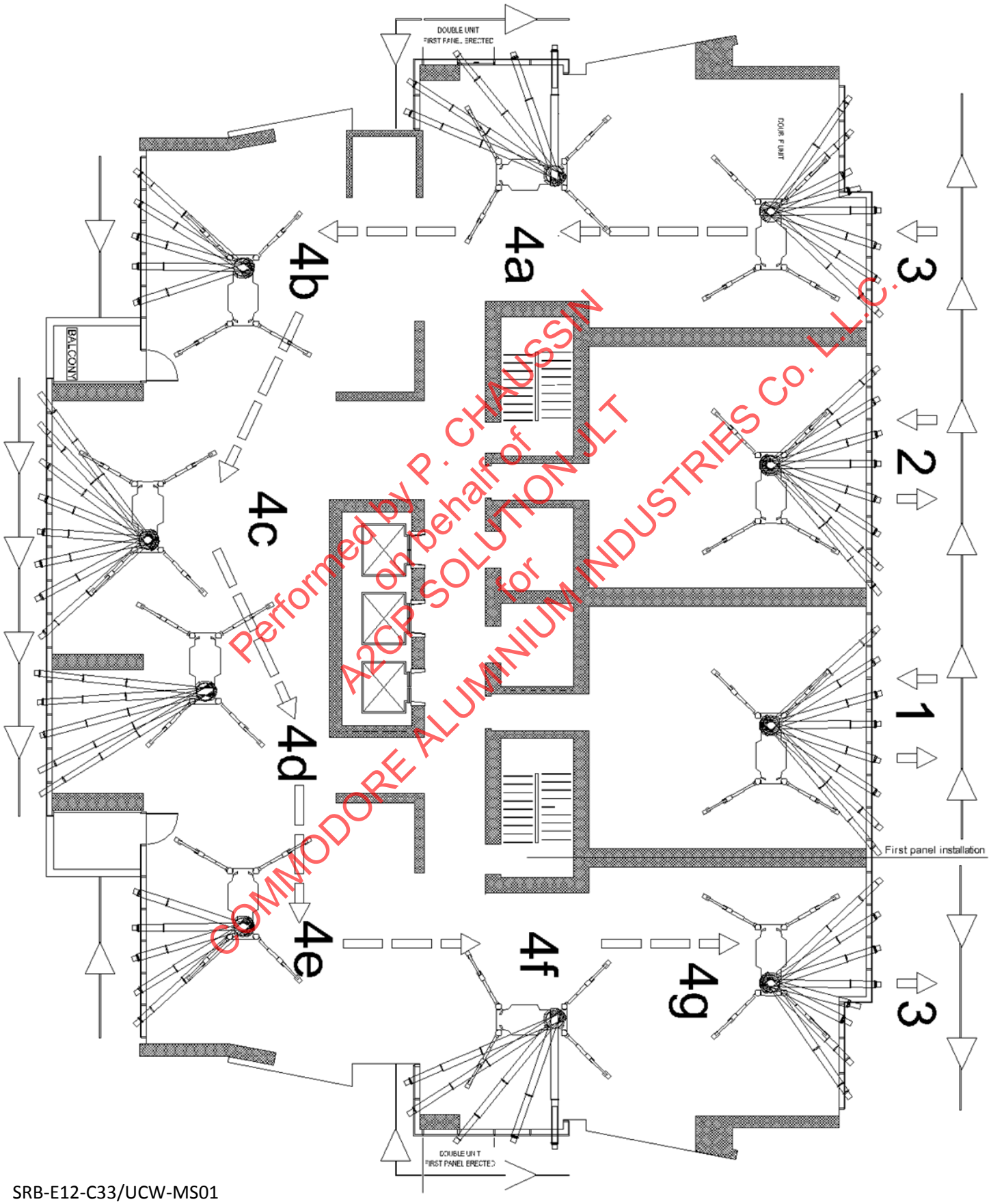

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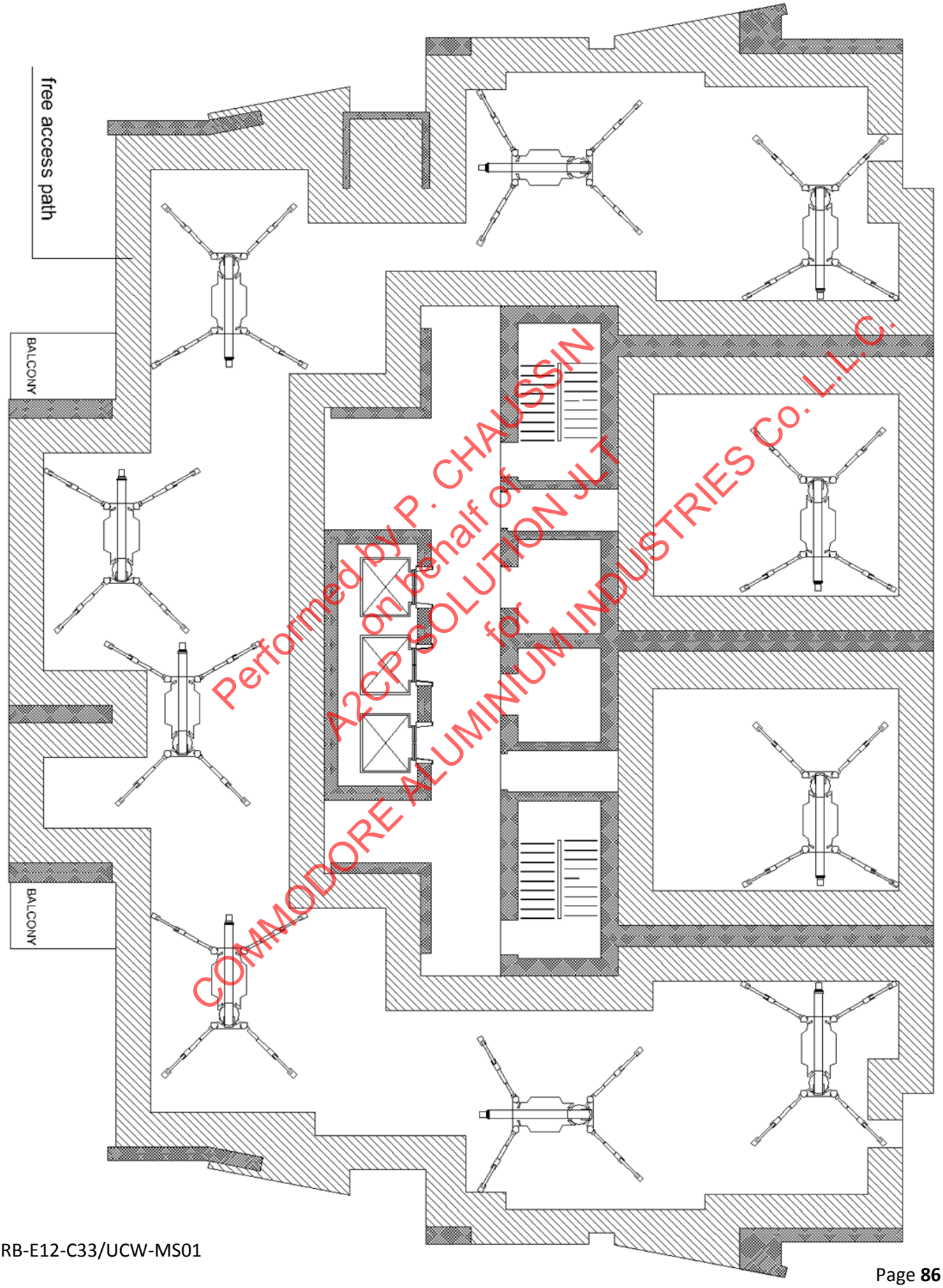

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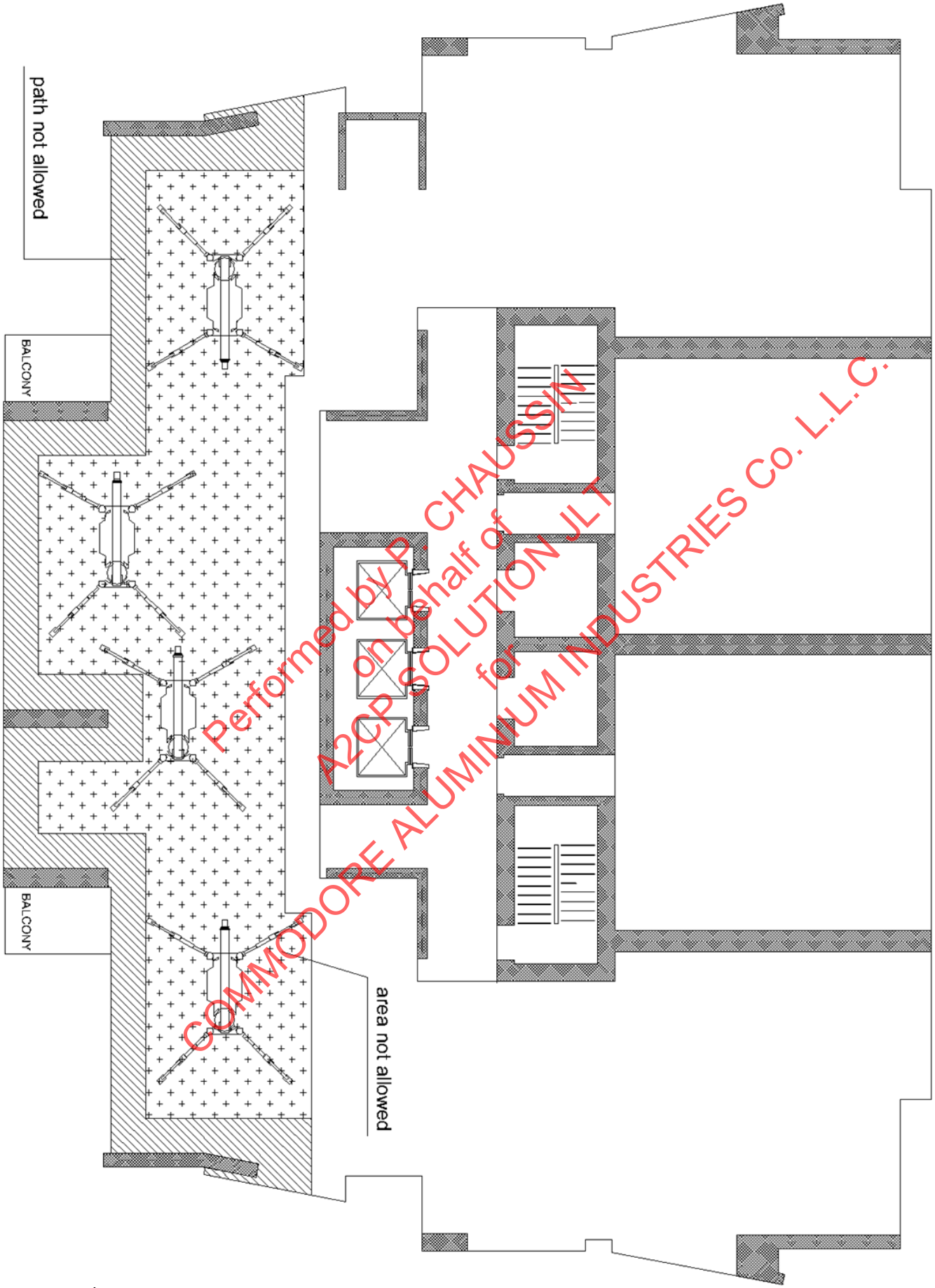

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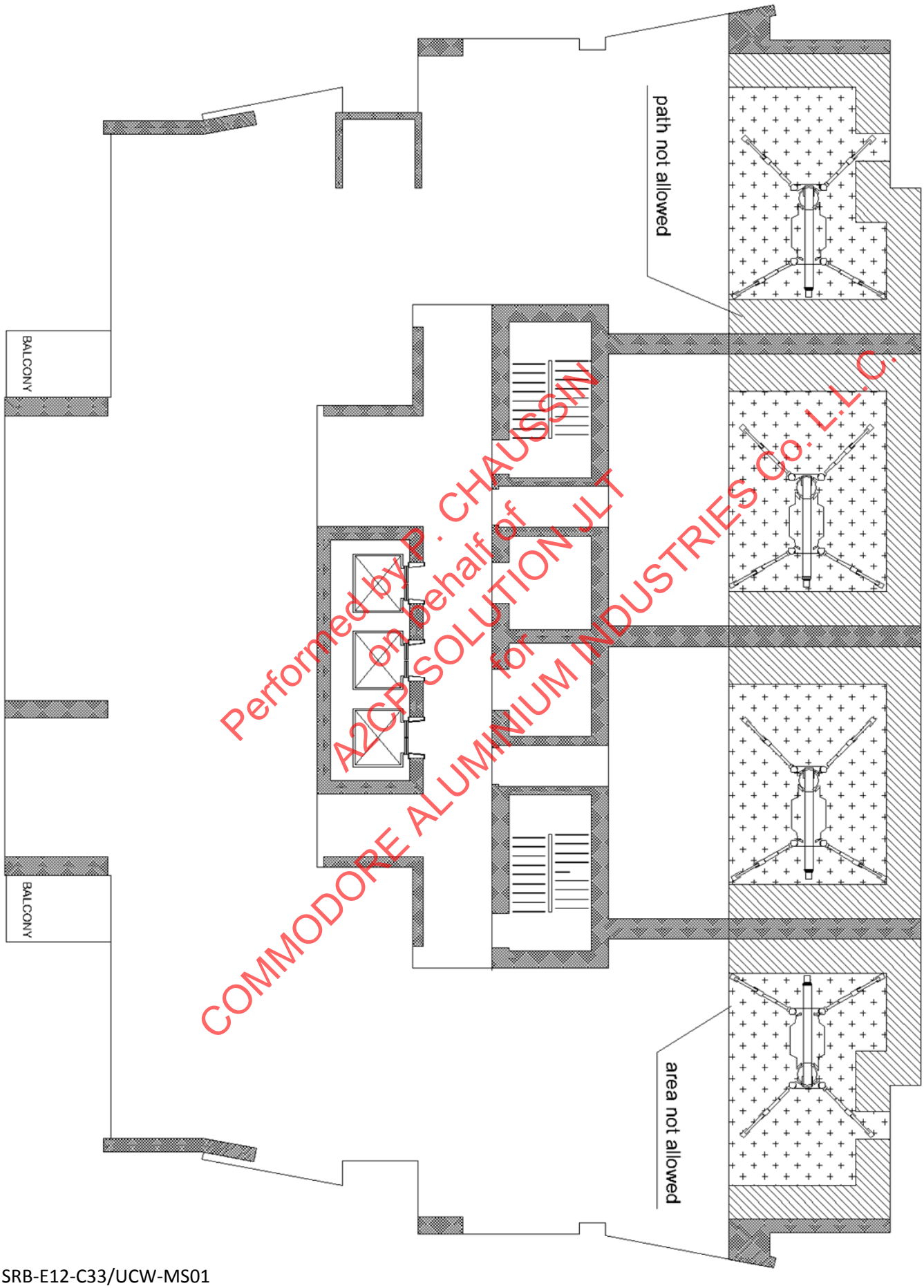

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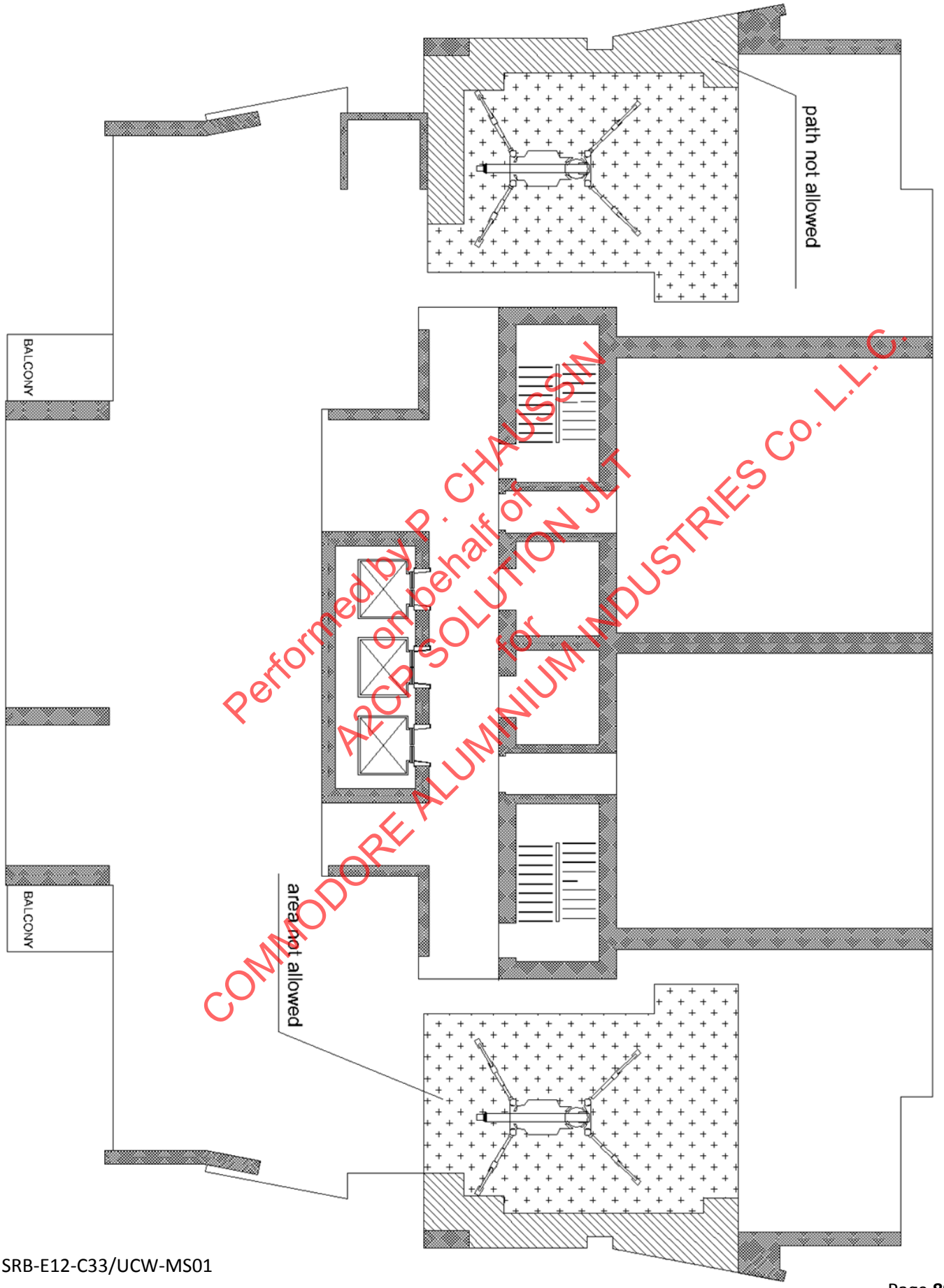
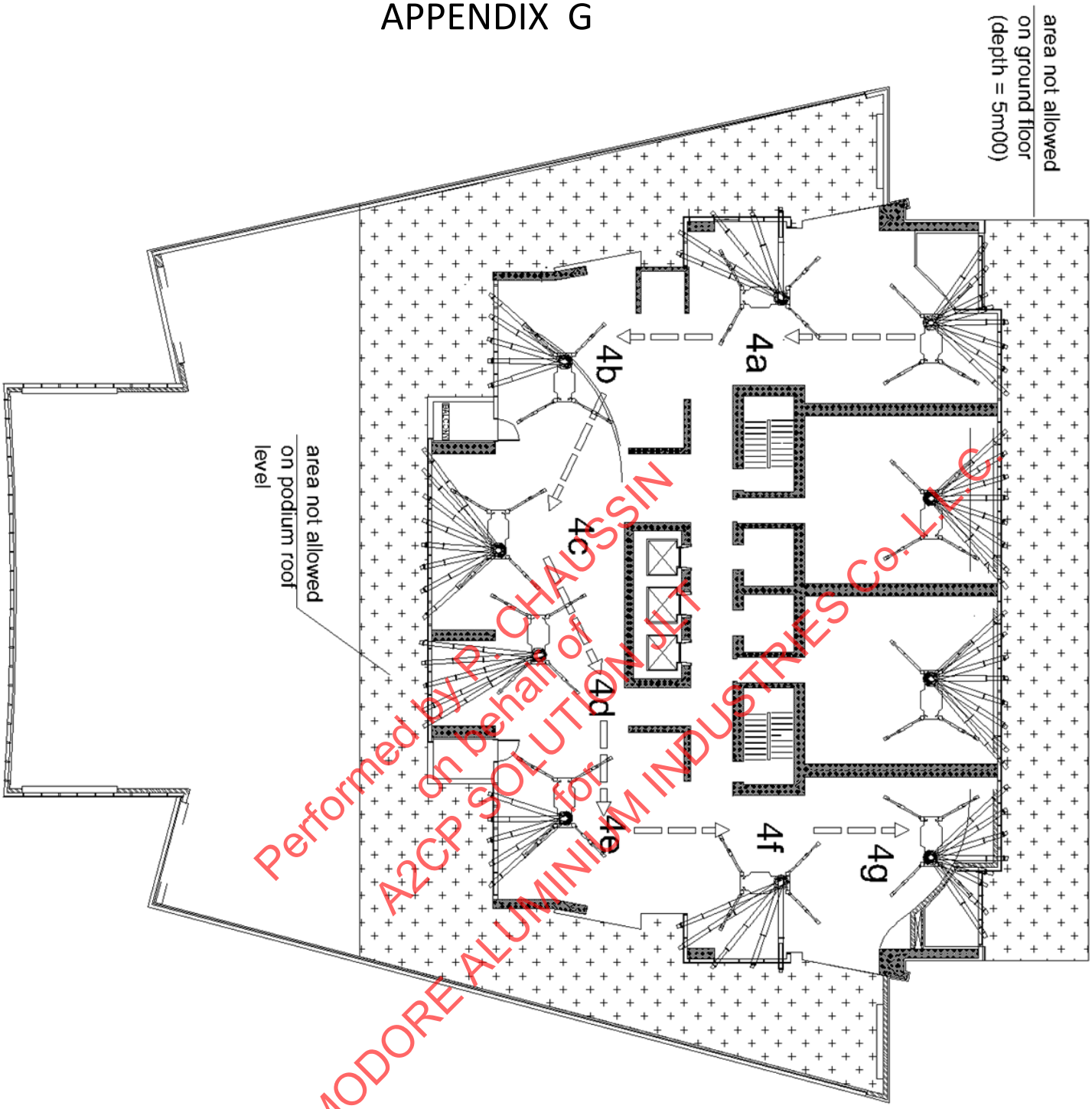
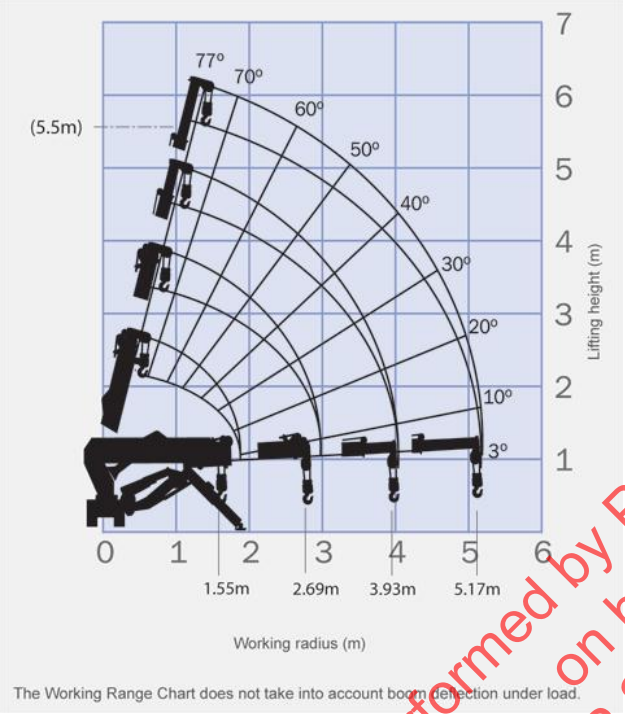


APPENDIX G



APPENDIX H (1)

MAEDA MINI CRANE MC 174



The Working Range Chart does not take into account boom deflection under load.

Total rated load Outriggers at Maximum position

1.83m boom		2.97m boom		4.21m boom		5.45m boom	
Working radius (m)	Total rated load (kg)	Working radius (m)	Total rated load (kg)	Working radius (m)	Total rated load (kg)	Working radius (m)	Total rated load (kg)
<1.0	1720	<1.0	1720	<1.3	1320	<1.7 or	770
1.30	1320	1.30	1320	1.50	1120	2.00	700
1.55	1090	1.50	1120	2.00	820	2.50	660
		2.00	820	2.50	670	2.80	580
		2.50	670	3.00	530	3.00	530
		2.69	580	3.50	420	3.50	410
				3.93	370	4.00	330
						4.50	270
						5.17	220

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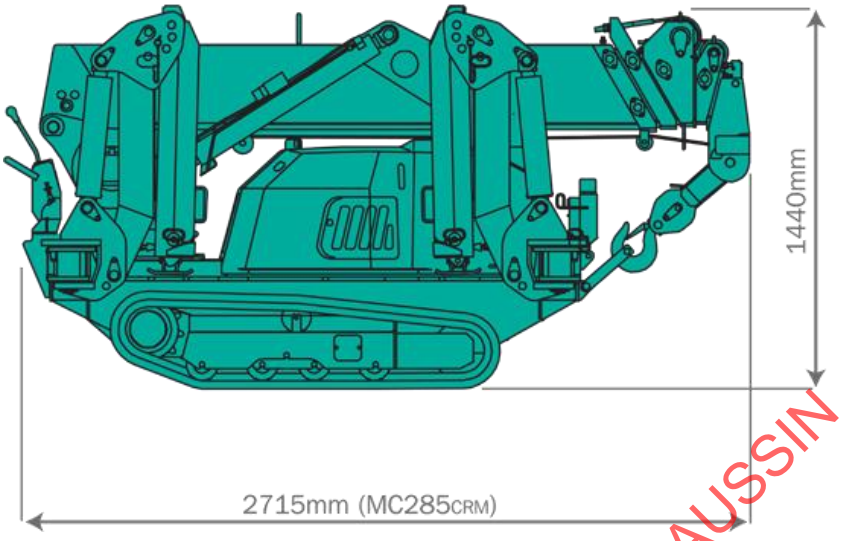
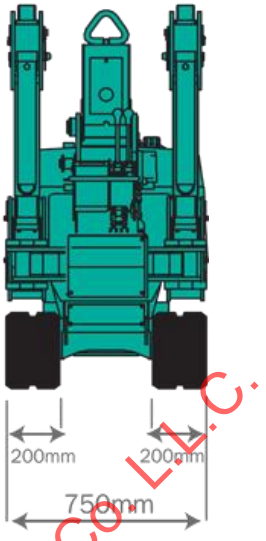
Total rated load Outriggers at any other position

1.83m boom		2.97m boom		4.21m boom		5.45m boom	
Working radius (m)	Total rated load (kg)	Working radius (m)	Total rated load (kg)	Working radius (m)	Total rated load (kg)	Working radius (m)	Total rated load (kg)
<1.0	1220	<1.0	1220	<1.3	940	<1.7	720
1.30	940	1.30	940	1.50	810	2.00	600
1.55	790	1.50	810	2.00	600	2.50	390
		2.00	600	2.50	390	2.80	330
		2.50	390	3.00	300	3.00	300
		2.69	310	3.50	220	3.50	220
				3.93	180	4.00	180
						4.50	140
						5.17	100

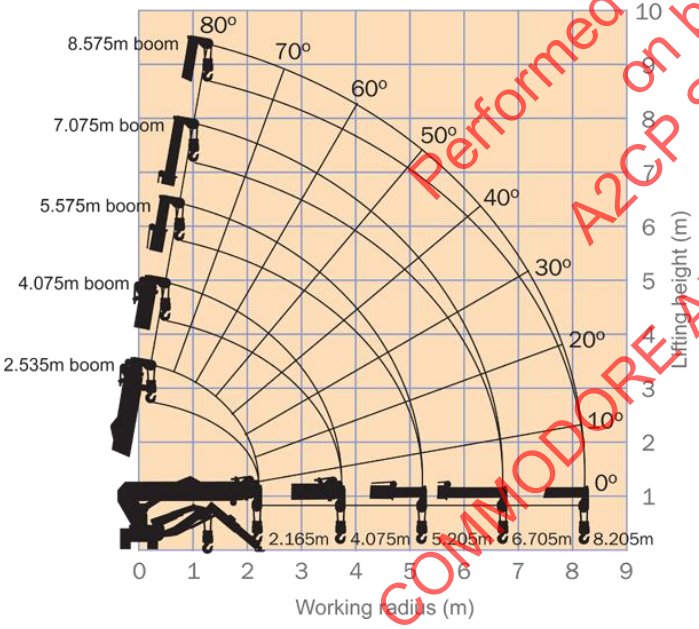
APPENDIX H (2)
MAEDA MINI CRANE MC 285

Overall Size





Working Range Chart



Total rated load Outriggers at Maximum position

4.075m boom		5.575m boom		7.075m boom		8.575m boom	
Working radius (m)	Total rated load (kg)	Working radius (m)	Total rated load (kg)	Working radius (m)	Total rated load (kg)	Working radius (m)	Total rated load (kg)
< 1.4	2820	< 3.0	1220	< 3.6	820	< 4.0	550
1.5	2520	3.5	970	4.0	740	4.5	400
2.0	1920	4.0	780	4.5	580	5.0	340
2.5	1570	4.5	630	5.0	480	5.5	300
3.0	1220	5.0	530	5.5	430	6.0	270
3.5	970	5.205	530	6.0	380	6.5	230
3.705	920			6.5	350	7.0	200
				6.705	330	7.5	180
						8.0	150
						8.205	150

Total rated load Outriggers at any other position

4.075m boom		5.575m boom		7.075m boom		8.575m boom	
Working radius (m)	Total rated load (kg)	Working radius (m)	Total rated load (kg)	Working radius (m)	Total rated load (kg)	Working radius (m)	Total rated load (kg)
< 1.5	1720	< 3.0	510	< 3.6	400	< 4.0	330
2.0	1070	3.5	410	4.0	330	4.5	280
2.5	630	4.0	330	4.5	280	5.0	230
3.0	520	4.5	280	5.0	230	5.5	180
3.5	430	5.0	230	5.5	180	6.0	160
3.705	350	5.205	200	6.0	160	6.5	150
				6.5	150	7.0	100
				6.705	140	7.5	80
						8.0	70
						8.205	60