SUSTAINABLE BUILDING STRAW-BALE CONSTRUCTION

TRIPLE BOTTOM LINE BEI

PROSPERITY BENEFIT

PERFORMANCE VALUE: SHORT TERM COSTS REFLECT A MORE ECONOMICAL BUILD THROUGH FASTER CONSTRUCTION —> LOWER LABOR COSTS

LONG TERM COSTS CONSIST OF MORE EFFICIENT ENERGY USAGE THAN THE COMMON BUILDING ——>LOWER ENERGY BILLS

TIME: FASTER BUILD DUE TO RELATIVE EASE OF CONSTRUCTION ->

OWNER/ BUILDER COOPERATIVE

MATERIALS: LOCAL, ENVIRONMENTALLY RESPONSIBLE MATERIALS AVAILABLE ---> LESS SHIPPING, RESULTING IN LOWER COST AND ACQUISITION OF LEED POINTS - SOURCES REPORT NEW HOMES BUILT FOR AS LITTLE AS \$40/SQ. FT .--->

APPRAISED FOR \$70/SQ. FT. (www.thefarm.org)

LEED RATING: PRESENTS POSSIBILITIES FOR POWERFUL BUSINESS STRATEGY -> COMPLETION OF LEED CERTIFIED STRUCTURES RESULTS IN FREE ADVERTISING; APPEALS TO

NEW BROADER, QUICKLY EMERGING CLIENT BASE

- CLIENT BASE IS GROWING DUE TO ELEVATED LEVELS OF ENVIRONMENTAL AWARENESS--> THIS MARKET GROWTH COINCIDES ACCORDINGLY WITH LEED STANDARDS: BROADER MARKET = HIGHER DEMAND = \$ FOR GREEN BUILDERS ---> MORE GREEN BUILDING

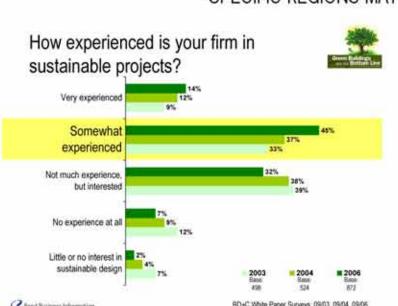
- EXISTING COMPUTER SOFTWARE ASSISTS IN STREAMLINING LEED SPECS (ie BSD SPECLINK)

INCENTIVES: INCENTIVES HAVE BEEN PUT IN PLACE TO PROMOTE GREEN BUILDING TECHNIQUES -> ARLINGTON, VIRGINIA: BONUS DENSITY/HEIGHT INCENTIVES FOR LEED CERTIFIED BLDGS

SANTA BARBARA, CALIFORNIA: FAST TRACK BLDG. PLAN APPROVAL, DESIGN ASSISTANCE, AWARDS, AND LOCAL TAX RELIEF FOR GREEN BUILDERS KING COUNTY, WASHINGTON: \$15-25,000 GRANTS, FREE PROJECT MNGMT, FREE TECH,

ASSISTANCE TO GREEN BUILDERS; BUILT SMART PROGRAM: OFFERS FINANCIAL INCENTIVES FROM SEATTLE CITY LIGHT FOR ENERGY EFFIECIENT HOUSING; CONSTRUCTION WORKS PROGRAM: GIVES MEDIA RECOGNITION, FREE ASSISTANCE FOR INCREASED RECYCLING/REUSE; WATERSMART TECH PROGRAM: AWARDS CASH REBATES FOR IMPLEMENTATION OF WATER SAVING FIXTURES

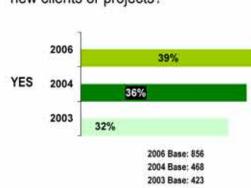
-SPECIFIC REGIONS MAY ALSO OFTEN COVER COSTS OF LEED PROJECT SUBMITTAL



With regard to gree	n building, which of the
following apply to ve	ou and/or your firm?

	2006	2004	2003
Firm has attempted at least one project based on green-building principles	45%	47%	49%
Firm has completed at least one project based on green-building principles	38%	41%	34%
Firm has sought certification (LEED, Green Globes) for at least one project	24%	19%	14%
Firm has achieved certification (LEED, Green Globes) for at least one project	20%	13%	11%
Respondent is a LEED Accredited Professional	13%	16%	4%
Others in my firm are LEED Accredited Professionals	37%	35%	25%
	Base: 872	Base: 400	Base: 332

Has acquiring sustainable building expertise helped your firm attract new clients or projects?



*IMPLEMENTATION OF GREEN BUILDING TECHNIQUES HAS BEEN RISING STEADILY, RESULTING IN BOTH INCREASED AWARENESS IN THE BUILDING PROFESSION AND THE GENERAL POPULATION, AND IN INCREASED BUSINESS FOR THOSE FIRMS AND CONTRACTORS WHO MAKE THE EFFORT TO PROMOTE GREEN BUILDING





STUDENTS AT WORK ON SITE; BALL STATE UNIVERSITY LAND LAB

NMENTAL BENEFIT

MATERIALS: EXTENSIVE LIST OF REUSED/RECYCLED MATERIALS COMMONLY USED IN

STRAW-BALE CONSTRUCTION, RANGING FROM CONCRETE TO INSULATION, OR

FROM LUMBER TO THE STRAW-BALES THEMSELVES

MAY INCLUDE: HIGH VOLUME FLY ASH CONCRETE (VERY INEXPENSIVE AND AVAILABLE, STRONGER, 6% FLY ASH USE IN U.S. WOULD RESULT IN USE OF 9 MILLION TONS ANNUALLY)

> STRAW-BALES (WASTE MATERIAL, ALSO READILY AVAILABLE IN MANY REGIONS) CELLULOSE (MADE FROM POST-CONSUMER PAPER)

STEEL, ALUMINUM, FIBER, AND RUBBER (ALL W/HIGH % POST-CONSUMER CONTENT) STRUCTURAL FIBERBOARD, LAMINATED PAPERBOARD (VERY HIGH % RECOVERED MAT.) POROUS PAVING PRODUCTS (REDUCE STORMWATER RUNOFF----> GROUNDWATER RECHARGE)

OSB/TJIs (OSB=REUSE MATERIAL, TJI=CONSERVATION OF LARGE CUT LUMBER)

ADDITIONAL SUSTAINABLE ELEMENTS: THE USE OF PASSIVE SOLAR ENERGY,

STORMWATER RETENTION TECHNIQUES, OR COMPOSTING TOILETS ARE COMMONLY IMPLEMENTED ALONGSIDE STRAWBALE CONSTRUCTION

BENEFIT

SHORT TERM POSSIBILITIES: A HIGHLY BENEFICIAL PSYCHOLOGICAL CONNECTION WILL BE CREATED BETWEEN BOTH YOU, THE BUILDER, AND THOSE FOR WHOM THE STRUCTURE IS BUILT AND THE LAND ITSELF -> THE KNOWLEDGE, RESPECT FOR THE ENVIRONMENT, AND ELEVATED LEVEL OF CONSCIOUS STEWARDSHIP WILL BENEFIT ALL WHO ARE INVOLVED

LONG TERM REALITY: WIDESPREAD IMPLEMENTATION OF SUSTAINABLE BUILDING TECHNIQUES AND THEIR RESULTANT POSITIVE EFFECTS UPON BUILDING SITES WILL TRIGGER A REACTION THROUGHOUT SITES, COMMUNITIES, CITIES, AND REGIONS, WITH THE ULTIMATE GOAL OF CREATING A SUSTAINABLE WORLD ---> GOAL SET THROUGH ADDRESSING OF SYSTEMS AT THREE LEVELS:

1. OBJECT LEVEL: DESIGNING BUILDINGS AND SITES

2. SYSTEMS LEVEL: MANAGING SYSTEMS AND RESOURCES 3. META LEVEL: LEADING SOCIETY TO A SUSTAINABLE FUTURE

THE NIGHT WOODEN LADDER INSERTED INTO BALE WALL TYPICAL R-VALUE FOR STRAW-BALE CONSTRUCTION IS AROUND R-40; TYPICAL 6" WALL WITH FIBERGLASS **INSULATION CARRIES AN ELECTRICAL BOX** R-VALUE OF 19 FASTENED TO WOODEN PEG INSERTED INTO BALE WALL What is R-value? A MEASURE OF THERMAL RESISTANCE. R-VALUE IS AN INSULATION INDUSTRY TERM DERIVED IN THE 1950'S. IT IS THERMAL

HEAT/COOL DIAGRAM

EXTERIOR BARRIER (ie PLASTER)

MUST BE APPLIED FOR THERMAL-

PERFORMACE OF STRAW-BALES

CONDUCTANCE THAT DETERMINES THE NUMBER FOR THE R-VALUE. THE SMALLER THE VALUE, THE LESS HEAT IS CONDUCTED AND THE BETTER THE THERMAL PERFORMANCE OF THE MATERIAL. THE HIGHER THE VALUE, THE BETTER THE PRODUCT IS AT RESISTING HEAT LOSS IN THE WINTER AND HEAT GAIN IN THE SUMMER.

HEAVY THERMAL MASS ALLOWS FOR INFILTRATION OF AIR TO BE WARMED

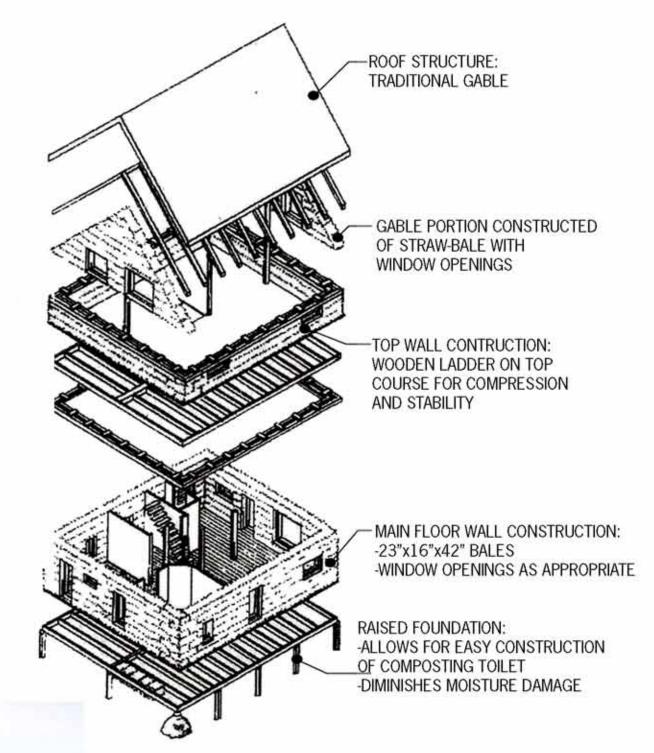
FROM INTERIOR AND

-ABSORBS SOLAR RADIATION

-RETAINS HEAT GAIN FOR

MAINTAINED

IN THE DAY



EARTH RENDER 2. TENSIONING WIRE RING BEAM 4. RABBIT FENCE MESH 5. WINDOW BOX STRAW BALE

LOAD BEARING STRAW-BALE WALL SYSTEM

8. CEMENT SEALER EARTH RENDER INTEGRATED WATER-WASTEWATER-ENERGY SYSTEM SEEC-LANDLAB AS BSU'S FIRST GREEN BUILDING AND GREEN BUILT-SITE WATER HARVESTING AEROBIC TREATMENT VIA ROCK-REED, CONSTRUCTED WETLAND, OR OTHER LIVING SYSTEM REUSE

7. REINFORCEMENT

TEM AND WATER TO LANDSCAPE SATURATION BEDS OF BUILDING PASSIVE ENERGY SYSTEM

COMMUNITY LANDSCAPE **BUILDING LANDSCAPE** SYSTEM SYSTEM CONSTRUCTED WETL AGROFORESTRY. LIVING FENCES WET PRAIRIE

SATURATED SOIL HEAT EXCHANGER OF BUILDING PASSIVE SOLAR ENERGY SYSTEM

PASSIVE SOLAR

BUILDING INTEGRATED

PHOTOVOLTAIC (BIPV)

GRID

OUTPUT TO ELECTRIC

DIAGRAM

VENT AT LEAST 2' TYPICAL COMPOSTING ABOVE ROOF PEAK TOILET CONFIGURATION

