National Association of Minority Contractors

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I. The Consulting Situation

The NAMC/BCA Organization

The National Association of Minority Contractors / Black Contractors Association (NAMC/BCA), Western Pennsylvania Chapter was founded in 1990 and is one of the forty-seven affiliates of the National Association of Minority Contractors. The NAMC/BCA is a not-for-profit, full service, educational and advocacy association consisting primarily of minority owned firms.
The NAMC/BCA motto is "Helping to Build America," and their stated mission is:

> To increase the volume of work that minority contractors are capable of performing and to broaden the base of the activity of the contractors to include the commercial, industrial and utility sectors.

The local chapter has also taken the initiative in the areas of housing development, workforce development, and community/economic development. The NAMC/BCA is funded with public and private donations and grants.
The NAMC/BCA's representative for this project was Linda Couch, the Chief Executive Officer. Ms. Couch oversees the day-to-day operations of the organization, including supervising payroll for the workforce development program, organizing educational programs, and writing proposals for grants and other sources of funding.

Population Served

The NAMC/BCA's primary mission, to assist minority contractors, involves mostly African-American contractors in the Pittsburgh area. However, their mission encompasses all minority groups that have traditionally been overlooked for high-paying contracting work, including female contractors and contractors based in low-income areas. The NAMC/BCA incubator program currently houses eight contractors who pay membership dues and rent to the NAMC/BCA.
The NAMC/BCA's secondary missions, workforce and community/economic development, encompass minority and low-income inhabitants of Pittsburgh and the surrounding communities.
Participants in the workforce development programs are recruited through brochures and flyers, and are often referred from government and private advocacy organizations. The workforce development program serves as a source of skilled labor for the economic development program and for member contractors.
The economic development program employs contractors to build and improve affordable housing for low and very-low income individuals in Pittsburgh. The NAMC/BCA manages approximately $3,000,000 worth of economic development projects within four square-blocks of their main office building.

Programs and Services

The local chapter of the NAMC/BCA performs three functions that they view as central to their mission.

1) Incubator for minority-owned contractors

The NAMC/BCA serves as an incubator for minority-owned contractors. NAMC/BCA rents office space, helps the contractors acquire bonding insurance and provides business-development assistance for up to twenty contractors (although there is room for less than half that in the current NAMC/BCA building). The incubator program provides training and management assistance to contractors, as well as low-cost office space in the NAMC/BCA building. Contractors are admitted to the program after providing a 3-month business plan. New contractors become part of a program designed to develop a sound business plan, develop good credit, and learn good business practices.

The NAMC/BCA provides consulting and advisory services to participants in the program. They also provide assistance with secretarial, legal and accounting issues, and serve as a gateway to the governmental and advocacy agencies that provide necessary services for minority contractors.

2) Workforce Development

In addition to their certification and training classes for contractors, the NAMC/BCA provides training and apprenticeship programs for aspiring minority youth. They host a Youth Construction Initiative (YCI) to teach contracting skills to interested youth, and provide job placement and licensing assistance. This pre-apprenticeship program is designed to prepare the student to enter into an apprenticeship with an established contractor.

3) Community/Economic Development Programs

The NAMC/BCA runs housing, community and economic development programs. These programs include a lead-removal initiative to remove the toxic metal, often found in pipes and paint used in older homes, from homes in the area. They plan to expand this initiative by offering classes for contractors on lead removal and clean up.

Organizational structure

The staff of the NAMC/BCA consists of:

- ❑ The **Chief Executive Officer**, who reports to the Board of Directors and manages the day-to-day operations of the organization.
- ❑ An **Economic Development Coordinator** to work with established contractors and with minority youth.
- ❑ A **Director of Training** to establish and implement training programs.
- ❑ **Secretaries** (2) to assist the NAMC/BCA administration *and* the resident contractors.
- ❑ **Interns** (2) who assist in administration and special projects (such as the newsletter).

The office staff manages payroll for the workforce development program, develops marketing and grant-proposal material, and administers the incubator and education programs.

Funding

The NAMC/BCA receives funding through grants from public and private entities, fees paid by contractors, and through government funding for economic development. They have an annual operating budget of approximately $150,000; funded half by membership fees and half by grants and donations.

Current Technology

When the NAMC/BCA building was remodeled two years ago, the goal was to install a state-of-the-art computer network. At the time there was insufficient funding to purchase and install all of the desired equipment. However, the NAMC/BCA now deems it possible to continue with this goal in mind.

The existing plan is to allow contractors in the building to purchase Internet access and share printers and centralized computer file storage. This will lower the total cost of doing business in the building because each contractor will not need to purchase his/her own printer and network connection.

The NAMC/BCA would like to allow contractors to share resources such as stored bid information from third parties. In particular, there are several repositories of project specifications and bid requests available through various state and private programs.

Facilities

The NAMC/BCA owns two buildings in the 7000 block of Frankstown Avenue in Homewood. Most of one building was remodeled and renovated two years ago, but the other remains undeveloped and uninhabited.

The single inhabited building has up-to-date telephone and CAT5 wiring and modular jacks, though the network has been completely inoperative since they re-arranged their office just after the remodel. The phone system is operational, but the NAMC/BCA plans to re-wire it to centralize control at a single wiring panel.

The building currently has office space for eight contractors and the NAMC/BCA staff. It also has an entry foyer used as a classroom for the contractor training and workforce development programs.

When completely developed, the NAMC/BCA facility has the potential to triple the available office space. The additional space will be used for contractor offices, classrooms and shared resources such as the print room mentioned above. The NAMC/BCA plans to develop this new space with similar wiring and electrical resources as the existing offices.

Technical Management

There is no individual whose sole job is to maintain the technical environment. However, one of the NAMC/BCA directors is an electrical contractor with knowledge of software and networking. He is working towards a degree in Information Technology, and has already taken courses in Network Administration.

Technical Environment

History

Immediately following the building renovation, the NAMC/BCA computers were networked using Microsoft Windows Networking. Two years ago, however, the office was rearranged, and the network was not reconnected. Since then, the person who maintains the NAMC/BCA computers has not had time (he volunteers his services to the NAMC/BCA) to maintain and reconnect the computers to the network.

Software

Most of the day-to-day work in the NAMC/BCA office is done with Microsoft Office™, and financial and other numerical information is stored in Excel spreadsheets or in paper ledgers.

Wiring

Wiring for the network is already in place, along with an adequate electrical system. There is a 24-port 3Com hub/switch already installed in the wiring closet. The switch appears to be in good condition and tests show it is functional and can be used to network up to 24 computers.

Security

Physical security is not an issue as every office has an independently keyed deadbolt lock. All CAT5 wiring returns to a secure wiring "closet" that currently serves as a NAMC/BCA staff office.

Computers

There are five computers in the NAMC/BCA offices, all of which run Windows 98 or above. An existing server is currently stored off-site, and will require less than $1000 worth of upgrades to support the NAMC/BCA's goals.

All of the computers were purchased separately and have different equipment. At *minimum*, every computer but one has the following equipment:

- 10Base-T LAN card
- Video card capable of 800x600 16-bit resolution
- 6 GB Hard Drive
- Keyboard and Mouse
- 15-inch monitor
- Audio adapter (two are not currently functioning)
- 200Mhz Intel processor (or better)
- Microsoft Window 98™ operating system

The remaining computer is an Intel Pentium 133, running Windows 98. It has no sound card, but has sufficient hard drive and memory resources to do word-processing.

Internet Access

A Digital Subscriber Line (DSL) connection has already been purchased and provisioned, but not installed. This will provide Internet access to all computers in the NAMC/BCA office.

Web Site

There is an existing web site at http://www.trfn.org/namcbca/. In the past, the NAMC/BCA had registered the namcbca.org domain name, but the registration was allowed to lapse due to a lack of funding. The

current site is hosted for free by Three Rivers Free-Net, a free web hosting service maintained by the Carnegie Library of Pittsburgh.

Email

Ms. Couch shares an America On-Line (AOL) account with the NAMC/BCA. She communicates with several clients and funding organization through this account, using the email address namcbca@aol.com. As Ms. Couch's computer is the only computer in the office with an Internet connection, none of NAMC/BCA staff use email for NAMC/BCA business. The NAMC/BCA directors either use their personal email addresses for NAMC/BCA business or do not use email at all.

Scope of Work

We decided to concentrate on:

1. Increasing office efficiency by implementing an office network
2. Improve organizational visibility by recreating the NAMC/BCA web site

1) Increasing office efficiency by implementing an office network

We decided to re-establish the existing office file and printer-sharing network. An office network will provide the benefits of file and printer sharing, and will allow the organization to reclaim several voice lines that had previously been spliced out to serve as data lines for computer modems. NAMC/BCA staff will save time by printing directly to shared printers, rather than swapping diskettes. This will effectively increase the number of projects staff can be working on at the same time.

We plan to implement a peer-to-peer network that will allow the office staff and CEO to share files, printers and a high-speed, DSL connection. Since the computers have already been networked once, we anticipate little difficulty in achieving this end.

Work Plan

We plan to implement a peer-to-peer network in the NAMC/BCA offices. A list of the anticipated milestones follows.

1. Inventory of hardware and software
2. Network wiring
3. Network software setup (Windows 98)
4. Network software setup (file and printer sharing)
5. Network software setup (DSL)
6. Computer cleanup (remove old files and programs)

Expected Outcomes

Upon completing this phase of the work, the NAMC/BCA will have a file and printer-sharing network that will allow them to collaborate more efficiently and better utilize their office printers. The NAMC/BCA technical management will also have the practical skills and knowledge to repair and maintain the office network.

Each computer will have access to the NAMC/BCA DSL connection, and will have the software necessary to browse the Internet and send and receive email.

2) Improve organizational visibility by recreating the NAMC/BCA web site

Like many non-profit service organizations, the NAMC/BCA relies on public and private grants and donations. They also deal extensively with government and private advocacy organizations that refer interested parties to the NAMC/BCA for membership and program information. In addition, they rely partly on volunteers and interns to fill out their office staff.

Visibility and marketing is vital in obtaining funding and volunteer support. Many agencies and volunteers now have email addresses and use them as their primary means of communication. Some volunteers and business go so far as to refuse to do business with an organization that does not have a quality web site and an email address. With the use of the Internet becoming ever more prominent, it is vital that the NAMC/BCA begin to integrate the "web" into their public relations strategy.

Ms. Couch will learn how to develop and maintain a quality web site. This site will help the NAMC/BCA present a unified, professional front to the NAMC/BCA members, volunteers and funding sources.

Work Plan

The initial web site will be relatively simple, and a list of the anticipated milestones follows:

1. Research and purchase web site hosting space
2. Collect and develop content
3. Develop the web site structure
4. Populate the website with content
5. Publish the website

Expected Outcomes

The NAMC/BCA plans to use the website to advertise their programs, attract volunteers and present a professional face to possible sources of funding. The goal for this solution is a functional, professional-looking web site with up-to-date and relevant content. Ms. Couch and one of the office secretaries will both know how to update and maintain the web site.

II. Outcomes and Recommendations

1) Increasing office efficiency by implementing an office network

The office staff can now print to any of the office printers without leaving their workstation. The NAMC/BCA will save money on printer supplies and diskettes, and will be able to do more work in a shorter amount of time. One of the major components of the NAMC/BCA's "new" office network is a DSL connection that provides high speed Internet to the computer in the NAMC/BCA offices.

Sustainability

The office network is based on standard technology and off-the-shelf components. Ben Mooney, the corporate secretary and de-facto technical support resource for the NAMC/BCA, has training in Information Technology (IT) and network management. He will be able to maintain and repair the network in the future (see Appendix A for notes on the NAMC/BCA network implantation).

<u>Recommendations related to the peer-to-peer network</u>

Three recommendations should be considered in order to prepare for future expansion and refinements: (1) create a client-server network to increase network efficiency, (2) prepare a hardware/software upgrade plan, and (3) convert the existing network to DHCP for increased flexibility.

(1) Create a client-server network

The NAMC/BCA office network is a peer-to-peer network, meaning that all network traffic and operations are handled by the individual workstations. All resources (printers, files, etc) are also managed by the individual workstations and, if a workstation "goes down," the resources it manages become unavailable. For example: if one of the secretaries turns a computer off, nobody in the office will be able to access files stored on that computer.

As the office network increases beyond ten workstations, a server-based network will become a necessity. As a general rule-of-thumb, networks of more than ten computers generate more traffic than they can reliable handle.

A client-server network solves this problem by concentrating the network resources in a single, heavily protected server. The server has special hardware and software to ensure that it does not fail and that, if it does fail, it can be rapidly and efficiently restored to operation. All shared resources such as printers, files, the Internet connection, etc are controlled and mediated by the server. This takes the burden off of the individual workstations and increases reliability. Due to the rapidity of technological change, the exact specifications of the client-server network cannot be predicted.

Resources

The following resources will provide general guidelines for evaluating future solutions.

Many computer stores and local retailers sell office network components and will setup and configure an office network for an hourly fee. Additionally, Ben Mooney, the NAMC/BCA corporate secretary, has the skill and training to supervise or carry out the upgrade to a client-server network.

The Tech Soup web site (http://www.techsoup.org/) provides an excellent introduction to office networking issues. The introduction can be found at:

http://www.techsoup.org/articles.cfm?topicid=3&topic=Computer%20Networks

Many computer vendors sell servers pre-configure for office networks. When viewing vendor web sites, terms like "SOHO" (small office/home office), "workgroup server", or "Intranet server" are used to indicate packages that will meet the NAMC/BCA requirements. The following vendors provide quality server solutions and excellent technical support:

http://www.dell.com/
http://www.gateway.com/
http://www.compaq.com/

(2) Prepare a hardware/software upgrade plan

The office computers are relatively up-to-date, most of them having been purchased in the last year or two. However, the rule-of-thumb for computers is that they will need to be upgraded once every three years if they need to have up-to-date hardware, and once every five years if they need only be compatible with current software. These numbers can be stretched by performing carefully selected upgrades. However, these upgrades sometimes cost almost as much as a new computer.

Based on my knowledge of the NAMC/BCA's computing situation and requirements, I estimate that their current computers will need to be upgraded or replaced within from two and a half to three years. Their computers are already two versions of Microsoft Windows™ out of date, and two versions of Microsoft Office™ out of date.

Although the computers themselves will continue to operate indefinitely, essential software packages such as QuickBooks will eventually cease to support Windows 98. Also, DSL providers have already begun to stop supporting Windows 95, and vendors will soon cease to support Windows 98. In order to keep up with software and hardware vendors in the computer industry, the NAMC/BCA must plan to upgrade their computers at least once every four years.

I recommend that the NAMC/BCA develop an upgrade plan to guide their efforts in maintaining their existing network and to protect their technology investment. This plan should contain the following:

- ❑ An inventory of the office computers, including: hard-drive space, operating system and RAM amount.
- ❑ An analysis of whether each computer can handle the upgrade to Windows XP and what, if anything, is required to make that upgrade possible.
- ❑ Pricing information to upgrade each computer from Windows 98 to Windows XP (based on non-profit, bulk pricing).
- ❑ Pricing information to upgrade each computer from Office 97 to Office XP (based on non-profit, bulk pricing).

Resources

The Tech Soup web site provides guidelines for creating a technology plan. The NAMC/BCA does not have the time or the need to develop a complete technology plan at this time. However, these resources can be used to develop an upgrade plan.

http://www.techsoup.org/articles.cfm?topicid=11&topic=Technology%20Planning

Information on pricing for non-profit organizations using Microsoft Products can be found at http://www.microsoft.com/catalog/default.asp. A third-part reseller such as CompuMentor (http://www.compumentor.org/) can be used to obtain the best non-profit and bulk pricing deals.

Resources for determining whether an existing system will support Windows XP can be found at http://www.microsoft.com/windowsxp/home/evaluation/sysreqs.asp.

2) Improve organizational visibility by recreating the NAMC/BCA web site

In addition to implementing the NAMC/BCA office network, we updated and recreated the NAMC/BCA web site. The pre-existing web site (http://www.trfn.org/namcbca/) was out of date, and offered very little room for technological expansion.

The updated web site will help the NAMC/BCA expand their advertising presence to reach new audiences. The web site will eventually reduce the cost of distributing a newsletter by allowing Ms. Couch to publish and distribute an email-based newsletter to member contractors, funding providers, and other interested entities.

Web site hosting purchase

Web hosting space, along with namcbca.org domain name, was purchased from Pair Networks, Incorporated (http://www.pair.net/). The total initial purchase amount was $122.09 and there will be an average yearly expenditure of $84.69 ($65.69 + $19) to retain the hosting space.

Web site hosting ($5.95 x 12)	71.40
$20 One-time Setup Fee	20.00
8% pre-payment discount	- 7.31
Domain name registration ($19 x 2)	38.00
Total	122.09

Web site architecture

The web site was designed with the knowledge that much of the site would be updated infrequently. However, because Ms. Couch plans eventually to "digitize" the NAMC/BCA newsletter, the templates and code for the site were designed to allow her to write custom articles without "breaking" the look-and-feel of the site. The front page of the site (shown below) contains the NAMC/BCA logo, the main site menu and a brief article containing timely and important information for member contractors or other site visitors.
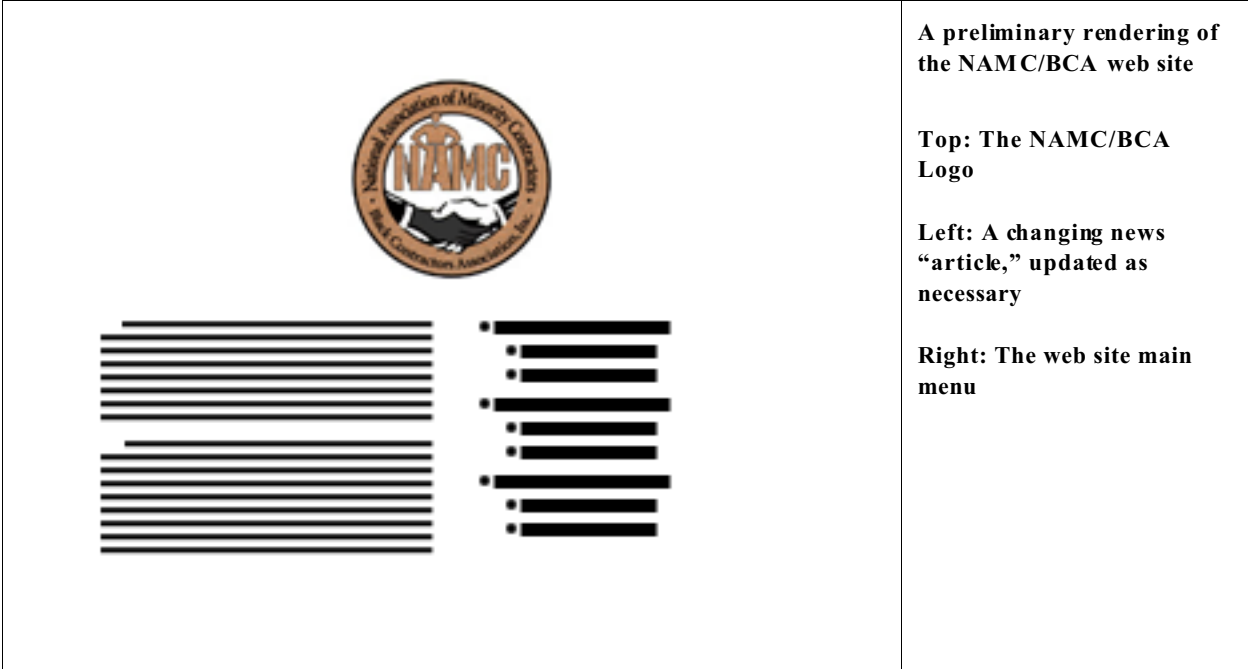
A preliminary rendering of the NAMC/BCA web site

Top: The NAMC/BCA Logo

Left: A changing news "article," updated as necessary

Right: The web site main menu

Ms. Couch identified four primary audiences for the NAMC/BCA web site. They are listed here in approximate order of "importance:"

Audience	Objectives	Site Areas
Member Contractors	Provide information	Newsletter, classes and training programs
Minority Contractors (non-member)	Advertisement, membership expansion	Membership Information
Workforce development participants (minority youth)	Advertisement, program enrollment	Youth Construction Initiative, Prepare for Jobs
Economic Development participants (underprivileged minorities)	Advertisement, education	Affordable Housing, Home Buyers Casses
All	Advertisement, education, obtaining funding	Contact Us, Interns and Volunteers

Each area of the site will be denoted on the menu by a main "audience" category followed by several content areas. Site visitors will be guided into their content areas from the main menu, a structure that allows Ms. Couch to write and organize content that is not directly visible from the main menu. Although the precise nature of the site content has not been determined, we have tentatively decided on the following main menu structure:

- ❑ Minority Contractors
    - ○ Become a member
    - ○ Member Services
        - ▪ Incubator
        - ▪ Education and Training programs
- ❑ Newsletter
- ❑ Workforce Development
    - ○ Youth Construction Initiative (YCI)
    - ○ Prepare for jobs (*similar to YCI*)
- ❑ Economic Development
    - ○ Home buyers classes
    - ○ Affordable Housing[1]
- ❑ Lead Initiative
- ❑ Contact Us
- ❑ Volunteers and Interns

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[1] "Affordable Housing" refers to low-cost or subsidized housing for low-income housing. Prospective participants in this program will understand this term as written.

Sustainability

Training (HTML programming)

Linda Couch, Ben Mooney and the administrative assistant have been trained in the basics of HTML[2] programming. They will be able to make changes and additions to the web site created as a result of this project and they can take courses or read books to learn more HTML programming techniques.

Web site expansion

The "FTP" plan provided by Pair Networks (http://www.pair.com/pair/shared/ftp.html) includes 100MB (100 Megabytes) of disk space, 100MB per day bandwidth (the amount of data that can be transferred within a given time period) and one email mailbox. This is more than adequate for a non-profit organization such as the NAMC/BCA[3]. When the NAMC/BCA is ready to upgrade to a more flexible plan (such as one that allows CGI scripting or database interaction), Pair Networks provides a simple, one-step upgrade procedure.

Recommendations related to the NAMC/BCA web site

(1) Purchase e-mail mailboxes for NAMC/BCA employees

Currently, each NAMC/BCA staff member provides his/her own email address and mailbox. In most cases, this does double-duty as a personal email address. When the staff member leaves the NAMC/BCA organization, contacts that have been in touch with that staff member must be notified of the "change of address," and must update their own address books. A more desirable situation would be to simply "forward" the old staff member's email address to that of his/her replacement.

The NAMC/BCA should consider the needs of each NAMC/BCA staff member and corporate officer, and set up email boxes for individuals who require a private email address in the namcbca.org domain. It may be desirable to set up a separate mailbox for individuals or "roles" such as the CEO or the administrative assistant. This will present a more professional appearance to the world, and will simplify the transition when a staff member leaves the NAMC/BCA organization.

The $5.95/month service provided by Pair Networks includes a single email mailbox with "unlimited" email addresses. This means that NAMC/BCA can host any number of email *addresses*, all pointing to a single mailbox. This mailbox can be checked by only one person. For example:

> ceo@namcbca.org and membership@namcbca.org are both set up to point to the main namcbca mailbox on Pair Networks' servers. When Ms. Couch checks her email, she will download (transfer to her computer) mail for **both** of these accounts.

A single email address is suitable for small organizations in which a single person does most of the email communication. However, just as postal mailboxes help to sort and distribute paper mail, email boxes ensure that mail addressed to a particular employee is read by him or her and not by another person.

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[2] HTML (Hypertext Markup Language) is used to write web pages

[3] 100MB is approximately 100 thousand kilobytes. An average web page uses between ten and fifteen kilobytes. 100MB therefore corresponds to approximately seven thousand web pages.

The next service "level" up from the FTP account with Pair Networks is the "Basic" plan, which provides 10 email mailboxes. Thus, for an additional yearly charge of approximately $45, each NAMC/BCA staff member and "role" can be given his/her own mailbox.

Resources

Information and pricing about Pair Networks' plans and service options can be obtained from their web site: http://www.pair.net/. The "FTP" and "Basic" plan types are considered to be "Shared" Hosting (http://www.pair.com/pair/shared/) because the NAMC/BCA web site will share its server with other low-volume sites.

The Tech Soup web site provides a brief discussion of "What email can do for you:" http://www.techsoup.org/articlepage.cfm?ArticleId=193&topicid=5

Qualcomm (a widely known and respected author of email applications) web site has additional information about using email, along with a link to download their award winning email "client," Eudora: http://www.eudora.com/

(2) Resell e-mail mailboxes to member contractors

The NAMC/BCA's mission is to serve its member contractors and to assist them in developing a successful business, and the Internet is rapidly becoming the quickest and most efficient way to do business and keep in touch with clients. Most people, and NAMC/BCA contractors are likely no exception, do not have the technical skills or the time to develop a professional presence on the Internet. One important component to a professional appearance on the web is a personalized email address from a reputable organization such as the NAMC/BCA.

Using its existing web site account, the NAMC/BCA can provide email addresses and/or mailboxes to member contractors. As with the NAMC/BCA staff, email addresses can be either forwarded to a contractor's ISP (Internet Service Provider) account, or hosted on the NAMC/BCA server. In the former case (forwarding email to the contractors' personal accounts), there is no additional cost to the NAMC/BCA. In the latter case, fees or dues can be used to offset the cost of this service.

Additional mailboxes from Pair Networks cost the NAMC/BCA approximately 45 cents per month (the price per additional mailbox decreases as more mailboxes are purchased). For less than $6 a year, member contractors can be provided with email addresses at namcbca.org.

Resources

The same resources as provided for the previous recommendation also apply for this recommendation.

(3) Update the newsletter and introductory article

The NAMC/BCA web site contains room for a brief article on the "home" page (the first page that most visitors see), as well as a longer newsletter. Both of these will require occasional updating and customization as new events and news become relevant.

The introductory article on the home page should contain information of interest to all audiences, and should provide enough information to "draw" the reader into the site. It should present a complete synopsis of the longer article (if any) in the newsletter.

The newsletter should contain information of interest to the member contractors, as well as to potential members and sources of funding. Topics that might be covered in the newsletter include:

- ❑ Annual financial statement

- ❑ Staff member profiles

- ❑ Contractor "success stories" (to encourage potential members)

- ❑ Notices of upcoming bid requests

- ❑ Registration information for upcoming classes

Resources

The newsletter and the web site will both require occasional updates and customizations. The Tech Soup web site provides good background information on planning, designing and creating web sites: http://www.techsoup.org/articles.cfm?topicid=13&topic=Web%20Building.

A company called *EVR Soft* provides a free HTML editor that is one of the best free computer products available. *EVRSoft 1st Page 2000* runs on Windows 95/95/ME/2000/XP, and can be downloaded from http://www.evrsoft.com/. *1st Page 2000* includes an HTML reference and all the tools necessary to update and maintain a web site.

The Yale Style Guide (http://info.med.yale.edu/caim/manual/contents.html) is published on the Web as well as in book format. It is kept very up-to-date and is respected in professional circles. The Style Guide not only teaches good site design, it also provides an excellent treatment of some of the technologies involved in web site design.

(4) Keep the web site up-to-date

This is one of the most important aspects of creating and maintaining a web site. The NAMC/BCA web site contains room for one article on the front page, and is designed to incorporate a monthly or bi-monthly newsletter. Additionally, the web site contains email addresses, phone numbers and names of contacts within the NAMC/BCA.

The NAMC/BCA should develop a yearly or semi-annual schedule to review and update the web site. This review should look deeper than the newsletter and other frequently updated components. Every link and every piece of information (such as contact names and phone numbers) should be examined to ensure that it is not "dead," out of date, or advertising an event or date that has already passed.

Network Maintenance

Repairing a Physical Malfunction **-** Ethernet cards, switches and CAT5 cabling (the hardware used to network the computers) do occasionally fail. However, the lifetime for this equipment usually exceeds the lifetime of the computer itself. Should any of the equipment fail, it can be replaced without difficulty. If the Ethernet cards fail, Ben Mooney can replace them by following the steps shown on the next page for adding a new computer to the network (begin at step 2).

Upgrading Obsolete Technology **-** The equipment used in this network is industry standard, and is expected to remain current for the next several years. Any technology that must be incorporated into the NAMC/BCA office network will support Ethernet and TCP/IP networking, or will provide a reasonable alternative to interface with the existing network.

Adding new computers

New computers that are added to the network will require the following components in order to "join" the office network. Most new computers come with these components standard, or can be ordered with these components pre-installed.

- ❑ Microsoft Windows™ operating system
- ❑ 10/100 base-T Ethernet card
- ❑ CAT-5 Ethernet cable

Each computer added to the NAMC/BCA office network will require minimal configuration changes. The following list of steps outlines the general procedure for adding a computer to the network:

1. Install Microsoft Windows™ operating system
2. Install and configure 10/100 base-T Ethernet card (see instruction included with card)
3. Install TCP/IP networking services
4. Use the following settings to configure Windows networking:
    - ❑ **Computer name:** choose any name not already in use on the network
    - ❑ **Workgroup name:** NAMCBCA
    - ❑ **IP Address:** 10.0.1.xxx (where xxx is any number from 1 to 255 not already in use on the network.
    - ❑ **IP subnet mask:** 255.255.255.0
5. Install Windows file and printer sharing
6. Configure and share any attached printers
7. Configure any shared printers that will be accessed from this workstation

This procedure should take less than 45 minutes per computer, and can be performed by any qualified network technician. Qualified network technicians should have experience working with TCP/IP and Microsoft Windows Networking.