



ArcelorMittal

steel design

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PROJECT SUBMISSIONS

Do you have a project using sheet steel that you would like to see in *Steel Design*? The editor welcomes submissions of completed buildings – commercial, institutional, industrial, recreational and residential – using components made from steel, including cladding, steel decking, light steel framing, steel roofing, steel doors, steel ceiling systems and steel building systems.

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COVER PHOTO: PREPAINTED GALVANIZED RIBBED STEEL, COLOURED OFF-WHITE.
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ArcelorMittal

transforming
tomorrow



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3 Alania Aeronautics Plant, Grottaglie-Monteiasi, Taranto, Italy

Steel is an integral material in the plant's construction. Steel not only forms a founding element of the structure's functionality, but it also contributes to the symbolic aspect of the site. Structural steel, prepainted galvanized steel exterior cladding and interior partition sandwich panels – pre-fabricated as appropriate – contributed to the project coming in on time and within budget.

6 Steel for green building solution

As society mobilizes to reduce our ecological footprint, pressure is building up on the construction industry to increase its contribution to environmental sustainability. That is one of the reasons why ArcelorMittal is now concentrating on new technical solutions for reducing energy use over a building's lifetime.

7 Frontier Mosakahiken School, Moose Lake, MB



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Sheet steel cladding was used for both the roof and walls, while steel studs and light steel framing were used liberally inside the school for their durable, non-combustible qualities. "Steel has a lot of flexibility, which provides you with plenty of design freedom. It's a robust material, fairly light-weight but durable, attractive and maintenance free." Art Martin, Stantec Architecture.

8 Wall House, Minneapolis, Minnesota

The owners of this single family dwelling, which was an infill house in an older neighbourhood, wanted a durable house made of sustainable materials. The majority of the exterior is clad with two different Firestone Uniclاد corrugated steel profiles, one in a Silver Metallic Kynar finish and the other in a Grey Kynar, both finishes are over AZM165 (AZ55) Galvalume coated steel.

10 King Fahad Medical City, Saudi Arabia

Steel plays a significant role in the design and construction for the fifteen storey, 16,258m² 175,000 sq. ft. building. Although originally designed in concrete, after a preliminary project study and full review of the building's original structural design, Bailey Metal Products presented a composite system (steel and concrete) for slabs and beams.

13 Coolidge Police Station, Arizona

The building is framed in steel, with interior light gauge steel framing has a dramatic cantilevered roof form clad with a PVDF

finish on galvanized steel. The Structural Quality, .76mm (.0299") Z275 (G90) galvanized steel with a PVDF finish was selected for its durability and freedom from maintenance.



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14 The Last Word in Steel News

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The Boeing 787 Dreamliner is a long-range, mid-size, wide-body jet airliner that can seat anywhere from 210 to 330 passengers. According to Boeing it is the company's most fuel-efficient airliner, consuming 20% less than a 767 of similar size. Much of this is attributable to the aircraft's light weight achieved by being the world's first major airliner to use composite materials (carbon fibre) in its construction.



Steel Contributes Significantly to Boeing Dreamliner Production

"A surprising project, completed in an astonishingly short time through top performances..."



An enlightened client, providing solid information support, permitted us to develop the design for this ambitious project in only four months."

Architect Alfredo Amati, C.E.O. of Studio Amati s.r.l

As seen in the (inserted) photo above, the 400 metre long façade of the plant reflects the functional areas of the building with the various light indentations. A small block protruding from the north front of the main block contains the plant's executive offices. As well, the two staircases and lifts, which reach the roof of the main block, are also located at the north front.

The actual production process is also innovative. Instead of traditional 'from the ground up' on-site construction, Boeing has subcontracted out completed subassemblies that are



Credit: fpa Fondazione Promozione Acciaio

PANEL DATA
Metecno Glamet A38-P100-G4 60
APPLICATION – ON SHED ROOFING

DIMENSIONS:

Width 1,000mm (39.3"), length 7,000mm (275")
+ curved junction mod. "GT1" length 1,000mm (39.3")
Thickness of panel out of fret 60mm (2.36")
Thickness of outer sheet 0.5mm (.020")
Thickness of inner sheet 0.4mm (.016")

SURFACE TREATMENT:

OUTER SKIN: Prepainted galvanized ribbed steel sheet, height of ribs 38mm (1.5") width of ribs 20mm (3/4") space between ribs 333.3mm (13") coloured RAL 9002 Off White

INNER SKIN: Prepainted micro-ribbed galvanized steel sheet coloured RAL 9002 Off White.
Space between micro-ribs 62.5mm (2.46")

INSULATION: Polyurethane foam

PANEL DATA
Metecno H-Wall 8P
APPLICATION – EXTERNAL CLADDING

DIMENSIONS:

Width 1,000mm (39.37"), variable length
Thickness of panel between ribs 50mm (1.97")
Thickness of outer sheet 0.6mm (.024")
Thickness of inner sheet 0.5mm (.020")

WEIGHT: 12.26kg/m² (3 lbs./sq. ft.)

SURFACE TREATMENT:

OUTER SKIN:
Prepainted and corrugated galvanized steel coloured RAL5010 Blue

INNER SKIN:
Prepainted galvanized steel, coloured RAL 9002 Off White

INSULATION: Polyurethane foam

PANEL DATA
Metecno Superwall ML
APPLICATION – EXTERNAL CLADDING & INTERNAL PARTITIONS

DIMENSIONS:

Width 1,000 mm (39.37"), variable length
Thickness of panel 60 mm (2.36")
Thickness of outer sheet 0.5 mm (.020")
Thickness of inner sheet 0.5 mm (.020")

WEIGHT: 11.13kg/m² (2.73 lbs./sq.ft.)

SURFACE TREATMENT:

Space between micro-ribs 62.5mm (2.46")

OUTER SKIN: Micro-slatted prepainted galvanized steel sheet coloured RAL9006 Silver Grey and RAL 5010 Blue

INNER SKIN: Micro-ribbed prepainted galvanized sheet steel, coloured RAL 9002 Off White (external cladding) and RAL 9006 Silver Grey (internal partitions)

INSULATION: Polyurethane foam

then shipped to the US for final assembly of the aircraft. One such subcontractor is Italian-based Alenia Aeronautica who built a new plant in Grottaglie-Monteiasi, Taranto, in Southern Italy, to house fabrication and assembly of the two centre sections of barrel fuselage for which they're responsible.

Steel is an integral material in the plant's construction. Steel not only forms a founding element of the structure's functionality, but it also contributes to the symbolic aspect of the site with the external prepainted galvanized steel sandwich panel covering. As architect Alfredo Amati stated, "This was a surprising project completed in an astonishingly short time through top performances by everyone involved and the choice of steel to support and clad the plant."

Alenia's Taranto facility is massive, covering a total 90,000m² (968,751 sq. ft.), including a 400m (1,312 ft.) façade, on 27 hectares (66.6 acres) of land with a production plant of 70,000m² (753,473 sq. ft.). The steel structure weighs 15,000 tonnes – twice the weight of the Eiffel Tower. The new plant was built to facilitate new manufacturing processes required by the Boeing 787 program. Those processes begin in a 'clean room' of 175,000m² (1,883,682 sq. ft.) calculated by Alenia to be the equivalent of a 3,000-room hotel. The project (€210-million, approx. Can. \$290-million) was completed in 16 months. Not surprisingly, steel's advantageous strength-to-weight ratio was key in its selection as the leading construction material.

Structural steel, prepainted galvanized steel exterior cladding and interior partition sandwich panels – pre-fabricated as appropriate – contributed to the project coming in on time and within budget. Steel's ability to allow long clear spans and subsequent 'open spaces' provided the flexibility necessary to house the various manufacturing processes for the fuselage barrels. At a width of 175m (574 ft.) and height of 24m (78.7 ft.) the facility houses some of the largest equipment of its kind



Prepainted galvanized ribbed steel sheet, coloured RAL 9002 Off White installed on the shed roofs. The height of ribs 38mm (1.5"), width of ribs 20mm (.75"), space between ribs 333.3mm (13"). The curved element is a Glamet-GT1 panel manufactured by Metecno, sandwiched and assembled on site from three curved sub-sections.

– examples being a 17m x 35m (55.8 ft. x 114.8 ft.) automated fibre placement machine and the world's largest autoclave (for curing fuselage sections) at 22m x 9m (72.2 ft. x 29.5 ft.).

A substantial amount of natural light is facilitated by 'northern light' roofing incorporating steel sandwich panels, corrugated steel, and clear panels of cellular polycarbonate, plus wall interruptions with clear panels protected by a steel louvered brise-soleil system.

At the time of construction, Alenia general manager Antonio Perfetti commented on the scope of the new plant and its tailoring to a specific project: "It is changing the whole of Italian industry as part of the undertaking to meet the needs of this aircraft. And steel made it happen".

The building design provides a solution that is both functional and exceptional at the same time, incorporating architectural quality into an industrial establishment. As well, it blends in with the environmental setting, fully respecting the landscape.



Credit: fpa Fondazione Promozione Acciaio

DESIGN AND CONSTRUCTION TEAM

PRINCIPAL:

Alenia Aeronautica S.p.A.

ARCHITECTURAL AND TECHNOLOGICAL DESIGN:

Studio Amati Architetti +39 06 3223905

STRUCTURAL DESIGN:

SEICO S.r.l. 06-85 35 08 38

GENERAL PROJECT COORDINATION:

Studio Amati Architetti

CONTRACTOR – STEEL STRUCTURE AND CLADDINGS:

Cometal spa: 0039 0521-316911 leader of the consortium with Cordioli S.p.A.: 0039 045-7950277

MBM S.p.A.: +39 045-8580766

Bit S.p.A.: +39 043-8998811

Ortolan S.p.A.: +39 043-8794933

TECHNICAL INSTALLATIONS:

Ariatta Ingegneria Dei Sistemi S.r.l. +39 02 4990271

ADOPTED SANDWICH PANELS:

Metecno S.p.A. +39 02 90695111

PHOTOGRAPHER:

© fpa Fondazione Promozione Acciaio

Luigi De Simone +39 02 863130



Credit: Studio Amati Architetti

As society mobilizes to reduce our ecological footprint, pressure is building up on the construction industry to increase its contribution to environmental sustainability. And for good reason, since it has been calculated that by 2050, energy savings in construction could easily have a greater impact on global CO₂ emissions than the combined environmental efforts of the entire transport sector. As a major supplier, ArcelorMittal is determined to play a key role in the 'green revolution' in the building industry.



Over the years, ArcelorMittal has continued to reduce the ecological impact of its steel manufacturing processes by drastically restricting waste generation, water use, greenhouse gas emissions and energy use. For example, ArcelorMittal has dropped its CO₂ emissions by more than 20% since 1990.

ArcelorMittal is making a substantial contribution to the development of breakthrough technologies designed to reduce CO₂ emissions from steelmaking by 30-70% by 2050.

Focusing on the use phase of buildings

The amount of energy required for lighting, heating and air conditioning a building over time far exceeds the energy used to build it. That is why ArcelorMittal is now concentrating on new technical solutions for reducing energy use over a building's lifetime.

A high proportion of energy use is devoted to heat control, by artificially heating or cooling the building. The

combination of a steel structure with insulation drastically reduces energy losses. Combined with double skin systems and/or sandwich panels with pre-painted technology, it is possible to create a thermally efficient envelope, meeting the strictest energy standards. In addition, the outstanding air tightness of steel cladding and roofing systems eliminates air leakage that contributes to energy waste.

Steel makes it much easier to adapt buildings to new and innovative uses. A steel building characterized by the absence of load bearing walls is intrinsically more versatile and flexible than other types of structure. With its prefabricated, lightweight and fast-to-erect components, steel construction means buildings can easily be updated to new construction standards. Steel gives buildings a longer, healthier life. In other words: it helps the construction industry to pursue sustainability.

From ArcelorMittal Update May 2010



Constructing a new school for the Mosakahiken Cree Nation posed a number of design challenges for Manitoba's Stantec Architecture Ltd. The new school building had to unite the entire community's education program, which was scattered after the previous school burnt down. It had to be a meeting place as well as a school and reflect the community's culture and future. The building also had to withstand Manitoba's northern climate and the challenges of a remote location.



Attractive, durable unpainted Galvalume excels in remote north

"Mosakahiken Cree Nation is a very progressive community and they wanted the school to reflect that progressiveness. They didn't want to see a building that was a literal translation of a tipi, turtle or eagle form. They wanted to see a modern school," remembers Art Martin, principal architect for Stantec Architecture Ltd. "Chief Phillip Buck really challenged the design team to look at the contemporary integration of cultural elements and symbols. He was inspiring that way."

The three-year project resulted in a 5,110m² (55,000 sq. ft.) school for K to 12 students and a 40 unit teacher's residence. It included playing fields, maintenance buildings, a hockey rink, a play area for kindergarten students, and a large parking lot.

Martin knew that steel was the right material for the school. Sheet steel cladding was used for both the roof and walls, while steel studs and light steel framing were used liberally inside the school because of their durable, non-combustible qualities.

"Steel has a lot of flexibility, which provides you with plenty of design freedom. It's a robust material, fairly light-weight but durable, attractive, and maintenance free," he says. "We tend to put steel at the three meter mark and higher to avoid the normal wear-and-tear that happens along building faces exposed to human activities and contact. Regarding ongoing maintenance, buildings in northern, remote locations are a particular challenge therefore the use of durable, the use of durable,

pre-finished and corrosion resistant steel is important."

With respect to the palette of the building exterior, Stantec was inspired by the traditional birch bark canoe to use different brick colours and textures for the masonry, and they echoed this design in the steel and composite aluminum panels. The school's wings flank the kindergarten play area, symbolizing the community embracing its future leaders. A medicine wheel was incorporated into the design of the school's floor, and Martin designed an Elder's Wall, which has images of the community's Elders dating back to the 1920s.

"At the grand opening ceremony, I was tickled pink when I heard the community say, 'look at *our* school.' When I heard that, I knew I'd done my job. The community definitely took ownership of it."

DESIGN AND CONSTRUCTION TEAM

CLIENT: Mosakahiken Cree Nation

ARCHITECTURE: Stantec Architecture Ltd.
Art Martin, Principal 204-928-8853

CONTRACTOR: Penn-Co Construction 204-326-1341

ROOFING CONTRACTOR: Flynn Canada Ltd.
Winnipeg Office 204-786-6951

ROOFING INSTALLER: Flynn Canada Ltd.

SUPPLIER-ROOF & WALL CLADDING: Flynn Canada Ltd.

The design of Frontier Mosakahiken School is practical, durable, efficient and flexible. The school for K to 12 students includes a 40-unit teacher's residence, playing fields, maintenance buildings, a hockey rink, a play area for kindergarten students as well as a large parking lot.

ROOF CLADDING:

Roof cladding is Flynn Accusteel site rolled from UnaClad supplied coil

6,698m² (72,100 sq. ft.)
unpainted .76mm (.0299")
Galvalume AZM180

WALL CLADDING:

.76mm (.0299") Unpainted
Galvalume AZM180 site rolled

Flynn Accusteel
(1.5" x 16") panels

Vicwest AD300R panels with
stiffening rib

Flynn Accumet
2000 clear anodic

INSULATION VALUES:

Walls: R-19.5; Roof: R40

As seen on the North-West face, (left) unpainted Galvalume roof and wall cladding offer excellent solar reflectance. Sheet steel cladding was used for both the roof and walls, while steel studs and light steel framing were used liberally inside the school for their durable, non-combustible qualities. Steel has a lot of flexibility, which provides plenty of design freedom. It's a robust material, fairly light-weight yet durable, attractive and maintenance free.





Roehr Schmitt Architecture, LLC in Minneapolis, used steel paneling in a most unusual way – on a residential home. The single family dwelling, which was an infill house in an older neighbourhood, was finished in 2007. The sleek, modern look of the new home caused quite a stir among the neighbours, recalls design principal Michael Roehr.

Steel Cladding – Durability and Sustainability



"We've always liked the look of steel, particularly the crisp lines and profile it lends to a building. It also looks good with many other materials such as the cedar siding and cement board", Michael Roehr.

"There was a mixture of reactions – there always is. Some people drove from other parts of the city to see it. There aren't many opportunities for building new modern homes in the heart of the city," he says. "A lot of people said how great it was to see something new and different and modern, but a handful of people were more perplexed. We're not doing our job if we don't get strong reactions."

The owners wanted a durable house made of sustainable materials and Roehr and his team knew that steel would fit the bill perfectly and used two different profiles. The majority of the exterior is clad with Firestone Uniclاد's Omega VR Classic Corrugated Panel System, .76mm (.0299") AZM180 (AZ60) in the Silver Metallic Kynar finish vertically. The second was a Firestone Uniclاد "UC 601", which is an exposed fastener corrugated sheet profile, prefinished in a stock charcoal gray Kynar finish over AZM165 (AZ55) Galvalume steel.

Several deep red panels were used for highlight purposes. "We were very much trying to make a durable and low-maintenance house, which is a big part of sustainability. You use materials that last, so you don't have to keep replacing them," Roehr explains. "This siding should last for decades without the owners having to do anything to it."

The use of steel also lent the home a completely modern esthetic. Roehr used some cedar paneling at the home's entrance to provide warmth.

"It's always somewhat unusual to have an opportunity to use some of these durable materials in a residential situation, but we like to mix warmer details into the composition as well," he says. "Being a modern house in a more traditional neighbourhood, it is boxier, with cleaner details and less fussy. We went with a clean, crisp modern design."

The original owners were thrilled with their new home, but sold it this year. Roehr says the house sold for \$450,000 in less than a week. "It's in a neighbourhood of \$250,000 houses, and it still looked like new," he added. "This house conforms to the way people want to live."

DESIGN AND CONSTRUCTION TEAM

ARCHITECT: Roehr Schmitt Architecture, LLC 612-216-4191

GENERAL CONTRACTOR:

Michlitsch Builders Inc., Minneapolis, MN 763-557-1694

CLADDING SUPPLIER:

Firestone Metal Products 763-576-4459

"As steel is a durable and recyclable material we felt it was an environmentally friendly choice for the exterior cladding".
Michael Roehr.



Two prepainted steel profiles have been used on this home, Firestone Uniclad VR "Classic Omega" corrugated profile, oriented vertically, in a AZM180 (AZ60) Galvalume finish; the second, Firestone Uniclad "UC 601", which is an exposed fastener corrugated sheet profile, prefinished in a stock charcoal gray Kynar finish over AZM165 (AZ55) Galvalume steel.



The economical benefits and effectiveness of using steel as a building material in institutional construction has long been recognized in North America and has now gained the attention of contractors in Saudi Arabia. A composite system (steel and concrete) was the choice over the conventional concrete construction method for slabs and beams. Steel plays a significant role in the design and construction for the fifteen storey, 16,258m² (175,000 sq. ft.) building.

Steel ComSlab system adds value to project in Saudi Arabia



The building is one of eight being built to accommodate nursing staff at the King Fahad Medical City. The structure, which includes a rooftop skylight, was originally designed in concrete, but after a value-added proposal was presented by Bailey Metal Products, ComSlab panels and cold formed steel sections replaced the conventional concrete system for slabs and beams. The vertical columns remained as reinforced concrete.

Aus Ahmad, Regional Technical Specialist at Bailey, explains that after a preliminary project study and full review of the building's original structural design, Bailey presented a detailed design introducing the ComSlab composite flooring system with cold formed steel beams as an alternative to reinforced concrete conventional slab and conventional beam forming. "We delivered a complete set of drawings for final review and approval and then, at the end of November 2009, received the order to proceed with the ComSlab flooring system to be used not only for this project, but for other KSA Ministry of Health future projects."

Bailey designed and built a mock-up at their Mississauga, Ontario location. "Our inside sales and production teams did a great job of making this difficult task happen smoothly. In less than three months, we produced and shipped a total of sixteen containers to the other side of the world," emphasizes Ahmad. "On May 11, 2010 the first floor slab was poured and it was a success." A Bailey crew was on-site to provide training and supervise the installation.

Commenting on the advantages of the ComSlab flooring system (utilizing cold formed steel sections) over conventional concrete slab, Aus Ahmad says, "In a conventional construction method the beams carrying the slab weight are usually formed out of plywood. Concrete is then poured and finally the temporary plywood form is removed. After finishing the beams, the same process is to be repeated for the slab.

The fire rating required by the Ministry of Health was one hour for this structure, but using the ComSlab Cold Formed Steel System, Bailey was able to submit a fire rating of up to 2 hours. The acoustical rating for the floors submitted by Bailey was STC57.



"In the new system, the beams are constructed out of several cold formed steel sections and inverted ComSlab deck, the slab and beams are poured in one single concrete pour. Forms of steel beams, inverted ComSlab deck stay in place permanently. Two steps are eliminated and, most importantly, material and time are saved."

ComSlab cold formed steel deck was used as the composite flooring system for all the levels. LSF sections (heavy gauge studs/tracks and special sections and clips) were used to form the concrete beams. Most of the bearing beams were formed out of ComSlab inverted deck. A number of non-load bearing studs were used in the beams where applicable.

The ComSlab panels consisted of .91mm and 1.22 mm (.036" and .048") galvanized steel with spans from 4.9m to 6.1m (16ft to 20 ft). The ComSlab floor deck used .91mm (.036") steel for 12,430.6m² (133,802 sq.ft.) and 1.22mm (.048") for the remaining 3,590.8m² (38,651 sq. ft.)





Summarizing the benefits gained in using steel for the project, Aus Ahmed says, "The cost savings is about 35-45% of the cost of reinforced rebar, concrete and shoring, in addition to the savings in labour and forming which I estimate to be approximately \$250,000 to \$350,000."

DESIGN AND CONSTRUCTION TEAM

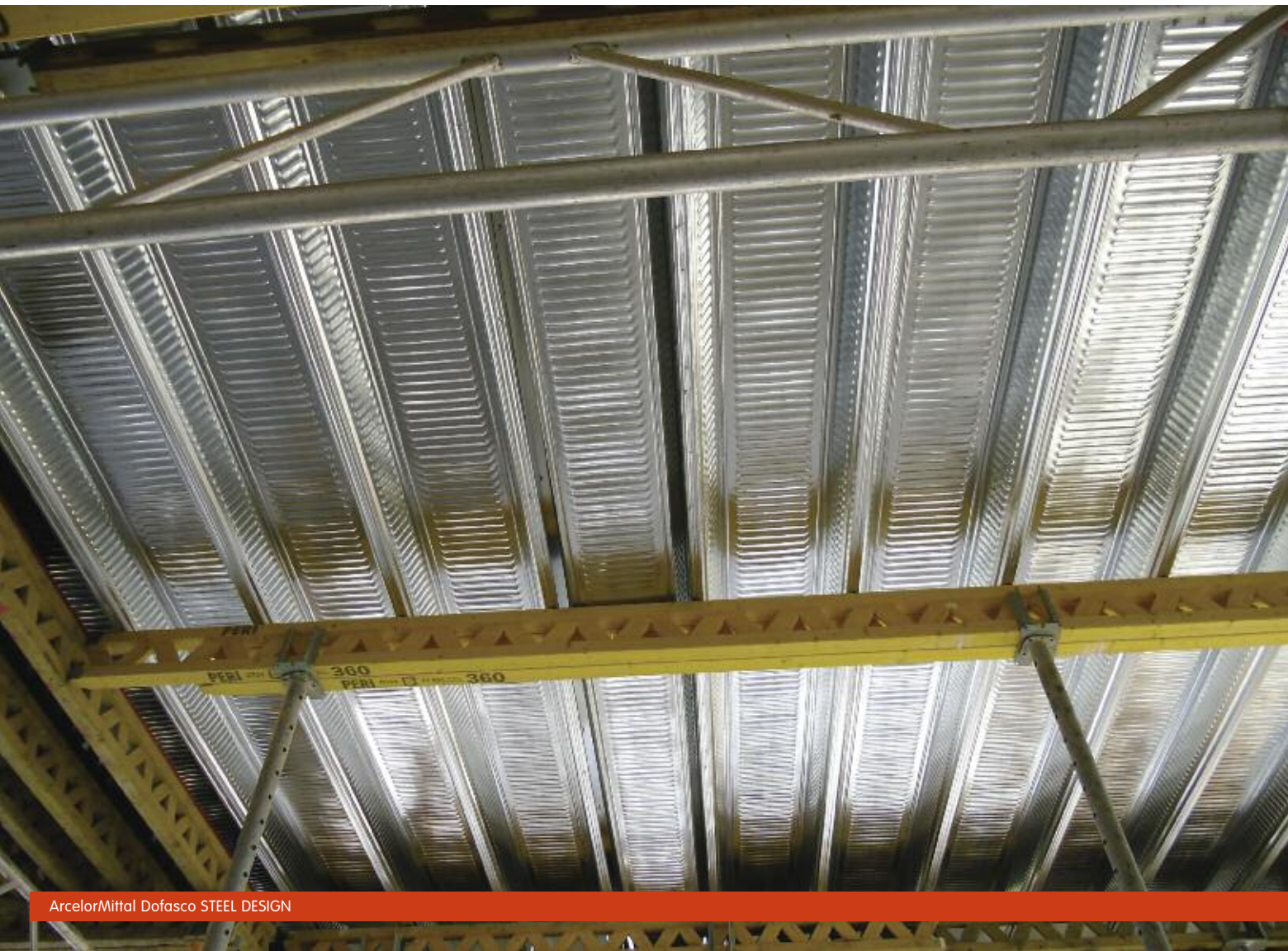
CLIENT: Kingdom of Saudi Arabia, Ministry of Health, King Fahad Medical City

GENERAL CONTRACTOR: Bin Dayel for Industrial and Contracting

ENGINEERING: Consulting Engineering Group – KSA

STEEL DECK & BEAM: ComSlab System by Bailey Metal Products Ltd. 1-800-668-2154

Converted ComSlab deck – bearing beams consisted of 3,352.8m (11,000 lin ft.) of 1.22mm (.048") steel. There were 54,000 lbs. (24.5 mt) of ComSlab accessories.



The 1,580m² (17,000 sq. ft.) Police Station and Council Chambers is the first new municipal building for the city in over 30 years. Its location on the main street of Coolidge and its iconic form sets a new aesthetic for the community. Inspired by the nearby Casa Grande Ruins, the building is framed in steel, with interior light gauge steel framing. A dramatic cantilevered roof form clad with a PVDF finish on galvanized steel hovers over the simple rectangular volume and programs below.



Coolidge Police Station, and Council Chambers, Arizona



The resulting large, protective porch reinforces the "community based policing" philosophy that encourages citizens to visit the facility on a proactive basis.

The plan is organized with an offset central corridor that unifies the various programs while allowing resultant clear span space for inherent flexibility over time. Durable and maintenance-free materials include, ASTM 653 Structural Quality, Grade 40 .76mm (.0299") Z275 (G90) galvanized steel with a pre-weathered PVDF finish, integral colour cmu, black granite and translucent glass.

A gravel-pave parking lot is screened by a gently sloping earth berm that counters the large roof and is rendered diagonal gabion walls.

Durable and maintenance-free materials include pre-weathered galvanized steel, integral colour cmu, black granite and translucent glass. The dramatic cantilevered roof is clad with prefinished Z275(G90) galvanized steel.

DESIGN AND CONSTRUCTION TEAM

CLIENT: City of Coolidge

ARCHITECT: Architekton 480-894-4637

STRUCTURAL ENGINEERING:
Brickey Design Associates
(now Struktur Studio) 602-254-7444

MECHANICAL/ELECTRICAL:
Air-Zona Systems Engineering Inc.
602-287-0300

CIVIL:
Southgate Associates 602-287-0300

LANDSCAPE:

Philip Ryan 480-899-5813

CONTRACTOR:

Walton Construction 816-753-2121

ROOFING INSTALLER:

Total Metals 480-782-9303

STEEL CLADDING SUPPLIER:

Atas International Inc. 480-558-7210

PHOTOGRAPHER:

Winquist Photography

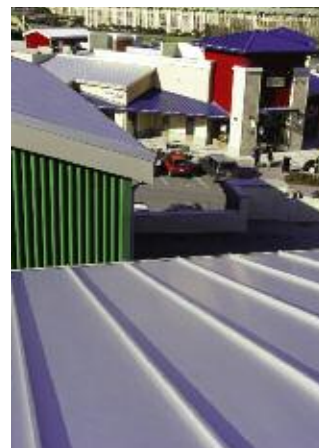
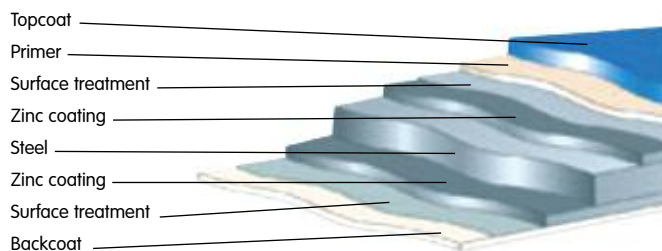
Prepainted Steel

Organic coated steels are used in all sectors of industry. In building and construction, profiles are used for wall cladding, roofing, and also for applications such as suspended ceilings, lighting etc. Organic coated steel is economic, environmentally friendly and it

has a consistent quality. Paint film thickness, colour matching and surface aesthetics are reproducible within narrow tolerances from batch to batch. The flexibility of the coil coating process allows the production of a range of different surface finishes such as smooth, grained, textured or embossed, which can be obtained in a wide choice of colours (solid, metallic, pearlescent etc.) and the required degree of gloss: anything from matte to high gloss.

Organic coated steel is generally composed of a steel substrate (with a zinc or aluminum-zinc based metallic coating) with a surface treatment layer, a paint primer coating and a topcoat. For certain applications, a colaminated polymer film may be added, and a temporary protective film, if required. In building and construction, the substrate is usually Galvalume or galvanized steel. The choice of the paint system depends on the environmental conditions to which the product will be exposed.

The role of the primer is mainly to enhance the adherence of the topcoat and improve flexibility and corrosion resistance. The topcoat and the colaminated film, if used, provide the required surface characteristics, such as the final appearance (colour, texture, gloss, etc.) hardness and resistance to abrasion and ultraviolet radiation. Depending on the required performance, a primer, or primer plus topcoat can be applied on one or both sides of the sheet.



Product stewardship and R&D More effective processes today, new technologies tomorrow

Sustainability is one of ArcelorMittal's core values, and absolutely integral to our overall vision to transform tomorrow. We know we operate in a sector that can have a significant impact on the environment, which means we have an even greater responsibility to make sure we use resources wisely and manage our waste and emissions effectively. Complying with environmental regulations is just the start: in our performance we aspire to excellence.

The challenge is that we have to do this in the context of an ongoing, and indeed growing, demand for the steel we produce. Steel is one of the building blocks of the world economy, and is helping to fuel much-needed growth and development in emerging markets. As a Corporation, we have to find a way to supply that demand today, while protecting the environment for the future. We do have one notable advantage on our side, and that's the fact that steel can be 100 percent recycled, over and over again. Steel has immense potential as an environmentally-friendly construction and manufacturing material, which puts us in a pivotal position to help drive the sustainability agenda. Karl Buttiens Manager Environment & Global CO₂ Strategy (Technology)

Managing our product life cycle

There is a dedicated team to evaluate our processes and products using Life Cycle Assessment methodology. This analyses every stage in the life of a piece of steel from mining and coating, to use, and finally recycling and disposal.

Use

We try to help our customers improve their own environmental performance by developing new uses for steel. We're working on using advanced steel in electrical engines and rail transport, which will help reduce CO₂ emissions, and have a growing presence in wind turbines, greener construction materials, more fuel-efficient cars, and solar panels.

Furthermore, steel is the single most essential component in wind generation, supplying the base, tower, and many of the moving parts. Around 85% of the world's wind turbines are installed on tubular steel structures, and one in three uses ArcelorMittal steel.

Recycling

Scrap steel has been extensively recycled for at least a hundred years. Here are just a few fast facts about this endlessly flexible and re-useable material:

- Nearly 95% of the steel used in car manufacturing is recycled. By sector, steel recovery rates are estimated at 85% for construction, 85% for automotive, 90% for machinery and 50% for electrical and domestic appliances.
- Across the world the recycling of steel saves about 600 million tonnes of CO₂ every year. ArcelorMittal is the biggest recycler of scrap steel in the world, and we work with local and national governments to promote it further. Every year more than 25 million tonnes of our products are recovered and recycled, which saves around 36 million tonnes of CO₂.

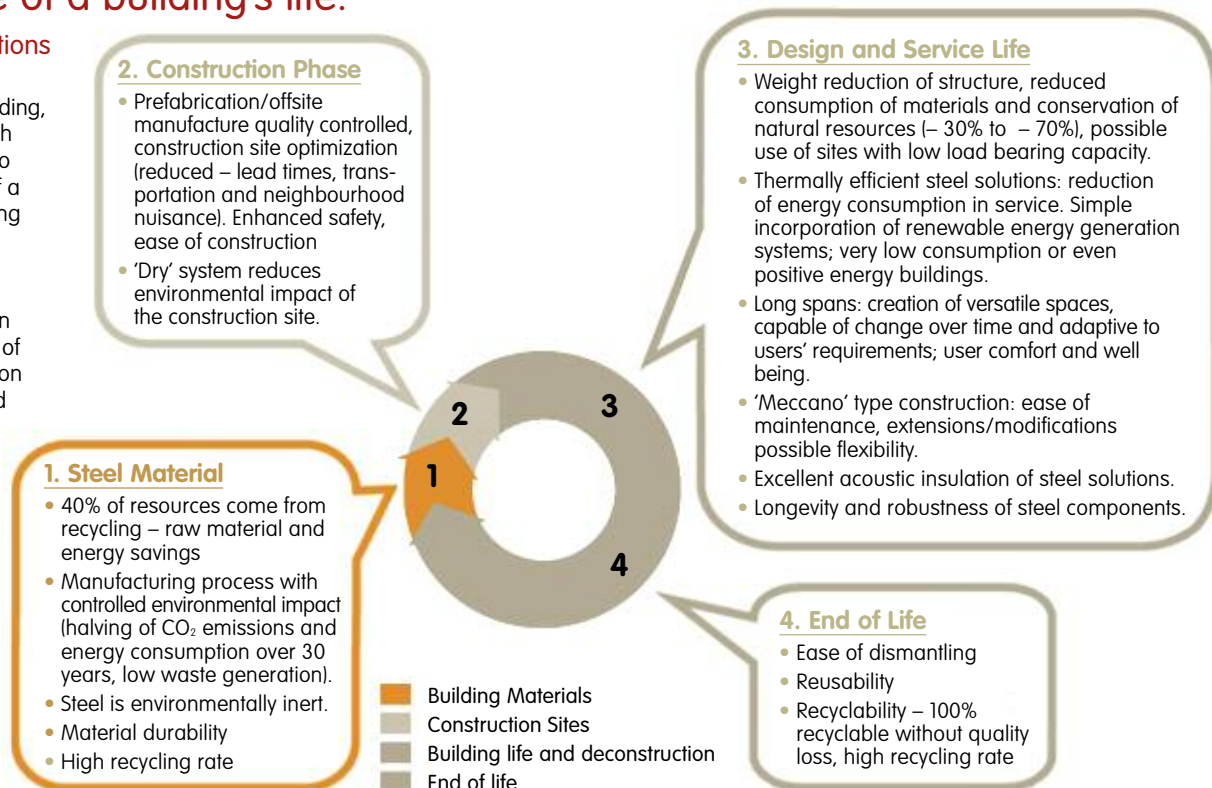
The ArcelorMittal Scientific Council

This Council is a new independent external body which advises our Research and Development management. The subjects cover science, innovation and opportunities for competitive advantage. The eight members of the council have been chosen for the quality and breadth of their academic experience, and the aim is to use that expertise to help us gain and maintain a leadership position in our industry.

Sustainable construction: the advantages of steel construction at each phase of a building's life.

Efficient steel solutions

When evaluating the sustainability of a building, the life cycle approach is required, taking into account all phases of a building's life, including materials production, transportation to the construction site, the construction operation itself, operational use of the building, demolition or deconstruction and end of life.



ROXUL launches new wall system and expands ComfortBatt™ line to meet growing demand

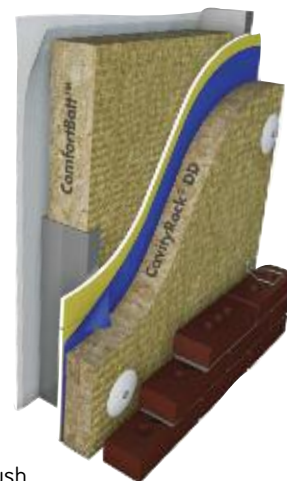
Roxul Inc., the world's largest producers of stone wool insulation and leader in residential and commercial premium insulation products has launched a new lineup of ComfortBatt products designed for steel stud construction and introduces a wall system offering higher energy efficiency, sustainability, and better overall durability and performance.

Roxul's new ComfortBatt products are designed specifically for steel stud applications in commercial buildings. The new ComfortBatt steel stud products are available in R10, R14 (Canada only), R15 (US only), R22.5 and R24. The new products expand the existing ComfortBatt line up of products that are ideal for exterior walls both in residential and commercial settings and offer top thermal performance. The new ComfortBatt steel stud product is part of Roxul's new high performance wall system that uses ComfortBatt insulation in the metal stud wall and Cavity Rock insulation in the cavity.

The Building Envelope Design by Roxul (BEDR) is a rainscreen system which combines Roxul insulation within the exterior stud wall and cavity offering superior long-term thermal efficiency, fire resistance, moisture control, and acoustic performance. The Roxul wall system includes a thick batt of Roxul thermal insulation in the stud wall (up to 6"), combined with a high density, semi-rigid insulation board (up to 5") in the external cavity, and can achieve significant thermal values.

The thermal value of Roxul insulation does not change over time, it will also keep its dimensional stability for a flush, tight fit resulting in optimal thermal performance. The Roxul BEDR wall system allows for attainment of international standards as outlined by the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) and International Energy Conservation Code (IECC) Standards 2009. Roxul's new system offers home owners, builders and architects a breathable, non-combustible wall system that significantly out performs the competition.

To learn more about Roxul, visit www.roxul.com for the complete line-up of interior and exterior insulations.



EDITORIAL INQUIRIES

We would like to hear from you! If you have comments about this issue or a project you would like to see in an upcoming issue of *Steel Design*, please send a description of the project, include photographs, to: The Editor, Steel Design, 1039 South Bay Road, Kilworthy, ON P0E 1G0. Or email: davidfollis@vianet.ca



ArcelorMittal

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Asthma.ca
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Building products made with ArcelorMittal Dofasco steel promote a healthy indoor air environment.



ArcelorMittal Dofasco steel is certified to EcoLogo® standard CCO-150 "Steel for Use in Construction Products"



Recycled