

PASSIVE SOLAR CONCEPT

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Spring Dales Public School – Mulbekh – Ladakh – Jammu and Kashmir

The SDPS Campus design is:

- fully based on passive solar energy:
 - passive solar heated buildings (both day and night use buildings)
 - passive solar water heating
 - solar panels to generate electricity
- using an insulated local roller blinds in front of thermal walls
- using an insulated rammed earth double walls
- using a double glazing
- using an improved local construction techniques and materials
- using a local irrigation canal system for greenery inside the campus
- is dealing with waste and brown water management
- reducing campus carbon footprint to its possible minimum



Current campus view



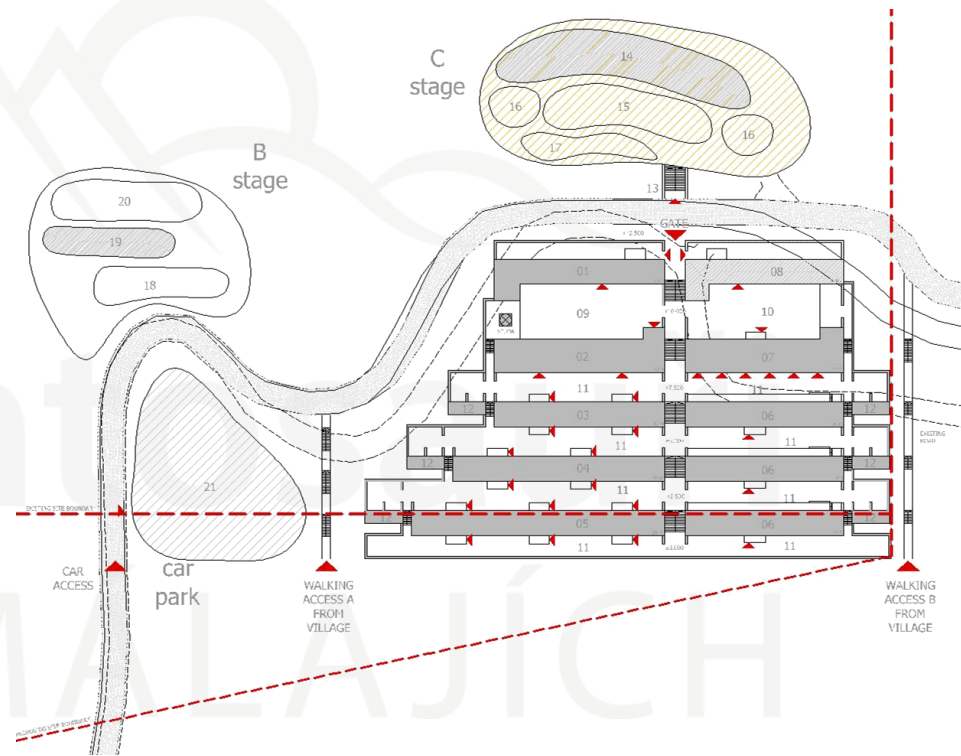
Campus design

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SDPS proposed master plan:

- 01 ... Administrative block + library
- 02 ... Prayer hall, LKG & UKG
- 03 ... 8 No. of classrooms
- 04 ... 4 No. of classroom, labs, computer lab
Art & music classrooms
- 05 ... 12 No. of classrooms
- 06 ... Student accommodation
- 07 ... Dining hall, canteen, kitchen, food storage
caretaker office, laundry, ironing, storages,
school helpers accommodation
- 08 ... V.I.P. and teachers accommodation
- 09 ... Main outdoor assembly area
- 10 ... Courtyard
- 11 ... Outdoor activity area
- 12 ... Ladakhi compost toilets
- 13 ... Access to sport fields
- 14 ... Gymnasium
- 15 ... Sport field: basketball, volleyball, tennis with
possibility of conversion in to ice ring in winter
- 16 ... Covered seating
- 17 ... Opened seating
- 18 ... Tourist accommodation
- 19 ... Cultural and training centre/workshops
- 20 ... Ladakhi museum
- 21 ... Parking



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Construction program for 2011 to 2014:



2011 - 2012 : First block of student accommodation



2012 - 2014 : First block of classrooms

Spring Dales Public School Development Project

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2011 – 2012: First block of student accommodation

Floor plans:

- Solar passive structure – double glazing
- Solar passive structure – thermal wall – direct heat gain
- Solar passive structure – thermal wall – indirect heat gain
- Other passive solar related structure
- Passive solar structure support
- Building structure



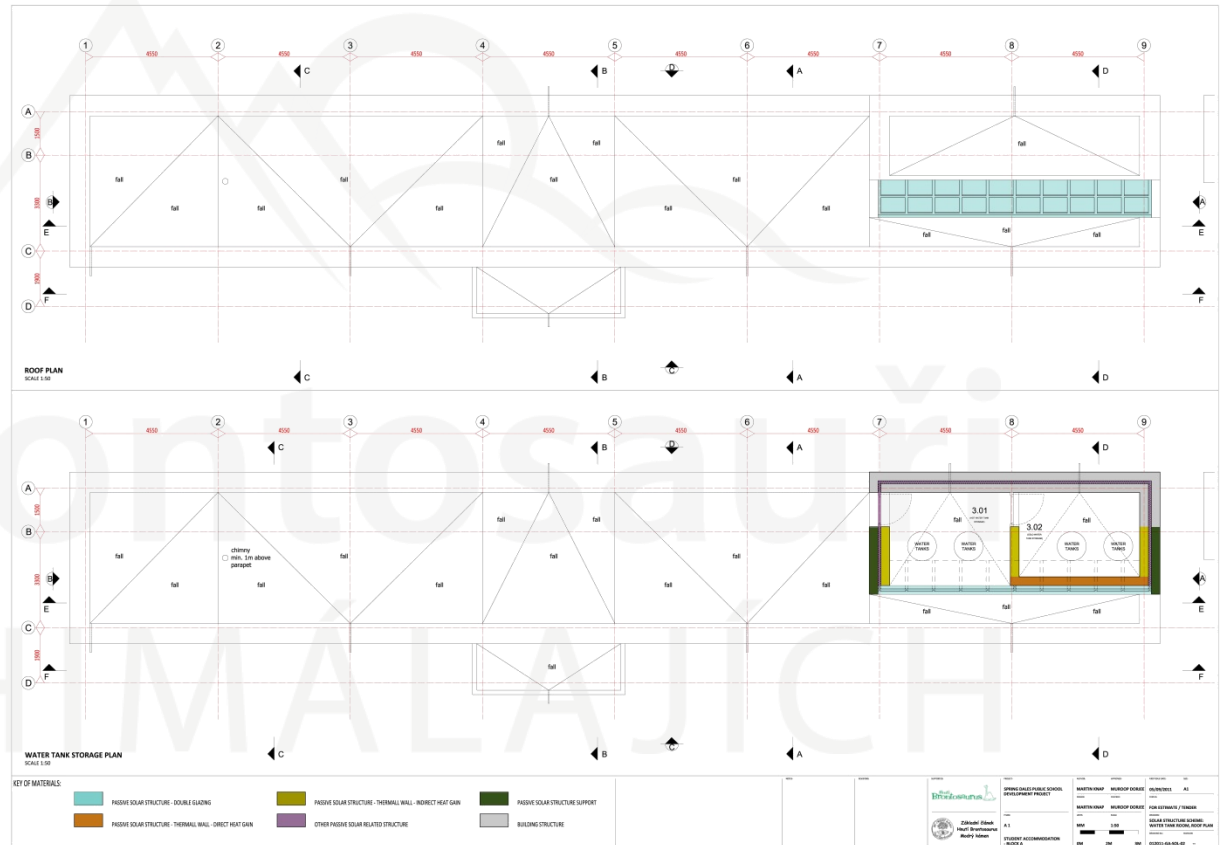
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2011 – 2012: First block of student accommodation

Roof plans:

- Solar passive structure – double glazing
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2011 – 2012: First block of student accommodation

Sections:

- Solar passive structure – double glazing
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Spring Dales Public School Development Project

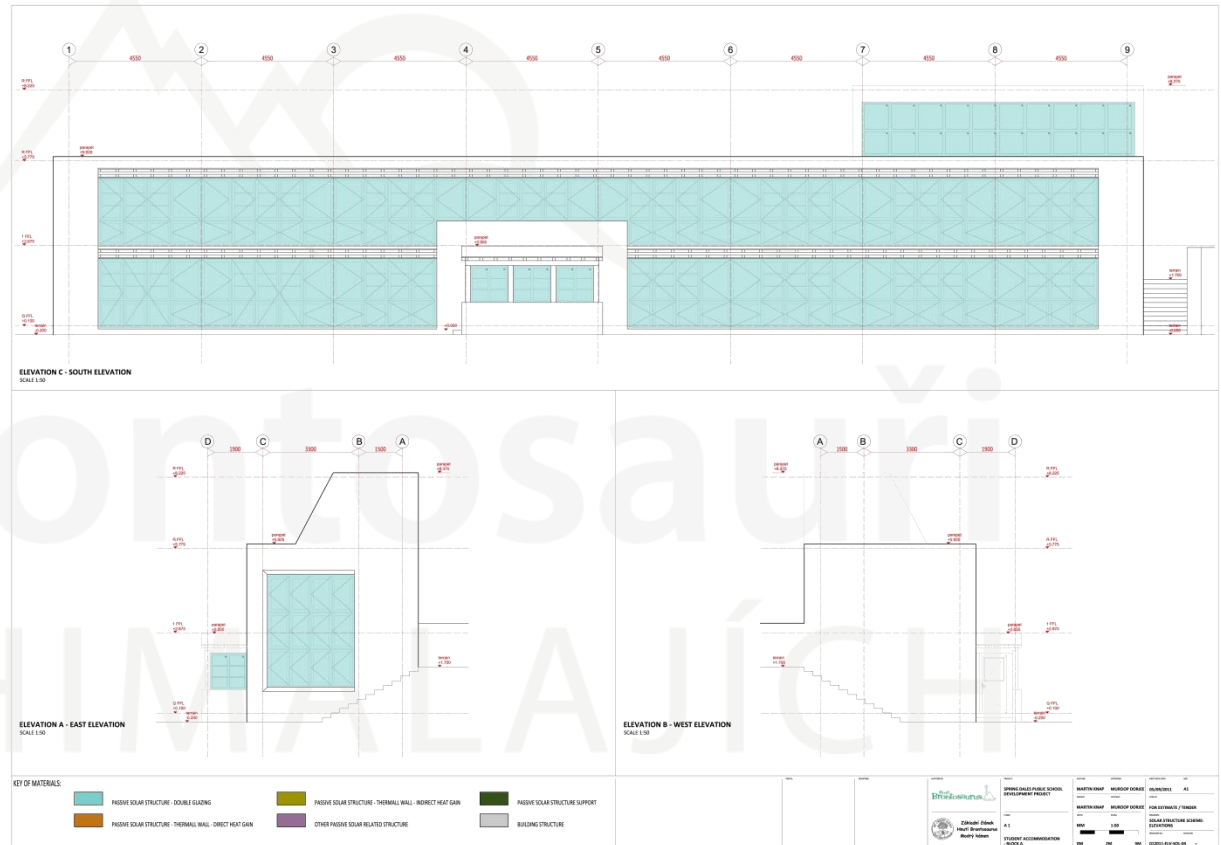
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2011 – 2012: First block of student accommodation

Elevations:

- Solar passive structure – double glazing
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2011 – 2012: First block of student accommodation

Estimate:

-  Solar passive structure – double glazing
-  Solar passive structure – thermal wall – direct heat gain
-  Solar passive structure – thermal wall – indirect heat gain
-  Other passive solar related structure
-  Passive solar structure support
-  Building structure

Category	Estimated Subtotal Whole Building (Rs)	Estimated Subtotal Passive Solar Related Structure (Rs)	Estimated Subtotal Passive Solar Related Structure (%)	Notes
Foundations + support structure	1,008,500	300,000	30%	passive solar structure structural support
Walls - rammed earth	2,355,000	1,177,000	50%	thermal wall - direct gain thermal wall - indirect gain
Wood	2,434,000	1,420,000	58%	solar walls: south, bathroom, water tank room; insulated windows to north; insulated doors; window shading structure
Glazing	432,000	432,000	100%	solar walls: south, bathroom, water tank room, insulated windows to north
Insulation	152,000	152,000	100%	local insulation inside double walls, floors and roofs
Insulated window roller blinds	230,000	230,000	100%	rolling blinds in between solar and thermal wall against stored heat loss from thermal walls
Excavation	42,000			
Formwork	621,500			
Ironmongery	12,800			
Furniture	240,000			
Painting	286,500			
Transportation	352,000			
Sanitary	653,500			
Electro installation	653,500			
Solar heated water tanks	50,000			
Furnishing	408,500			
Add W.C. and contingencies	245,000			

ESTIMATED GRAND TOTAL	Rs. 10,176,800	Rs. 3,711,000	36%
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PASSIVE SOLAR PART	Rs. 3,711,000	36% OF THE GRAND TOTAL BUILDING ESTIMATE
GRAND TOTAL BUILDING COST	Rs. 10,176,800	

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2012 – 2014: First block of classrooms

Floor plans:

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Spring Dales Public School Development Project

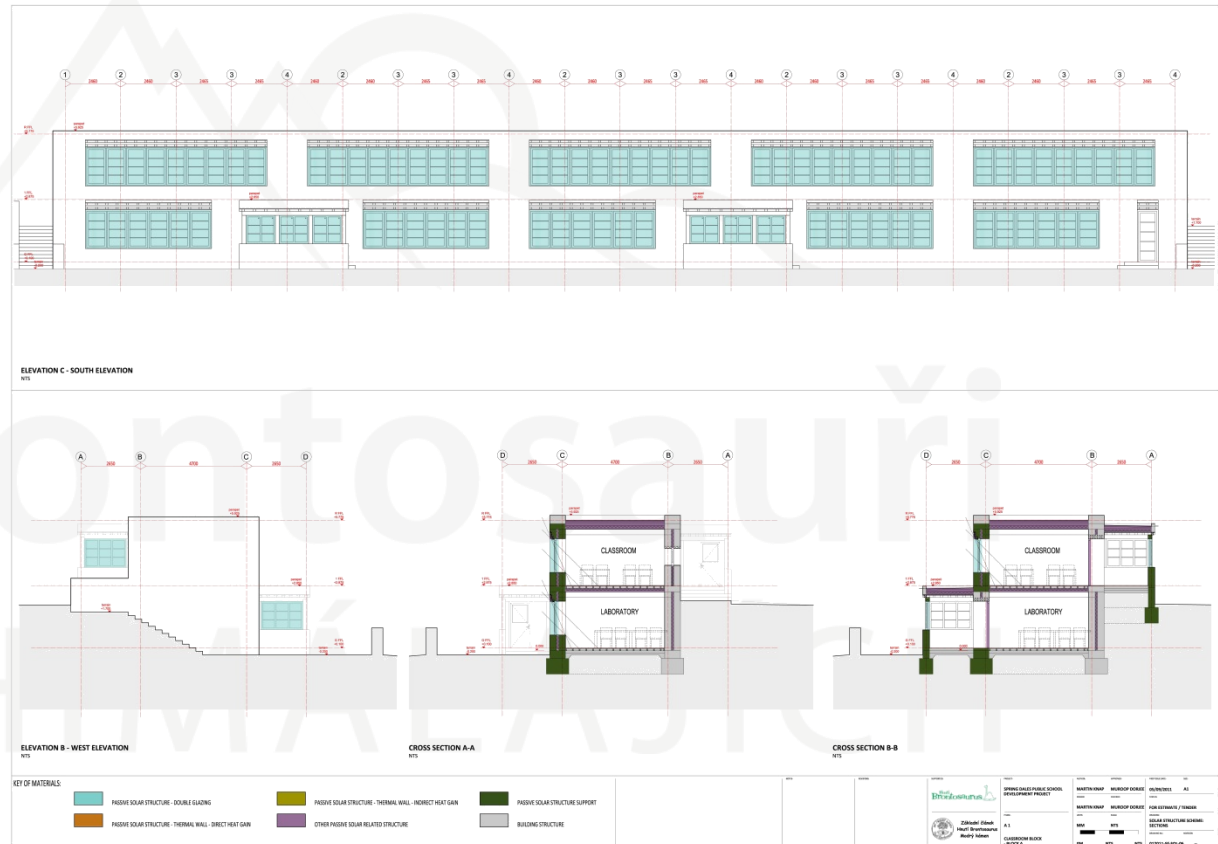
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2012 – 2014: First block of classrooms

Sections & elevations:

- Solar passive structure – double glazing
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2012 – 2014: First block of classrooms

Estimate:

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Category	Estimated Subtotal Whole Building (Rs)	Estimated Subtotal Passive Solar Related Structure (Rs)	Estimated Subtotal Passive Solar Related Structure (%)	Notes
Foundations + support structure	1,412,000	423,000	30%	passive solar structure structural support
Walls - rammed earth	3,306,500	1,653,500	50%	thermal wall - direct gain thermal wall - indirect gain
Wood	2,802,500	1,332,000	48%	insulated windows to south and small windows to north; insulated doors; window shading structure
Glazing	378,000	378,000	100%	double glazing to south and small windows to north
Insulation	214,000	214,000	100%	local insulation inside double walls, floors and roofs
Excavation	58,500			
Formwork	870,000			
Ironmongery	18,000			
Furniture	339,000			
Painting	401,000			
Transportation	492,500			
Sanitary	514,500			
Electro installation	823,500			
Furnishing	823,500			
Add W.C. and contingencies	309,000			

ESTIMATED GRAND TOTAL	Rs. 12,762,500	Rs. 4,000,500	31%
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PASSIVE SOLAR PART	Rs. 4,000,500	31% OF THE GRAND TOTAL BUILDING ESTIMATE
GRAND TOTAL BUILDING COST	Rs. 12,762,500	