



Discover The  
Royal  
Advantage





# Presentation Outline

- Introduction and background
  - Who is Royal Group Technologies
  - Who is Royal Building Technologies
- Royal Building Systems™ (ERBS)
  - What is ERBS?
  - ERBS wall system.
  - ERBS flooring system.
  - ERBS roofing system
  - ERBS accessories
  - Advantages using the ERBS system
  - Portfolio of works
  - Design of ERBS Walls
  - Erection of ERBS system
  - Code Approvals
  - Pricing
  - Video



- Over 120 operating divisions with 12 million square feet of manufacturing facilities worldwide
- Traded on the New York Stock Exchange and on the Toronto Stock Exchange
- Sales over \$1.9 Billion per year
- Largest extruder of plastic building products in North America first established in 1970





# Group Technologies

## Product Segment

### Home Improvement Products

- PVC Windows
- Doors
- Siding
- Roofing

### Consumer Products

- Window covering
- Outdoor Storage
- Fencing
- Decking
- Railing
- House wares
- Furniture

### Construction Products

- PVC Pipes
- PVC Fittings
- Commercial Doors
- Royal Building Systems

## Support Segment

### Materials Manufactures

- PVC Resin
- Chemical Additives
- Compounding
- Recycling

### Machinery Development

- Extrusion Equipment
- Tooling
- Handling

### Services

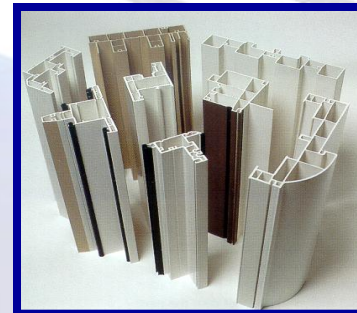
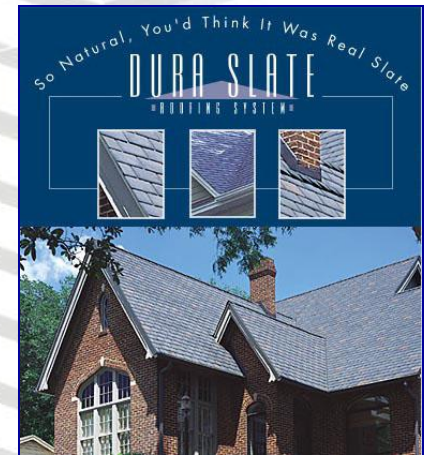
- |            |               |
|------------|---------------|
| Purchasing | Distribution  |
| Finance    | Property Mng. |
| Admin.     | R & D         |
| Sales      | Marketing     |





## Home Improvement Products

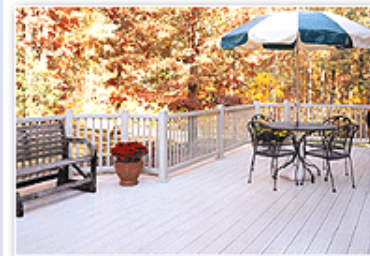
- Siding
- Roofing
- Window Profiles
- Patio Doors





## Consumer Products

- Window Coverings
- Outdoor Storage (e.g. Sheds)
- Indoor Storage & Housewares
- Patio Furniture
- Fencing
- Decking & Railing
- Docking







# Construction Products

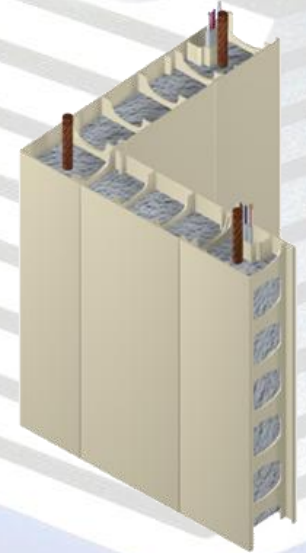
- Pipe & Fittings
- Commercial Doors





## RBS & Foreign Operations

- Royal Building Systems™
- Royal RENEW Paneling System™







- **Global representation in over 65 countries**
- **ISO 9001 certified**
- **Research & Development**
- **On-site support and installation training**
- **Sales & Marketing**



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# Worldwide Manufacturing Facilities





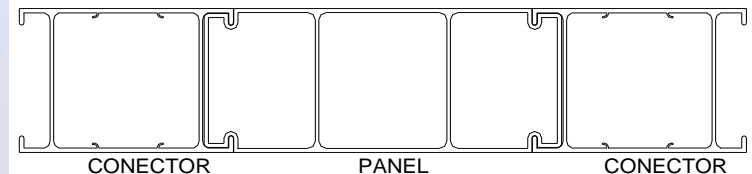
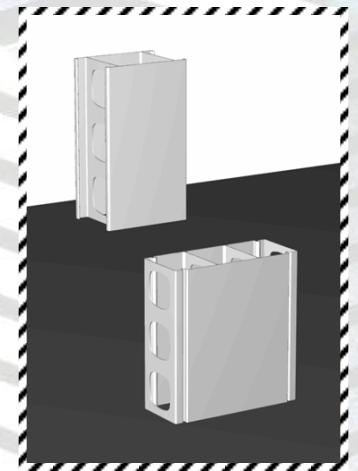
# What is the RBS system?

A rigid polymer-based stay in place form-work for concrete walls. The extruded components slide and interlock together to create a concrete form-work. The result is permanent attractive, and pre-finished concrete walls that can be easily constructed in any climate.

This patented wall system is available in a variety of sizes, shapes and colors to meet every building need.

The system includes several hundred

- Wall Components.
- Roofing Components.
- Flooring Components.
- Structural Components.
- Finishing components.





# Wall Types – 6 profiles



1

**RBS64**  
(64mm  
2.5" wall)



2

**RBS4**  
(100mm  
4" wall)



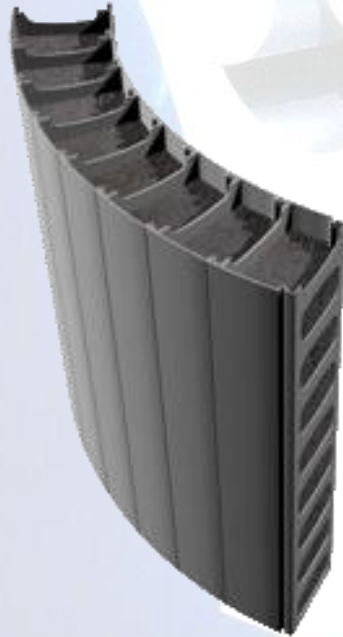
3

**RBS6**  
(150mm  
6" wall)





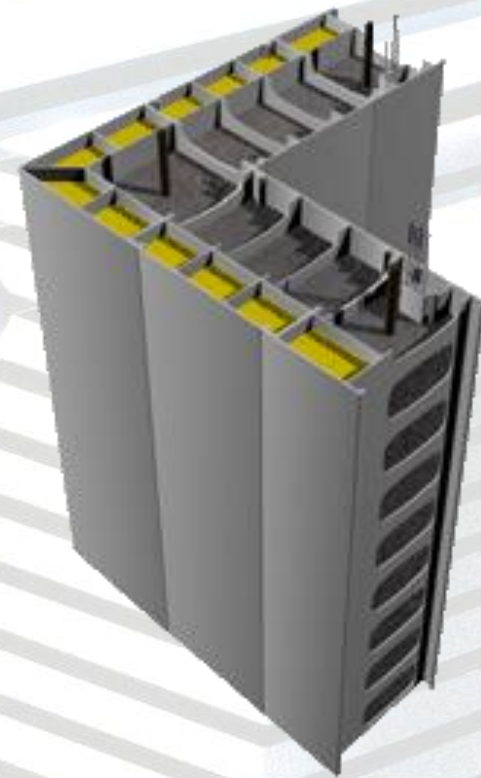
# Wall Types – 6 profiles



4  
**RBS6**  
(150mm  
6" wall)



5  
**RBS8**  
(200mm  
8" wall)



6  
**RBS8i**  
(200mm  
8" wall)



# Renewal panels





# RBS64mm

(2.5" -64 mm) 2.5"  
concrete wall; used  
for single storey  
residential and  
partition walls  
designed as load  
bearing and non  
load bearing walls.

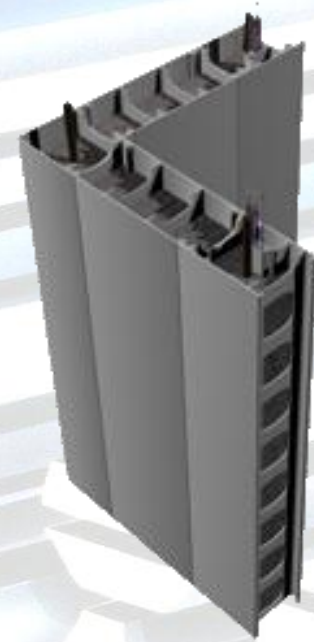






## RBS4 (4" - 100 mm) - 4"

concrete wall; used for single storey residential, retaining walls and light commercial (e.g. car washes). The RBS4 is generally designed as a load bearing wall.

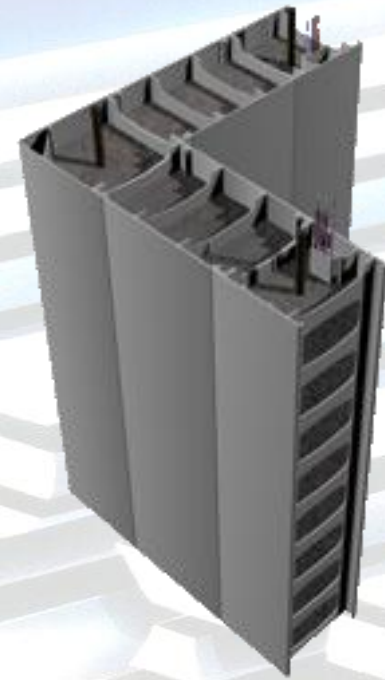






## RBS6 (6" - 150 mm) - 6"

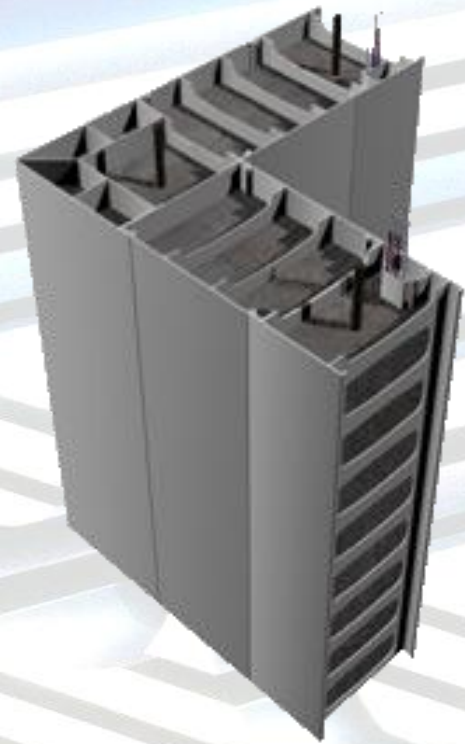
concrete wall; used for large scale residential projects, commercial, industrial, institutional and agricultural applications. The RBS6 can be designed as a load bearing or non-load bearing wall.





# RBS8 (8" - 200 mm) -

8" concrete wall; used for commercial, industrial, institutional and agricultural applications. The RBS8 can be designed as a load bearing or non-load bearing wall. The RBS8 is generally used where walls with higher load capacity are required.

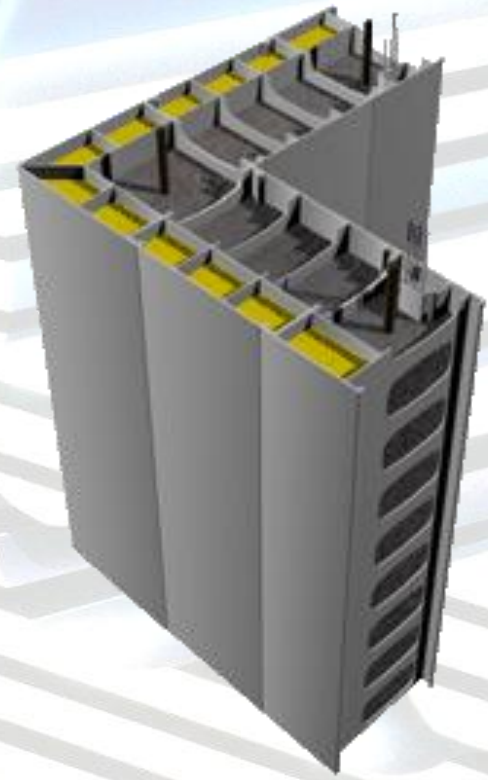


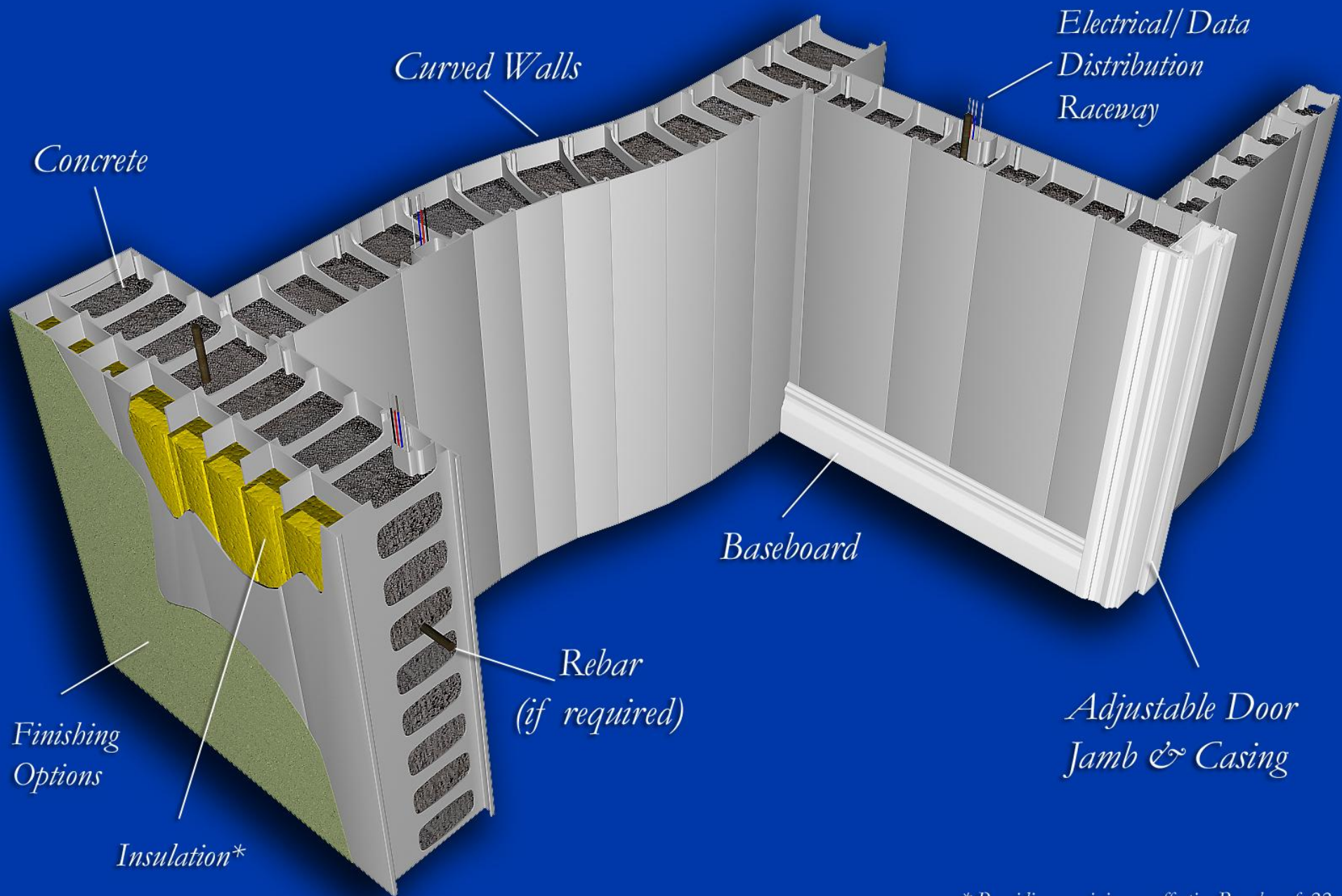




# RBS8i (8" - 200 mm) -

6" concrete wall, with 2" factory installed polyurethane insulation; used for residential basements, commercial, industrial, institutional and agricultural applications where thermal efficiency is a requirement. The RBS8i can be designed as a load bearing or non-load bearing wall.





*Curved Walls*

*Electrical/Data  
Distribution  
Raceway*

*Concrete*

*Baseboard*

*Rebar  
(if required)*

*Adjustable Door  
Jamb & Casing*

*Finishing  
Options*

*Insulation\**

*\* Providing a minimum effective R-value of 22  
for the wall assembly*

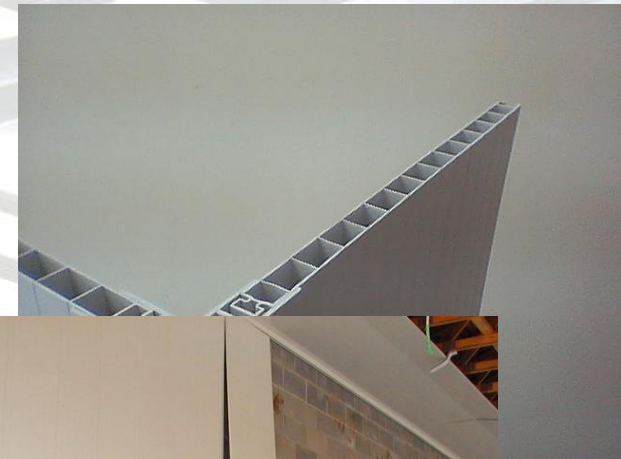




# RBS Renewal

## Panels (3/4" 19mm)

These are a series of durable lightweight panels that fasten directly to existing walls and ceilings. Mainly used in carwashes benefiting from its long term performance, ease of installation, withstanding harsh chemical materials since these panels do not rust or corrode and need no paint.



# Polymer Encasement:

is a complex combination of:

- PVC as a main element.
- Acrylic modifiers.
- Waxes.
- Lubricants.
- Tin stabilizers (Non lead stabilizers used).
- Ultraviolet ray protector.
- Flame and smoke suppressants.

What is PVC?

*Poly Vinyl Chloride* commonly known as "PVC" is a rigid thermoplastic polymer, composed of molecules which are made up of carbon, hydrogen and chlorine atoms.

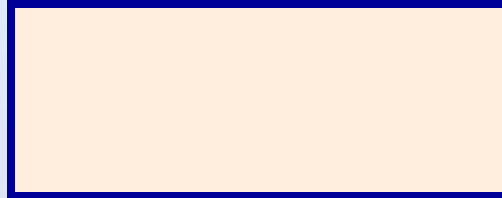
Thermoplastic - can be repeatedly softened, molded and hardened while retaining properties

Polymer - Long chains of carbon based monomers





# Color Choices



**Tan**



**White**



**Light Grey**



**Grey**



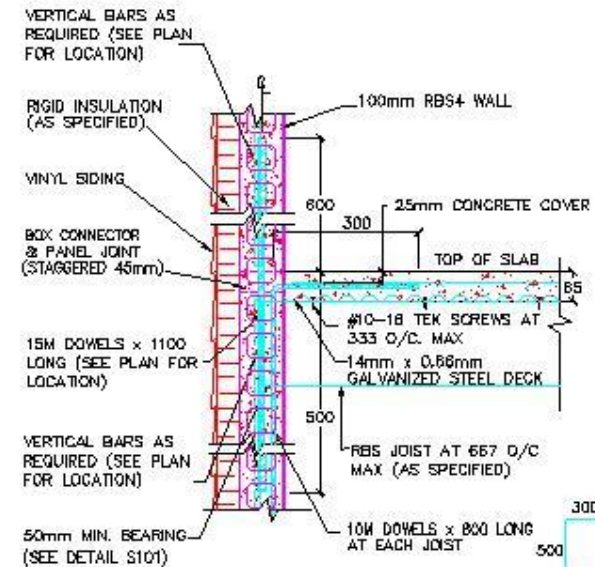




# Floor Framing by RBS

Are available to construct floors and flat roofs and include:

- Framework supporting 65mm concrete slabs.
- Corrugated steel deck formwork.
- Cold formed steel joists and
- Steel angles.
- Connectors.







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OR

Hollow  
Core  
Slabs  
By  
Others







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OR

Flooring by others

Mexico







Mexico

Flooring by others





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# Roof Framing components

14 degree RBS roof with anchors and roof tiles.







Mexico

Combination  
of  
roof  
by  
Royal  
and  
beams  
by others





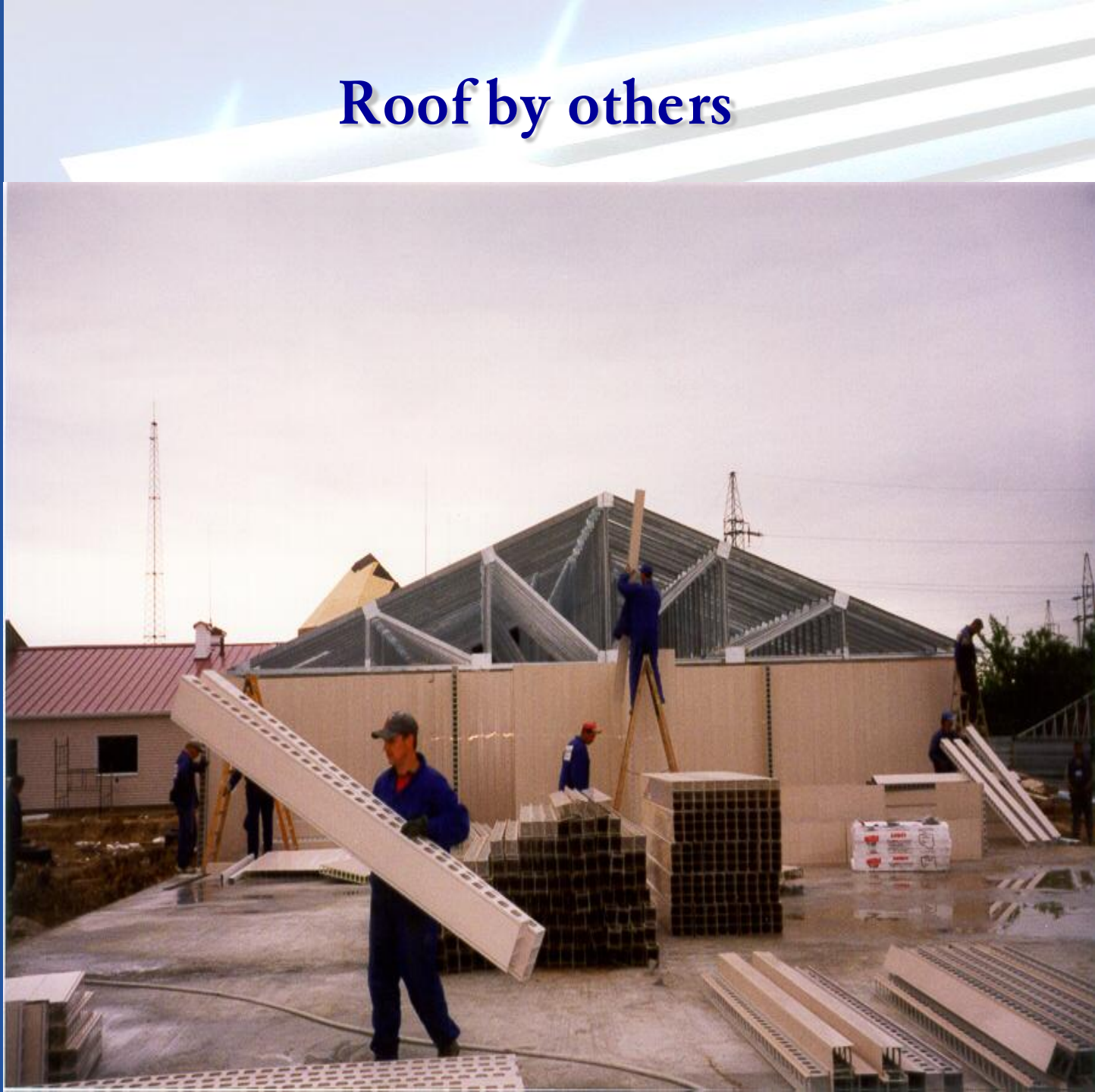


# Roof by others





# Roof by others







# Where to use the RBS system?

Our system provides flexibility of design that are tailored made to accommodate any design such as but not limited to:

- Residential
- Commercial
- Industrial
- Educational
- Recreational







# The Royal Advantage

- Solid concrete technology - “Built tough - Built to last!”... A true disaster-resistant building system



Ocean Point Villas - Grand  
Cayman Islands

Survives Hurricane Michelle  
with Sustained Wind Speeds of  
143 mph





# The Royal Advantage

- Pre-Finished Wall Surfaces - No Painting Required with Unparalleled finishing flexibility
- Protects concrete from deterioration
- Effective deterrent to termites and other pests
- Superior energy efficiency
- Easy to design using RBSD for AutoCAD design tool
- Fast-track construction increases bottom line



# Constructs Quickly

- Every Building is Custom Made in our Factory
- All Components are Pre-Cut and Labeled for Easy On-Site Assembly
- Less Skilled Labor Required on Site
- Cleaner Overall Work Site
- Start Earning Revenue Sooner







# Cleans Easily

- Maintenance-free wall system that is resistant to UV degradation
- Cleaning RBS Walls is Easy Using Household Cleaners and a Power Washer





**25 Year**

**Limited Warranty on Surface  
Finish**





# Industrial







# Industrial





# Industrial





# Industrial







Commercial





# Commercial







# Commercial







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Commercial







# Commercial







# Commercial







# Commercial





# Recreational Facilities







# Recreational Facilities







# Recreational Facilities







# Residential Mid-Rise







# Residential Mid-Rise







# Residential Mid-Rise





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# Residential Mid-Rise







# St-Kitts Beach Resort







# St-Kitts Beach Resort







# St-Kitts Beach Resort







# Institutional







Institutional



# Institutional







# Institutional





# Residential







# Residential







# Residential







# Residential





# Residential





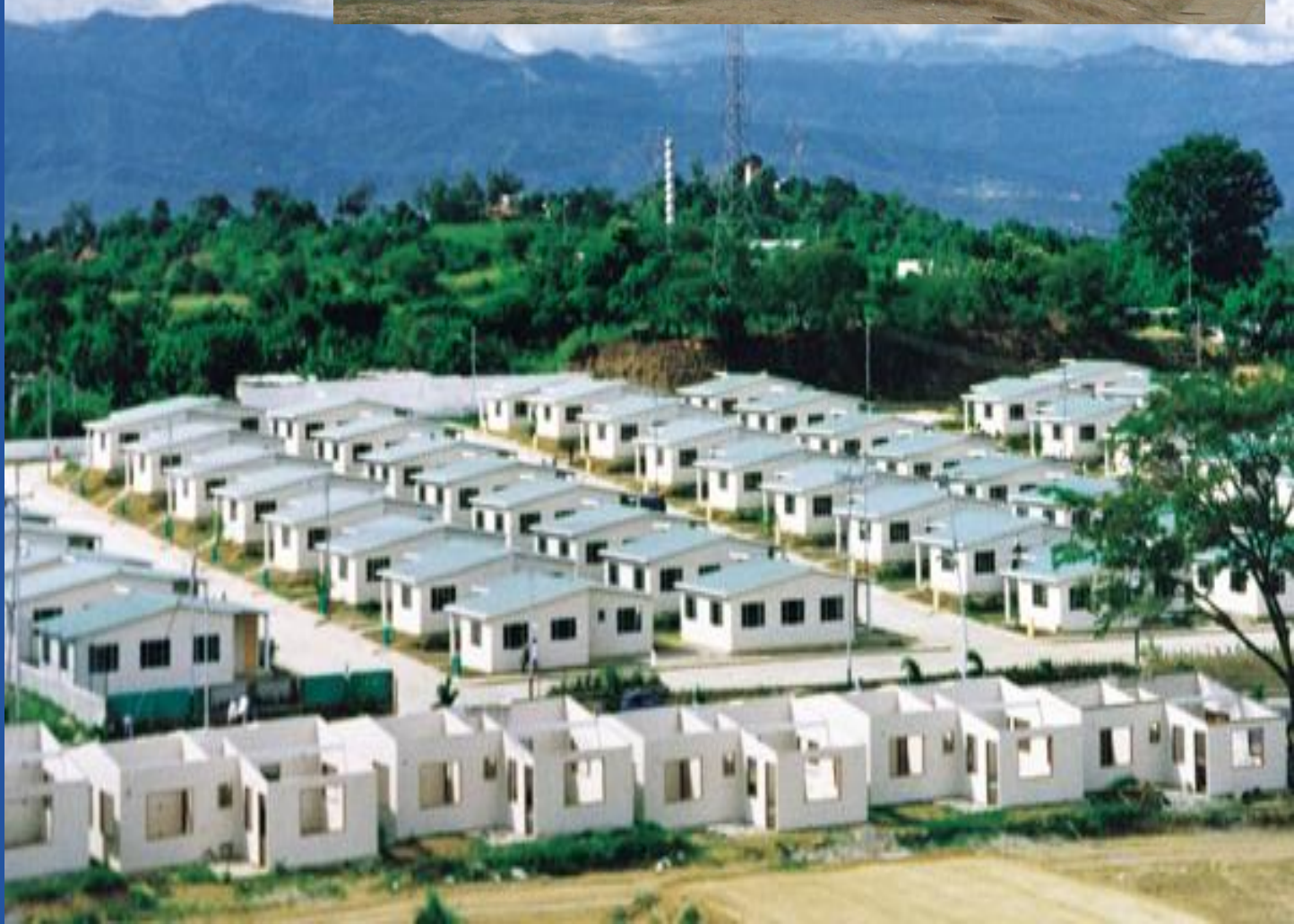


# Residential





# Large Scale Social Housing







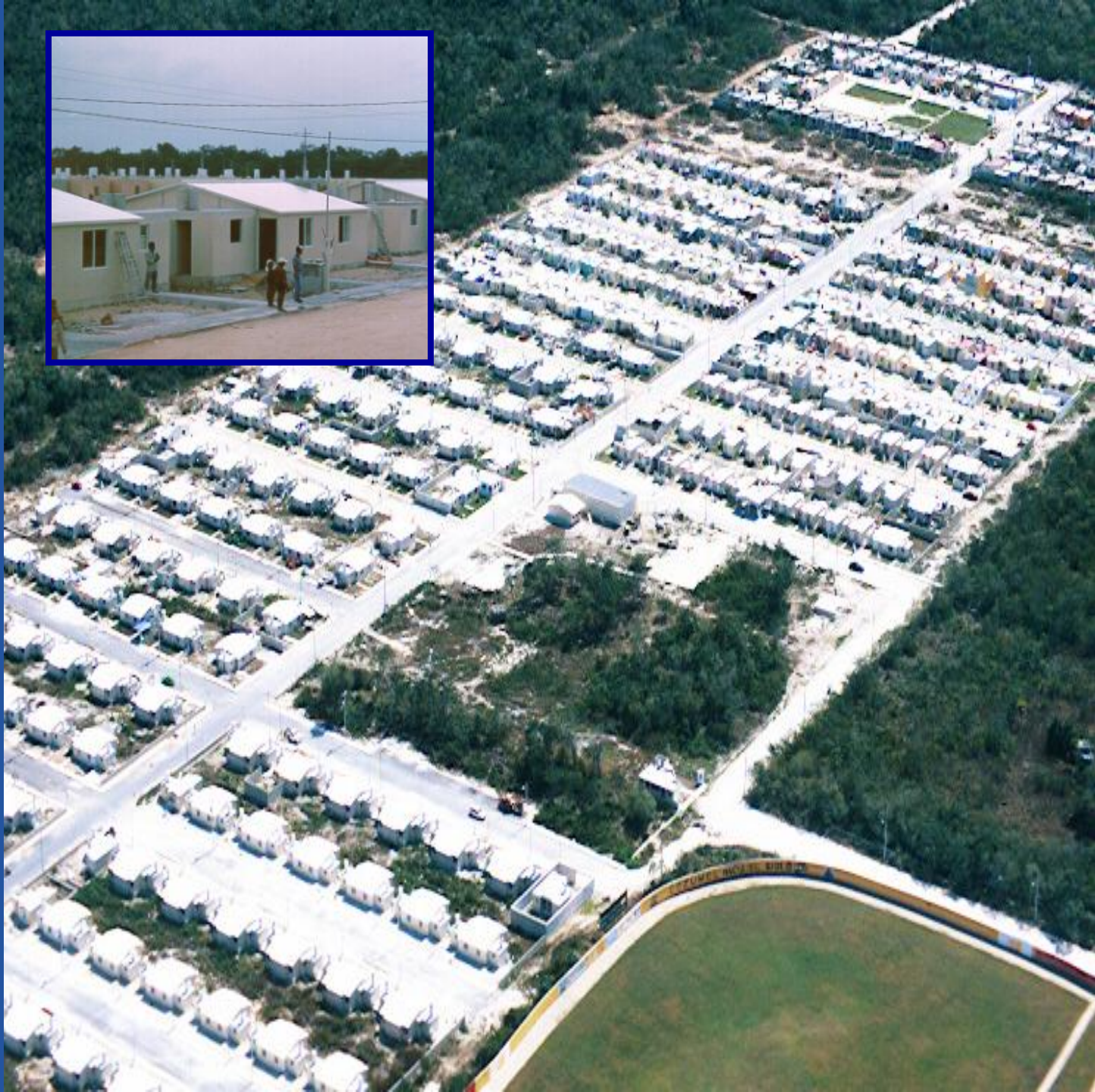
# Large Scale Social Housing







# Large Scale Social Housing







# Large Scale Social Housing



2002 4 26



# Large Scale Social Housing







# Large Scale Social Housing





# Agricultural







# Agricultural





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# Military projects







# Military projects





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# Telecom shelters







# Telecom shelters





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# Carwash projects







# Carwash projects





# Radar stations







# Radar stations





# Portable applications







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# Portable applications





# Portable applications







# Aquaculture tanks







# Wave breakers







# Wave breakers





# Retaining walls







# Retaining walls





# Retaining walls







# Retaining walls





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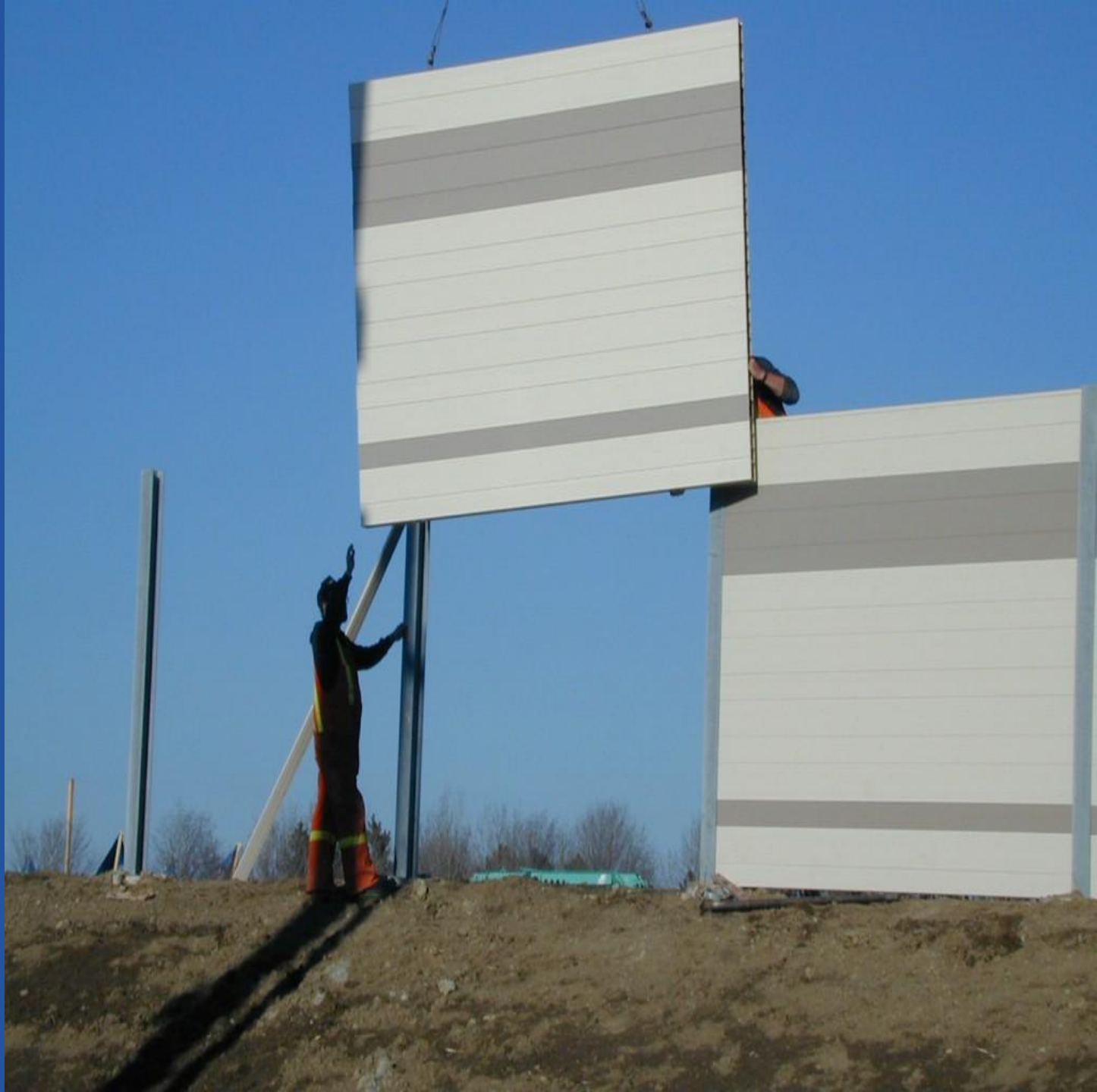
# Fences







# Fences



# Designing using the RBS system



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ROYAL BUILDING TECHNOLOGIES DESIGN SERVICES

## PROJECT CRITERIA

VENTURE: \_\_\_\_\_ MODEL NAME: \_\_\_\_\_

CLIENT: \_\_\_\_\_ LOCATION: \_\_\_\_\_

UNIT SIZE: \_\_\_\_\_

The following criteria must be completed, by a licensed professional engineer or architect familiar with the local structural requirements and in accordance with applicable building codes and governing authorities.

### SUPERIMPOSED ROOF DEAD LOAD (Specified loads in addition to self weight of 0.19kPa (4psf) (20 kg/sq.m))

NONE  0.10 kPa. (2psf) (10kg./sq.m.)  
i.e. Royal Spanish Roof Tile

SPECIFY \_\_\_\_\_

### ROOF LIVE LOAD (Specified minimum live load or specified load due to snow, ice and rain)

1.0 kPa. (20 psf) (100kg./sq.m.)  1.5 kPa. (30 psf) (150kg./sq.m.)

2.0 kPa. (40 psf) (200kg./sq.m.)  SPECIFY \_\_\_\_\_

### ALLOWABLE ROOF DEFLECTION (Maximum allowable deflection due to specified roof live load)

1/90 of span  1/180 of span

SPECIFY \_\_\_\_\_

### SUPERIMPOSED FLOOR DEAD LOAD (Specified loads on Framed floors in addition to self weight of 1.58 kPa (33psf) (161 kg/sq.m))

0.10 kPa. (2psf) (10 kg./sq.m.) ie: Bare concrete Carpet, Vinyl.  0.24 kPa. (5psf) (24 kg./sq.m.) ie: 10 mm (3/8") 10 mm (3/8") Ceramic tile on thin set adhesive.

0.80 kPa. (16psf) (80kg./sq.m.) ie: 20 mm (3/4") Quarry tile on 12 mm (1/2") mortar bed.  0.12 kPa. (2.5psf) (12kg./sq.m.) ie: 16 mm Gypsum ceiling board, Suspended tiles.

SPECIFY \_\_\_\_\_

### FLOOR LIVE LOAD (Specified minimum live load due to use on framed floors)

(Two storey units only)

1.4 kPa. (30psf) (140 kg./sq.m.) ie: Bedroom  1.9 kPa. (40 psf) (190kg./sq.m.)

SPECIFY \_\_\_\_\_

### ALLOWABLE FLOOR DEFLECTION (Maximum allowable deflection due to specified floor live load on framed floors)

1/360 of span  SPECIFY \_\_\_\_\_

ROYAL BUILDING TECHNOLOGIES DESIGN SERVICES

## PROJECT CRITERIA

### WIND LOAD (Specified average roof uplift load due to wind) (1)

1.0 kPa. (20 psf) (100kg./sq.m) 80 mph  1.5 kPa. (30psf) (150kg./sq.m.) 100mph

2.0 kPa. (40psf) (200kg./sq.m.)120 mph  SPECIFY \_\_\_\_\_

(1) Specified wind loads for the components and for the main force resisting system will be to be as noted on pages 3.3.2.2.1, 3.3.2.3 and 3.3.2.5 of the Royal Housing System Technical Guide. Wind speed values are approximate.

### EARTHQUAKE LOAD (Earthquake coefficient) (2)

0.00  0.05

0.10  0.15

SPECIFY \_\_\_\_\_

(2) Earthquake coefficient is multiplied by the building dead load (roof & walls) to calculate the horizontal shear force applied at the mean roof height. Earthquake loads vary with applicable building codes, site location, soil conditions and the building construction. The Royal Housing System™ has a bearing wall system with a lateral force resisting system of concrete shear walls.

### FOUNDATION TYPE (One storey units only)

Thickened slab on grade and compacted subgrade with a min. soil bearing pressure 50 kPa. (1000 psf), (5000kg/sq.m.)  SPECIFY \_\_\_\_\_

### FOUNDATION TYPE (Two storey units only)

Wall footings with a min. soil bearing pressure 150 kPa. (3000 psf), (15000 kg/sq.m.)  SPECIFY \_\_\_\_\_

### FOUNDATION WALL SOIL PRESSURE LOAD (Equivalent fluid pressure proportional to depth of retained earth) (Two storey units only)

4.71 kPa./m (30psf/ft.) (480 kg./sq.m/m)  SPECIFY \_\_\_\_\_

### DECLARATION AND DIRECTION

The undersigned (i) declares that he/it completed this document after reference to and consideration of the applicable building code, (ii) assumes responsibility for its content, and (iii) directs you, in reliance upon same, to prepare a proposal for the specified housing unit(s).

SIGNED: \_\_\_\_\_ DATE: \_\_\_\_\_

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

Duly Authorized

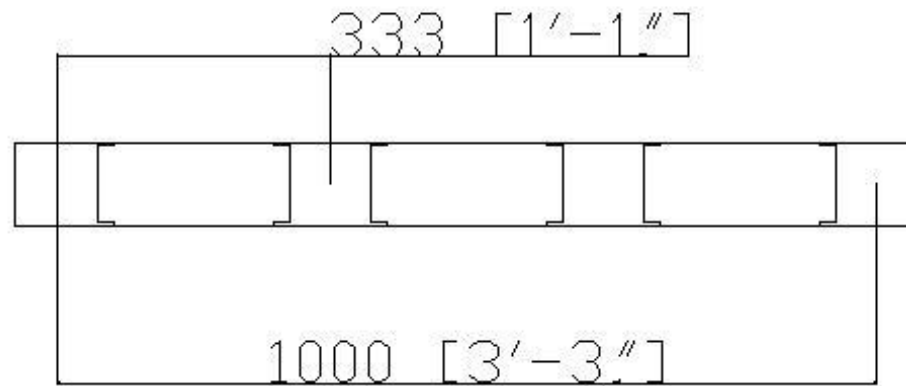
Loading criteria affects design.





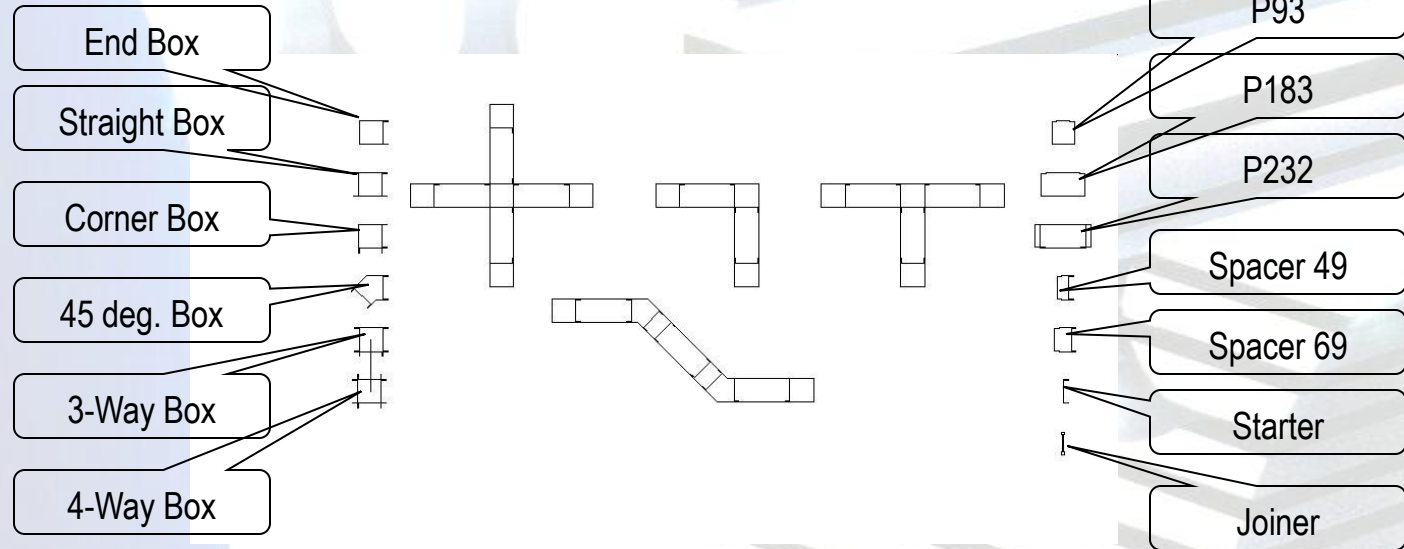
# Wall lengths

- . Design is based on the metric measurement system.
- . One grid is 1/3 of a meter. (RBS64 one grid is of a meter)
- . For non metric wall lengths, a combination of pieces will accommodate any required wall length using a special program





# Different wall pieces

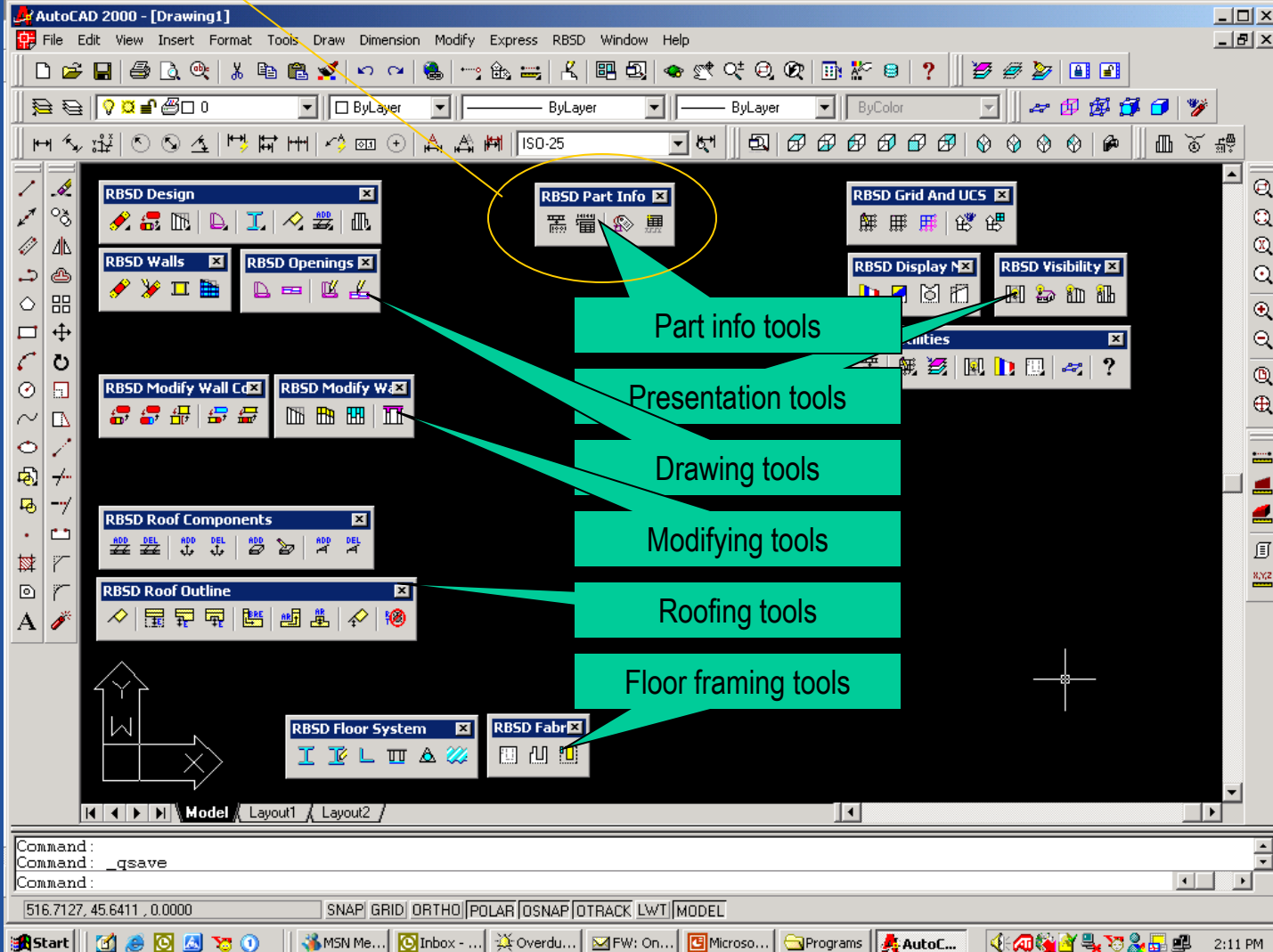


RBS4 as an example



# RBSD software utilizing AutoCAD 2000

Export  
Part Info



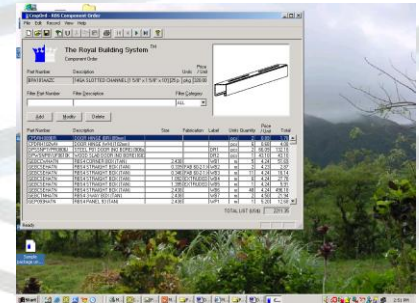
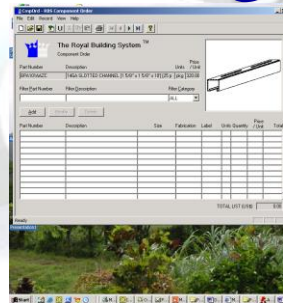
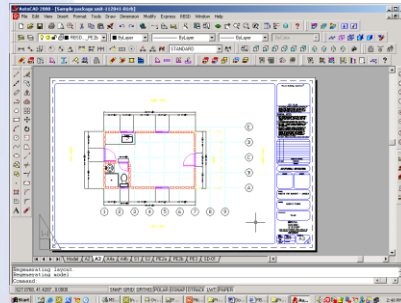
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SNAP GRID ORTHO POLAR OSNAP OTRACK LWT MODEL



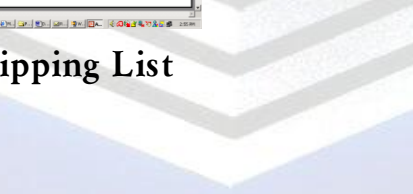
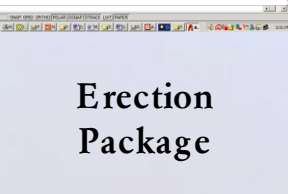
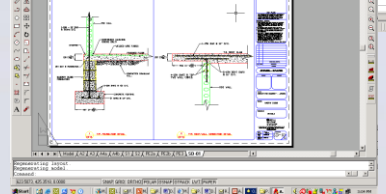
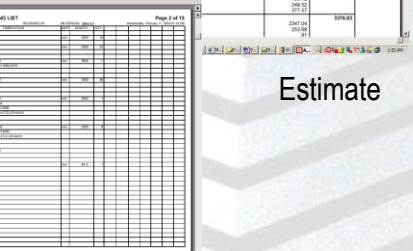
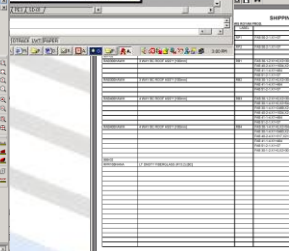
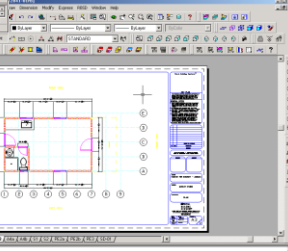
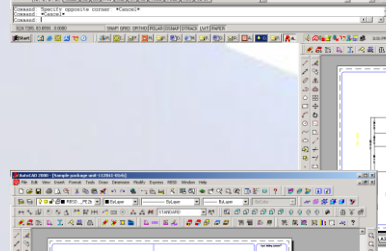
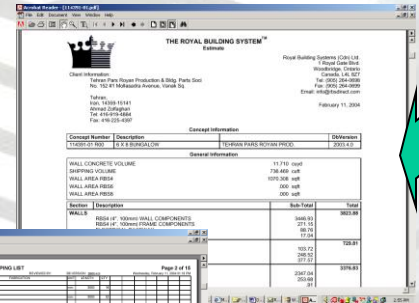
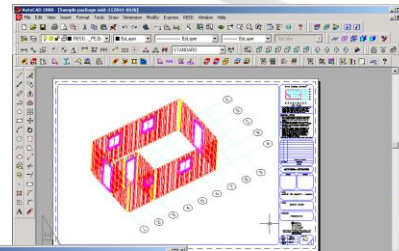
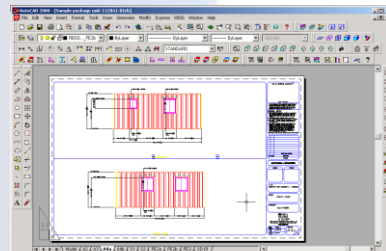
# Estimates & erection packages



Project drawn using  
RBSD

Component  
List

Obtain  
component list



Erection  
Package

Shipping List

Estimate





# Site work

- Erection Package sent to client/ contractor to start with:
  - Site cleaning and preparations
  - Excavation works
  - Foundations
  - Floor slabs
- It takes approximately 6 weeks to deliver RBS material to the Gulf.
- During which, the contractor should be done with the above and ready to receive RBS units to start erection.





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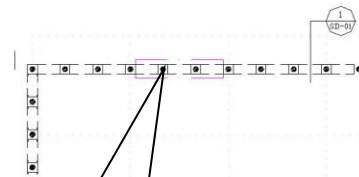




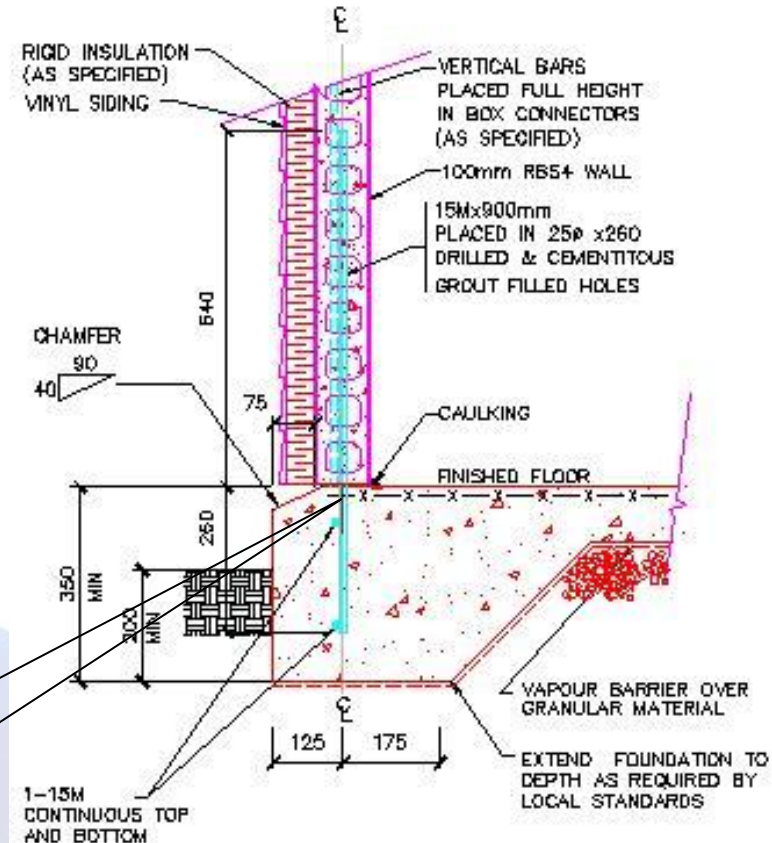


# Dowel placement

Structural details, location of vertical dowels, number of dowels and specs will be specified in the erection package depending on loading criteria.



Dowel locations are specified on erection drawings



Dowel specs are specified on structural details







# Erecting the RBS wall pieces

- RBS coordinator is on site.
- Normally, a crew of 1 foreman and 3-6 workmen are required.
- Erection starts at a corner.
- Erection proceeds along a wall to the next corner by sliding the pieces.
- Walls should be plumped.
- Sill pieces will get erected, frames put in places and header pieces. This is done in three stages for the pour of concrete.



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FINISHED CONCRETE FORMS





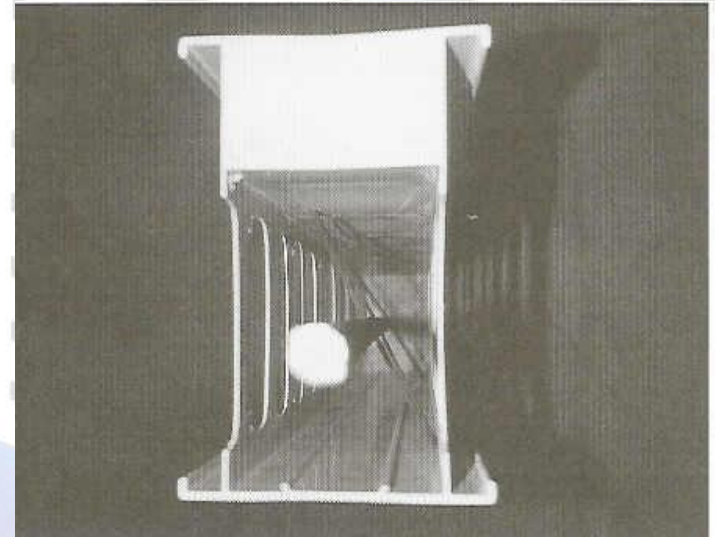
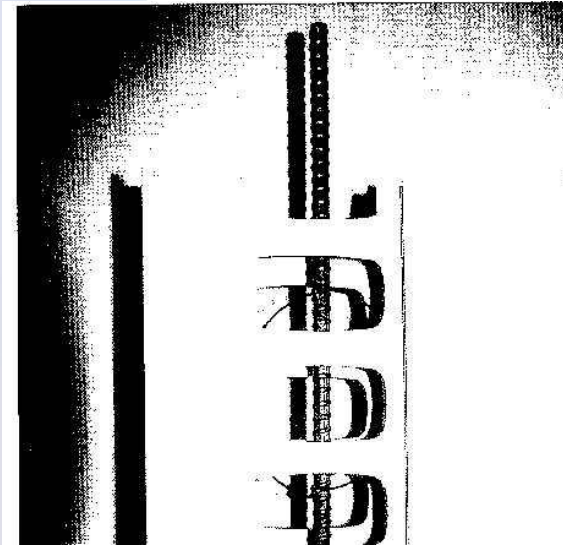


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# Vertical bar placement

- 15M bars are the smallest recommended to maintain alignment of bars.
- Bars are placed in box connectors since it is the largest concrete cell.
- Wire hoops are tack-welded or tied to vertical bars to align bars in cells.







# Electrical raceways



Electrical Raceways slide in  
box connectors wherever  
required



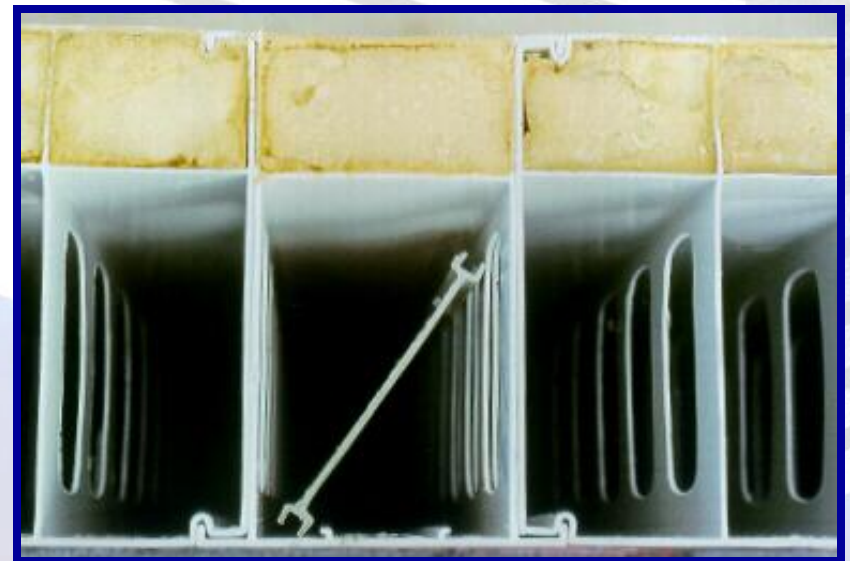


# Expansion & Control Joints



Expansion Joint

Control Joint







# Bracing RBS walls





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# Concrete Specifications

- 90% of volume is concrete
- Minimum 20 MPa (3000 psi) – 28 day compressive strength
- Maximum 10 mm ( 3/8" ) aggregate
- Minimum 115 mm (4 1/2" ) slump
- Concrete does not segregate due to inner webs of wall components





# Concrete placement

- Concrete pump or manual placement of concrete is used to pour concrete.
- The hose should have a reducer to 10cm at discharge point.
- Lifts of 1.5m to 1.8m is recommended.
- Concrete is first poured at corners of the building and sills (Frames will be installed and headers will get filled with the remaining of the full height walls.
- Screed the top of concrete at wall level.
- Power wash RBS walls from both sides within less than 30 min.









# Concrete Core



Core taken at the bottom of a 32' high wall



# Additional finishing... if req'd

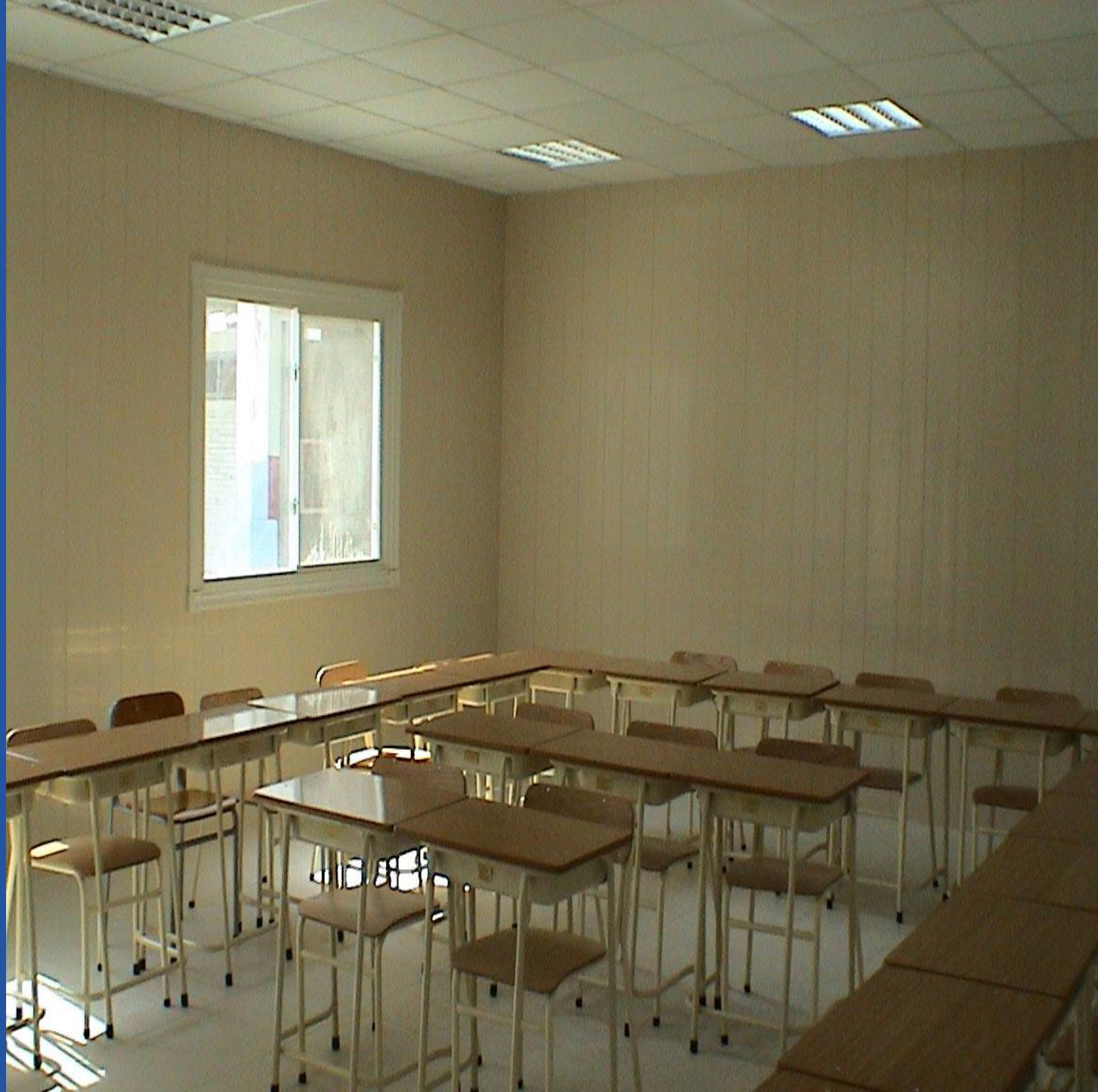
- RBS System is designed as finished walls with min maintenance requirements.
- Several types of secondary finishing can be applied after applying a base coat directly on the RBS walls to enable them to receive secondary finishing such as vinyl or plaster & paint finish.







FINISHED CONCRETE FORMS





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# Building Code Approvals

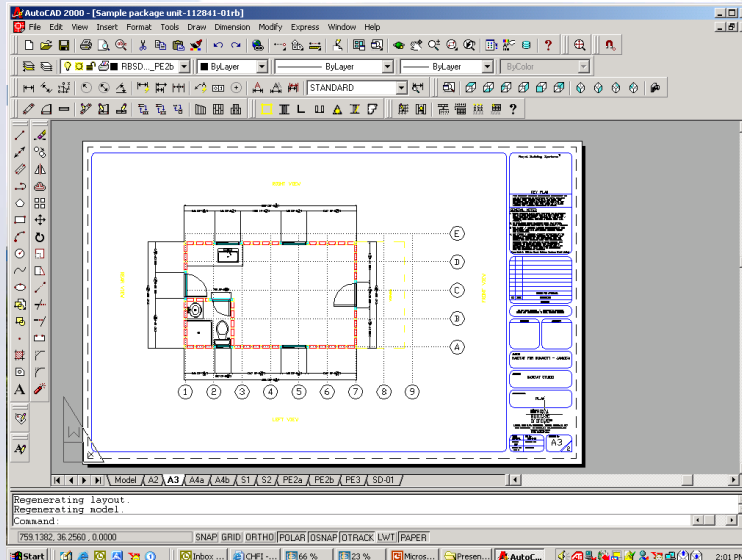
- The RBS walls have been designed and tested to meet the requirements for structural loads for the NBC, BOCA, SBC, UBC, and over 20 other building codes worldwide
- BOCA - National Building Code (Report # 94-57)
- ICBO - Uniform Building Code (Report # ER-5174)
- NY Building Code (C of A No. 0093)
- CCMC (Report 12536-R)
- OBC (Minister's Ruling No. 95-01-20-(12536-R))



# Pricing packages

- Prices given are per packages and not per square meters.
- Reasons are:  
**Specifications vary.**

**Example: The unit below 6 X 3.667m (20sq.m) can be priced for walls, doors, windows, frames, casings and baseboards from X\$ to 4X\$ depending on the factors above.**







[www.EurocanRoyal.com](http://www.EurocanRoyal.com)

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