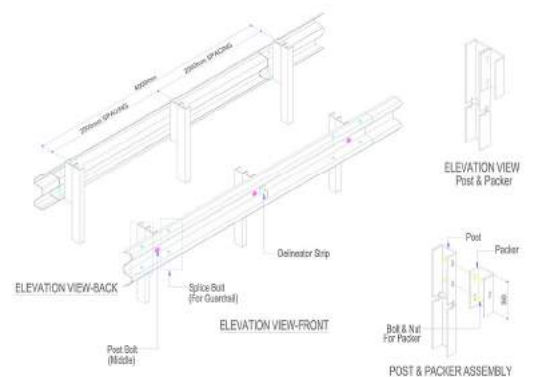




PROJEK GARUDA SDN BHD

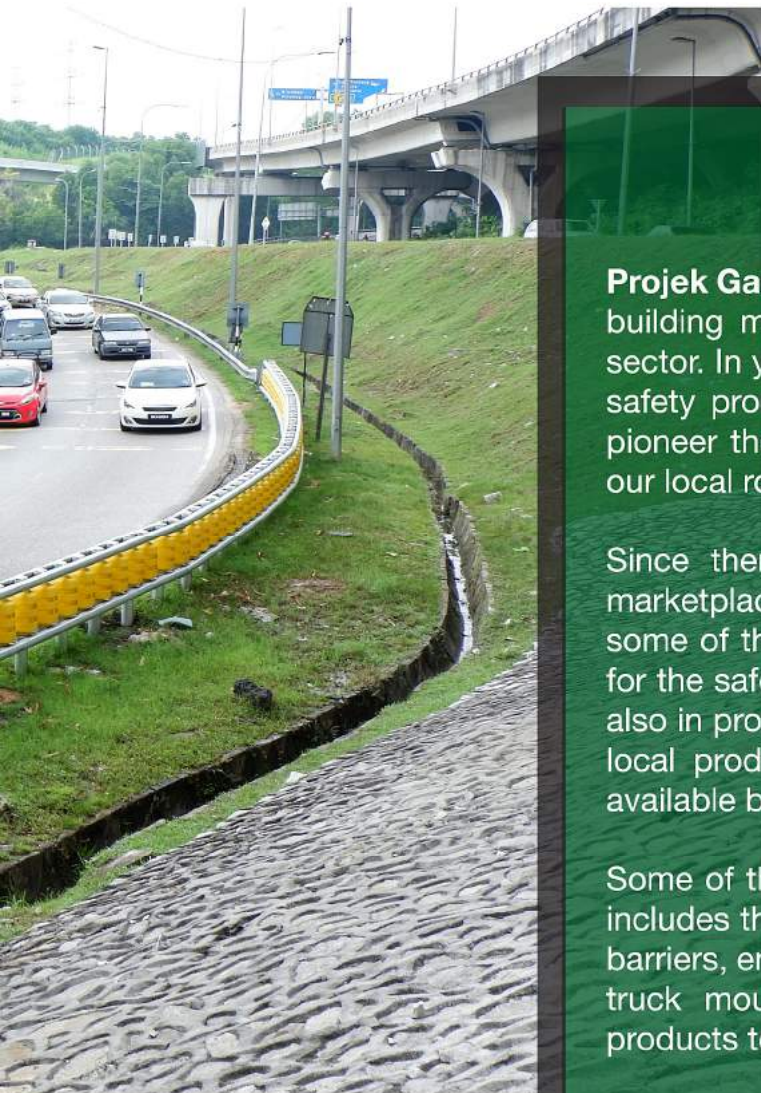


Powder Color Coated





ABOUT US



Projek Garuda was incorporated in 2014 as a concrete and building materials supplier to the Malaysian construction sector. In year 2015, the company began its foray into road safety products and was the first Malaysian company to pioneer the installation of the innovative Roller Barriers to our local roads.

Since then, the company has established itself in the marketplace as a serious player and continued to introduce some of the highest quality of road products and furniture for the safety welfare of the Malaysian motorists. Plans are also in progress to set up local manufacturing facilities and local productions of some of these products should be available by mid of 2018.

Some of the other significant innovations by the company includes the world's first powder coated guard rails, sound barriers, end terminals, crash cushions, anti glazing boards, truck mounted attenuators and many other innovative products to keep our road users safe.

The company's mission is to help to reduce road accidents and fatalities significantly throughout the region and its vision is to be the No.1 most innovative road safety products supplier in South East Asia.





“PG Powder Coated Guardrail” had excellent durability and visibility through powder coating over zinc-galvanized steel (HGI).

What is PG Powder Coated Guardrail

PG Powder coated guardrail is guardrail with highly corrosion-resistant powder coating technology over zinc-galvanized steel (HGI) and comes with colors that can be customized according to environment. When raining, rain water cleans pollutants on the rail surface.

PG Powder Coated Guardrail Vs Zinc Galvanized Guardrail



Color Available



Yellow (pattern no. EE065K)



White (pattern no. NW015K)



Green (pattern no. EC024K)



Grey (pattern no. NK00K)



Advantages Over Coventional Guardrail



“PG Powder Coated Guardrail” is manufactured with an automation system technology. Thus, it can be offered high-quality with competitive price!

■ Durability

Double protection compare to conventional zinc-galvanized guardrail (whereby corrossion normally starts after 3~6 months).

■ Visibility

Better visibility compare to conventional guardrail due to possibility of coloring different zones.

■ Uniformity

After maintenance/repair work, there will be no two tone coloration.

■ Better Implementation

No whitening phenomenon (white dust) effect during storage in warehouse

■ Self Cleaning

Maintains good visibility as rain water can wash away dirt and maintain good colour

■ Possible Road Theming

Different zone can identify quickly by road user

Example:



Yellow

School/Hospital



Green

Forest/Park



White

Petrol Station/
Coastal Road



Silver

Normal



Product Test

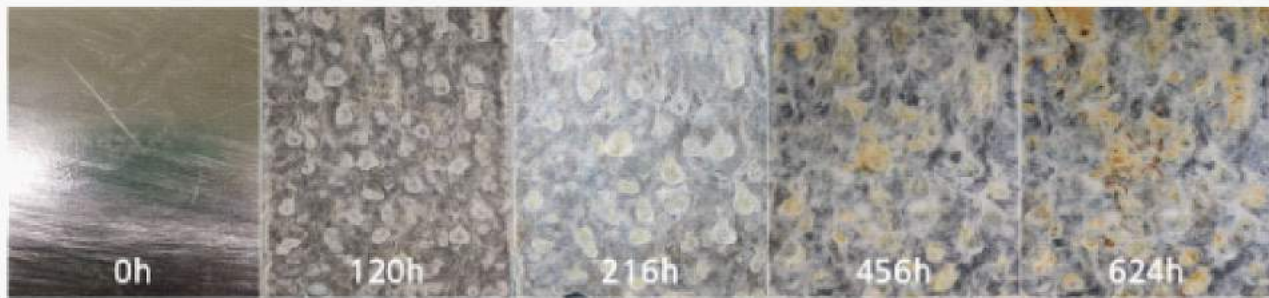
Acetic Salt Spray Test (Normal Surface Condition for Corrosion Test)

| | | | |
|-------------------|-------------------------------------|-----------------|--|
| Testing Institute | Korean Conformity Laboratories | Test Conditions | <ul style="list-style-type: none"> * Acetic + Salt Spray Test * Temperature(35±2)°C, 0.7~1.8 kg/cm * Purity 3.1~3.2 * Concentration of salt 5±1% * 1000 hours |
| Testing Items | ① Powder Coating ② Zinc-galvanizing | | |
| Kind of Test | Acetic acid salt spray test | | |

| | Pre-testing | 192 hours | 384 hours | 768 hours | 1000 hours |
|--------------------|-------------|-----------|-----------|-----------|------------|
| ① Powder Coating | | | | | |
| ② Zinc-galvanizing | | | | | |

Acetic Salt Spray Test (Scratch Surface Condition for Corrosion Test)

Zinc Galvanization



Discoloration & Corrosion Detected

Powder Coated



No Discoloration & Corrosion

ASTM B117 624h



High visibility of “**PG Powder Coated Guardrail**” creates driver confidence. This is an important factor especially at night or in fog conditions.

Comparison between Powder Coated Guardrail and Zinc-galvanized Guardrail



| Powder Coated Guardrail on Zinc-galvanized Steel | Comparison Description | Zinc-galvanized Steel Guardrail |
|---|--|---|
| No discoloration and corrosion detected after 1000 hours | Salt Water Spray Test (Corrosion Test) | Discolored and corroded after 96 hours |
| Excellent | Visibility | Deteriorated after 3 - 6 months installed with discoloration and corrosion |
| Uniformity with non-glossy rail is mingled with existing guardrails | After being maintained/replaced | Glossy rail with lacks unity with existing guardrails |
| Longer storage duration with no whitening phenomenon even after a few years in open-storage | Storage | Shorter storage duration due to whitening phenomenon and become non merchantable quality after 3 months |
| Color theming possibility. Various colors are able to manufacture upon request | Color | Single Colored |
| Easy to keep and manage. Able to keep stock and distribute immediately upon ordering | Lead Time | Unable to keep for longer lead time. Guardrail need to replenish upon ordering |



Product Pictures Comparison

General Zinc Galvanized Guardrail Pictures After Few Years Installation



General Powder Coated Guardrails Pictures After More Than 10 Years Installation



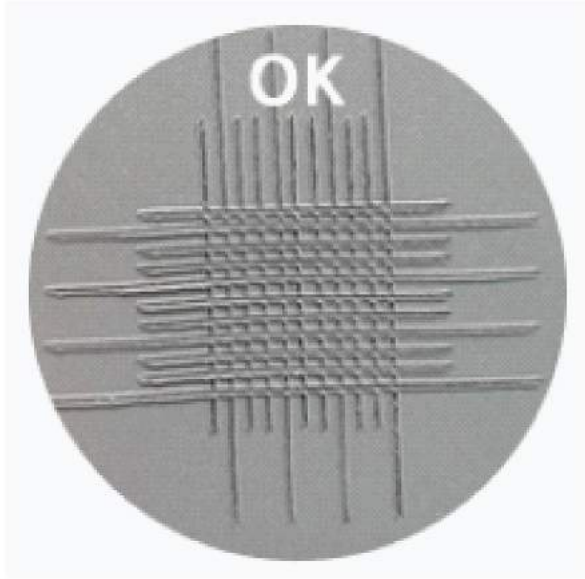


Product Test

Adhesive Strength Test (ASTM D 3359 Standard)

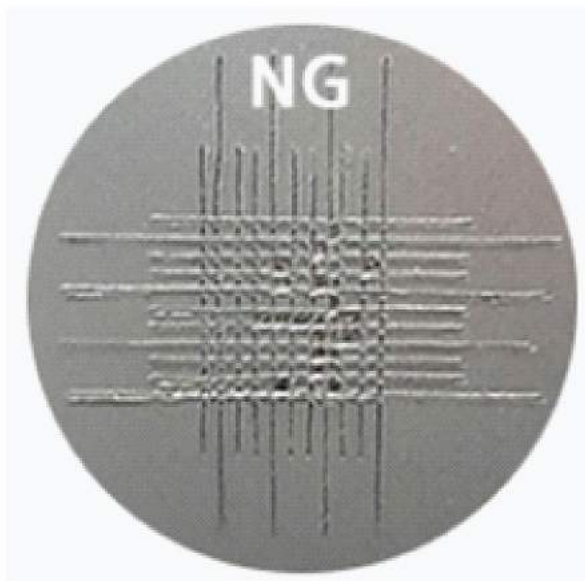
The adhesive strength is an important test to test the coating is strong against peeling regardless of man made or environment-caused over time.

For the test, the adhesive tape is attached and detached repeatedly on the surface after scratching the surface for 2cm length by 2mm gap with Cross Cut Test Tool.



PG Powder Coated Guardrail (Powder Coated over HGI Steel)

RESULT: No peeling of coating



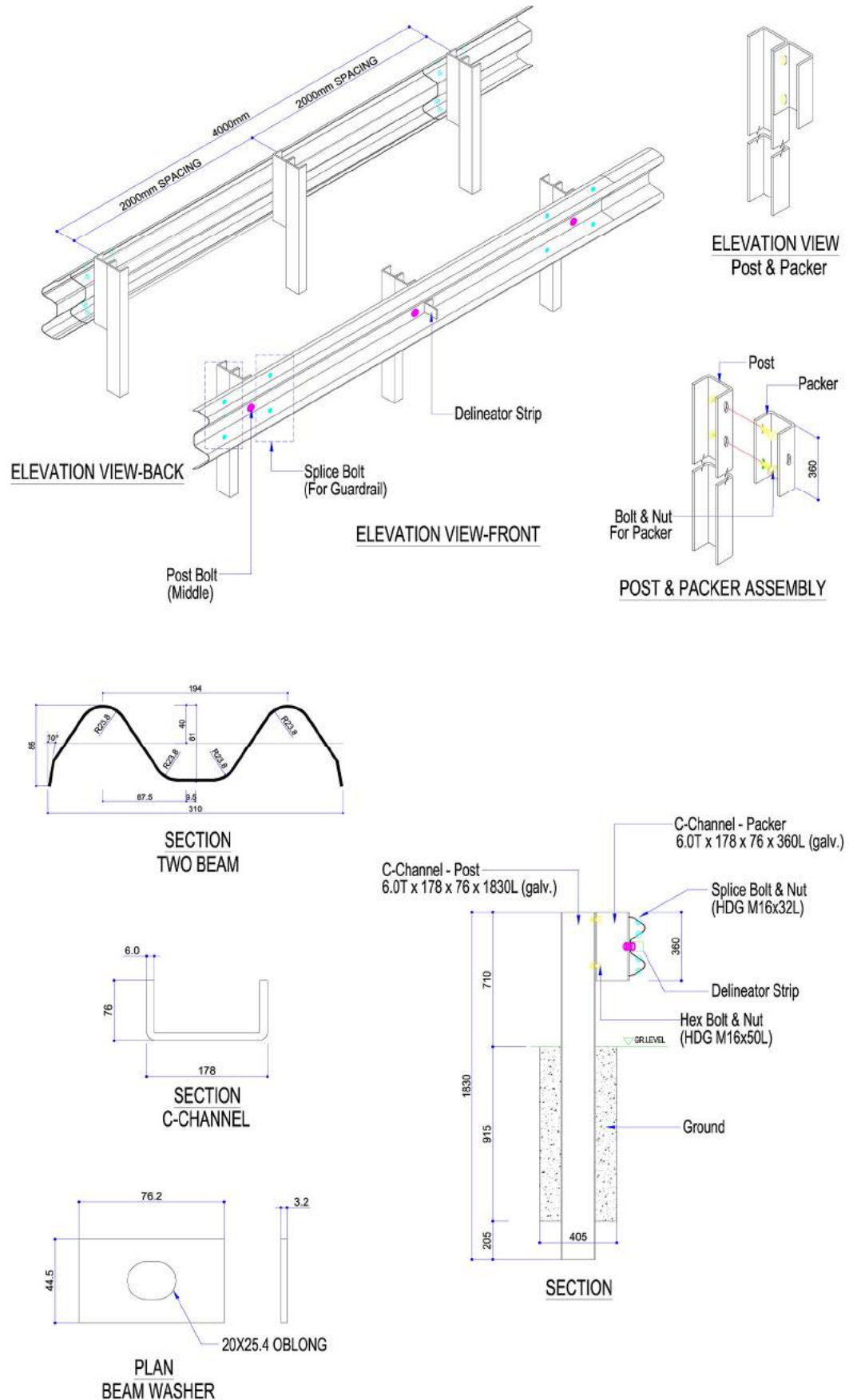
Sample of others Powder Coated Guardrail (Powder Coated over HR Steel + Zinc Galvanized)

RESULT: Peeling of coating detected



Specification (Single Mounted 1 Row)

Exhaust gas from cars and dust in the air make the guardrail polluted, that diminished the visibility and accident preventing ability





Cambodia



Myanmar





South Korea





South Korea



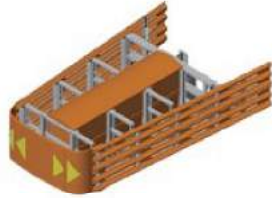


Other Products

Cushion Tank System CCS I



EU - CCS50
L3,594 x W800 x H1,010(mm)



EU - CCS50 (Large)
L4,317 x W1,989(2,600) x H1,000(mm)

Cushion tank System CCS II



CCS II 50
L3,698.5 x W808 x H608 (mm)



CCS II 80
L4,648.5 x W808 x H608 (mm)

End Terminals



Urethane Fence



Flexible Delineator Post





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