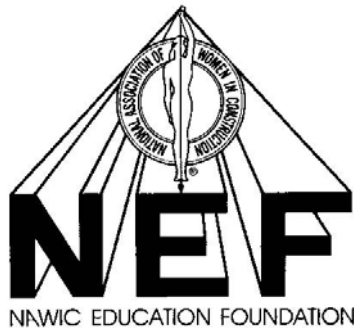


PO Box 549
Clemson, SC 29633
Toll-free: (866) 277-2883
Telephone: (864) 654-5886
Facsimile: (864) 654-5851
E-mail: nef@bellsouth.net



**NAWIC Education Foundation
CAD/DESIGN/DRAFTING
SCHOLARSHIP AWARD COMPETITION
2010-2011**

**Design Problem and
Project Requirements**

Design Problem and Project Requirements

1. Project Description

The project is a home for a family of five, the Walkers. They are moving into an older neighborhood in the city. The neighborhood is becoming popular for families to move into because of its accessibility to new commercial developments such as shopping and restaurants as well as public transportation. Your creativity and expertise will give you an opportunity to design additional houses in the area.

The surrounding houses were built sixty or seventy years ago. Some of them have been “rehabbed” so that on the outside they look much like they did when they were originally built, but have been updated on the inside with new fixtures and finishes. The Walkers have purchased an empty lot in the neighborhood and want a house that expresses some new ideas, but also keeps some of the patterns of the neighborhood.

Mr. Walker is an accountant and sometimes works at home. Mrs. Walker is a professor at the nearby university and often prepares her lectures at home. They both would like a shared home office away from the living and activity areas of the house.

The Walkers are looking forward to their own master bedroom and bathroom with adequate closet space. They have three children. Their daughter is a junior in high school and they have a son who is in eighth grade. They will each have their own bedrooms. They would like to have their own bathrooms, but Mr. and Mrs. Walker are not sure that they can afford a bathroom for every member of the family. Therefore, they would like to consider a shared bathroom for the two older children that could possibly be compartmentalized with separate sink areas, but shared bathing and toilet facilities.

A special concern for the Walkers is accommodations for their youngest son who is in fifth grade and has cerebral palsy. During the week he attends a private boarding school for children with disabilities; however, he spends the weekends and vacations at home with the rest of the family. The Walkers would like a bedroom for him on the first floor of the home with his own bathroom. The bathroom should have a roll-in shower and adequate space around the other fixtures to accommodate a wheel chair. This bathroom could be accessed from a hallway/common area or it could be accessed directly from the bedroom and combined with a connected powder room so that the lavatory and toilet area of the powder room can be used by the family without going through the bedroom, but then the shower and possibly another lavatory (if space allows) could be separated for the privacy. Although Universal Design is not required for all aspects of the first floor because this is a private residence, ease of access on the first floor should be considered, in particular by making all of the doors on the first floor three feet wide.

Mr. and Mrs. Walker enjoy cooking and want a large kitchen that includes a family activity space for the family to gather for meals, to do homework, watch television or play video games. The family has decided that they wouldn't use a separate formal dining room and would rather have a large dining area that is open to the kitchen and allows space for activities near the kitchen and for family gatherings with aunts, uncles and cousins. A separate living room for family gatherings and entertaining should be close to the kitchen and dining areas and have access to a patio or deck outside.

The site faces a residential street with an alley at the rear and another alley next to a vacant lot to the east. The Walkers want a garage or carport for one car and one van. They also need secure

storage for bicycles, lawn mower, gardening equipment and outdoor furniture. Access to the garage/car port can be from the alleys, and it can be either a separate structure or attached to the house. They do wish to have wheelchair access from the garage area to the first floor of the main house with a ramp (slope 1" per 1 ft.) or sloped sidewalk (slope 1" per 20 ft.). There are three large trees on the lot that the family wants to keep.

The Walkers have also requested these things in their new house:

1. A fireplace somewhere in the family activity area or living room
2. Computer set-ups in the family activity area and the home office
3. Walk-in closets in the master bedroom/bath
4. A laundry room

Other areas or rooms may be added as you think they are necessary. The total heated/cooled space cannot exceed 3,500 square feet (does not include the garage or any decks, porches or patios). The style of house should be appropriate for a house in your area. It may be stucco, brick, wood or vinyl sided, etc. with a low-sloped roof or steep-sloped roof. Zoning in this neighborhood permits houses to be 3 stories high with a maximum building height of 40 ft. to the highest point. This means that a third floor level is permitted, but if the roof slope is steep, this third floor space may likely be under the roof line (would not have full height walls, would have sloped ceilings, and dormer windows). A basement for mechanical systems is acceptable but not necessary.

2. Site Design

Students will redraw the Site Plan at a scale of 1" = 10'-0", using their school's software or drafting by hand. **There is no CAD file available.** There are two .pdf versions of the site plan available. A site plan formatted at 8.5" x 11" is included with the Design Problem and Project Requirements. A site plan formatted at 24" x 36" at the scale of 1" = 10'-0" is available on the NEF website. Go to www.nawiceducation.org, under K-12 Programs/CAD to download this file.

- A. Use the setbacks and restrictions as shown on the site plan. The building structure(s) cannot be located within the yard setbacks.
- B. Access to the garage/car port can be from either alley and can cross the adjacent vacant lot on the east side, but no buildings can be erected on the vacant lot.
- C. A sidewalk must be added in front of the site along Oakwood Avenue.
- D. The North Arrow should appear on the site plans and floor plans. On the Site Plan the North Arrow should point up with Oakwood Avenue at the bottom (South) and River Street at the left side (West). The Floor Plans can be shown on the sheet in the orientation that best works with the plan layout so that it fits on the page, but a North Arrow must be shown on the sheet.

3. Drawing and Submittal Requirements

- A. Submit a minimum of five (5) drawing sheets; a maximum of seven (7) drawing sheets on 24" x 36" paper.
- B. Each drawing sheet should contain:
 - 1" x 6" title block placed in the lower right-hand corner of each sheet shall include project title, date, student code number and drawing sheet number.
 - Appropriate labels for drawings and materials

- Required scale for each drawing labeled on the sheet
 - Accurate and readable dimensions
 - North Arrow where appropriate
 - Floor plans must be labeled with the North Arrow.
- C. Submit entries as Black Line photocopies of Black Line or Blue Line prints. Original computer plots may be submitted on bond paper only and in black ink only.
- CAD only – Computer plots or prints are required. DO NOT submit CD's, diskettes, plots on vellum or color ink plots. Drawings must be plotted at the required scale. DO NOT plot "Scale to Fit" the sheet size.
 - Hand Drafting only – DO NOT submit hand-drafted original drawings. All lettering is to be freehand and all drawings drawn by hand. Guidelines and straightedges for vertical strokes may be used for lettering.
- D. All submissions must comply with the requirements of the competition to be eligible for judging. Do not submit an incomplete set of drawings. All judges' decisions are final.
- E. All submitted sheets shall be stapled in the left-hand border with the Design Narrative stapled in the upper left-hand corner of Sheet A-1.
- F. The bottom portion of the signed student application forms shall be placed in a plain envelope and stapled to the back of Sheet A-1 (on the opposite side from the Design Narrative).
- G. The student's school name should not appear in the Title Block or in any place visible on the drawing sheets.
- H. Drawings will not be returned to the contestant.

4. Design Narrative

- A. The Design narrative is a statement about what the student feels are the positive and appropriate elements in the design and how the design meets the project description.
- B. Be creative! This is your first impression with the judges.
- C. Narrative will be 400 to 500 words and must be typed. Please use either Times Roman or Arial fonts in 10 pt. or 12 pt. – black ink please.
- D. Place the student code number in the upper right-hand corner of the narrative. DO NOT put the student name or school name on the narrative.
- E. Staple the narrative to the upper left-hand corner of the drawing set.
- F. Spelling and grammar will be considered. Do not rely on your computer's spell-checker.

5. Required Drawings

A. DRAWING SHEET A-1: SITE PLAN WITH ROOF PLAN

Scale: 1" = 10'- 0"

1. Students must use the site plan in the competition package.
2. Show the location of proposed building(s) on the site plan with the roof plan.
3. Show driveway and sidewalks on the site plan. Show paving, walks, curbs and existing trees to remain.
4. Show building setback lines and property lines.
5. Show the location of the building with dimensions to the property lines. (Setback requirements are shown on the site plan).
6. All students will be required to draw the site plan. **No CD, diskette or CAD file is provided.**

B. DRAWING SHEET A-2: Floor Plans

Scale: ¼" = 1'-0"

1. LABEL THE TOTAL ENCLOSED SQUARE FOOTAGE OF THE BUILDING ON THE DRAWING.
2. Show walls, windows, doors and door swings and openings along with appropriate dimensions for each. Show door and window sizes on the plan or provide a door/window schedule.
3. Show closets, built-in cabinets, plumbing fixtures and appliances. Optional (encouraged but not required): show furniture placement.
4. Show changes in floor elevation, stairs, stair landings and ramps.
5. Label each room or area (example: "Kitchen", "Master Bedroom") and indicate floor finishes for each room or area (wood, vinyl, ceramic tile, carpet, etc.).
6. Show section cut marks to correspond with Drawing Sheet A-5.
7. Optional (encouraged but not required): show shading of walls with accepted symbols to indicate wall construction materials

C. DRAWING SHEET A-3: Exterior Elevations

Scale: ¼" = 1'-0"

1. Show two (2) exterior elevations; one must depict the Oakwood Avenue (south) front elevation of the house, and one must depict either the right (east) or left (west) elevation.
2. Label the elevations as "South", "East", "West", etc.

3. Show walls, windows, doors, roof; indicate roof slopes.
4. Label all exterior finish materials (shingles, brick, stucco, siding, stone, etc.).
5. Show finish grades and the floor levels on each elevation.

D. DRAWING SHEET A-4: Building Section and Wall Section

Building Section Scale: Scale: $\frac{1}{4}" = 1'-0"$

1. Show footings and foundation walls, exterior and interior walls, floors, windows, ceilings and roof line.
2. Label rooms where the section is cut through.
3. Label different construction materials.
4. Dimension room heights and roof overhangs.
5. Optional items which can be shown (encouraged but not required): interior wall elevations

Wall Section Scale: $\frac{3}{4}" = 1'-0"$ or $1" = 1'-0"$

1. Show and label footing, foundation wall, floor slab or framing, typical exterior wall eave, roof structure and roofing materials.
2. Use break lines to shorten the wall section (if needed to fit the drawing on the 24" x 36" drawing sheet).
3. Show and label wall thickness and different construction materials (concrete, wood, insulation, sheathing, finishes, etc.).

E. DRAWING SHEET A-5: Electrical Plans

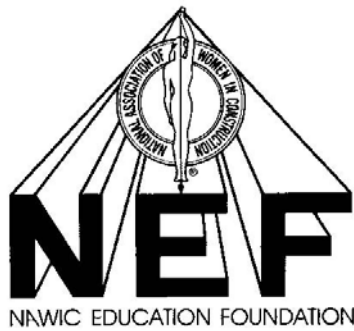
Scale: $\frac{1}{4}" = 1'-0"$

1. Show light switch locations, electrical outlets, TV/cable jacks, telephone jacks, computer data jacks or wireless hubs, lighting fixtures, ceiling fans, etc.
2. Show any lighting on the exterior of the building.
3. Show electrical symbol legend on your drawing.

F. DRAWING SHEETS A-6 and A-7: Optional Drawings (maximum of two)

1. Additional two (2) elevations not shown on Sheet A-3. Follow instructions for Sheet A-3.
2. Additional building sections and/or wall sections. Follow instructions for Sheet A-4.
3. Interior Elevations (scale $\frac{1}{2}" = 1'-0"$) for the kitchen and bathrooms.

4. Exterior or interior perspective sketch.
5. Landscape Plan (this is a separate drawing from the Site Plan) at 1"=10'-0" showing new plantings, trees, shrubs and their names.



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Resource Material

Design Resources

1. Energy Efficiency

The Walkers would like their new home to be as energy-efficient as possible. Energy efficiency is just one aspect of "green" building design, and new construction is an ideal opportunity to explore "green" design. Here are some of its principles:

- Energy efficiency and alternative energy sources in the building's plumbing, heating/ventilation/air conditioning systems (for example, passive or active solar energy, heat pumps, appropriate building location on the site)
- Use of building materials with less of an environmental impact than traditional materials (for example, fiber-cement siding, recycled lumber or stone, wall-board panels using recycled material, paints and adhesives that do not give off toxic fumes)
- Consideration of transportation costs and manufacturing processes in selection of materials and suppliers

"Green" building is an extremely important element of responsible design and construction. A good starting place for your research is the website of the U.S. Green Building Council:

www.usgbc.org

2. Universal Design and Accessibility

Although this is a private residence, the Walkers would like some consideration for accessibility on the first floor level of the house for ease of mobility for the youngest son. There are Universal Design guidelines specifically for residential dwelling units.

The following resources will provide the necessary dimensions and clearance information to make the home more accessible:

- ADA Standards for Accessible Design
www.ada.gov/stdspdf.htm

Guidelines are available in both .pdf and html formats

- International Code Council American National Standard Accessible and Usable Buildings and Facilities ICC/ANSI A117.1 most recent addition.

3. Design Ideas

Here are some websites, books and magazines to look at as you are designing the Walker's new home.

A. Architect Sarah Susanka has written three books with many project photos of "not so big" houses that meet clients' needs with ingenious and beautiful ideas. These books are widely available in bookstores.

[The Not So Big House](#)
[Creating the Not So Big House](#)
[Home by Design](#)

Visit this website for more information and ideas: www.ntsobighouse.com

B. A Traditional Neighborhood Development can be defined as an “approach to designing cities, towns, and neighborhoods.” The goal being not only to reduce urban sprawl, but to create communities where people live, and work and socialize. Revitalizing, rebuilding and renovating urban neighborhoods can also be viewed as “green” design. The New Urbanism movement includes design principles for creating “ ‘small towns’ and neighborhoods where people work, live, play, and walk from place--is on.”

While the Walkers are not building a house in one of these planned communities, some of the principles and ideas in the book [The New Urbanism: Toward an Architecture of Community](#) by Peter Katz and Vincent Scully be a useful resource in designing a home on a narrow lot in and urban community.

The City of Roanoke, Virginia has put together a pattern book for residential architecture, [Residential Pattern Book for the City of Roanoke](#). “In developing the Pattern Book, the City of Roanoke strives to preserve and enhance the character and quality of its residential neighborhoods. The Pattern Book is a design aid for new construction and renovation of residential buildings...But most importantly it is intended to instill pride in homeowners and encourage them to preserve the unique character of their homes and neighborhoods.” The Walkers do not necessarily live in Roanoke, Virginia and, therefore, the designer does not need to exactly follow the design direction and requirements in this Pattern Book. However, this is a good resource for ideas and understanding what is meant for a new home to fit into the historic character of its neighborhood.
<http://www.roanokeva.gov/85256A8D0062AF37/vwContentByKey/N27ANQJY490FGUREN>

C. [Fine Homebuilding](#) magazine, published by Taunton Press six times a year, also has good information about custom-designed houses. It is geared for professional builders, so there is technical information about tools and construction methods. Website: www.tauntonpress/finehomebuilding.com

4. Field Research

One of the best resources that you have is to look at the buildings around you.

- Many community organizations sponsor house tours. Attend one of these and keep a list of ideas you see that you like.
- Write down a list of questions as you begin designing. Ask a residential architect to visit your class and discuss some of these questions.
- Visit a historic or famous house that's open to the public in your area. Notice and write down what you like and don't like. Use these ideas as you design.
- What do you like/dislike about your own house? What would you change?