STARRCO

Responsive | Friendly | Easy | Knowledgeable | With Integrity

PRE-ENGINEERED OFFICES & ENCLOSURES

PORTABLE BUILDINGS

11700 Fairgrove Industrial Blvd.
Maryland Heights, MO 63043
starrco@starrco.com

(314) 567-5533 (800) 325-4259
Fax: (314) 567-7555
www.starrco.com

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Chapter 1

THE STARRCO EXPERIENCE

THE STARRCO EXPERIENCE

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Starrco's MISSION is to create the best solutions for effective space utilization.

Our corporate VISION is to lead the industry in providing support and value for a growing number of partners and repeat customers.

To allow us to achieve our mission and accomplish the company vision, we created *The Starrco Experience*.

The Starrco Experience is defined by five simple phrases:

- Responsive
- Friendly
- Easy
- Knowledgeable
- With Integrity

These five phrases guide how we do business and how we treat our customers. They drive everything we do from the moment someone contacts us until a project is completed.

The Starrco Experience. Let us show you how business should be done.

SUSTAINABILITY COMMITMENT

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Starrco is committed to environmental stewardship, and we strive to minimize the impact of the construction business on the environment, today and in the future.

Starrco components are pre-cut and pre-finished at our facility. No cutting, sanding or painting is required at the jobsite. Starrco uses gypsum board featuring 95% post-consumer materials and paper facing that is 100% recycled material. recycled material. Our aluminum frame work is 70% reclaimed or scrap material. When your business needs change, Starrco products are designed to be reconfigured and re-used, creating no additional contribution to landfills.

All of our products support environmental efforts for those companies who want to incorporate a sustainable design into their organization. As an additional benefit our products provide various elements in the LEED qualification of your building.

STARRCO SALES PROGRAM & PRODUCT SUMMARY

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I) Introduction

1. Starrco is committed to environmental stewardship, and we strive to minimize the impact of the construction business on the env systems in 1965.

2. By limiting the number of products we offer, it allows us to focus on providing the highest quality material and design for the systems we manufacture.

3. Starrco does NOT market our products based on price only. We are looking to partner with relationship based dealers who are continually looking to exceed their customer's expectations.

II) Dealer Support

1. Starrco provides the best business development program in our industry. This includes:

    - Multiple sources for generating qualified leads
    - Mailers and postcards for end user targeting
    - Territory Managers dedicated to dealer support. Our Territory Managers are Starrco employees who dedicate 100% of their time to our products and services
    - Starrco is a long time member of MHEDA. Starrco's president, Bryan Carey, recently served on the MHEDA Manufacturers Board of Advisors

2. Comprehensive sales support tools including:

    - Dealer binder designed to walk a salesman completely through the sales process
    - High quality 12 page brochure with application photos and testimonials
    - Complete specification document detailing products and applications
    - Dealer specific mailers and brochures
    - Sample kit that includes all products plus many optional accessories
    - Technical support staff including inside sales has over 70 years of industry experience

3. Starrco's inside sales team is highly experienced and well trained. Several team members have Installation experience that allows them to handle job site inquiries from installers and customers.

4. Quote turn around is quick and accurate. Dealer sales person does not have to spend time pricing the product and can concentrate on selling.

5. Starrco's main focus is on doing the job right the first time so the dealer is spending less time supporting the product and more time selling.

III) Products

1. Starrco uses only structural aluminum framework for our wall systems. Aluminum resists corrosion and will not rust.

2. All framing components and wall panels are pre-cut at the factory, even for our most economical system. Installation time is significantly reduced and the jobsite is left much cleaner than with systems that require field cutting.

3. All the components are labeled making identification quick and easy, especially for an installer who is not familiar with our products.

4. Starrco developed a steel door frame that locks into the framing. The design is easy to install and eliminates shifting and racking that can occur with traditional door frames.

5. Starrco designed a modular central HVAC system. This system is pre-charged and allows you to provide and install a central HVAC system without the need to coordinate with an HVAC contractor.

6. Our products are packaged on reinforced wood skids with four-way forklift access. The skids are protected with "dunnage" panels on top and bottom, shrink wrapped, reinforced at the corners and banded.

7. All packages come with an individual material list that allows the installer to determine what components are in each package.

IV) Operational Issues

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1. Starrco's standard lead time for our office wall systems is 3-4 weeks after receipt of order. All "quick ship" requests are reviewed on an individual basis. Every effort is made to accommodate a customer's requirements.

2. Starrco supplies CAD drawings for all orders. Presentation drawings for quotes are available upon request.

3. Starrco offers a full one year warranty on all of our products. Labor charges are covered on any items found to be defective. Labor charges are to be submitted to Starrco in writing prior to any work being performed.

4. Starrco's standard payment terms are Net 30 days. On projects that exceed $50,000.00, we require a manufacturing deposit of 33% with the order.

5. Starrco's interior office systems are shipped in a closed van via common carrier. Larger projects will ship on a dedicated truck. If you have a truckline you work with regularly, we will be happy to ship the product on that carrier. We do not recommend shipping the interior offices on a flatbed truck.

6. Starrco carries all of the required general liability, product liability and excess liability insurance. A certificate of insurance is available upon request.

TAXES AND STARRCO PRODUCTS

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The current tax laws allow very favorable depreciation on all Starrco modular offices, portable buildings and mezzanines. These products qualify for a 7-year depreciation period while conventional construction is depreciated over 39 years.

Conventional construction, by its nature, becomes a permanent structural addition to a building, and thus it is classified as **"real property"** with the longer **39-year depreciable life**.

Starrco products, on the other hand, can be fully dismantled, relocated, and reassembled. This mobility, under the Modified Accelerated Cost Recovery System (MACRS), allows the Starrco products to be classified as **"tangible property"** with a shorter **7-year depreciable life**.

EXAMPLE:

Assume the cost of a new office is $20,000. At the end of 8 years (½ year depreciation in the year of acquisition and in the 8th year of the life of the office) the Starrco Modular Office System has fully depreciated and reduced taxable income by the original $20,000 cost. Conversely, the conventional construction has depreciated 21% and reduced taxable income by $4,103. Assuming a 34% tax rate you pocket $5,405 in tax savings over the first 8 years.

CONSTRUCTION METHOD	COST	8 YR DEPRECIATION DEDUCTION	TAX RATE	8 YR TAX REDUCTION
Starrco Modular Office	$20,000	$20,000	34%	$6,800
Conventional Construction	$20,000	$4,103	34%	$1,395
8 Yr Tax Savings				$5,405

If the difference in the reduction of taxes ($5,405) were invested at 8% for the remaining 31 years, the result would be substantial and could approach $64,000.

The accelerated depreciation for Starrco products means faster recovery of the total cost.

Under **Section 179 of the Internal Revenue Code**, tangible property may be treated as an expense deduction rather than a capital expenditure. The maximum deduction allowed changes annually. Please check with your tax professional regarding the current deduction amount.

Since tax laws are constantly being modified, we suggest that you consult with your company accountant to determine the application of these provisions.

INTRODUCTION TO PRE-ENGINEERED OFFICE SYSTEM CONSTRUCTION

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Pre-Engineered office systems can be used for a wide variety of applications. The flexibility and structural integrity of Pre-Engineered construction allows for virtually unlimited uses, including:

- Personnel Offices
- Conference Rooms
- Lunch/Break Rooms
- Quality Control Rooms
- Smoking Rooms
- Equipment/CMM Enclosures
- Supervisor's Offices
- Cleanrooms
- Executive/Administrative Offices
- Parts Distribution Areas
- Computer Rooms
- Two Story Offices

Pre-Engineered vs. Conventional Construction

Starrco Pre-Engineered offices feature several advantages over traditional "stick-built" and block construction. The offices are engineered for easy installation and relocation while providing the structural integrity and strength of conventional construction. A summary of the advantages of Pre-Engineered construction are listed below:

- Flexibility – The wall panels and framework are pre-finished creating a system which is 100% reusable. This makes modifying and expanding existing offices quick and easy.

- Pre-engineered – Starrco wall systems allow for multiple configurations including two-story offices, load-bearing systems and single person portable offices.

- Structural – Starrco wall systems are engineered to be durable and maintenance free. We can design offices to meet the most demanding conditions including seismic loading requirements.

- Installation – The walls and framework ship pre-finished and cut to size allowing for quick installation with minimal disruption to the surrounding workspace. Each system will include a detailed CAD drawing and material list. The components are individually labeled allowing for easy identification of parts by crews unfamiliar with Starrco's materials.

- Taxes – Starrco's products can be fully dismantled, relocated and reassembled. This mobility allows our products to be classified as tangible property with a seven- (7) year depreciation life (in lieu of the 39-year life of conventional construction).

PRODUCT SPECIFICATIONS

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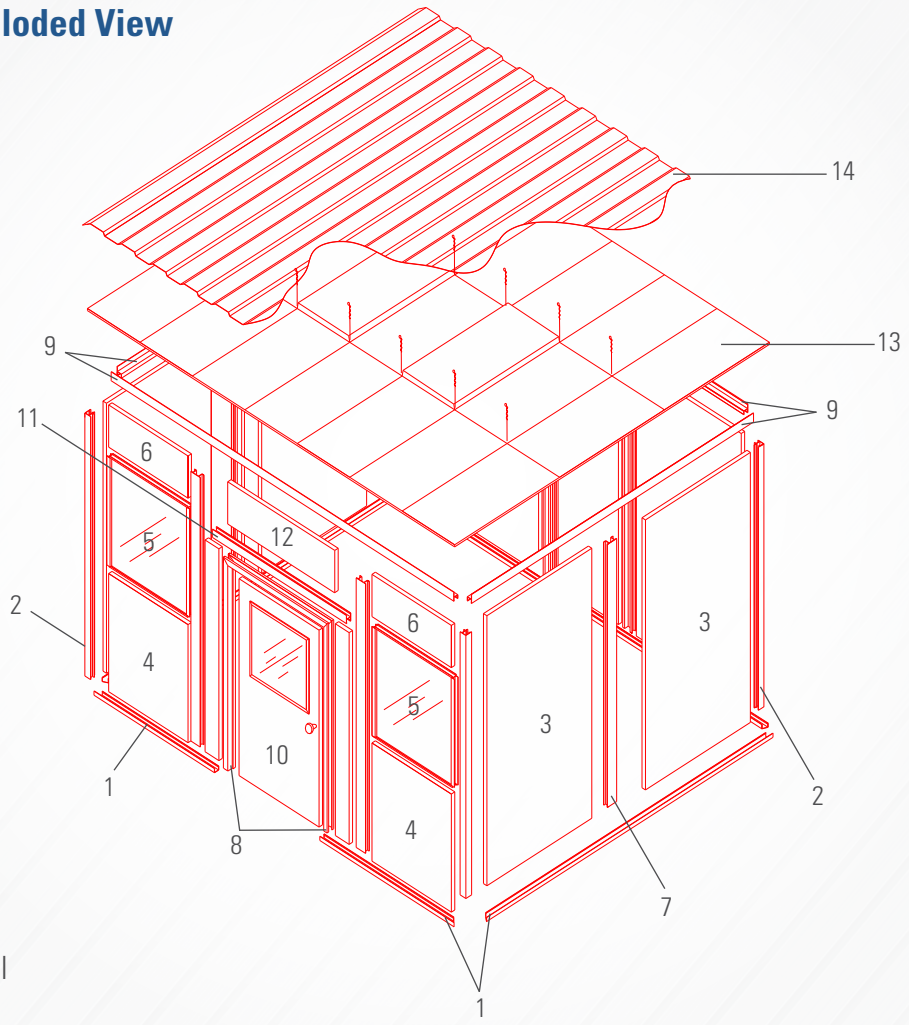
Starrco manufactures two different Pre-Engineered office wall systems with 3" thick panels. Each system features design characteristics that will meet a wide array of office applications and requirements. The following pages include detailed specifications on each system plus general information useful when designing an office.

Typical Office – Exploded View



Parts List:

1. Floor Track
2. Corner Post
3. Wall Panel
4. Lower Window Panel
5. Window
6. Upper Window Panel
7. Wall Stud
8. Steel Door Frame
9. Ceiling Track
10. Door
11. Header Stud
12. Header
13. Grid Ceiling
14. Dust Cover

SS3000 - 2 piece w/removable cover plate
SS3500 - 2 piece w/removable cover plate

Chapter 2

PARTNERING WITH STARRCO

OFFICE PLANNING & DESIGN CRITERIA

The design and layout of an office incorporates many different factors.
Some of the items to keep in mind when planning an office are:

- Number of people working in or using the office.
- Location of the office in your facility.
- Environment around the office location. i.e. Is it noisy? Is there equipment nearby generating heat or chemical residue that the office should resist? Will the location take away from valuable work or storage space within the facility?
- Flexibility. The layout should allow for changes and revisions that will inevitably occur.
- Potential downtime. How long will it take to erect and finish the office?
- Total cost including maintenance.

The purpose of this manual is to give you the knowledge that will allow you to analyze the factors listed above and then design an office space to meet your present and future needs. The following pages will include information on wall systems, sound control, heating, cooling, electrical requirements…virtually everything you need to consider when planning an office space.

SURVEY OF QUESTIONS FOR MODULAR OFFICE SYSTEMS

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Listed below are some questions we recommend asking your customer regarding their office requirements. The customer's responses will help us determine which product is best suited to satisfy their needs:

1. What is this building going to be used for? i.e. Office, Equipment Enclosure, Breakroom, Laboratory, etc.

2. What are your main concerns regarding the performance of this building?

    - Temperature Control
    - Sound Control
    - Fire Resistance
    - Chemical Resistance
    - Protection of Employees and/or Equipment From Surrounding Environment
    - Some Combination of the Above

3. Will this building be relocated or expanded in the future?

4. Do you have a drawing of the new building? If not:

    - What is the size of the building?
    - Is this a four wall structure or will it be connected to one or more existing walls?
    - Do you have a specific interior height requirement? (Standard is 7'6")
    - How many doors and windows are required?
    - Do you have any special electrical requirements?
    - Will you need air conditioning or heating?
    - Do you have any special requirements or want any options not listed above? (i.e. Special Wall Finish, Special Door Locks, etc….)
    - Reference Starrco's Request For Quote Form

5. Will the customer be installing this building with his personnel? Starrco has qualified installers located around the country to handle any installation.

6. Do you currently have a modular office system in your facility? If yes, who was the manufacturer?

7. Were you happy with the performance of the existing system?

JOB-SITE SURVEY

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The following are areas of concern which could impact the quality of installation on your STARRCO pre-engineered office system. By examining these areas early and clearly indicating them on a drawing with dimensions keyed to your office layout, STARRCO can better fill your customer's needs.

- Building columns: Note locations, orientations, sizes of columns and base plates.
- Floor condition: Note any unusual aspects such as excessive slope, uneven sections, or curbs. Is floor sufficient for point loads if load-bearing applies?
- Overhead obstructions: Note any sprinkler pipes, electrical conduit or trays, overhead cranes, or conditions such as a leaking roof.
- Existing walls: Note wall type and any existing attachments to the wall such as conduit, water pipes, circuit breaker boxes, etc. Are there any areas we are attaching to which are recessed or require special attention?
- Existing windows or doors: Note locations and dimensions. Describe what dimensions are taken from such as block wall or mullions. Be aware of heights and sizes which may infringe on ceiling placement or attachment of dust cover support angle.
- Manufacturing process: Note traffic aisles and be aware of door swings. Be aware of processes that may produce unwanted conditions such as excess heat or moisture and describe. Note areas where condensate lines for thru-wall air conditioning may empty. Are there excessive airborne debris that may impede the proper performance of air conditioners. Will there be excessive heat loads inside this office that should be considered in sizing the correct a/c?

Addressing these areas early not only helps to insure that the office is pre-engineered properly, but could also point out areas where additional labor may be incurred. The above items are meant to be used as a guideline and may not be inclusive of all conditions which may be encountered.

PROJECT SURVEY SHEET

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Date: _____

Dealer: _____ Salesman: _____

End User Name: _____ End User Contact: _____

Site Address: _____

City: _____ State: _____ Zip: _____ Phone: _____ Fax: _____

1. Desired date for modular office system to be installed: _____
2. What will this office system be used for? _____
3. Do you have plans to expand or move this office sometime in the future? _____
4. Dimensions: _____
5. Load-bearing roof? (yes/no)
6. Draw layout of building on attached grid sheet: (show any internal walls, windows and door ways)
7. What panel type? ___DL ___SP ___SC ___Special Panel Construction: _____
8. Inside Ceiling Height: _____ Exterior Wall Height: _____
9. Sound Protection required? (yes/no)
10. Do you have enough room in the ceiling plenum area to run electrical, HVAC, etc.? (yes/no)
11. Will Starrco supply electrical components? (yes/no) Field Wired or Modular? (yes/no)
12. Air Conditioning? (yes/no) Heat? (yes/no) Exhaust fan? (yes/no)
13. Who is supplying the A/C and Heat? _____
14. Starrco to provide acoustical ceiling? (yes/no)
15. Number of Doors: ____ Any special size doors required (standard size is 3'0" x 6'8")? _____
    Glass in door/standard? (yes/no) Door sweep? (yes/no)
    Door threshold? (yes/no) Door gaskets? (yes/no)
16. Number of Windows: ____ Special glazing required? (1/4" tempered safety glass is standard) _____
17. Who is installing modular building? (Client or Other)
18. If installation by others, will install crew be allowed to use customer's forklift? (yes/no)
19. Safety Rail? (yes/no) If yes, please indicate safety rail location on office layout sketch.
20. Are permits required? (yes/no) If yes, who is responsible for securing them? _____
21. Will customer allow trash to be disposed of in their dumpsters? (yes/no)
22. Do you need sprinklers? (yes/no)
23. Plumbing of any type? (yes/no)
24. Shipping estimated to zip code of _____? (yes/no)
25. Flooring? (yes/no) If yes, what type is required?

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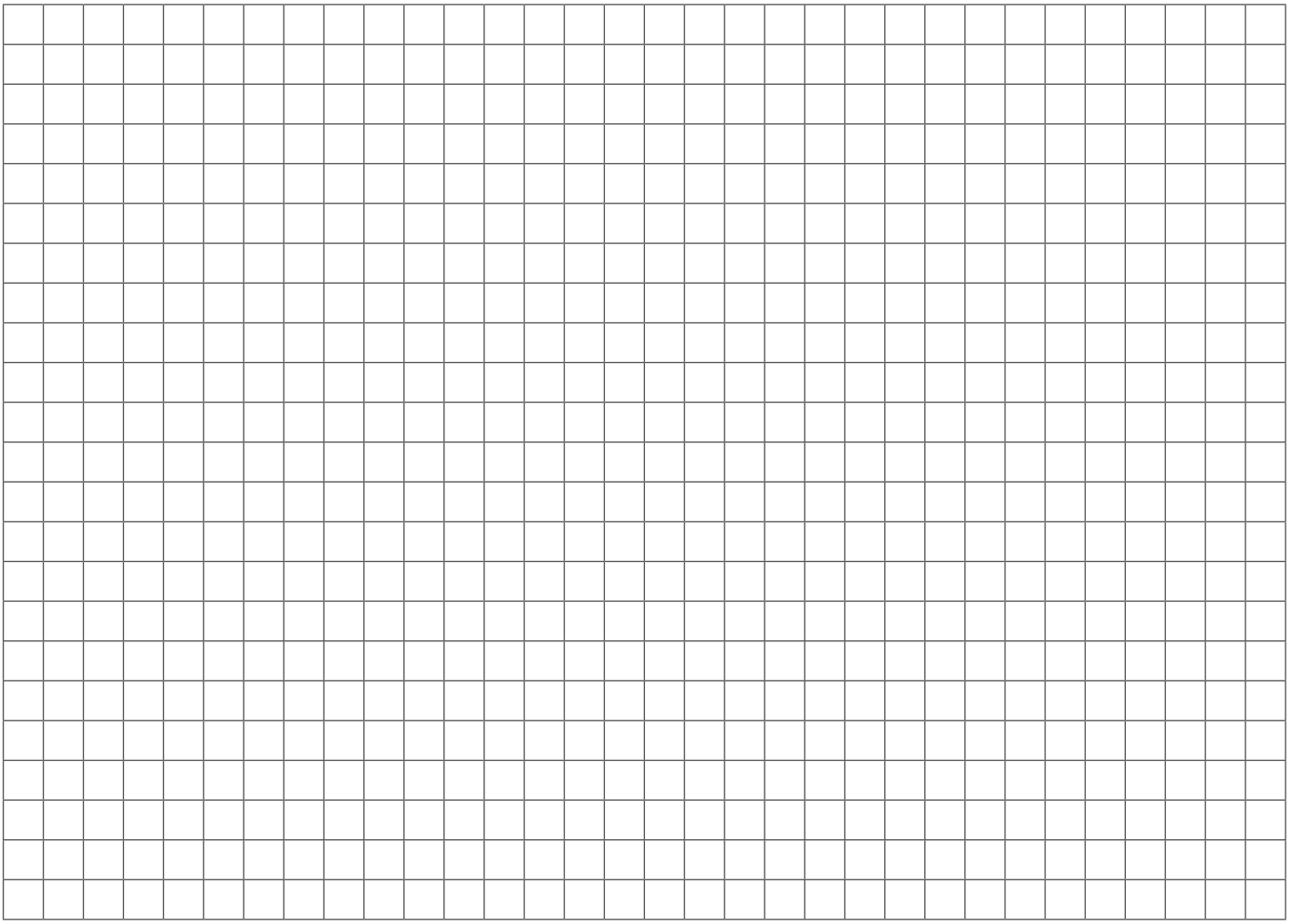
- Drawing required with every order
- All details must be clearly indicated
- Include location of windows, HVAC, cutouts
- Location and swing of doors
- Make a special note of critical dimensions



LEGEND

W	Window Panel	AC/HT	Combination Unit or Cutout Only
SW	Sliding Window	$	Switch
A/C	Air Conditioner	⫼	220 Volt Receptacle
⫐	110 Volt Receptacle		

INFORMATION REQUIRED WHEN PLACING STARRCO ORDERS

THE FOLLOWING INFORMATION IS ESSENTIAL FOR STARRCO
TO COMPLETE YOUR ORDER IN A TIMELY AND EFFICIENT MANNER.

1. FIRST TIME ORDERS:

- Signed Dealer Application With Bank And Credit References
- Sales Tax Exemption Certificate

2. COMPLETED PURCHASE ORDER MUST CONTAIN:

- Name And Address Of Purchasing Company
- PO Made Out To Starrco As Vendor
- Phone Number Of Office That Will Be Paying Bill
- Complete Shipping Information, Including:
  - > Ship To: Company, Address, Phone No. And Contact Person
  - > Tag Number
  - > Shipping Instructions Regarding:
    - – Specific Truck Line Choice Or Best Way
    - – Collect Payment Or 3rd Party Bill
    - – Date Shipment Is To Be Delivered/Received
- Reference The Starrco Quote Number
- Brief Description Of Office Or Building
- Purchase Price Of Building
- Terms: Net 30 Days

3. BUILDING INFORMATION:

Layout (Plan View) Showing The Following:

- Dimensions (Outside)
- Door Location, Hinge And Swing
- Orders With Modular Electric Must Show Location Of CB Box, Outlets, Switches, Etc.
- Window Locations (Note Any/All Special Heights)
- Interior Walls
- A/C Locations
- Size And Location Of Cut-Outs Or Framed Openings
- Color(s) Of Panels, Interior And Exterior
- Extrusion Color

4. NOTE ALL OPTIONS OR SPECIAL ITEMS:

- Reference Original Quote Number If Possible And Send Worksheet With Order.

We at Starrco pride ourselves on our ability to serve our customers. This Starrco fact sheet tells you who you will be dealing with and other pertinent information about our company.

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Mailing/Shipping Address & Phone Numbers:

Starrco Company, Inc.
11700 Fairgrove Industrial Blvd.
Maryland Heights, MO 63043

Phone: 314-567-5533
Toll Free: 800-325-4259 (All States)
FAX: 314-567-7555

Website:

www.starrco.com

Office Hours:

7:30 A.M. - 5:30 P.M. Central Standard Time

Who Should I Call?

1. Price Quotations, Order Placement, Shipping Information, to Check on Existing Order – Sales at (800) 325-4259.
2. To Order Literature or Samples – Sales at (800) 325-4259
3. Question Regarding Invoices, Credit, Etc. – Sales Support at (314) 400-5700

Click to View Current Personnel (Listed in Alphabetical Order)

Chapter 3

PRODUCT LITERATURE

MODULAR OFFICES & ENCLOSURES

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Interior Solutions for Today and Tomorrow

From 1- Story Offices...

From a single office to two-story multiple office systems, no job is too small or too large. Starrco pre-engineered modular enclosures provide flexible solutions to fit your ever changing needs.

Administrative offices
Shipping and receiving offices
Cafeterias and break rooms
Conference rooms
Sound, paint and dust enclosures
Cleanrooms
Plant foreman's office
Computer and engineering labs

To 2- Story Multiple Office Systems...

Two-story structures can be designed to better utilize space and maximize your investment. With Starrco pre-engineered space solutions, you can install quality offices for as low as $20 per sq ft.

Pre-engineered for Fast, Easy installation...

Starrco modular offices & enclosures are completed in about 25% of the time of conventional construction. You can drastically reduce your down time with no mess, dust or debris. Often, your Starrco office can be installed over the weekend, ready for occupancy (and work) Monday morning in a clean, quiet, comfortable environment.

Saves Money and Taxes, Too

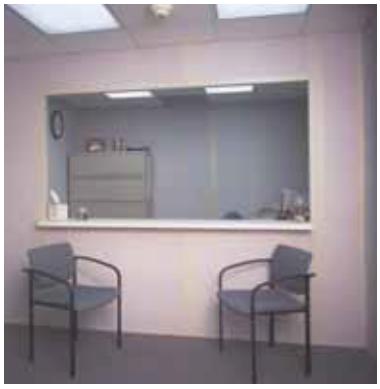
Starrco pre-engineered office systems can save you up to 50% of your total project cost compared to traditional construction. All material is pre-cut, mitered and completely finished. You save the cost of sanding, painting or wallpapering. We also provide built-in electrical raceways for easy installation of electrical, phone and computer wiring.

Starrco offices & enclosures can be completely dismantled, relocated and reassembled. Therefore they can be depreciated over 7 years as opposed to 39 years required with conventional construction. This difference results in an immediate reduction in taxes and saves you money. Bottom line: Starrco significantly reduces your capital expenditure.

Designed to Your Specifications

Starrco modular office systems are pre-engineered and manufactured to precisely fit your application.

All materials come completely finished and require no sanding or painting. Starrco's wide variety of materials, finish and colors allow owners, architects and contractors the freedom to design offices from high profile administrative offices to industrial applications.



THE STARRCO ADVANTAGE

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From a two-wall structure to a two-story multiple office complex, every Starrco modular office system comes with the Starrco Advantage.

The Starrco Advantage means:

- Each project begins with a careful needs assessment. The office is then designed and engineered to precisely fit your application.
- Tax advantages and significant cost savings over conventional construction.
- The flexibility to easily and conveniently expand, reconfigure or relocate your Starrco enclosure when your needs change.
- Raceways are built in to allow quick installation of electrical, telephone and computer wiring.
- Aluminum track and posts are more durable and will not rust or corrode.
- A two-piece wall stud design allows panels to be easily removed or replaced.
- Detailed CAD drawings along with individually labeled components make your installation fast, easy and completed in a fraction of the time of conventional construction.
- All materials are pre-cut, mitered and completely finished.
- Installation is completed quickly, with minimal mess, dust and disruption to your operation.

When you choose the Starrco Advantage, you'll get a custom designed modular office system that is pre-engineered and manufactured specifically for your needs.

TOP QUALITY MATERIALS ENGINEERED TO EXACTING STANDARDS

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Every Starrco modular building, whether a single one-story office or a large two-story complex, begins with selection of the system that best fits your application. The next key part of the design of your building is selection of the correct wall panels. Starrco's 3" thick wall panels are completely self-contained, allowing your structure to be reconfigured easily and conveniently.

Then we'll add:

- Windows that meet all applicable standards
- Commercial grade steel or wood doors
- A corrugated steel roof deck and drop ceiling system, including lighting
- A standard or pre-wired modular electrical system;
- A variety of other options to maximize the functionality and appearance of your building

All of your components are manufactured to our precise standards, labeled and delivered with a complete set of CAD drawings to make on-site installation quick and convenient. Our quality packaging minimizes shipping damage and the resulting delays. From initial design to finished installation, the Starrco Advantage can insure that your project runs smoothly.

Deluxe Noncombustible Panel (DL)

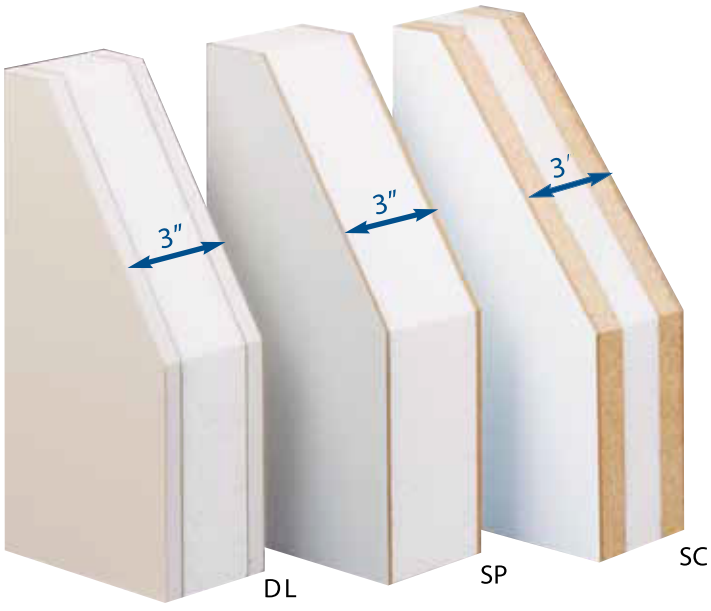
- Vinyl covered gypsum board interior & exterior/rigid polystyrene core
- STC rating of 28
- Thermal rating of R11
- Class A noncombustible

Standard Panel (SP)

- Vinyl covered hardboard interior & exterior/rigid polystyrene core
- STC rating of 22
- Thermal rating of R13

Sound Control Panel (SC)

- Vinyl covered hardboard interior & exterior/ high density particle board substrate and a rigid polystyrene core
- STC rating of 33
- Thermal rating of R10



Standard panel colors are khaki, grey and white (custom colors are also available).

UNIQUE STUD SYSTEM ADDS STRENGTH, FLEXIBILITY

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The choice of the stud system for your Starrco enclosure depends on the use of the space both now and in the future.

All studs in Starrco modular office systems accommodate quick and easy vertical installation of electrical, data transmission and communication lines in raceways accessible from a removable cover plate.

Made of structural grade extruded aluminum, the SS3500 stud acts as a structural column on spaces with long clear spans, on two-story structures or for load-bearing roofs. The stud system will accommodate steel tube inserts for additional load-bearing capability.

The innovatively designed SS3000 is a two-piece stud that allows both sides to be equipped with electrical devices and communication receptacles.

The design of both studs allows removal and replacement of a wall panel without disturbing adjacent panels. The design also allows the system to be easily revised and reconfigured as your needs change.

SS3000 Stud

Track and posts are available with a baked on paint finish.

SS3500 w/ Optional Steel Tube Insert

DOORS, WINDOWS, FINISHES AND OPTIONS COMPLETE YOUR PROJECT

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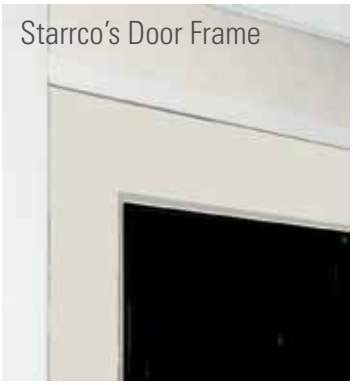
The doors, windows and wall panel finishes that you choose reflect both the style and function of your Starrco modular enclosure.

You can pick a commercial grade steel or wood door. Both doors come with Starrco's unique three-piece steel frame that will never get "out of square" and ball bearing hinges for smooth opening and closing. The top half of the door includes 1/4" tempered safety glass. Special door hardware can be included at your option.

Starrco's standard windows are 1/4" tempered safety glass which meet all applicable ASTM and ANSI standards. Special glazing options include sliding windows, full height windows and more.

Starrco's wall panels are available in three standard colors: Khaki, White and Grey. Optional wall finishes are available including painted aluminum, painted steel, fiberglass reinforced plastic and more.

Electrical options include standard field wired components or Starrco's exclusive modular Quick-Tric pre-wired electrical package. The wide variety of materials and finishes is an important part of the Starrco Advantage. It lets you create a modular space solution that reflects the function and individual "look and feel" of your company.

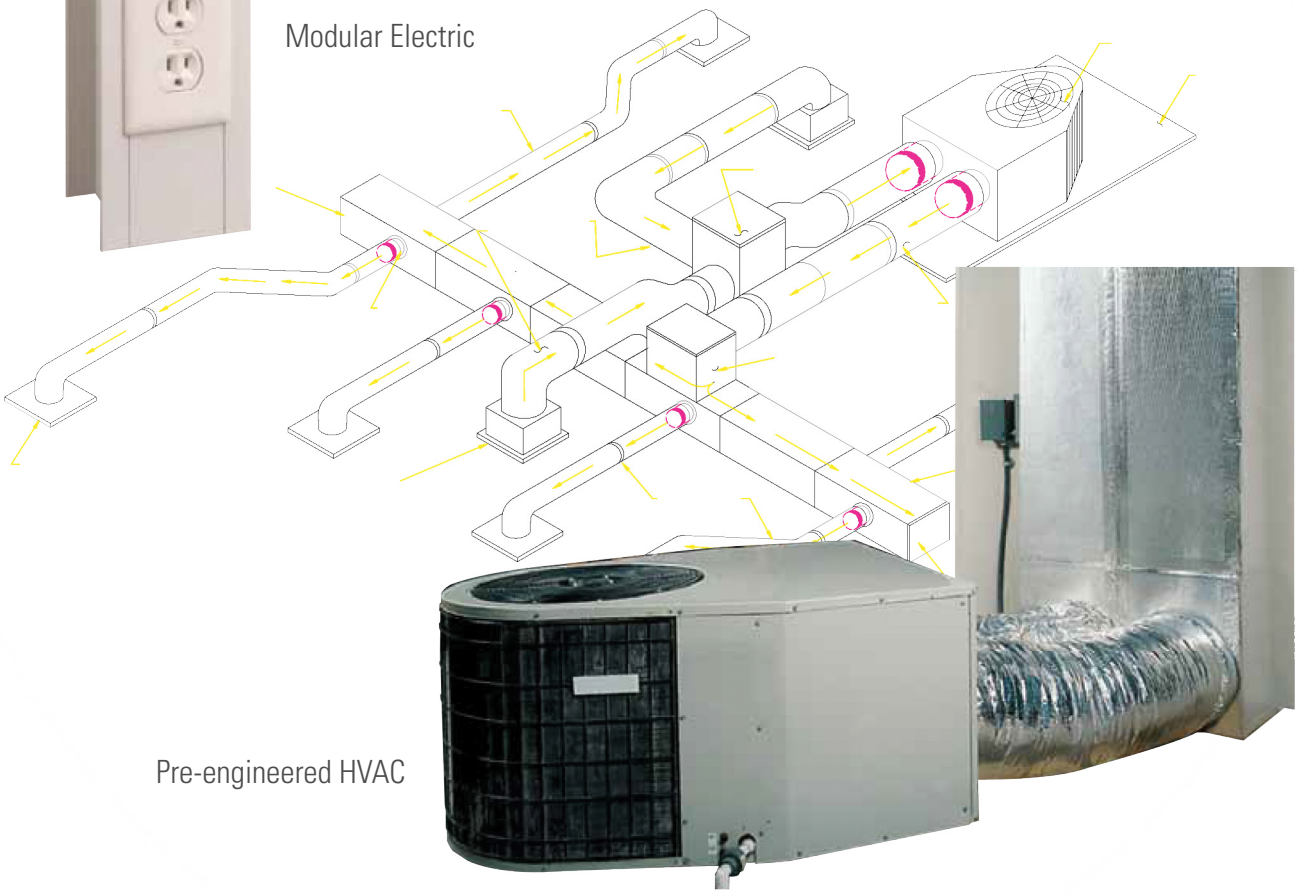

Starrco's Door Frame


Competitor's Door Frame

- Starrco's innovative door frame locks into our stud eliminating movement which results in smooth, hassle-free operation
- Low profile design is flush with the wall surface
- Traditional drywall style frame requires constant adjustment
- Their frame has an unsightly 1/2" protrusion from the wall surface

Full View Tempered Safety Glass

Modular Electric



Pre-engineered HVAC

Enhance the form and function of your Starrco modular office or enclosure with any of these options:

- Pre-wired modular electrical system
- Pre-engineered heating and air conditioning unit
- Doors with full length glass
- Custom door hardware
- Ceiling insulation
- Custom glazing


COLD
DRINKS


818-2510
CoxHEALTH
Sports Medicine

PRE-ASSEMBLED PORTABLE BUILDINGS

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Selection

Starrco has been providing Pre-Assembled Buildings since 1965. Our success and growth is built on our steadfast commitment to innovation, technology and our unparallel customer service. We always seek better, faster and more economical ways to design, engineer and manufacture portable buildings. With our network of factory-trained distributors, supported by our St. Louis staff, we complete projects on time and on budget.

- Kiosk
- Airport Taxi Dispatcher
- Parking Booth
- Toll Booth
- Security Guard House
- Airport Rental Car Office
- Portable Office
- Ticket Booth

Engineering Specifications

Starrco's pre-assembled buildings are designed to provide years of maintenance free service. The structural members are either aluminum or steel with a rust retardant finish. Walls, ceiling and floor have a solid impact resistant core with a durable aluminum or vinyl covered finish. Windows and sliding doors are aluminum finish, swing doors are commercial grade steel. The model number of the building indicates its approximate size. (i.e. Model #46 is 49" wide x 78" long). The overall height of the building will be a nominal 90" with an interior height of 82".

STRUCTURAL:

The loading characteristics of the buildings are: Snow Load: 30 PSF, Wind Load: 90 MPH, Floor Load: 50 PSF

FRAMEWORK:

Structural members for corners are 3" x 3", 1/4" aluminum angle. Structural members between panels are 4" x 2 -1/2", 3/16" aluminum "T" extrusion. Top frame will be 2 -1/2" x 2 -1/2", 3/16" aluminum angle. All aluminum structural members will be 6063 alloy, T6 temper, with painted grey enamel finish.

PANELS:

Wall panels are a minimum 3/4" thick sandwich construction. Exterior of panel is smooth white painted aluminum laminated to high density OSB board. Panel interior will be 1/8" gray vinyl covered hardboard. Panels will be caulked with a urethane sealant and fastened to structural members with plated screws.

CEILING:

Ceiling panels are a minimum 3/4" thick sandwich construction. Interior of panel is 1/8" white vinyl covered hardboard laminated to high density OSB board. Top of panel will have an aluminum vapor barrier.

FLOOR/BASE:

The building base will be 4" structural steel channels, welded, with stringers on maximum 24" centers. Base includes forklift pockets. Steel channels will be painted with a rust inhibitive paint. Sub-flooring is two layers of 5/8" OSB board with aluminum vapor barrier laminated underneath. Finished floor will be commercial grade seamless vinyl.

ROOF:

On buildings 4' wide or less, the roof will ship installed on the building. Installed roof consists of .060" EPDM membrane laminated to ceiling panels with aluminum gutters on all four sides. On buildings larger than 4' wide, roof consists of corrugated aluminum pans. Perimeter of roof will be anodized aluminum gutters and fascia trim. Roof is shipped knocked-down, ready for on-site assembly by others.

WINDOWS:

Windows will be single sliding aluminum with locking device. Sliding sections are glazed with 1/8" clear tempered safety glass. All window framing is aluminum with white enamel painted finish.

DOORS (Swinging):

Door will be a commercial grade 3068 20ga. steel with a 1/8" tempered safety glass window in top half. Door includes 1-1/2" pair of 4-1/2" x 4-1/2" ball bearing hinges and a stainless steel key-in-knob lockset. Door will be mounted on a painted aluminum door frame with wool pile weather strip. Door is painted white.

DOORS (Sliding):

Door will be 6068 aluminum patio sliding type. Doors will be glazed with 3/16" tempered safety glass in upper section and have a solid panel in lower section. Keyed locking device with pull handle is included. All door parts are a painted aluminum finish. Buildings with a model number ending with "-1" indicate two sliding doors are included on the long walls.

ELECTRICAL:

Pre-wired electrical package includes one 125v duplex receptacle, one 230v single receptacle, fluorescent lighting, and one 125 amp circuit breaker box. All electrical components and wiring conform to National Electrical Code.

Advantages

- Buildings are shipped fully assembled, ready for immediate use.
- All buildings are custom designed to meet your specific application.
- Full support capabilities, including initial layout and design.
- Buildings are designed with an electrical package that includes lights, switches, outlets and a circuit breaker box.
- Aluminum extrusions and exterior wall panels are more durable, with no rust or corrosion.
- Buildings can be fitted with forklift pockets for easy relocation.
- Optional equipment, finishes and colors allow you to order exactly what you need.

Optional Equipment

- Air Conditioning and Heating
- Exterior Lighting
- Thermal Insulation
- Custom Painted Exterior
- Special Glazing (Tinted, Insulated, Polycarbonate, etc…)
- Countertops and Shelving
- Standard or Thru-Wall Cash & Transaction Drawers
- Aluminum Tread Plate Flooring

Order Information

Ordering standard sizes from this catalog saves you time.

Model Number (Hinged Door)	Exterior Dimensions	Weight	Included Lighting
43	49”x 42”x 90”H	500 lbs.	1-20w
46	49”x 78”x 90”H	720 lbs.	2-40w
48	49”x 96”x 90”H	875 lbs.	4-40w
56	60”x 78”x 90”H	875 lbs.	2-40w
66	78”x 78”x 90”H	1,000 lbs.	2-40w
68	78”x 96”x 90”H	1,275 lbs.	4-40w
88	96”x 96”x 90”H	1,600 lbs.	4-40w
810	96”x 120”x 90”H	1,900 lbs.	4-40w
812	96”x 143”x 90”H	2,250 lbs.	6-40w
1012	120”x 143”x 90”H	2,880 lbs.	6-40w
(Sliding Door)			
43-1	49”x 42”x 90”H	650 lbs.	1-20w
46-1	49”x 78”x 90”H	750 lbs.	2-40w

STARRGUARD SAFETY RAIL

TABLE OF CONTENTS

PROTECT YOUR INVESTMENT AND INVEST IN SAFETY

Protect your in-plant offices, machinery, traffic aisles, storage areas, conveyors, mezzanines and more with Starrco's Starrguard Safety Rail.

The Starrguard Safety Rail consists of 11 gauge formed steel rails and 4" x 4" structural steel posts offering protection and safety for your employees and equipment. All components are modular for easy installation, expansion or future relocation. The system's components are painted yellow and include all the bolts, connectors and floor anchors necessary for a proper installation.

Save time and money by having Starrco supply you with both our Safety Rail and Modular Offices. One source for both items reduces freight costs, assures timely delivery and helps coordinate installation of both products.

POSTS

- Structural Steel Tube is 4"x 4" x 1/4" Thick
- Posts Include an 8"x 8"x 3/4" Welded Baseplate
- Baseplates are Pre-Drilled for Floor Anchors
- 1/2"x 4" Anchor Bolts are Included
- Standard Post Heights are 16 and 42 Inches

RAILS

- Rails are Ribbed 11 Gauge High Strength Steel
- Rails are 8 3/4" High by 2 1/2" Deep
- Rails are Pre-Drilled for a 2 Bolt Connection at Each End
- Carriage Bolts are Included for all Rail Connections
- "Lift Out" Rail Sections are also Available

STARRMAX TALL WALLS

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INTERIOR SOLUTIONS FOR TODAY AND TOMORROW

Starrco is proud to add the STARRMAX Tall Wall to our line of high quality wall systems.

The STARRMAX line is designed for those applications where increased ceiling height is required to enclose equipment or create operational areas within a facility.

It can also be used as a floor to ceiling partition to divide portions of an existing facility to set up work areas or separate a section of the plant for environmental control.

The STARRMAX system is available in heights up to 30' tall for floor to ceiling applications.

As with all of our interior systems, the STARRMAX wall is completely demountable. It can be reused, reconfigured or modified easily allowing for maximum flexibility in today's modern facility with it's ever changing workflow requirements.

Contact Starrco today for more information on how the new STARRMAX wall system can create solutions for your interior space needs.

Tall Wall Specifications:

Pre-Engineered wall system shall be STARRMAX Tall Wall as manufactured by Starrco Company, Inc., St. Louis, MO.

Wall Panels:

DL Panels - Wall panels shall be a sandwich type construction with ½" vinyl covered gypsum board laminated to both sides of 2" thick noncombustible 1 lb. density expanded polystyrene core. Total panel thickness is 3". Panel carries a Class A flame spread when tested in accordance to ASTM E-2768. Insulation value R-11.

Optional Finishes:

Optional wall coverings include painted aluminum, painted steel, fiberglass reinforced plastic (FRP), Melamine, cork, PVC, etc.

Framework:

H Studs - Studs shall be extruded from 6063 aluminum alloy with T6 temper. Studs are on either side of a 3" steel tube structural column.

Optional wire studs are available which allow for electrical, data processing and communication lines to be run vertically in a raceway accessible from a removable cover plate. Two piece design of the optional wiring stud provides access to both sides for wiring of electrical devices and communication receptacles.

Floor and Ceiling Track - Track shall be extruded from 6063 aluminum alloy with T6 temper. Track shall be precut and mitered to eliminate need for field cutting. Overall thickness of system at floor and ceiling track is 3-7/16".

Finish - The aluminum extrusions and panels are available in Khaki, White or Grey Finish. Special color finishes are available.

Height - The system is available in heights from 16' to 30'. The wall panels will be spliced. Splice location will depend upon the panel construction or finish.

General Specifications:

Several items, which Starrco supplies, are common to all of our Pre-Engineered office systems. For convenience, these items are listed below.

Doors:

Doors shall be 3068 20 gauge commercial grade steel door with insulated core. Each door is equipped with 1 ½ pair of 4 ½" x 4 ½"ball bearing hinges and a stainless steel key-in knob commercial grade (ANSI A156-2) lockset. The top half of the door shall be glazed with 1/4" tempered safety glass.

The doorframe for all three systems shall be 18-gauge steel, three-piece frame, mortised to accept hinges. Door & frame to be painted to match wall color.

Other Doors Available Upon Request

Windows:

Fixed window shall be nominal 4' wide x 3' high. Window is glazed at the factory with 1/4" tempered safety glass in an extruded aluminum frame. The 1/4" tempered glass complies with ASTM C 1048 and ANSI Z97.1-1984.

Ceiling:

Suspended ceiling consists of commercial quality 2' x 4' white mineral fiber tiles supported in an intermediate duty white painted steel grid. The ceiling tiles have a CAC Rating of 35-39 and are Class A noncombustible.

Dust Cover:

Dust cover shall be 22 gauge, type B, 1 ½" ribbed steel deck, prime painted gray. The dust cover is not designed for storage load unless noted otherwise.

Electrical:

(All electrical materials supplied by Starrco are U.L. listed and meet N.E.C. requirements).
Electric package consists of 2' x 4' T-8 fluorescent troffer type light fixtures, 120v duplex receptacles, 120v light switch and a 125-amp load center with appropriate circuit breakers. Electric package does not include lamps or wire.

Options:

Starrco Pre-Engineered offices are available with a variety of optional features to meet specific needs and applications.

Chapter 4

PRODUCT SPECIFICATIONS

STARRSPACE 3000 WALL SYSTEM

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General:

The Pre-Engineered office system shall be SS3000 as manufactured by Starrco Company, Incorporated, St. Louis, MO. Starrco has been designing and manufacturing pre-engineered office systems since 1965.

Wall Panels:

SP Panels – Wall panels shall be a sandwich type construction with 1/8" vinyl covered hardboard laminated to both sides of a 2 3/4" thick noncombustible 1 lb. density expanded polystyrene core. Total panel thickness is 3". Insulation value R-13.

DL Panels – Wall panels shall be a sandwich type construction with ½" vinyl covered gypsum board laminated to both sides of 2" thick noncombustible 1 lb. density expanded polystyrene core. Total panel thickness is 3". Panel carries a Class A flame spread rating when tested in accordance to ASTM-E-2768. Insulation value R-11.

SC Panels – Wall panels shall be a sandwich type construction with 1/8" vinyl covered hardboard laminated to 5/8" high density particle board on both sides of noncombustible 1 lb density expanded polystyrene core. Total panel thickness is 3". Insulation value R-10.

Optional Finishes:

Optional wall coverings include painted aluminum, painted steel, fiberglass reinforced plastic (FRP), Melamine, cork, PVC, etc.

Framework:

Wire Studs – Studs shall be extruded from 6063 aluminum alloy with T6 temper. Wire studs allow for electrical, data processing and communication lines to be run vertically in a raceway accessible from a removable cover plate. Stud is designed in two pieces that allow both sides to be wired with electrical devices and communication receptacles. Design also gives system the capability of removing a panel without disturbing the adjacent panels.

Channel – Track shall be extruded from 6063 aluminum alloy with T6 temper. Shall be precut and mitered at the factory to eliminate the need for field cutting. Overall thickness of system at floor and ceiling track is 3 7/16".

Finish – The aluminum extrusions are available in khaki, white or grey baked on painted finish. Special color finishes are available.

Height – The system is available in the following standard heights: 8', 9', 10' and 12'. Systems over 8' tall may have spliced panels depending upon the panel construction or finish.

STARRSPACE 3500 WALL SYSTEM

TABLE OF CONTENTS

General:

The Pre-Engineered office system shall be SS3500 as manufactured by Starrco Company, Incorporated, St. Louis, MO. Starrco has been designing and manufacturing pre-engineered office systems since 1965.

Wall Panels:

SP Panels – Wall panels shall be a sandwich type construction with 1/8" vinyl covered hardboard laminated to both sides of a 2 3/4" thick noncombustible 1 lb. density expanded polystyrene core. Total panel thickness is 3". Insulation value R-13.

DL Panels – Wall panels shall be a sandwich type construction with ½" vinyl covered gypsum board laminated to both sides of 2" thick noncombustible 1 lb. density expanded polystyrene core. Total panel thickness is 3". Panel is Class A noncombustible when tested in accordance to ASTM-E-2768. Insulation value R-11.

SC Panels – Wall panels shall be a sandwich type construction with 1/8" vinyl covered hardboard laminated to 5/8" high density particle board on both sides of noncombustible 1 lb density expanded polystyrene core. Total panel thickness is 3". Insulation value R-10.

Optional Finishes:

Optional wall coverings include painted aluminum, painted steel, fiberglass reinforced plastic (FRP), Melamine, cork, PVC, etc.

Framework:

Wire Studs – SStuds shall be extruded from 6063 aluminum alloy with T6 temper. Wire studs allow for electrical, data processing and communication lines to be run vertically in a raceway accessible from a removable cover plate. Stud is a two-piece design that allows it to act as a structural column on offices with long clear spans, two story offices, and load-bearing roofs. The design also gives the system the capability of removing a panel without disturbing the adjacent panels.

Channel – Track shall be extruded from 6063 aluminum alloy with T6 temper. Track shall be precut and mitered at the factory to eliminate the need for field cutting. Thickness of system at floor and ceiling track is 3 7/16".

Finish – The aluminum extrusions are available in a Khaki, Grey or White Baked on Painted Finish. Special color painted finishes are available.

Height – The system is available in the following standard heights: 8', 9', 10', and 12'. Special heights are available. Systems over 8' tall may have spliced panels depending upon the panel construction or finish.

STARRMAX TALL WALL SYSTEM

TABLE OF CONTENTS

General:

The Pre-Engineered wall system shall be StarrMax as manufactured by Starrco Company, Incorporated, St. Louis, MO. Starrco has been designing and manufacturing pre-engineered office systems and enclosures since 1965.

Wall Panels:

DL Panels – Wall panels shall be a sandwich type construction with ½" vinyl covered gypsum board laminated to both sides of 2" thick noncombustible 1 lb. density expanded polystyrene core. Total panel thickness is 3". Panel carries a Class A flame spread when tested in accordance to ASTM E-2768. Insulation value R-11.

Optional Finishes:

Optional wall coverings include painted aluminum, painted steel, fiberglass reinforced plastic (FRP), Melamine, cork, PVC, etc.

Framework:

H Studs – Studs shall be extruded from 6063 aluminum alloy with T6 temper. Studs are on either side of a 3" steel tube structural column. Optional wire studs are available which allow for electrical, data processing and communication lines to be run vertically in a raceway accessible from a removable cover plate. Two piece design of the optional wiring stud provides access to both sides for wiring of electrical devices and communication receptacles.

Floor and Ceiling Track – Track shall be extruded from 6063 aluminum alloy with T6 temper. Track shall be precut and mitered to eliminate need for field cutting. Overall thickness of system at floor and ceiling track is 3-7/16"

Finish – The aluminum extrusions and panels are available in Khaki, White or Grey Finish. Special color finishes are available.

Height – The system is available heights from 16' to 30'. The wall panels will be spliced. Splice location will depend upon the panel construction or finish.

General Specifications:

TABLE OF CONTENTS

Several items, which Starrco supplies, are common to all of our Pre-Engineered office systems. For convenience, these items are listed below.

Doors:

Doors shall be 3068 commercial grade steel with 20 gauge facings and polystyrene core. Steel door complies with ANSI/SDI 100. Each door is equipped with 1 ½ pair of 4 ½" x 4 ½" ball bearing hinges and a stainless steel key-in knob commercial grade (ANSI A156-2) lever handle lockset. The top half of the door shall be glazed with 1/4" tempered safety glass.

The door frame for both systems shall be 18-gauge steel, three-piece frame, mortised to accept hinges.

A commercial quality hollow core wood door with light oak facings is also available.

Other Doors Available Upon Request

Windows:

Fixed window shall be nominal 4' wide x 3' high. Window is glazed at the factory with 1/4" tempered safety glass in an extruded aluminum frame. The 1/4" tempered glass complies with ASTM C 1048 and ANSI Z97.1-1984.

Ceiling:

Suspended ceiling consists of commercial quality 2' x 4' white mineral fiber tiles supported in an intermediate duty white painted steel grid. The ceiling tiles have a CAC Rating of 35-39 and are Class A noncombustible.

Dust Cover:

Dust cover shall be 22 gauge, type B, 1 ½" ribbed steel deck, prime painted gray. The dust cover is not designed for storage load unless noted otherwise. When load-bearing deck is required, the roof deck and structural steel components shall be pre-engineered to meet the loading requirements.

Electrical:

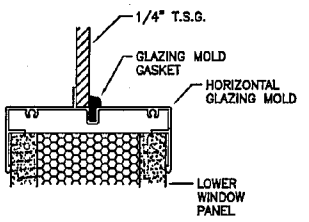
(All electrical materials supplied by Starrco are U.L. listed and meet N.E.C. requirements).

Electric package consists of 2' x 4' T8 three lamp fluorescent troffer type light fixtures, 120v duplex receptacles, 120v light switch and a 100-amp load center with appropriate circuit breakers. Electric package does not include lamps or wire.

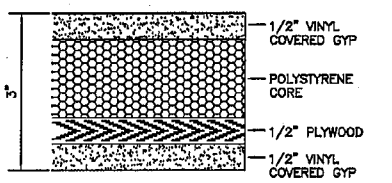
Pre-Engineered Quick-Tric modular electric components are available as an option.

Options:

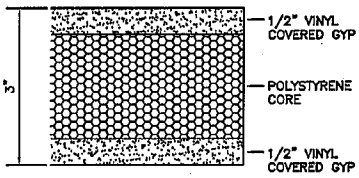
Starrco Pre-Engineered offices are available with a variety of optional features to meet specific needs and applications. Options include (but are not limited to); special wall finishes, reinforced panel cores, special door hardware, sliding windows, special glazing, HVAC systems, flooring materials, etc.



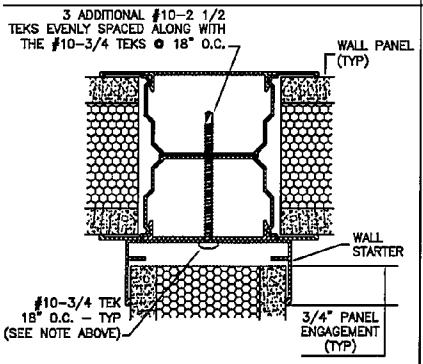
WINDOW SILL DETAIL



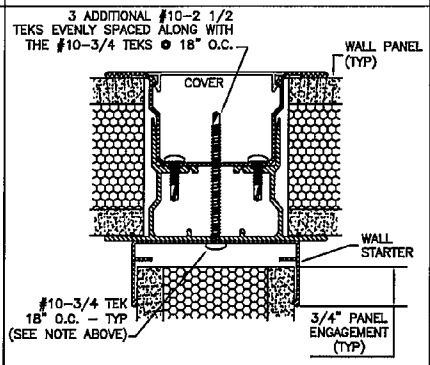
TYPICAL STARRCO REINFORCED "DL" PANEL



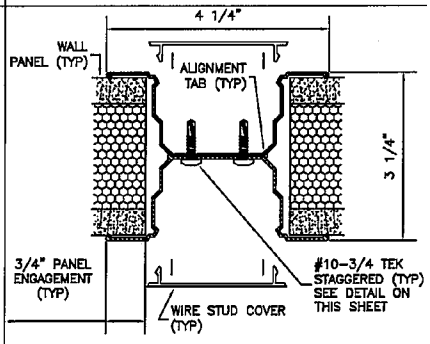
TYPICAL STARRCO "DL" PANEL



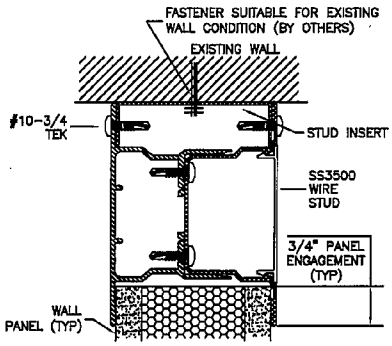
3-WAY WALL START FOR SS3000



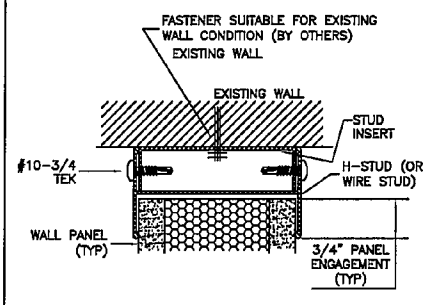
3-WAY WALL START FOR SS3500



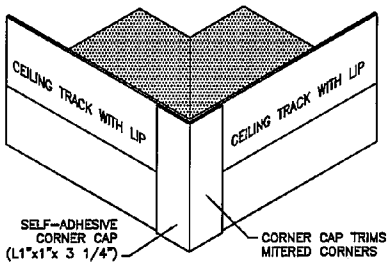
SS3000 WIRE STUD



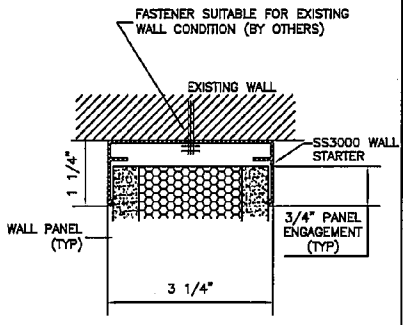
ALTERNATE WALL START @ EXISTING WALL



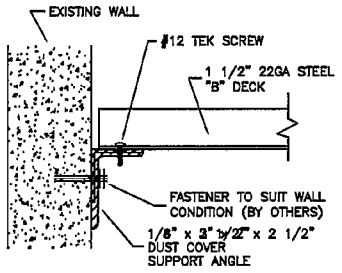
ALTERNATE WALL START @ EXISTING WALL



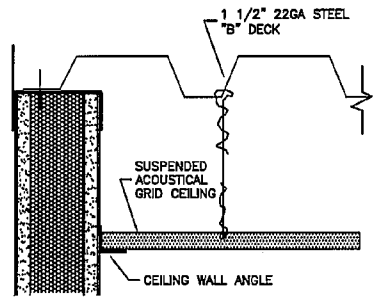
CORNER CAP DETAIL



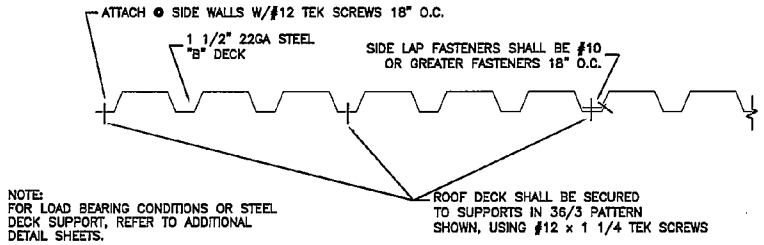
WALL START @ EXISTING WALL - TYPICAL



DECK SUPPORT ANGLE @ EXISTING WALL FOR ROOF LOAD BEARING SPF APPLICATION

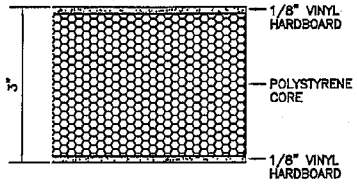


PLENUM SECTION

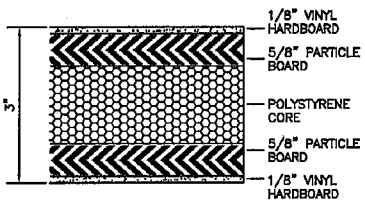


NOTE:
FOR LOAD BEARING CONDITIONS OR STEEL DECK SUPPORT, REFER TO ADDITIONAL DETAIL SHEETS.

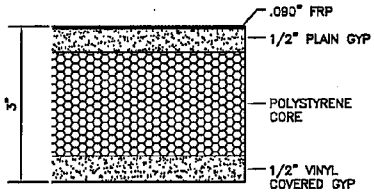
ROOF DECK CONNECTION DETAIL



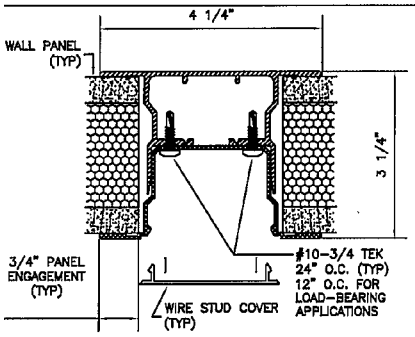
TYPICAL STARRCO "SP" PANEL



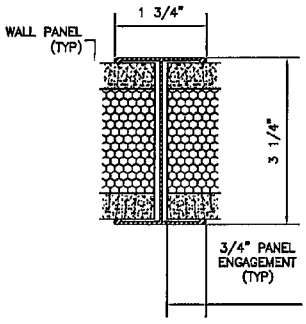
TYPICAL STARRCO "SC" PANEL



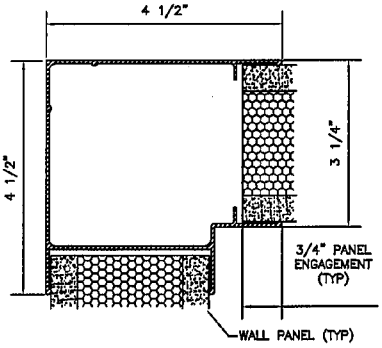
TYPICAL STARRCO "DL" PANEL
FRP / VINYL GYP



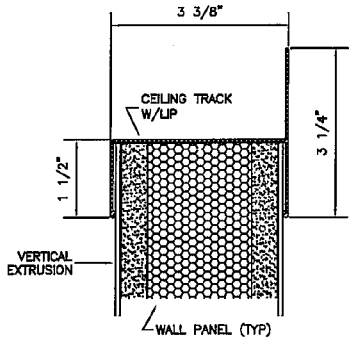
SS3500 WIRE STUD



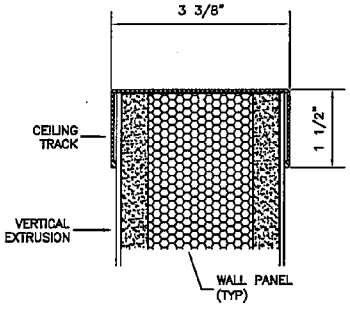
SS3000 H-STUD



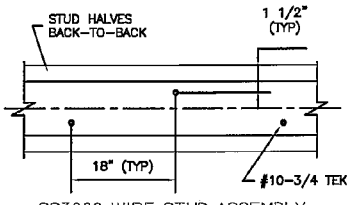
CORNER POST



CEILING TRACK WITH LIP

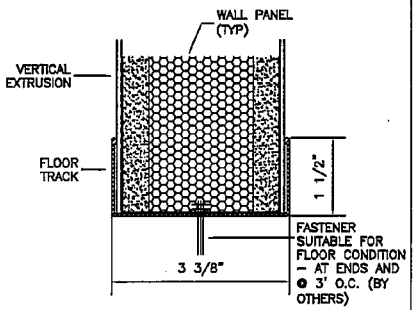


CEILING TRACK WITHOUT LIP

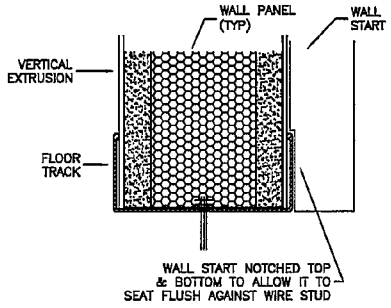


SS3000 WIRE STUD ASSEMBLY
(ELEVATION VIEW, ROT. 90°)

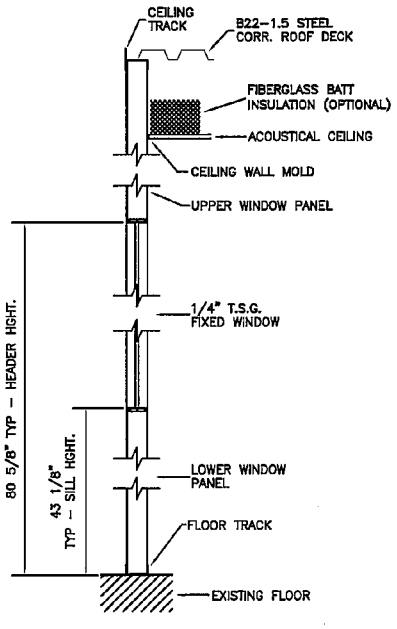
1. PRE-DRILL #7/32" HOLES IN ONE STUD HALF. DRILL FROM OUTSIDE STUD HALF TOWARDS CAVITY TO AVOID BURRS BETWEEN HALVES. THIS WILL HELP REDUCE MISALIGNMENT DURING ASSEMBLY.
2. CARE SHOULD BE TAKEN TO ENSURE HALVES ARE ALIGNED PROPERLY WITH TABS ON OPPOSITE SIDES.
3. INSTALL FULL LENGTH STUD OUTER COVER PLATE BEFORE INSTALLING STUD INTO FLOOR TRACK.



FLOOR TRACK

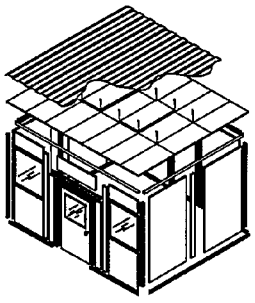


WALL START NOTCH @ FLOOR TRACK



WALL SECTION - TYPICAL

GENERAL NOTES:
1. ALUMINUM EXTRUSIONS ARE 6063-T6 ALLOY.
2. LAMINATED PANELS ARE 3" THICK. ACTUAL PANEL DESCRIPTION SHOWN ON WALL PANEL LAYOUT DRAWING.
3. TYPICAL PANEL ENGAGEMENT INTO VERTICAL EXTRUSIONS IS 3/4".
4. DETAILS SHOWN ARE TYPICAL. ACTUAL PROJECT DETAILS MAY VARY. REFER TO INCLUDED SHEETS.



STARRCO DEFINITIONS

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A/C UNITS:
We provide a variety of General Electric A/C and combo HVAC units, both in 110v and 220v. In round numbers you need one ton of air (12,000 BTU's) per 375 SF. Our price for an A/C unit also includes the cutout, framing, and support shelf.

A/C CUTOUT:
When the customer has their own A/C unit and wants a cutout, we need the size of the cutout. Unless advised otherwise, the default position for the top of the cutout is 80" off the floor.

A/C FRAMING:
We rarely do a cutout without also providing framing. This is either grey or khaki aluminum "C" channel.

BTU:
A British Thermal Unit. Nobody in America really knows what it is, but 12,000 of them equal one ton. So a 12,000 BTU A/C unit is referred to as a "one-ton unit".

C-4 BEAM:
As the name implies, a "C" shaped beam that is 4"H x 3.5"W. It is used to provide support for the dust cover when the span is 12' to 16'. It is installed into a joist-hanger placed over a stud. The top of the beam is flush with the ledge of the ceiling track. Usually placed on nominal 12' centers (every 3rd stud).

C-7 BEAM:
A "C" shaped beam that is 7"H x 3.5"W and is used to provide support for the dust cover when the span is 16'- 24'. Placed on 12' centers when the span is 16'- 20', 8' centers for spans 20'- 24'. The dust cover is attached with #10 x ¾" S.D. screws that we provide.

CEILING TILE:
The standard ceiling tile is 2' x 4'. Our price for the tile also includes the grids and the layout plans. They are packed (8) pcs. per box. We only ship full boxes. So while a 12'x 12' unit would need 144 SF of ceiling, we would only bill for the 144 SF, and would actually ship 192 SF (3 boxes).

CEILING TRACK:
This is a "chair shaped" aluminum extrusion that sits on top of the wall panels. We call the top of the chair a "lip". It is also referred to as a "floor track with lip". Conversely a floor track can also be referred to as a "ceiling track without lip". It comes only in 13' lengths (to allow for splices over the studs). It is attached to each stud and corner post. All ceiling track covers the top 1.5" of the wall panel. The "lip" is 1.75"H and hides the 1.5"H dust cover. The widths (o.d): 3000 & 3500 – 3.5".

CIRCUIT BREAKER BOX:
Our standard box is 125 amps, has 4 breakers, and is sufficient for most units. Lights are 10/breaker, duplex are 8/breaker. HVAC units get their own breaker. We have an almost unlimited capability to add additional breakers.

COLORS:
Our metal extrusions are available in Khaki, White and Grey. Our panels are available in Khaki, White, and Grey. Other panel colors are available at an upcharge. Custom colors may increase the lead time by up to 2 weeks.

COLUMNS:
Used to support beams. They are 3"x 3" square steel tubes and have plates at both the top and the bottom.

CORNER POST:
An aluminum extrusion that, as the name implies, accepts wall panels at 90 degrees. Like with wire studs, the panels go into the post .75".

DOORS:
Doors are described by their size, in feet and inches. The standard door is 3' wide and 6'8" tall. The nomenclature for this would be 3068 (three feet, zero inches by six feet eight inches). Any change from this size door results in a cost increase, even if it's smaller.

When the quote request is for a double door, the default is a 6068 (6'0" x 6'8") steel door with window. We can custom-make almost any size door.

DIMENSIONS:
The default is the outside dimension (o.d.) of the unit, not the inside dimension (i.d.). Actual outside dimensions are ¼" larger than the unit.

DOOR HARDWARE:
A variety of options are available. The most popular are thresholds, door sweeps, gaskets and heavy-duty closers. The thresholds, sweeps and gaskets are often used when sound control is a concern. The heavy duty closers can only be used on steel doors.

DUPLEX OUTLETS:
Needs vary but generally 1 per 8 - 12 LF of wall.

DUST COVER:
This is the "corrugated" steel roof deck that actually holds the unit together. The material is 22 gauge steel and is 1.5"H by 3'W. It comes in nominal lengths of 8', 10', 12', 13'- 6", 16' and 20'. Actual length is nominal length less ½" so the installer doesn't have to cut it on the job to fit inside the ceiling tracks. It weighs 1.7 PSF. It is screwed into the ceiling track every 18" with #10 x 3/4" S.D. screws which we provide.

E-MAIL:
Being a small company has its advantages. If you know the first name of the person you want to reach, it's easy (i.e. Bryan Carey=bryan@starrco.com;) If that doesn't work call us at 800-325-4259.

EXTRUSIONS:
A generic term used to describe the metal parts of the wall system – studs, corner posts, wall starters, floor track and ceiling track. They are available in three colors – White, Grey and Khaki. Special color extrusions are available at additional cost.

FLASHING:

An "L" shaped piece of aluminum that is 2.25"x .5" x .0625 (1/16) thick that is painted the same color as the extrusions used on the job. It is used in load-bearing one story applications where .75" plywood will be installed over the dust cover. The flashing "hides" the plywood from view (because the plywood would be visible over the ceiling track) and protects the edges from damage. We ship in 10' lengths only, we do not pre-cut. The 2.25" leg overlaps the ceiling track.

FLOOR TILE:

Tile squares are 1/8" thick x 12" x 12". (45) tiles per box, we only ship full boxes. Weight is 1.4 lbs/SF. Contact the factory for colors and color charts.

FLOOR TRACK:

A "U" shaped extrusion that is the first step in the construction process. All floor track is 1.5"H x 13'L; the length will vary depending on the wall panel. Since we rarely know what the existing floor is (steel, wood, concrete) we do not provide the fasteners. Typical fasteners for a concrete floor would be 1" nails with a #3 charge, 1.5" nails with a #4 charge or various expansion anchors. Attachments are made at the ends of each piece and on 36" centers. All floor track is pre-cut and pre-mitered; we provide layout plans.

FRP:

Stands for Fiberglass Reinforced Plastic. It can be laminated to one or both sides of any panel to provide a corrosion-resistant finish. We typically use it on bathroom walls.

GUARDRAIL / HAND RAIL:

Our basic Hand Rail is built to the IBC code. 42" high, 2-rail with a 4" kick plate. 3-rail system is also available.

HEATING UNITS:

Generally sold as a combo unit with air, referred to as HVAC (Heating, Ventilating, Air Conditioning). Separate heating-only units are available.

HVAC:

This stands for Heating/Ventilation & Air Conditioning. It is usually a window unit as opposed to "Modular HVAC" which is like central air conditioning. The upcharge for adding heat to an A/C unit is less than $100 so we almost always quote a combo unit. Generally you need one ton (12,000 BTU) per 375 SF. For trivia buffs, BTU is a British Thermal Unit.

I-BEAMS:

These are used in all load-bearing applications and in non load-bearing applications where the wall span is in excess of 24' (the limit for a C-7 beam). These beams are described by their thickness (height) and weight. A W10x12 beam would be 10" thick (high) and weigh 12 pounds per lineal foot. They are attached to the ceiling track using #12-24 x 2 TEK 5 screws. In load bearing situations the angle clip attached to the beams that sits on top of the studs is .75" thick; in non load-bearing situations, the top of the angle iron is flush with the beam so we don't need wood blocking.

INTERNET:

Our website is www.starrco.com. The key here is that there are two "r" in Starrco.

LIGHTING:
Standard lighting is a 2' x 4' T8 fluorescent light fixture. Shipped 1/box, weight is 27 lbs. They are shipped without the bulbs because they would probably break in transit. Lighting needs are computed by 1 per 64 SF; this resulting in 70 foot candles and is satisfactory for most applications. Needs exceeding whole numbers are rounded up. Except for rooms 12'W or less, for aesthetic purposes we try for an even number of lights per room. Laboratories may require 100 foot candles (1 light per 45 SF).

LIGHT SWITCHES:
These are figured one per room with no more than 10 lights per switch.

LUAN:
This is a .25" thick extremely smooth board that is used in conjunction with floor tile. It goes on top of OSB.

MODULAR ELECTRIC:
This is referred to as the "Quik Tric" electric system. In layman's terms it is a series of custom-made extension cords for both lights and duplex. It eliminates the need for on-site electricians (except for hook-up to the power supply). While more expensive than "hard-wired" electric, it is cost-justified if the unit is ever moved.

OSB:
This stands for "oriented strand board". We normally use the .75" tongue & groove for the floor on two story units.

PASSAGE SET:
A door knob without a lock.

R-VALUE:
R stands for resistance to heat transfer. The higher the number the more "resistance" it has, so the higher the number, the better it is.

RUBBER CLOSER:
This is a 1.5"H x 36"L piece of foam that is die-cut so it can close off the openings at the two open ends of the dust cover. It serves three functions: (1) it keeps dirt/dust from entering into the plenum area; (2) it reduces sound transmission, and (3) it increases the efficiency of the HVAC unit by reducing air infiltration.

SOUND BATT INSULATION:
This is placed on top of the ceiling tiles and provides both insulation and sound deadening. 2" thick.

SPECIAL CUTS:
When there is an oddball height, say 9'9", we would have to cut the wall panels, studs, corner posts, wall starters, etc. Contact the factory for the cost of cutting the system to a special height.

STAIRS:
We make stairs to meet the specifications of the International Building Code and NFPA 101 Life Safety Code.

STAMPED ENGINEERING DRAWINGS/CALCULATIONS:

If a customer decides to pull permits for the office, the local municipality will usually require "stamped" drawings. This means that an engineer licensed in that particular state must "sign-off" saying that the unit meets code. Contact the project manager for the cost of this service.

STC:

Sound Transmission Class. A rating system used to measure the transmission loss (decibel reduction) of various materials. This number can vary significantly at different frequencies. The standard frequency used is at 500Hz (megahertz). The higher the number the better.

STEEL ANGLE:

Steel angle is used in two cases – load-bearing and less than 4-wall jobs. For load-bearing, the angle iron goes on all walls parallel to the beams and on top of the wood "shims" (see Wood Blocking).. This angle iron is 2.5" (on top of the ceiling track) x 3.5" (down the wall) x .25" thick. The purpose is to "spread the load" imposed between the studs to the studs. For less than 4-wall applications, we need to support the dust cover at the existing walls.

STRUCTURAL STEEL:

There are a number of items used in load-bearing: beams, angle iron, wood blocking, floor track cutouts, flashing (on 1-story units). Rather than itemize all these on the quote, we lump them together and quote as one item, i.e. "Steel for X psf load" with X being anything from 25-125 psf.

STUD COVER:

A removable 2.625" face plate that allows access to the electric cavity inside each stud. The stud cover is cut 5" shorter than the stud to facilitate removal and attachment. The max length is 16'.

SUPPORT ANGLE:

Used to support the dust cover on offices attaching to an existing wall. The angle is 2" x 2" x 1/8" thick. Since there are many different types of wall construction, we do not supply the fasteners to connect to the existing wall.

WALL PANELS:

We have three constructions available – SP, DL and SC.

The SP is the "Standard Panel" and consists of 1/8" fiberboard laminated to both sides of a noncombustible foam core. It is available in Grey, Khaki, and White.

The DL is the "Drywall Lined" panel and consists of 1/2" drywall laminated to both sides of a noncombustible foam core. This is used where fire control and sound control is a concern. It is available in three standard colors Grey, Khaki and White. (contact the factory for cost and availability of special colors)

The SC is the "Sound Control" panel and consists of two pcs. of 1/8" fiberboard laminated to 5/8" particleboard on both sides of a noncombustible foam core. It is available in three colors - Grey, Khaki, and White.

WALL STARTER:
A "U" shaped aluminum extrusion that is placed inside the floor track and then attached to an existing wall.

WARRANTY:
Our warranty is one year.

WINDOWS:
Our standard window is a "fixed" window 4' wide by 3' high with 1/4" tempered glass. The bottom of the window is 43" off the floor. Sliding and custom made windows are available and there are glass options (plexiglass, laminated, etc.). On a full-width window the glass itself is 46.375"W x 37.375"H.

WIRE STUD:
A stud typically placed on nominal 4' centers (actually 50.75"). All studs have a 4.25" face. The two sides of the stud provide a .75" deep cavity for the wall panels. The middle of the stud has a removable 2.625"W face plate to facilitate installation of electric. All studs have the same size cavity for electric. The "thickness" of the stud is what determines its structural strength, with thicker being stronger. All studs are 2-piece studs. The 3000 and 3500 series are 3.25" thick (o.d.).

The two piece studs should be loosely assembled before being placed into the floor track. They are fastened together with #10 x 3/4" self drilling Philips screws (we provide) into pre-drilled holes. On new units, the electrical outlet boxes and switches are usually installed before installing the wall panels. The screws should be tightened after the wall panels have been installed. Tightening before this time could make wall panel installation difficult.

Wire studs are available standardly in Khaki, White or Grey. Special colors are available but will increase the cost and extend the lead time.

WOOD BLOCKING:
There are two sizes - .75" thick and .5" thick; both are 2.5" wide. The .75" is used to level the wall between beams and is 44" long. The .5" is 8'L and is used in conjunction with .25" angle iron to raise the height of the walls parallel to the beams so it is the same height as the beams (.75" above the ceiling track). The wood blocking is attached with 6x1 ¼" bugle head screw.

Chapter 5

AIR CONDITIONING, HEATING & VENTILATION

AIR CONDITIONING & HEATING

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Starrco offers several options when it comes to providing climate control for our office systems and pre-assembled buildings:

- Pre-charged Modular Central HVAC
  Starrco's exclusive design allows us to provide a complete self contained central air conditioning and heating system for any office larger than 800 square feet. What makes the system unique is the installation can be handled by anyone. We have designed it to allow someone with NO experience with HVAC systems to install the system quickly and accurately.

  Included with the design is a pre-charged air handler (the coolant is already added to the unit), modular ductwork, ceiling diffusers, air return grilles, flexible ductwork, and an electronic thermostat. We even provide the duct tape, staple gun, staples and duct cutter. A complete set of installation instructions and step-by-step detailed drawings is supplied with each system.

- Thru-Wall Air Conditioners and Combination A/C-Heat Units
  For smaller in-plant offices and pre-assembled exterior buildings, Starrco offers General Electric brand air conditioners and air conditioner/heater combination units.

  These commercial grade units feature an adjustable thermostat, separate evaporating fan system to reduce condensation*, a washable air filter and energy saver controls.

- Heating & Ventilation
  We carry the Markel brand of commercial wall mounted fan forced heaters. The heaters are low profile (less than 4" deep) and have an adjustable thermostat. We can also provide Markel's baseboard heaters for those customers who want a radiant heating system for their office.

  For ventilation, we offer Broan brand ceiling mounted exhaust fans in a variety of sizes to handle almost any application.

* The self evaporating units greatly reduce the amount of condensation generated BUT they do not eliminate it entirely. In high humidity conditions, the units will still "drip". Starrco supplies a drain kit with all of our A/C and HVAC units to allow for the connection of a drain line if needed.

HEATING, VENTILATION, AIR CONDITIONING

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The HVAC design formulas shown below are based upon normal conditions and should only be used as a general guide. For extreme or demanding conditions, we recommend consulting with an architect or qualified environmental engineer to design an HVAC system for your specific requirements.

Heating:

Heater sizing formula - 7 watts of heat per square foot of floor space

Example: 10' x 20' room = 200 square feet
200 sq. Ft. x 7 = 1400 watts of heat required
(Note: 1 watt is equal to approximately 3.4 BTU's)

Ventilation:

The ventilation required within a room depends on a couple of factors:

Occupancy: The number of people normally using the room.

Usage: Lunchrooms or conference rooms may require more ventilation, especially if smoking is permitted in the room.

In general, changing the air in the room once every 10 minutes is sufficient.

Example: 10' x 20' room with 8' ceiling height = 1600 cubic feet
1600 cu. ft. /10 minutes = 160 cubic feet per minute (CFM)
160 CFM exhaust fan required for room

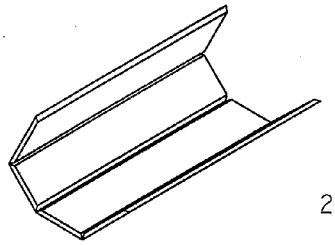
If smokers will occupy the room, the air should be changed every 3 minutes.

Air Conditioning:

Air conditioner sizing formula - 30 BTU's of cooling per square foot of floor space.

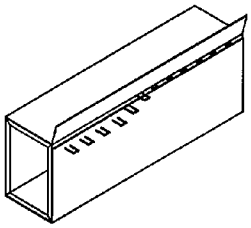
Example: 10' x 20' room = 200 square feet
200 sq. ft. x 30 = 6000 BTU's of cooling required

If the room is going to be heavily occupied (i.e. lunchroom, conference room) or located near a heat-producing piece of equipment, the amount of air conditioning should be increased. A good rule of thumb is to add 500 BTU's for each person in the room.

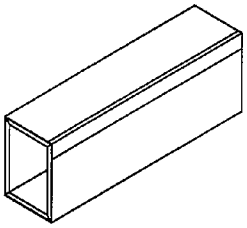


1. FOLD DUCT BOARD INTO RECTANGULAR SECTIONS. LIFT THE FOIL FLAP AND STAPLE THE CORNER SEAM. STAPLES SHOULD BE PLACED ON 2" CENTERS.

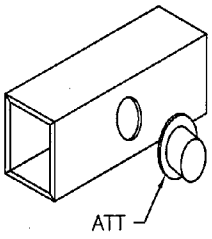
2. FOLD THE FOIL FLAP OVER THE STAPLES AND USING THE DUCT BOARD TAPE, COMPLETE THE SEAL BY TAPING THE CORNER SEAM.



3. THE TAPE IS USED TO COMPLETE THE AIR SEAL AND SECURE THE CORNER CONSTRUCTION. USING THE TAPE APPLICATOR KNIFE, APPLY PRESSURE TO THE TAPE SEAL BY WIPING ITS ENTIRE LENGTH.



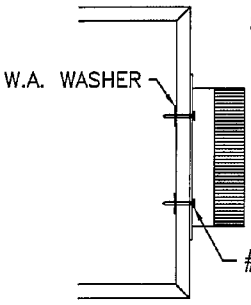
4. LAYOUT DUCT BOARD SECTIONS PER THE "HI" DRAWING(S). DO NOT INTERLOCK SECTIONS AT THIS TIME.



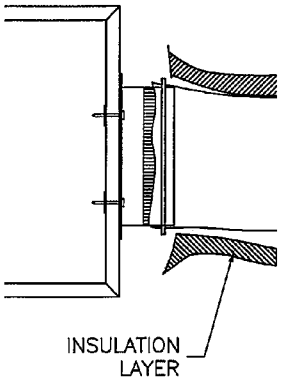
5. LAYOUT THE FLEX TUBING AND AIR TIGHT TAKE-OFFS (ATT) PER DRAWING(S) "HI"

6. HOLDING THE APPROPRIATE ATT AGAINST THE DUCT BOARD BOX, SCRIBE A LINE AROUND THE INSIDE DIAMETER. REMOVE THE INSIDE SECTION WITH A UTILITY KNIFE.

7. NEXT, REMOVE THE PROTECTIVE PAPER FROM THE ATT FLANGE AND PRESS FIRMLY OVER THE HOLE.



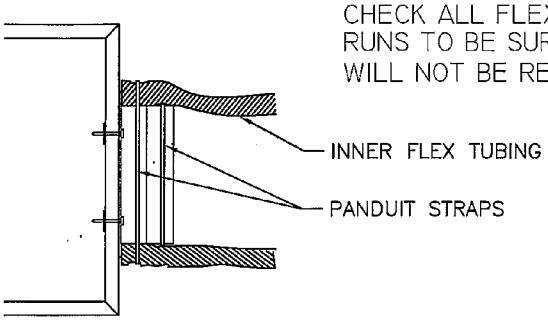
8. COMPLETE THE ATT ATTACHMENT WITH THE #8 X 1/1/2" SABRE POINT SCREWS AND W.A. WASHERS.



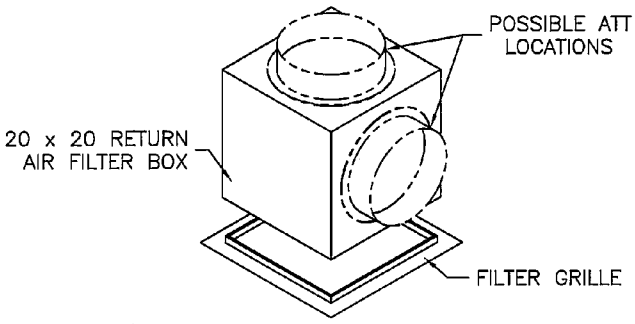
12. TO INSTALL THE FLEX TUBING, PEEL BACK THE INSULATED COVER FROM THE FLEX TUBING AND SLIDE THE INNER TUBE OVER THE ATT.

13. WRAP THE OUTSIDE OF THE INNER TUBE WITH A PLASTIC PANDUIT STRAP AND TIGHTEN USING THE PANDUIT TOOL.

14. FOLD THE INSULATED COVER OVER THE INNER TUBE AND TIGHTEN A PANDUIT STRAP AROUND THE CONNECTION. CHECK ALL FLEXIBLE DUCT RUNS TO BE SURE AIR FLOW WILL NOT BE RESTRICTED.



15. FOLD, STAPLE, AND TAPE THE 20 X 20 DUCT BOARD FOR FILTERED RETURNS. CUT LENGTH FOR IN-PLENUM OR THRU-ROOF INSTALLATION. STAPLE AND TAPE END CAP ON TOP TO FORM 5-SIDED BOX. ATTACH ATT PER STEPS 6, 7, & 8.

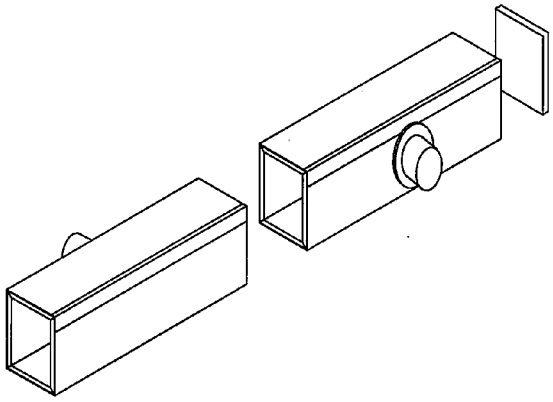


NOTE: JUNCTION BOXES ARE ASSEMEBLED THE SAME AS 20 x 20, BUT TWO END CAPS FORM A 6-SIDED BOX.

16. PLACE THE RETURN AIR GRILL AND FILTER IN THE LOCATIONS SHOWN ON THE "HI" DRAWING(S). FIT THE 20 X 20 RETURN AIR BOXES OVER THE GRILLE FLANGES.

9. COMPLETE THE MAIN TRUNK LINE BY INTERLOCKING THE DUCT BOARD SECTIONS AND STAPLING THE SEAM. TAPE ALL THE JOINTS AIR TIGHT.

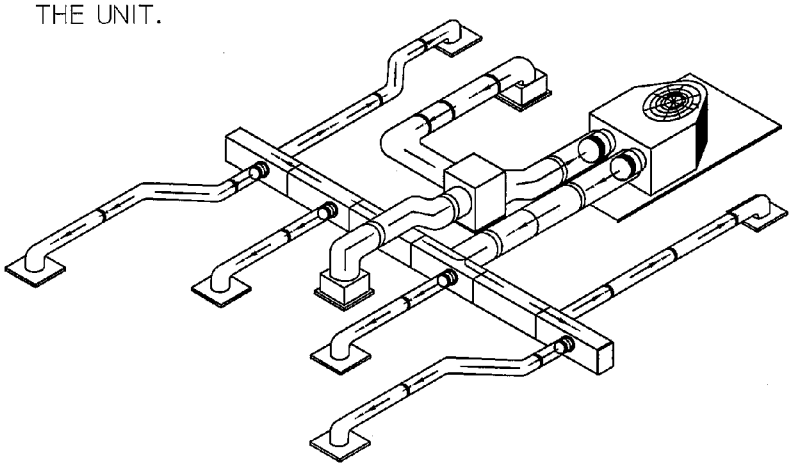
10. STAPLE THE DUCT BOARD END CAPS TO EACH END AND TAPE THE JOINTS AIR TIGHT.



11. LAYOUT THE 24 X 24 LAY-IN DIFFUSERS IN THE POSITIONS SHOWN ON THE "HI" DRAWING(S). BE SURE TO CHECK THE DAMPER LOCATED BEHIND THE GRILLE OF EACH DIFFUSER TO SEE THAT IT IS OPEN - THIS IS VERY IMPORTANT.

17. COMPLETE THE RETURN AIR DUCTWORK BY CONNECTING THE FLEX TUBING FROM THE RETURN AIR FILTER BOXES TO THE AIR BAFFLE BOX PER STEPS 12 THRU 14.

18. TO FINISH THE DUCTWORK INSTALLATION, CONNECT THE FLEX TUBING FROM THE AIR BOX (14") AND THE MAIN TRUNK LINE (12") TO THE UNIT.



NOTE: THIS SHEET IS ONLY A GENERALIZED MODEL; ACTUAL LAYOUTS & COMPONENTS MAY VARY.

Revisions

No.	Date	Description

STARRCO
11700 FAIRGROVE INDUSTRIAL BOULEVARD
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FAX (314) 567-7555 E-mail: starrco@starrco.com
http://www.starrco.com

Dealer STARRCO Customer

DUCTWORK INSTALLATION

Drawing Title: DUCTWORK INSTALLATION

Job No.:

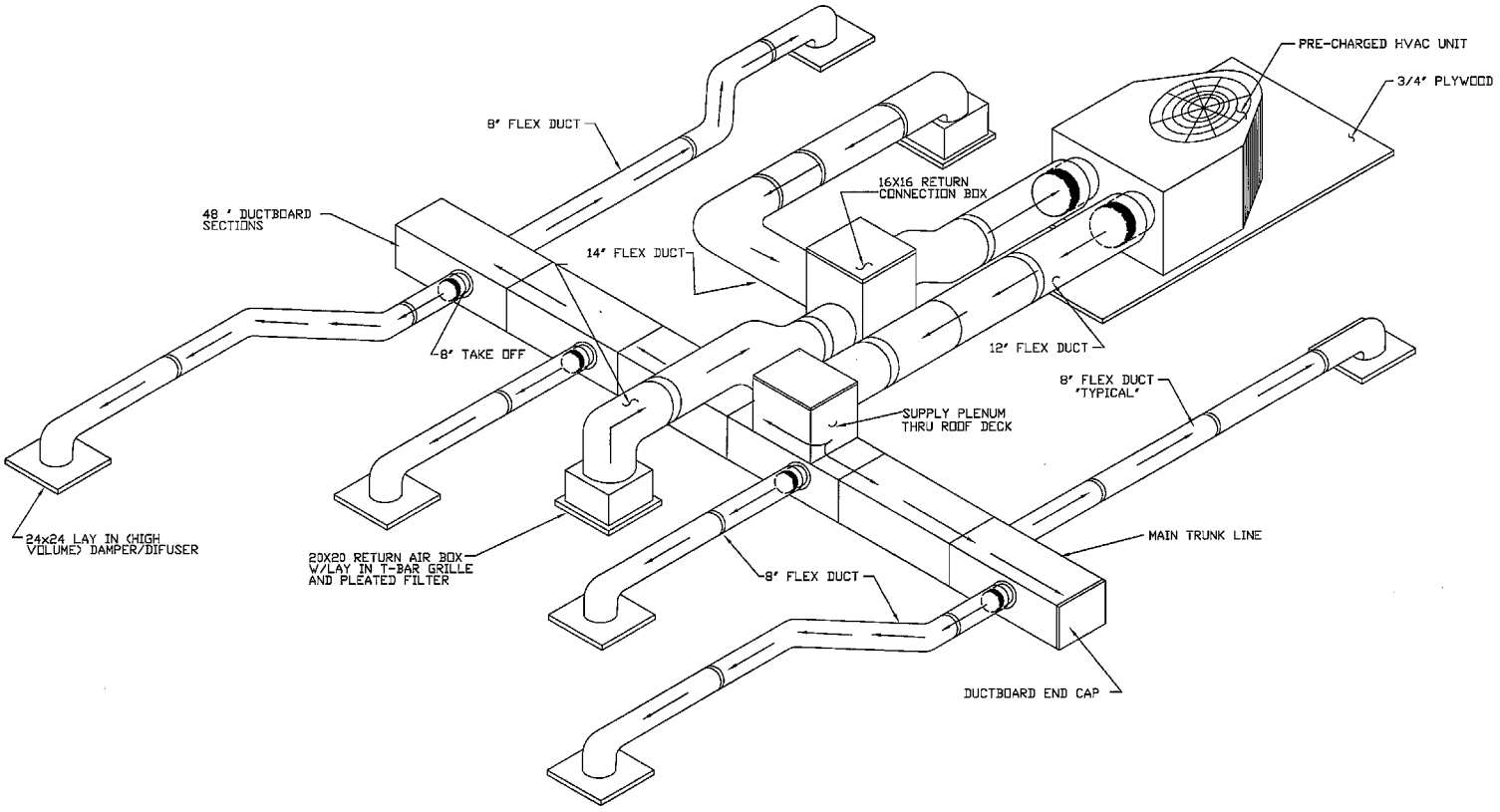
Checked By:

Drawn By:

Date:

Scale: NTS

Sheet No.: H2 0



SAMPLE HVAC LAYOUT

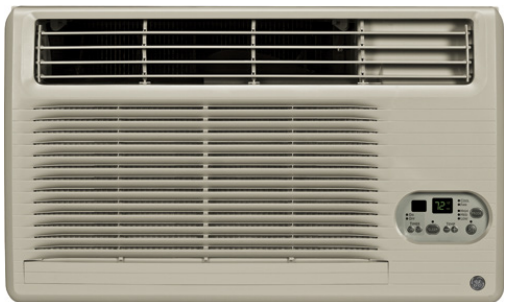
SEE DRAWING H1 FOR
ACTUAL HVAC PLAN

GE® ENERGY STAR® 115 VOLT BUILT-IN ROOM AIR COOL UNIT

TABLE OF CONTENTS

Model# AJCM08ACD

- R-410A refrigerant
- 8,350 Cooling BTU
- 9.4 E.E.R.
- 115 Volts
- ENERGY STAR® qualified
- Electronic Controls with Remote
- Electronic Digital Thermostat
- Four-Way Air Direction
- Up-front, Washable Air Filter
- 3 cooling / 3 fan speeds



Features:

Control Type	Electronic
Air Discharge	Over / Under
Airflow (cfm) Roomside (hi/low)	297/261/212
Chassis Type	Slide-Out
Filter Type	Rigid Frame EZ Slide-Out Washable
Louver Style	4-Way Air Direction
Outdoor Vent / Exhaust	Yes
Cord Length	75"
Plug Type	Parallel/Right Angle LCDI
Rotary Compressor	Yes
Thermostat Type	Electronic Digital
Unit Type	Cool Only
Fan Speed Selections	3 Cooling 3 Fan Only
Room Air Conditioner Features	Smart Fan Switch 24 Hr. Timer Sleep Auto 8 Hr. Timer Remote Control Batteries Included Sleep Mode Power Interruption Restart
Style	Window or Thru-Wall
Refrigerant Type	R-410A
Sound Level (Max)	Indoor - 53dBA, Outdoor 59dBA

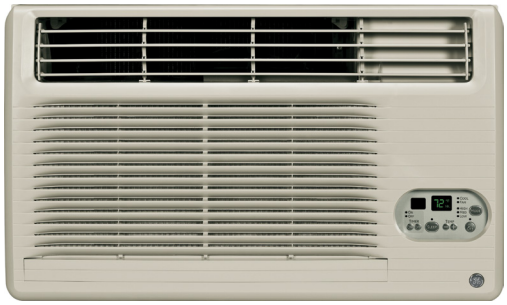
Have more questions? Please contact 1-800-626-2005

GE® ENERGY STAR® 230/208 VOLT BUILT-IN ROOM AIR COOL UNIT

TABLE OF CONTENTS

Model# AJCM12DCD

- R-410A refrigerant
- 11,600/11,400 Cooling BTU
- 9.4/9.4 EER
- 230/208 Volts
- ENERGY STAR® qualified
- Electronic Controls with Remote
- Electronic Digital Thermostat
- Four-Way Air Direction
- Up-front, Washable Air Filter
- 3 Cooling / 3 Fan Only Speeds



Features:

Control Type	Electronic
Air Discharge	Over / Under
Airflow (cfm) Roomside (hi/low)	307/290/212, 293/261/177
Chassis Type	Slide-Out
Filter Type	Rigid Frame EZ Slide-Out Washable
Louver Style	4-Way Air Direction
Outdoor Vent / Exhaust	Yes
Cord Length	75"
Plug Type	Parallel/Right Angle LCDI
Rotary Compressor	Yes
Thermostat Type	Electronic Digital
Unit Type	Cool Only
Fan Speed Selections	3 Cooling 3 Fan Only
Room Air Conditioner Features	Smart Fan Switch 24 Hr. Timer Sleep Auto 8 Hr. Timer Remote Control Batteries Included Sleep Mode Power Interruption Restart
Style	Window or Thru-Wall
Refrigerant Type	R-410A
Sound Level (Max)	Indoor - 53dBA, Outdoor 59dBA

Have more questions? Please contact 1-800-626-2005

GE® 230/208 VOLT BUILT-IN ROOM AIR HEAT/COOL UNIT

TABLE OF CONTENTS

Model# AJEQ09DCD

- 8900/8700 BTU
- 11,600/9500 Resistance heat BTU
- 3670/3010 Watts heat
- 9.5/9.5 EER
- 230/208 Volts
- Electronic Controls with Remote
- Electronic Digital Thermostat
- Four-Way Air Direction
- Up-front, Washable Air Filter
- 2 Cooling / 2 Heating / 2 Fan Only Speeds

Features:

Control Type	Electronic
Air Discharge	Over / Under
Airflow (cfm) Roomside (hi/low)	311/268, 293/244
Chassis Type	Slide-Out
Filter Type	Rigid Frame EZ Slide-Out Washable
Louver Style	4-Way Air Direction
Outdoor Vent / Exhaust	Yes
Cord Length	75"
Plug Type	Parallel/Right Angle LCDI
Rotary Compressor	Yes
Thermostat Type	Electronic Digital
Unit Type	Cool Only
Fan Speed Selections	2 Cooling 2 Fan Only
Room Air Conditioner Features	Smart Fan Switch 24 Hr. Timer Sleep Auto 8 Hr. Timer Remote Control Batteries Included Sleep Mode Power Interruption Restart
Style	Window or Thru-Wall
Refrigerant Type	R-410A
Sound Level (Max)	Indoor - 55dBA, Outdoor 61dBA

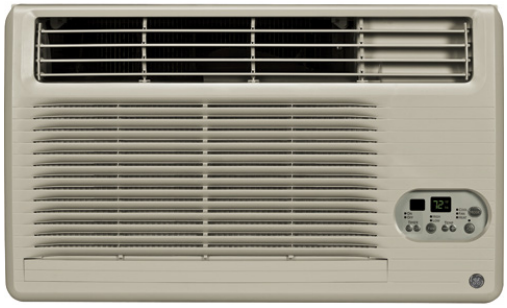
Have more questions? Please contact 1-800-626-2005

GE® 230/208 VOLT BUILT-IN ROOM AIR HEAT/COOL UNIT

TABLE OF CONTENTS

Model# AJEM12DCD

- 12,100/11,900 Cooling BTU
- 11,600/9500 Resistance heat BTU
- 9.4/9.4 EER
- 230/208 Volts
- Electronic controls
- Variable position thermostat
- Four-Way Air Direction
- Up-front, Washable Air Filter
- 2 Cooling / 2 Heating / 2 Fan Only Speeds



Features:

Control Type	Electronic
Air Discharge	Over / Under
Airflow (cfm) Roomside (hi/low)	304/286, 290/258
Chassis Type	Slide-Out
Filter Type	Rigid Frame EZ Slide-Out Washable
Louver Style	4-Way Air Direction
Outdoor Vent / Exhaust	Yes
Cord Length	68"
Plug Type	Parallel/Right Angle LCDI
Rotary Compressor	Yes
Thermostat Type	Electronic Digital
Unit Type	Cool Only
Fan Speed Selections	2 Cooling 2 Fan Only
Room Air Conditioner Features	Smart Fan Switch 24 Hr. Timer Sleep Auto 8 Hr. Timer Remote Control Batteries Included Sleep Mode Power Interruption Restart
Style	Window or Thru-Wall
Refrigerant Type	R-410A
Sound Level (Max)	Indoor - 56dBA, Outdoor 63dBA

Have more questions? Please contact 1-800-626-2005

HEIL PAJ3

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13 SEER, R-410A | PACKAGE AIR CONDITIONER FOR MANUFACTURED HOUSING, RESIDENTIAL AND LIGHT COMMERCIAL APPLICATIONS | 2–5 TONS | Single Phase, 208/230 V, 60 Hz

BUILT TO LAST – EASY TO INSTALL AND SERVICE

- Compact, fully self-contained, electric cooling unit with horizontal suppy and return ducts
- Light weight, compact construction ideal for manufactured housing and residential applications
- Environmentally sound R-410A refrigerant
- Vibration isolation provides quiet operation. Compressors have internal over current protection
- Liquid refrigerant filter driers
- Hand holds built into the base unit plan
- Designed to be serviced from both the side and front
- Accessory electric heaters with single point connections
- Durable pre-painted steel cabinet
- No-rust base pan with integrated drain pan standard to all units
- Direct-drive ECM multispeed, blower motor standard on all models
- Louvered coil enclosure for protection against vandalism and hail damage
- Aerodynamic fan blade design reduces overall sound
- All models available with optional factory installed tin-coated copper evaporator coil. (These models are identified with letters TP in the 11th and 12th positions in the model numbers
- LIMITED WARRANTY - 5 years parts limited warranty (including compressor and coils)

Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program. For verification or certification for individual products, go to www.ahridirectory.org.

AHRI CERTIFIED™ www.ahridirectory.org

c UL us LISTED

UNIT PERFORMANCE DATA					
Model Number	COOLING			Unit Dimensions H x W x D in (mm)	Operating Weight lbs (kg)
	Capacity BTU/h	SEER	EER		
PAJ324000K000A PAJ324000KTP0A	22,800	13.5	11.5	30 (765) x 51 (1,295) x 32 (813)	237 (108)
PAJ330000K000A PAJ330000KTP0A	22,800	13.2	11.5	30 (765) x 51 (1,295) x 32 (813)	249 (113)
PAJ335000K000A PAJ336000KTP0A	34,800	13.5	11.5	30 (765) x 51 (1,295) x 32 (813)	279 (127)
PAJ342000K000A PAJ342000KTP0A	40,500	13.5	11.5	34 (867) x 51 (1,295) x 32 (813)	303 (138)
PAJ348000K000A PAJ348000KTP0A	40,500	13.2	11.5	34 (867) x 51 (1,295) x 32 (813)	305 (139)
PAJ360000K000A PAJ360000KTP0A	55,000	13.2	11.5	42 (1,070) x 51 (1,295) x 32 (813)	352 (160)

Chapter 6

LOAD-BEARING DESIGN

LOAD-BEARING DESIGN

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The unique design of Starrco's SS3000 and SS3500 wall systems allow them to be used for load-bearing and two story applications. The two-piece wiring stud for each system acts as a structural column as well as a wiring raceway. This eliminates the need for separate structural columns to support the beams for a load-bearing deck.

Design Parameters:

- The SS3000 wall system is designed to accommodate beams for dust cover support and light load-bearing.
- The SS3500 wall system is designed to accommodate support beams for medium to heavy storage (75 to 150 PSF). The strength of the 3500 wire stud makes it possible to design offices with longer clear spans when interior columns are not desired or practical. The SS3500 system can accommodate two story offices up to 35' wide without using interior columns for support. This provides greater flexibility in placing interior offices, partitions or equipment.
- The wiring studs for all of our wall systems are the same width (4-1/4"). When designing a two-story office, the more economical SS3000 wall system may be used for the second floor without affecting the aesthetics of the office.
- Starrco can provide calculations sealed by a professional engineer if required for a specific project.
- Starrco designs the load-bearing support beams with a deflection criteria of L/360. This ensures the deck will be solid with very little "bounce" or deflection.
- All of our wall systems have been designed to resist a horizontal load of 5 pounds per square foot applied to the wall surface. This complies with the requirements of the four national building codes for interior wall design.

LOAD-BEARING DESIGN

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Listed below are the loading capabilities of the SS3500 wire studs based upon the height of the wall system. The chart below represents the "clear-span" capabilities of each stud at various heights and loading requirements. The loading capacities shown are "live loads":

SS3500 Wire Stud:

Wall Height	10 PSF	25 PSF*	50 PSF	80 PSF	100 PSF	125 PSF
8′	50′	50′	50′	40′	32′	26′
9′	50′	44′	46′	32′	25′	20′
10′	50′	36′	36′	26′	20′	16′
11′	50′	28′	28′	20′	16′	13′
12′	50′	20′	20′	15′	12′	10′

SS3500 Wire Stud with Steel Tube Insert:

Wall Height	10 PSF	25 PSF*	50 PSF	80 PSF	100 PSF	125 PSF
8′	50′	50′	50′	50′	42′	34′
9′	50′	50′	50′	40′	33′	27′
10′	50′	45′	48′	33′	26′	21′
11′	50′	36′	38′	26′	22′	18′
12′	50′	28′	30′	22′	18′	14′

*The 25 PSF loading capabilities are based upon beams on 8′ centers. If the beams are moved to 4′ centers, the clear span capability of the stud is increased by 1.5. For example, with the 3500 wire stud the clear span at 11′ tall with beams on 4′ centers would be 42′ (28′ x 1.5 = 42).

Notes:

- Keep the available ceiling height in mind when determining clear span capability. A 40′ long beam to support 10 PSF will be 14" deep. This would put the ceiling at a minimum of 16" below the top of the panel.
- All of our wall systems have the same width wire studs. This allows different systems to be stacked on top of each other and the studs will line up.

IBC STAIR

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DECK HEIGHT	# OF RISERS	# OF TREADS	HORIZONTAL STAIR RUN*
1′ 9-1/2 to 2′ 4″	4	3	2′ 9″
2′ 4-1/2″ to 2′ 11″	5	4	3′ 8″
2′ 11-1/2″ to 3′ 6″	6	5	4′ 7″
3′ 6-1/2″ to 4′ 1″	7	6	5′ 6″
4′ 1-1/2″ to 4′ 8″	8	7	6′ 5″
4′ 8-1/2″ to 5′ 3″	9	8	7′ 4″
5′ 3-1/2″ to 5′ 10″	10	9	8′ 3″
5′ 10-1/2″ to 6′ 5″	11	10	9′ 2″
6′ 5-1/2″ to 7′ 0″	12	11	10′ 1″
7' 0-1/2" to 7' 7"	13	12	11′ 0″
7′ 7-1/2″ to 8′ 2″	14	13	11′ 11″
8′ 2-1/2″ to 8′ 9″	15	14	12′ 10″
8′ 9-1/2″ to 9′ 4″	16	15	13′ 9″
9′ 4-1/2″ to 9′ 11″	17	16	14′ 8″
9′ 11-1/2″ to 10′ 6″	18	17	15′ 7″
10′ 6-1/2″ to 11′ 1″	19	18	16′ 6″
11′ 1-1/2″ to 11′8″	20	19	17′ 5″
11′ 8-1/2″ to 12′ 3″	21	20	18′ 4″
IBC STAIR TREAD = 11″ DEEP			

*Stair run does not include landing.

Chapter 7

SOUND CONTROL

SOUND CONTROL DESIGN

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Terms and Definitions:

Sound	A pressure variation in air which creates an auditory effect
Noise	Unwanted sound, sound without particular value
dB	Decibel; unit of sound or noise measurement versus frequency
STC	Sound Transmission Class. Rating system used to measure the transmission loss (decibel reduction) of various materials. Testing method is ASTM E90 which compares the transmission loss over a range of frequencies.
TL	Transmission Loss; reduction of sound passing through materials when tested in accordance to ASTM E90
NR	Noise Reduction. This is the actual difference in sound between two areas. The NR is determined by the transmission loss of the material between the two areas
NRC	Noise Reduction Coefficient. Rating system which measures the ability of materials to absorb sound.

Design:

Starrco modular offices can be extremely effective in dealing with noise problems within a working environment. Listed below are some items to consider when designing for noise control:

- OSHA requires manufacturing facilities with noise levels at 90 dB and above to limit the amount of time workers are exposed to the noise.
- The noise reduction capabilities of an office are only as good as its weakest point. If possible have doors and windows facing away from the noise source.
- Noise will attack the weakest point of the office. The noise reducing capabilities of the various components making up the office should be approximately equal. In other words, upgrading the walls to sound control panels will not be acoustically effective unless the doors, windows, ceiling, etc… have also been upgraded.

Products:

Starrco offers two different 3" thick wall systems. The STC ratings for each system and available panel construction is shown below. Also shown are the STC ratings for some of the common components of our modular offices:

PANEL TYPES	SP	SC	DL
SS3500 3" Thick Panels	22	33	28
SS3000 3" Thick Panels	22	33	28
3068 Vinyl Faced Door		26	
3068 20ga. Steel Door		30	
Window w/ ¼" Tempered Safety Glass		28	
Window w/ ¼" Laminated Safety Glass		34	
2' x 4' Mineral Fiber Ceiling Tile		35-39	

Please keep in mind the STC ratings are a result of laboratory testing. The actual sound reduction experienced in the field will be less. The amount of reduction achieved depends upon the type and frequency level of the noise source and the quality of the installation.

SOUND CONTROL DESIGN

TABLE OF CONTENTS

The chart below shows the correlation between common noise sources and decibel levels. This can help to give some perspective to how loud a particular decibel level may be:

DECIBEL LEVEL	SOUND SOURCE
170	Jet Engine
150	Prop. Engine
140	Pain Threshold
130	Jack Hammer
110	Punch Press
90	Busy City Street
70	Business Office (Busy)
60	Normal Speech
50	Business Office (Private)
40	Library Room
20	Quiet Speech (Whisper)
0	Hearing Threshold

As previously mentioned, OSHA limits the amount of time workers may be exposed to noise levels of 90 db or greater. Modular "breakrooms" located on the production floor can help meet exposure requirements while maximizing the available productive time of workers in an area.

OSHA STANDARDS

ALLOWABLE WORK HOURS	DECIBEL LEVEL
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
.5	110
.25	115

RIVERBANK ACOUSTICAL LABORATORIES

1512 BATAVIA AVENUE
GENEVA, ILLINOIS 60134

OF
IIT RESEARCH INSTITUTE

630/232-0104

FOUNDED 1918 BY
WALLACE CLEMENT SABINE

REPORT

FOR: Starrco Company, Inc.

ON: IOS3500-DL 3" Thick Panel

Sound Transmission Loss
Test RAL™-TL96-255

CONDUCTED: 7 August 1996

TEST METHOD

Unless otherwise designated, the measurements reported below were made with all facilities and procedures in explicit conformity with the ASTM Designations E90-90 and E413-87, as well as other pertinent standards. Riverbank Acoustical Laboratories has been accredited by the U.S. Department of Commerce, National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP) for this test procedure. A description of the measuring technique is available separately. The microphone used was a Bruel & Kjaer serial number 1330658.

DESCRIPTION OF THE SPECIMEN

The test specimen was designated by the manufacturer as IOS3500-DL 3" thick panel. The overall dimensions of the specimen as measured were 1.22 m (48 in.) wide by 2.44 m (96 in.) high and 76 mm (3 in.) thick. The specimen was placed directly in the laboratory's 1.22 m (4 ft) by 2.44 m (8 ft) test opening and was sealed on the periphery (both sides) with a dense mastic. The manufacturer's description of the specimen was as follows: The panel consisted of a 13 mm (0.5 in.) thick vinyl covered gypsum board laminated to both sides of a 51 mm (2 in.) thick polystyrene core. A visual inspection verified the manufacturer's description of the specimen. The weight of the specimen as measured was 60 kg (132 lbs) an average of 20 kg/m^2 (4.1 lbs/ft^2). The transmission area used in the calculations for transmission loss was 3.0 m^2 (32 ft^2). The source and receiving room temperatures at the time of the test were 22°C (72±2°F) and 61±3% relative humidity.

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GENEVA, ILLINOIS 60134

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FOUNDED 1918 BY
WALLACE CLEMENT SABINE

REPORT

Starrco Company, Inc.

RAL™-TL96-255

7 August 1996

TEST RESULTS

Sound transmission loss values are tabulated at the eighteen standard frequencies. A graphic presentation of the data and additional information appear on the following pages. The precision of the TL test data are within the limits set by the ASTM Standard E90-90.

FREQ.	T.L.	C.L.	DEF.	FREQ.	T.L.	C.L.	DEF.
100	27	0.34	0	800	22	0.29	8
125	29	0.24	0	1000	27	0.27	4
160	28	0.28	0	1250	37	0.22	0
200	26	0.34	0	1600	45	0.22	0
250	28	0.31	0	2000	49	0.21	0
315	29	0.20	0	2500	47	0.15	0
400	29	0.24	0	3150	47	0.15	0
500	29	0.31	0	4000	52	0.09	0
630	25	0.31	4	5000	59	0.08	0

STC = 28

ABBREVIATION INDEX

FREQ. = FREQUENCY, HERTZ, (cps)
T.L. = TRANSMISSION LOSS, dB
C.L. = UNCERTAINTY IN dB, FOR A 95% CONFIDENCE LIMIT
DEF. = DEFICIENCIES, dB<STC CONTOUR
STC = SOUND TRANSMISSION CLASS

Tested and Reviewed by
Dean Victor
Senior Experimentalist

Submitted by
Peter E. Straus
Senior Experimentalist

RIVERBANK ACOUSTICAL LABORATORIES

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1512 BATAVIA AVENUE
GENEVA, ILLINOIS 60134

630/232-0104
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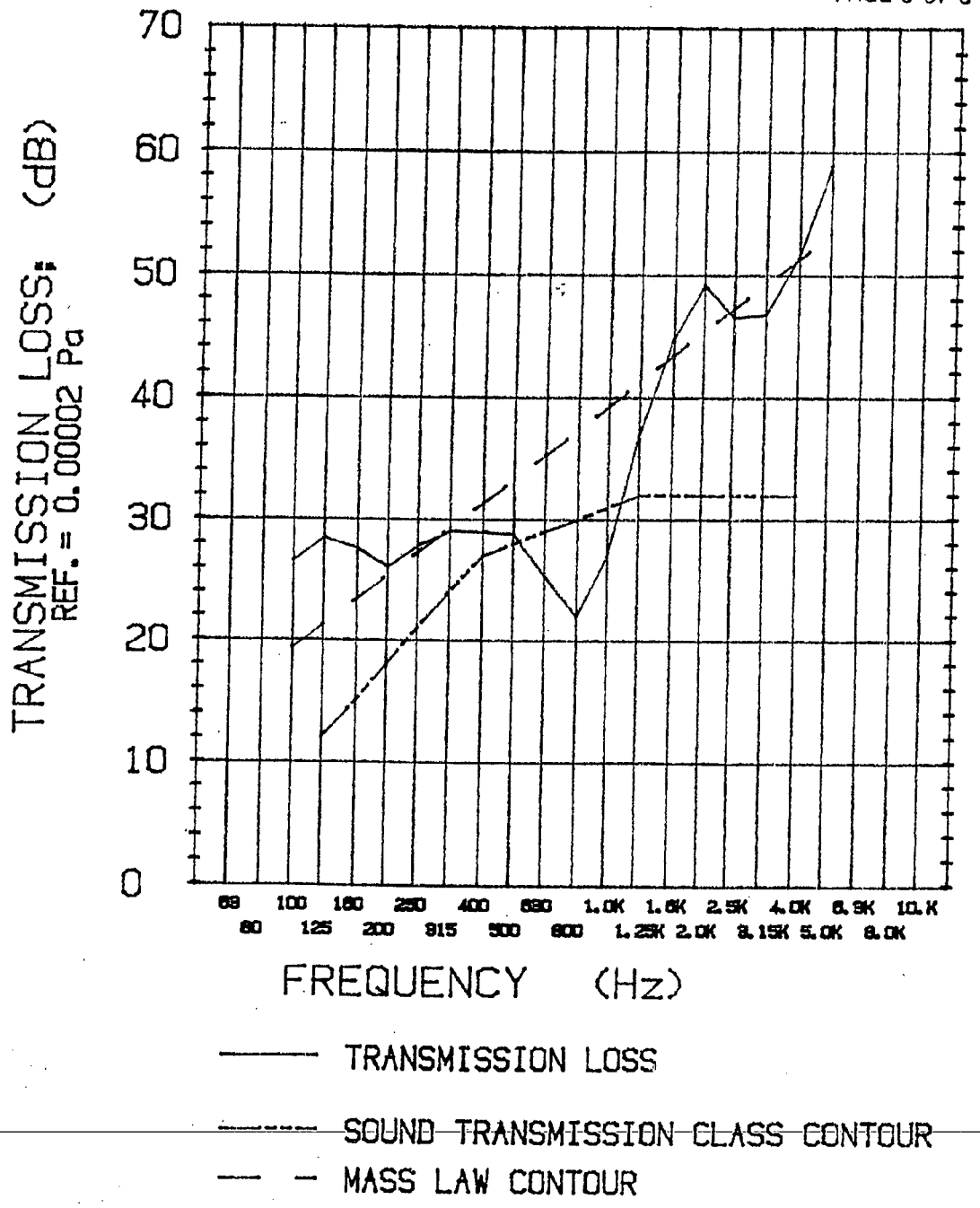
REPORT

TRANSMISSION LOSS REPORT
RAL-TL96-255



Chapter 8

FIRE RESISTANCE

FIRE RESISTANT MATERIALS

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Definitions:

- Flame Spread: Indicates the surface burning characteristics of building materials when tested in accordance to ASTM-E-2768. The range for the flame spread is from 0 to 200. The lower the number the more fire resistant the material is considered to be.
- Class A: Defines materials with flame spread of 0-25. Material in this range is considered to be noncombustible.
- Class B: Defines materials with flame spread of 26-75.
- Class C: Defines materials with flame spread of 76-200.
- Smoke Density: Indicates the amount of smoke generated by the materials during the ASTM-E-2768 test. The range for the smoke developed is from 0 to 450. The lower the number, the less smoke the material is generating.

Products:

Starrco's DL panel construction complies with the requirements for Class A materials. The DL panels have been tested in accordance to ASTM-E-2768 (copies of the laboratory tests are available upon request):

Product	Flame Spread	Smoke Density
SS3000-DL Panel	5	10
SS3500-DL Panel	5	10

The other components of a Starrco Pre-Engineered office, i.e. suspended ceiling, dust cover, steel door and windows, are noncombustible. Incorporating the DL panels into the office design will create a system in which all the components are noncombustible.

Starrco's standard (SP) panels consist of 1/8" vinyl covered hardboard (with Class C rating) laminated to both sides of a Class A polystyrene core.

Starrco's sound control (SC) panels are manufactured with all Class C substrate materials laminated to both sides of a Class A polystyrene core.

Fire ratings defined by a time limit (like one or two-hour fire rated) generally do not apply to Pre-Engineered offices. Rated walls are normally used to separate one area from another or to protect entrance and exit points between areas.

Starrco ASTM E-2768-2011 Test, 3" thick Sandwich Panel 1/2" gypsum board with polystyrene core.
Time Shown In Minutes & Seconds.

Before Test: Sandwich Panels

Gas On

FIRE RESISTANT MATERIALS

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Starrco ASTM E-2768-2011 Test, 3" thick Sandwich Panel 1/2" gypsum board with polystyrene core.
Time Shown In Minutes & Seconds.

01:12

05:20

FIRE RESISTANT MATERIALS

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Starrco ASTM E-2768-2011 Test, 3" thick Sandwich Panel 1/2" gypsum board with polystyrene core.
Time Shown In Minutes & Seconds.

10:00 No Change

20:00 No Change

FIRE RESISTANT MATERIALS

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Starrco ASTM E-2768-2011 Test, 3" thick Sandwich Panel 1/2" gypsum board with polystyrene core.
Time Shown In Minutes & Seconds.

After 30-minute test:
Showing exposed side of 1st 2 panels.

GUARDIAN FIRE TESTING LABORATORIES, INC.

Testing & Listing Field Labeling
Engineering & Product Certification Services
Factory Inspections

Guardian Fire Testing Laboratories, Inc.
15 Wenonah Terr. (Office)
Tonawanda, NY 14150

480 Hinman Ave.
Buffalo, NY 14216 (laboratory): Phone: 716 877 2760

Phone: 716 835 6880 Fax: 716 835 5682
Lab Phone & Fax: 716 884 9690
Email: gftli@earthlink.net
Web Site: www.firetesting.com

FIRE TEST REPORT: **Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30-min. Tunnel Test)**

CLIENT/MFG: Starrco Co., Inc.
11700 Fairgrove Industrial Blvd.
Maryland Heights, MO 63043

MODEL, NAME & NUMBER: 3" thick composite panel of 1/2" gypsum board with polystyrene core and aluminum framing

STANDARDS TESTED TO: ASTM E-2768-2011

TEST RESULTS:
Flame Spread Index of 5
Smoke Developed Index: 10

REPORT NO: GL 37512
REPORT DATE: 7/27/12

TEST DATE: 7/19/12

REPORT PREPARED BY: GUARDIAN FIRE TESTING LABORATORIES, INC.
480 Hinman Ave.
Buffalo, NY 14216

Table of Contents

Summary of Starrco 3" Composite Panel of 1/2" Gypsum Board with Polystyrene Core and Aluminum Framing Test Results

Flame Spread Index: 5

Smoke Developed Index 10

Material was self-supporting.

Material ignited at 0:28 seconds

Max. Flame Front @ 9:39: 1.31 ft.

Max. Flame Front @ test termination was 4 ft.

Starrco Composite Panel sample is rated Class "A"

MATERIAL TESTED:

Material tested was described as 3 Inch Thick Sandwich Panel of 1/2 in. Gypsum Board with Polystyrene Core and Aluminum Framing.

The material provided was submitted in 24 in. wide x 48 in. long panels.

The composite panels were inserted into transverse mullions as directed by Starrco. The longitudinal supports were not included in the testing.

METHOD OF SUPPORT

The test sampes were placed on the furnace ledges and butted tightly together end to end to achieve the required 24 ft. length. No additional support was required.

LID PROTECTION: 1/4 in. thick non-combustible fiber reinforced cement board was placed over the specimen as lid protection.

RESULTS:

The test results are shown on page 1 and 3 of this report.

Test Performance

The testing of the Starrco 3 in. thick Sandwich Panel of 1/2" Gypsum Board and Polystyrene Core with Aluminum Framing was conducted in the Steiner tunnel at:

NGC Testing Services
1650 Military Road
Buffalo, NY 14217-1198

NGC Testing Services is an ISO 17025-2005 compliant testing laboratory, report #TL-216.

Statistical data sheets, Section C of this report, have been provided by NGC Testing Services.

Test Witness

The conducting of the tests on Starrco's Sandwich Panel and the testing procedures followed by NGC Testing, were monitored and witnessed by Guardian Fire Testing personnel.

Test Reviewed by:

R. Joseph Pearson
Fire Testing Engineer

Uncertainty Measurement in Guardian's fire testing is less than 1% as per ASTM E 2536-06.

This test is accredited and meets the requirements of ISO/IEC 17025 as verified by ANSI/ASQ National Accreditation Board/ACLASS. Refer to certificate and scope of accreditation Report AT1247.

Guardian is accredited as an Inspection Agency per ISO 17020 through ANSI/ASQ National Accreditation Board/ACLASS, Report 1547.

Guardian is accredited as a Product Certification Agency (Product Listing & Labeling) by ANSI/ASQ National Accreditation Board/ACLASS, Accreditation ID# 1028.

N.B.: ANSI/ASQ/ACLASS is a signatory member of the International Laboratory Accreditation Cooperation's (ILAC) Mutual Recognition Arrangement (MRA). ANSI/ASQ/ACLASS accreditation of Guardian ensures global recognition for Guardian's services.

Guardian Fire Testing Laboratories, Inc.
15 Wenonah Terrace, Tonawanda, NY 14150 (office) 716 835 6880: Fax: 716 835 5682
480 Hinman, Buffalo, NY 14216 (laboratory) 716 877 2760
email: gftli@earthlink.net
web site: www.firetesting.com

Chapter 9

ELECTRICAL

BASIC ELECTRICAL STUFF

TABLE OF CONTENTS

Terms:

Watts = Power	The amount of electrical energy required to convert volts into heat energy
Amperes = Current	The flow of electrical energy
Volts = Pressure	Measurement of force required to move current through a circuit

Relationships:

Watts = Amps x Volts
Amps = Watts/Volts
Volts = Watts/Amps

Estimating amp draw for typical office:

Most important aspect of calculating amp draw for an office is to get information from the customer as to what equipment or machines are going to be in the office. Most normal office items (i.e. Personal computers, monitors, printers, calculators, fax machines, etc…) do not draw enough amps to be concerned about. The items that have large amperage requirements are the ones to find out about. These include main frame computers, vending machines, space heaters, hvac systems, welding equipment, etc… we would also like to know if an office or an area in the office is going to have a concentration of machines (like a typing pool or copier room).

Based on the Architectural Graphic Standards guidelines, listed below are some general rules to figure power requirements:

Average electrical loads for typical spaces in watts per square foot:

General office	4
Copier rooms	15
Conference rooms	1
Word processing	5
Computer rooms	40

(Note: these loads do not include hvac or special equipment requirements)

Example:

20' x 40' office with 2-wall mount a/c-heat units
800 Sq. Ft. X 4 = 3200 watts
3200/120V = 26.7 amps
2-Hvac units @ 20 amps each
Total amp draw for office: 66.7 amps

ELECTRICAL DESIGN

TABLE OF CONTENTS

All electrical components supplied by Starrco are UL listed. The standard components are designed for use with a 120/240-volt single-phase system operating at 60 Hz. (Components for three phase and other special requirements are available as special orders).

Lighting:

The standard light fixture is a 2' x 4' recessed fluorescent troffer designed for 3-32 watt bulbs. Total watts per light fixture are 96.

Determining the amount of lighting needed for a particular application can be a complex process involving several different formulas. Listed below are some simplified guidelines to help figure the quantity of lights needed. (Starrco standard lighting design is based upon 70-foot candles):

Recommended Foot Candles of Lighting

50 Foot Candles	70 Foot Candles	100 Foot Candles
Classroom	Office Area	Drafting
Stores	Proof Reading	General Assembly
Rough Assembly	Testing	Inspection

Quantity of Lights @ 50FC =	Square foot of room x 1.5 watts 96 watts
Quantity of Lights @ 70FC =	Square foot of room x 2.0 watts 96 watts
Quantity of Lights @ 100FC =	Square foot of room x 3.0 watts 96 watts

Note: to reduce the quantity of lights needed for an entire area, concentrate the lighting in the areas where the actual work is being performed. Limit the lighting in common or non-critical areas. This not only reduces the number of lights in an area, but will also reduce cooling requirements and maintenance costs.

Outlets:

Starrco's standard design is to supply an outlet approximately every 8 linear feet of wall, unless specified otherwise. A simple design alternative is to put outlets in the areas they are needed (i.e. around work stations, equipment, etc...)

Outlets for computers, air conditioners, copiers or equipment with motors should be on separate circuits. Do not count on these outlets for general usage.

Circuit Breaker Box:

Starrco's standard circuit breaker box is a 120/240v single-phase panel capable of handling up to twelve single pole breakers. We use the following guidelines for determining the quantity of breakers supplied with each circuit breaker box:

- Twelve (12) lights per light switch or 20 amp breaker
- Eight (8) 120v duplex receptacles per 20-amp breaker. (Note: the types of electrical components being used may affect the quantity of receptacles assigned to each breaker. For example, if space heaters are going to be used in the office, the quantity of receptacles per breaker should be reduced because of the potential amp draw of the heaters).
- Air conditioners and HVAC units are on separate circuits.
- Items requiring 220-250v will be on a separate two-pole breaker.

PRE-ENGINEERED QUICK-TRIC ELECTRICAL SYSTEM

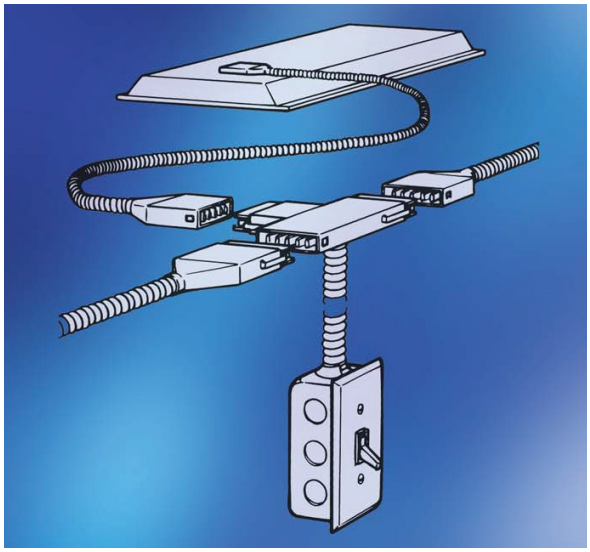
TABLE OF CONTENTS

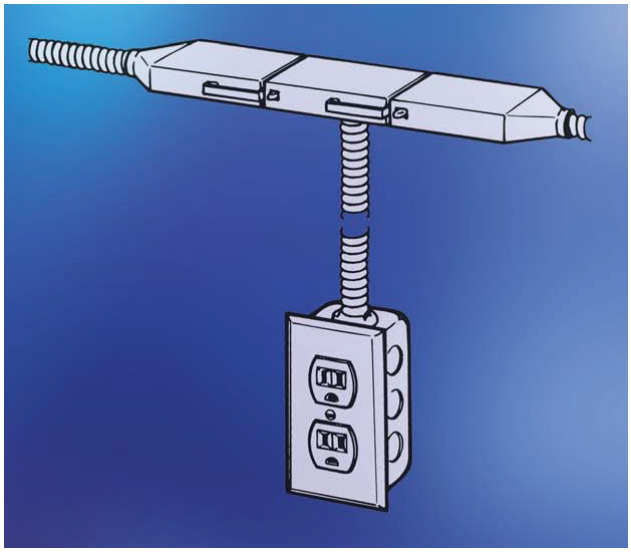
Starrco Co., Inc. has available an electrical package that is completely Pre-Engineered. Our "Quick-Tric" Pre-Engineered electrical system is designed to snap together for fast and easy installation. The connections are color-coded and safety keyed to lock together in one direction making it virtually impossible to connect the system incorrectly.

Specifications/Benefits:

- Components are 100% reusable.
- All components are U.L. listed and comply with N.E.C. section 604.
- System is easy to add-on to or relocate.
- Electrician is needed only to hookup power source to breaker box.
- System snaps together quickly and can be installed while the office is being assembled.

- Spring latches hold connections securely in place.
- System is 5 wire with 2-circuit capability.
- All wiring is 12 gauge with THHN insulation.
- A complete layout drawing and material list are supplied.
- System design complies with UL standard 183.





*Important note: A few local electrical codes do not allow Pre-Engineered electrical components. The local building inspector should be consulted prior to ordering to determine if any code restrictions apply.

**Some office manufacturers offer modular electric packages but they require the installer to wire the connectors to the electrical devices in the field. Starrco's Quick-Tric system comes from the factory with all components, including the panel board, wired with the modular connectors.

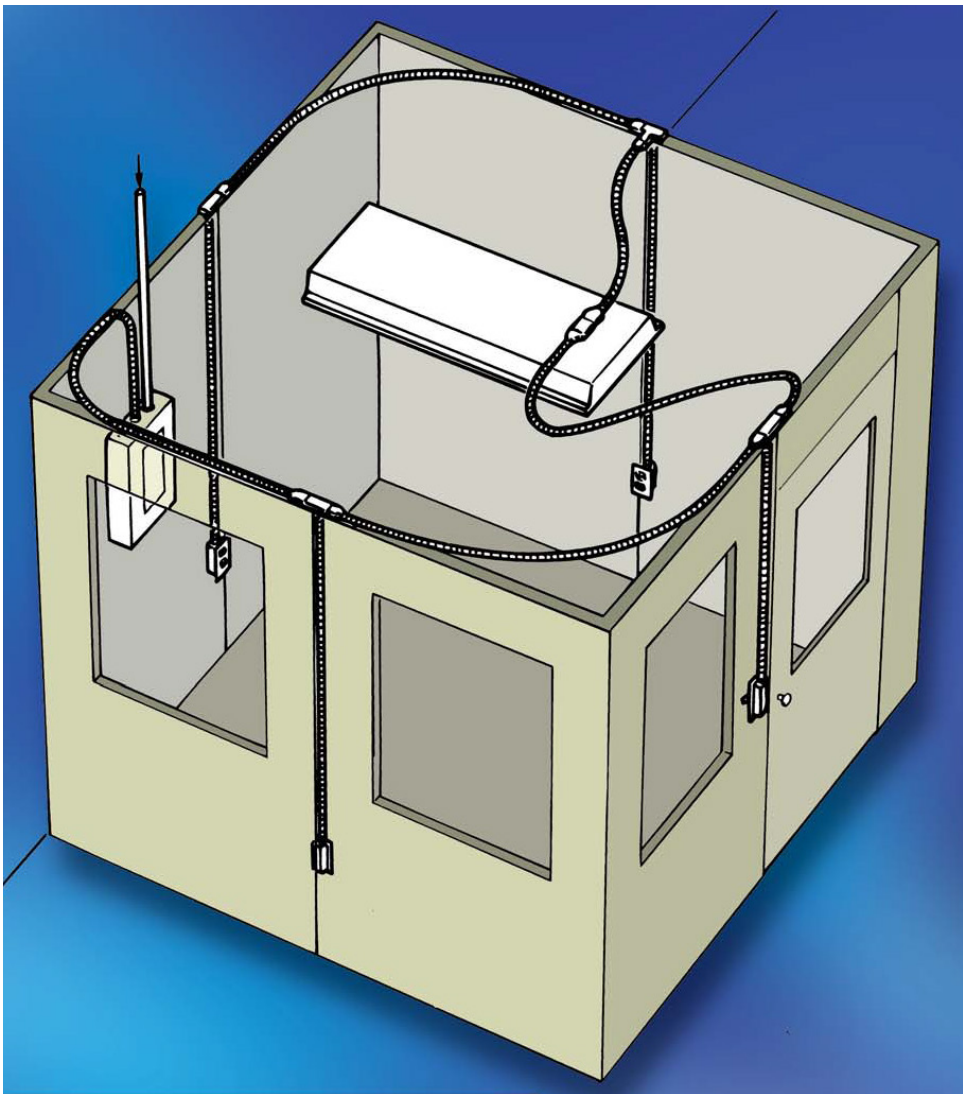
PRE-ENGINEERED QUICK-TRIC ELECTRICAL SYSTEM

TABLE OF CONTENTS

Starrco offers a 100% modular electrical package with its "Quick-Tric" Modular Electrical System. Starrco Quick-Tric components are designed to snap together and lock in place. All components are color coded making installation both fast and easy. This unique five wire system is both U.L. and N.E.C. listed. Like all Starrco products, Quick-Tric was engineered with your needs in mind.

Fast, Economical, Reusable

- Quick-Tric System snaps together for fast installation
- Components are pre-wired, color- coded and designed to fit together one way
- Easily snaps apart for relocation or expansion
- Electrician is needed only at the power source
- All components are U.L. and N.E.C. listed



MODULAR ELECTRIC SAMPLE DRAWING

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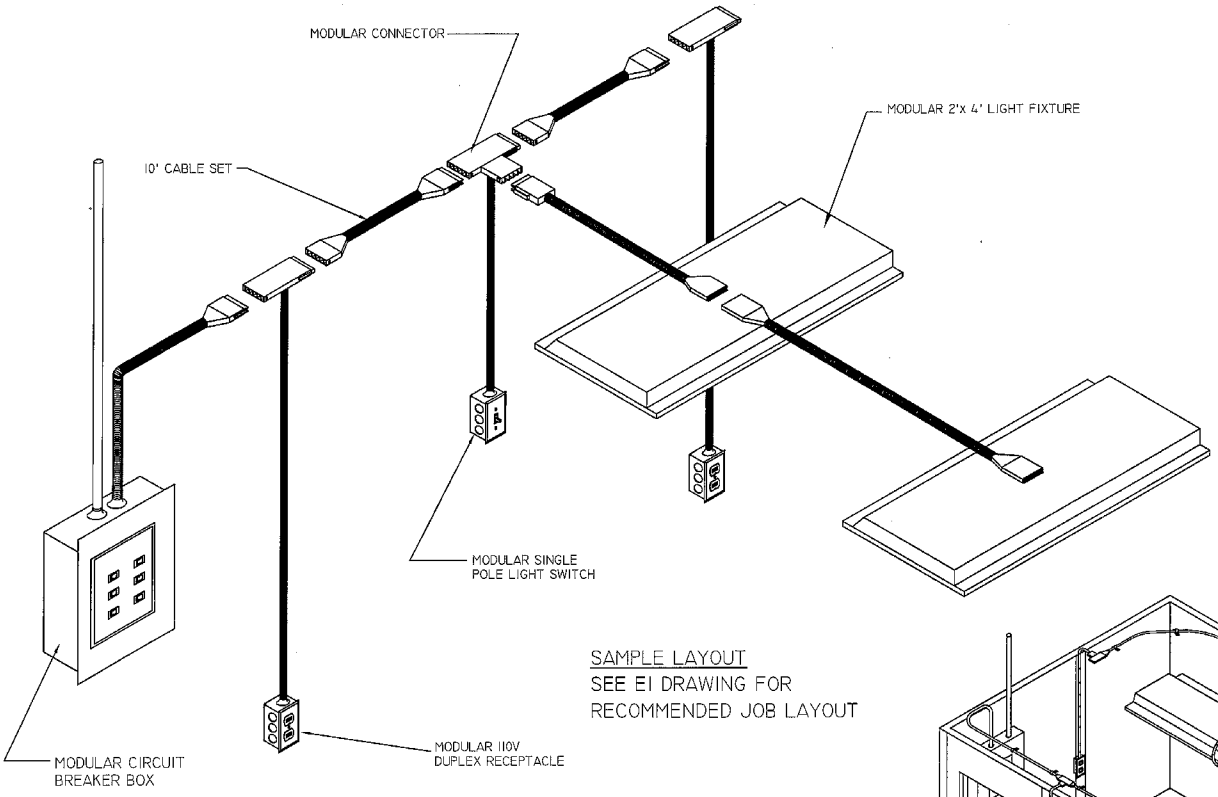
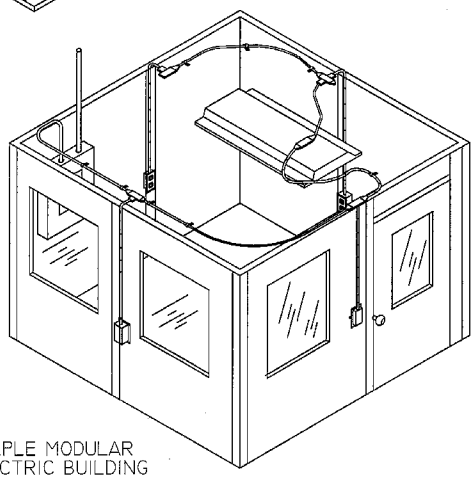


SAMPLE LAYOUT
SEE EI DRAWING FOR
RECOMMENDED JOB LAYOUT



SAMPLE MODULAR
ELECTRIC BUILDING

GENERAL NOTES:

1. EACH CABLE SET CONTAINS ONE OUTLET CIRCUIT (20 AMPS, MAX. 8 OUTLETS) AND ONE LIGHTING CIRCUIT (20 AMPS, MAX. 10 T12 LIGHTS OR 14 T8 LIGHTS).

2. ALL AIR CONDITIONERS OR HVAC UNITS SHOULD BE ON A DEDICATED OUTLET CIRCUIT (ONE OUTLET PER CIRCUIT)

Chapter 10

INSTALLATION

GUIDELINES FOR FIGURING INSTALLATION MAN HOURS

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ITEM	HOURS	UNIT
Walls & Framework	.175 Hours	L/F
Ceiling	.027 Hours	Sq. Ft.
Ceiling Insulation	.015 Hours	Sq. Ft.
Dust Cover	.015 Hours	Sq. Ft.
Door	1.0 Hours	Each
Double Door	2.0 Hours	Each
Beam	.5 Hours	Each
Column	1.0 Hours	Each
Plywood	.02 Hours	Sq. Ft.
Floor Tile	.03 Hours	Sq. Ft.
Modular Electric	.15 Hours	Per Component
Stair & Landing	3.0 Hours	Each
Handrail	.1 Hours	L/F
Guardrail	.2 Hours	L/F
Wall Mount A/C Unit	.5 Hours	Each
Starrco Central HVAC System	16 Hours 24 Hours	Lot (Single Story) Lot (Two Story)

Important Note:

The times shown above do not include the following:

- Receiving And Unloading
- Transferring Material To Jobsite
- Unpacking And Inventorying Components
- Clearing Jobsite
- Jobsite Obstruction (i.e., Existing Columns, Machinery, etc.)
- Clean Up And Trash Removal
- Hardwiring Standard Electrical Components
- Floor Preparation

SINGLE DOOR INSTALLATION

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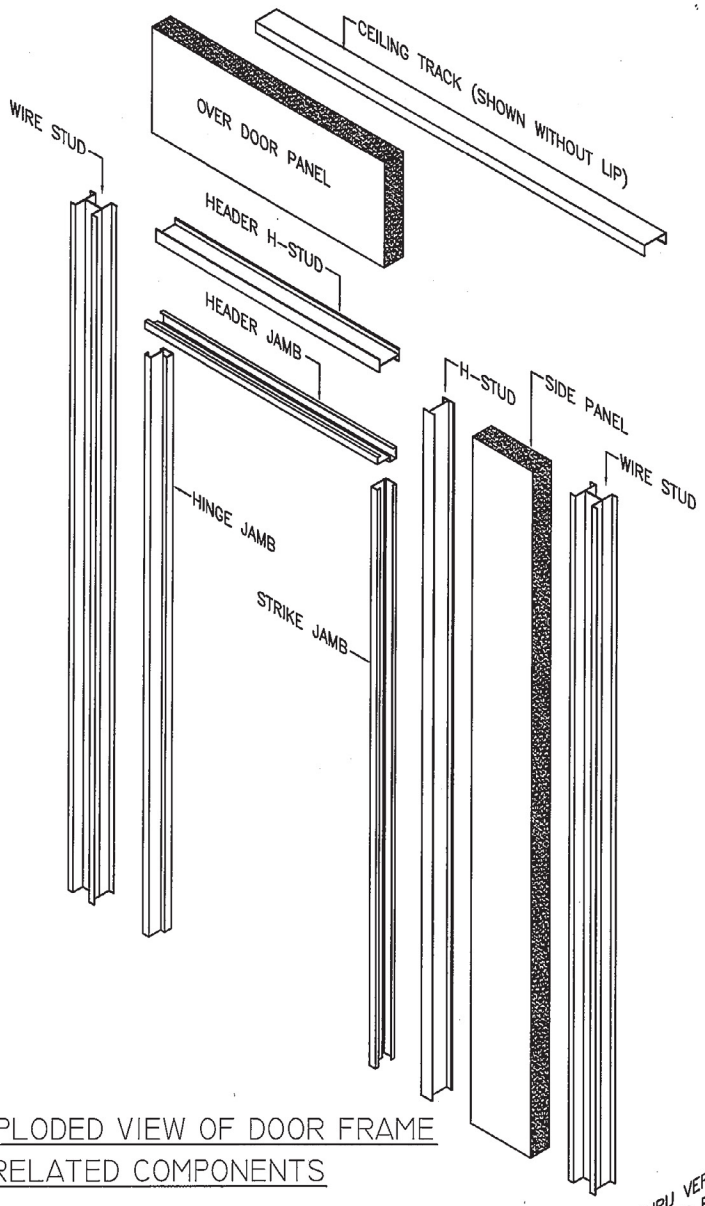
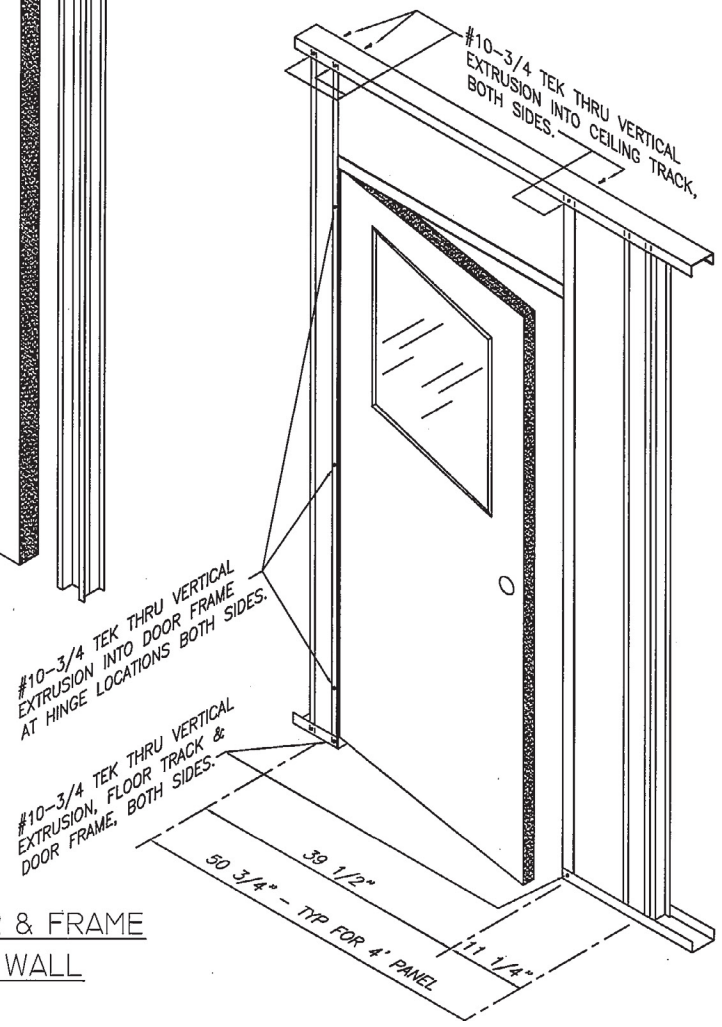


EXPLODED VIEW OF DOOR FRAME & RELATED COMPONENTS

1. VERIFY DOOR LOCATION & SWING ON WALL PANEL LAYOUT.
2. MAKE SURE THAT ADJACENT WALL COMPONENTS ARE SQUARE, PLUMB & LEVEL.
3. ASSEMBLE HINGE JAMB, STRIKE JAMB & TOP JAMB TO MAKE DOOR FRAME ASSEMBLY.
4. INSERT COMPLETED FRAME ASSEMBLY INTO THE ADJACENT WALL STUD. FRAME SHOULD INSERT 3/4" INTO WALL STUD.
5. PLACE HEADER H-STUD OVER TOP JAMB.
6. INSTALL HEADER PANEL INTO ADJACENT WALL STUD AND HEADER H-STUD.
7. INSTALL OPPOSITE ADJACENT STUD OVER REMAINING JAMB.
8. CHECK FOR SQUARE & PLUMB.
9. HANG DOOR IN DOOR FRAME.
10. CHECK DOOR PLUMB, SWING, AND MARGINS ON TOP & SIDES. ADJUST FOR UNIFORMITY. THIS MAY REQUIRE RAISING ONE SIDE OF THE FRAME OR ADJUSTING THE WIDTH OF THE FRAME AT THE FLOOR TRACK.
11. AFTER DOOR IS PLUMB, LEVEL & THE MARGINS SET, SECURE FRAME TO ADJACENT WALL STUDS AT FLOOR TRACK AND HEADER H-STUD AS SHOWN BELOW.



VIEW OF DOOR & FRAME INSTALLED IN WALL

SINGLE DOOR INSTALLATION

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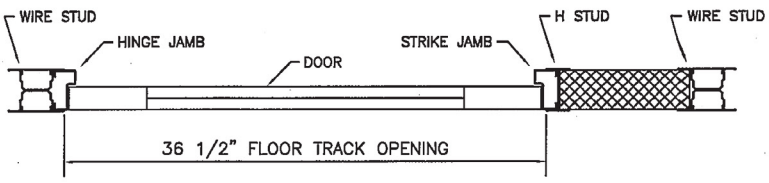
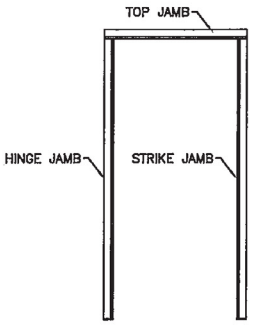
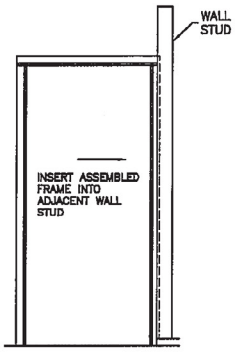


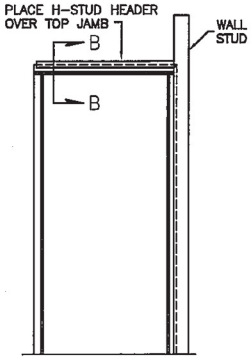
SECTION "A-A"



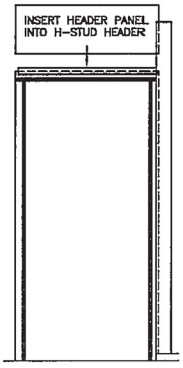
ASSEMBLED DOOR FRAME



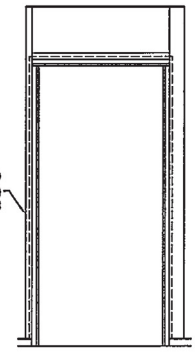
FRAME INTO WALL STUD



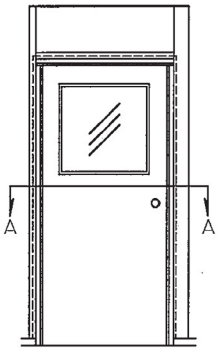
H-STUD HEADER OVER TOP JAMB



HEADER PANEL INTO H-STUD HEADER



ADJACENT WALL STUD OVER HINGE JAMB



HANG DOOR

DOUBLE DOOR INSTALLATION

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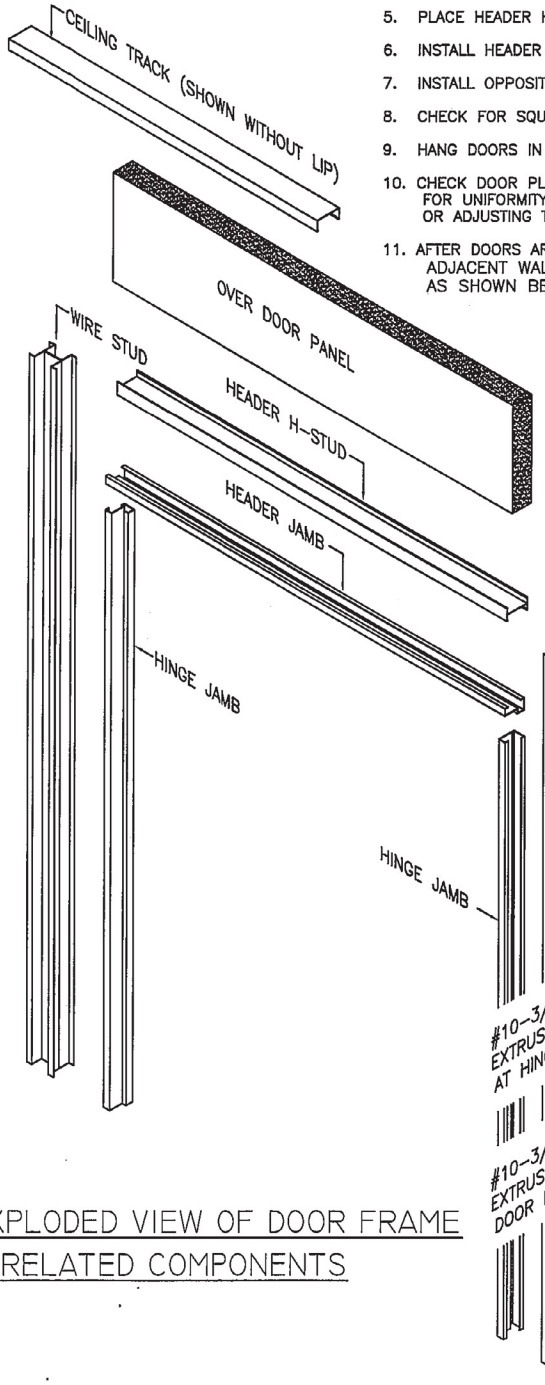
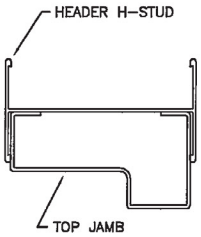
1. VERIFY DOOR LOCATION & SWING ON WALL PANEL LAYOUT.
2. MAKE SURE THAT ADJACENT WALL COMPONENTS ARE SQUARE, PLUMB & LEVEL.
3. ASSEMBLE HINGE JAMBS & TOP JAMB TO MAKE DOOR FRAME ASSEMBLY.
4. INSERT COMPLETED FRAME ASSEMBLY INTO THE ADJACENT WALL STUD. FRAME SHOULD INSERT 3/4" INTO WALL STUD.
5. PLACE HEADER H-STUD OVER TOP JAMB.
6. INSTALL HEADER PANEL INTO ADJACENT WALL STUD AND HEADER H-STUD.
7. INSTALL OPPOSITE ADJACENT STUD OVER REMAINING JAMB.
8. CHECK FOR SQUARE & PLUMB.
9. HANG DOORS IN DOOR FRAME.
10. CHECK DOOR PLUMB, SWING, AND MARGINS ON TOP & SIDES. ADJUST FOR UNIFORMITY. THIS MAY REQUIRE RAISING ONE SIDE OF THE FRAME OR ADJUSTING THE WIDTH OF THE FRAME AT THE FLOOR TRACK.
11. AFTER DOORS ARE PLUMB, LEVEL & THE MARGINS SET, SECURE FRAME TO ADJACENT WALL STUDS AT FLOOR TRACK AND HEADER H-STUD AS SHOWN BELOW.



EXPLODED VIEW OF DOOR FRAME & RELATED COMPONENTS



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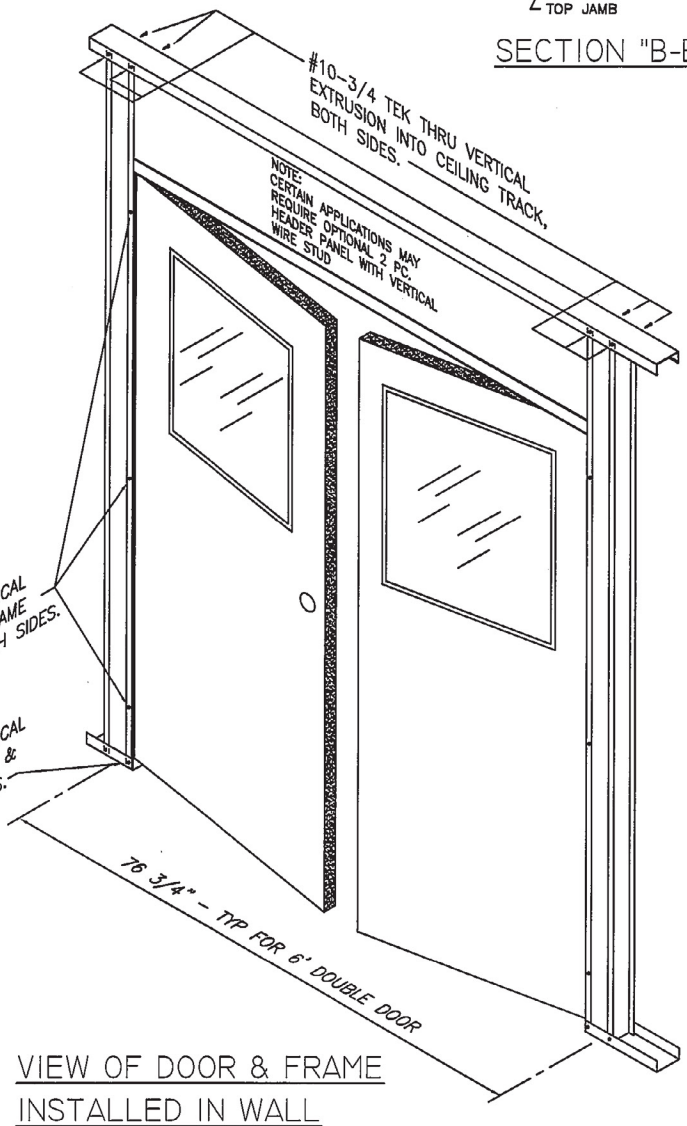

VIEW OF DOOR & FRAME INSTALLED IN WALL

DOUBLE DOOR INSTALLATION

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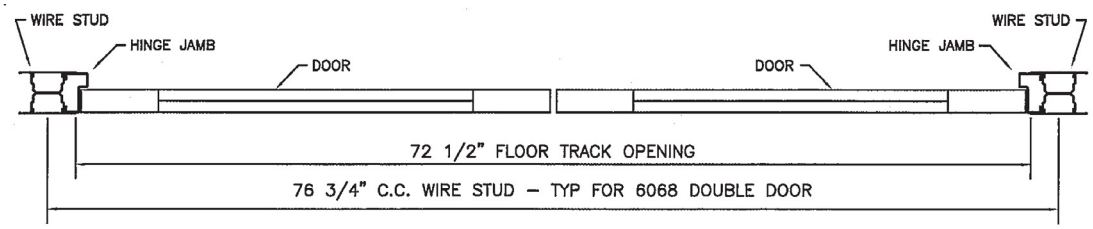
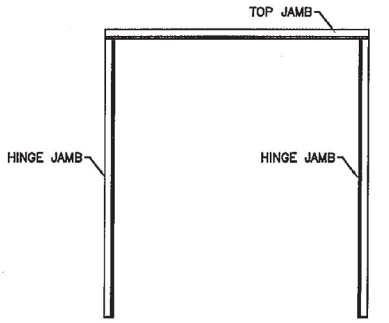
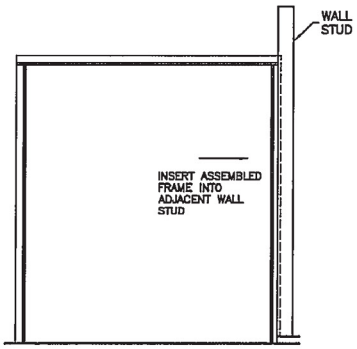


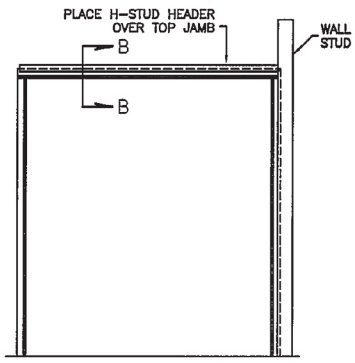
SECTION "A-A"



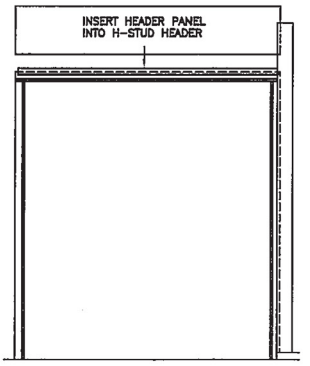
ASSEMBLED DOOR FRAME



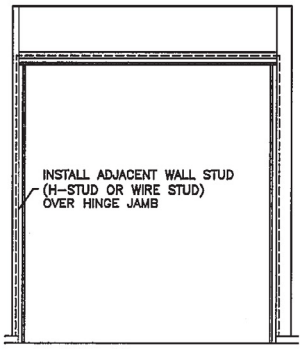
FRAME INTO WALL STUD



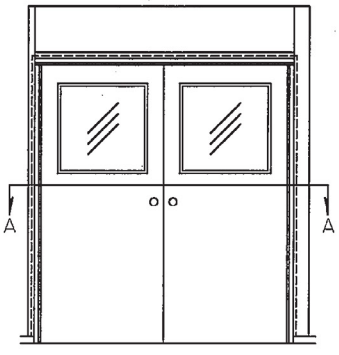
H-STUD HEADER OVER TOP JAMB



HEADER PANEL INTO H-STUD HEADER



ADJACENT WALL STUD OVER HINGE JAMB



HANG DOOR

Chapter 11

CLEANROOM DESIGN

CLEANROOM SOLUTIONS

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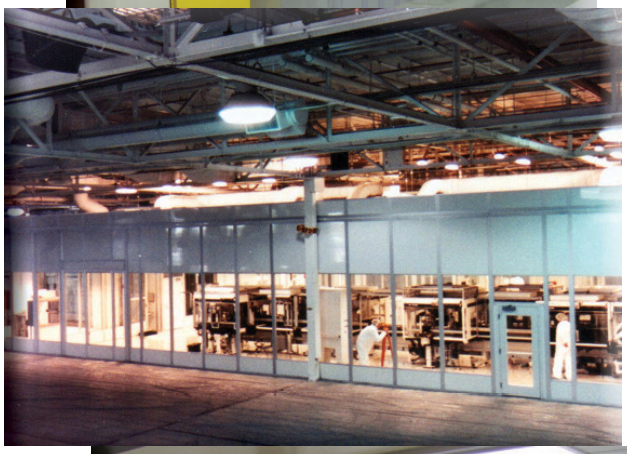
MODULAR SPACE SOLUTIONS FOR TODAY AND TOMORROW

Starrco Cleanroom Systems

Starrco Modular Systems will provide you with the most cost effective cleanroom construction. Our systems can accommodate anything from a sound or equipment enclosure to pharmaceutical applications. Our interfacing walls, floors, ceilings and mechanical components will provide a contaminate free environment, effectively allowing control of air flow, pressure, temperature, humidity and filtration. Since all material is pre-cut, mitered and completely finished, installation is completed quickly; with minimal mess, dust and disruption to your operation. With Starrco Modular Cleanrooms, class 100 conditions can be easily obtained. Our cleanroom systems allow you the flexibility to easily and conveniently expand, reconfigure or relocate as your needs change. The design of the studs allows removal and replacement of a wall panel without disturbing adjacent panels. Starrco Modular Cleanrooms can be completely dismantled and relocated, therefore, you get the tax advantage of 7 year depreciation as opposed to 39 years required with conventional construction. Check with your financial advisor. When you choose Starrco, you'll get a custom designed Cleanroom system that is pre-engineered and manufactured specifically for your needs.

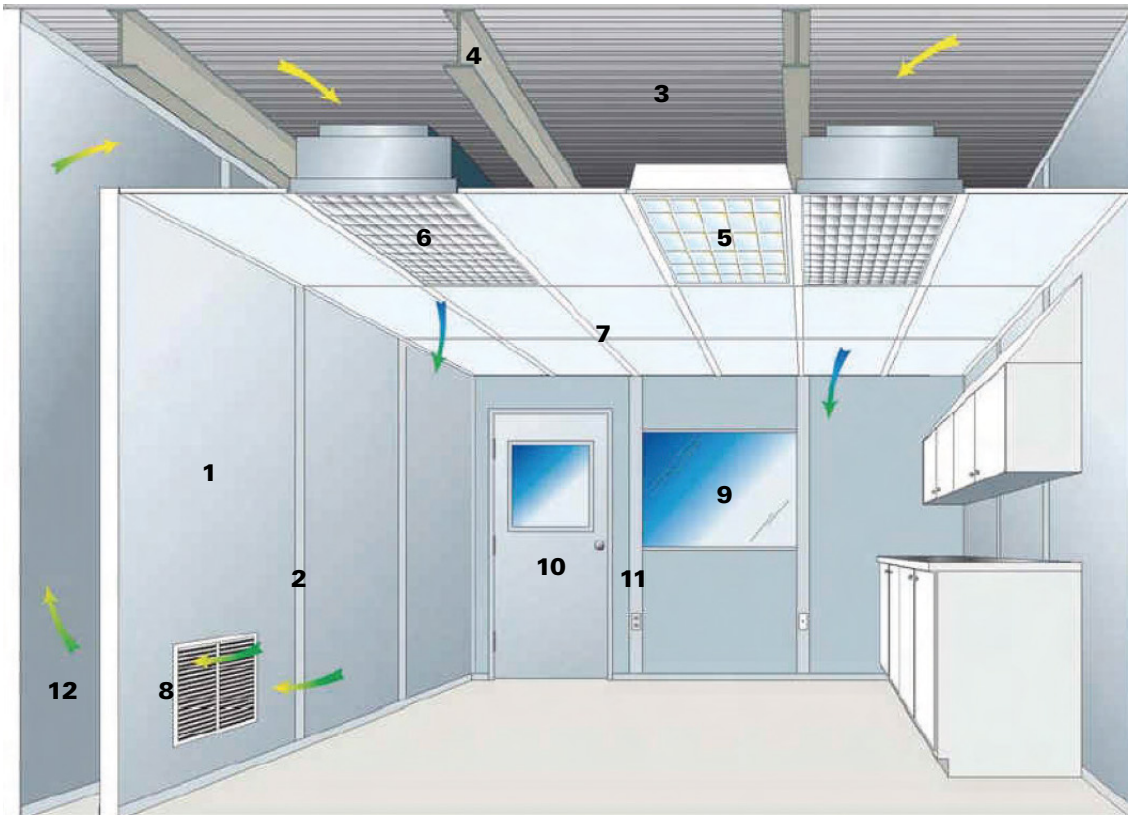


Cleanroom Applications

Sound Enclosures	Equipment Enclosures	Automotive Industry
Medical Device	Assembly Areas	Laboratories
Optic Industry	Nano Technology	Wafer Fab Production
Composite Industry	Compounding	Pharmacies
Animal Housing Labs	Aerospace Industry	CMM Rooms
Oil Mist Enclosures	Life Science Industry	Meteorology Labs
Environmental Rooms	Pharmaceutical	Industry

Quality Materials Engineered to Exacting Standards

Each project begins with a careful needs assessment. The office is then designed and engineered to specifically fit your application. All of our components are manufactured to our precise standards, labeled and delivered with a complete set of CAD drawings to make on-site installation quick and convenient. Our quality packaging minimizes shipping damage and the resulting delays. From initial design to finished installation, Starrco can insure that your project runs smoothly. All studs in Starrco Cleanrooms accommodate quick and easy vertical installation of electrical, data transmission and communication lines in raceways accessible from a removable cover plate.



1. Wall Panel – wall finishes available in vinyl, fiberglass, pre-finished aluminum
2. Aluminum Wiring Stud allows for installation of electrical and communication devices
3. Corrugated 22 ga. Steel Roof Deck
4. Steel Beam – for load-bearing capabilities
5. Sealed Light Fixture
6. Fan powered HEPA Filter Unit
7. Gasketed Tee Grid Ceiling
8. Return Air Grille
9. Fixed Window – preglazed with 1⁄4" Tempered Safety Glass in Aluminum Frame
10. 3068 20 ga. Steel Door with Window and Steel Frame
11. Duplex Receptacle
12. Return Air Chase

What the Starrco Advantage Means to You

Starrco will provide a custom designed solution that is pre-engineered and manufactured to precisely fit your application. And while it fits your application today, Starrco's modular Cleanroom systems are designed with the flexibility to be easily reconfigured or relocated to meet your future needs. Starrco will deliver materials that are all pre-cut, mitered and completely finished so that your project will be installed in a fraction of the time of conventional construction, with no mess, dust or debris. The Starrco advantage means that you receive the peace of mind that your project will be completed on time and on budget. When you select Starrco Cleanroom Systems, you get the advantages of an integrated team of professionals committed to delivering quality, innovation and value.

STARRSPACE 3000 CLEANROOM WALL SYSTEM

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General:

The Pre-Engineered cleanroom wall shall be SS3000 as manufactured by Starrco Company, Incorporated, St. Louis, MO. Starrco has been designing and manufacturing pre-engineered wall systems since 1965.

Wall Panels:

DL Panels - Wall panels shall be a sandwich type construction with ½" vinyl covered gypsum board laminated to both sides of 2" thick noncombustible 1 lb. density expanded polystyrene core. Total panel thickness is 3". Panel carries a Class A flame spread rating when tested in accordance to ASTM-E-2768. Insulation value R-11.

Optional Finishes:

Optional wall coverings include painted aluminum, painted steel, fiberglass reinforced plastic (FRP), Melamine, cork, PVC, etc.

Framework:

Wire Studs - Studs shall be extruded from 6063 aluminum alloy with T6 temper. Wire studs allow for electrical, data processing and communication lines to be run vertically in a raceway accessible from a removable cover plate. Two piece design allows access to both sides of stud for wiring of electrical devices and communication receptacles. Design also gives system the capability of removing a panel without disturbing the adjacent panels.

Floor and Ceiling Track - Track shall be extruded from 6063 aluminum alloy with T6 temper. Track shall be precut and mitered to eliminate need for field cutting. Overall thickness of system at floor and ceiling track is 3-7/16"

Finish - The aluminum extrusions are available in White, Khaki or Grey baked on painted finish. Special color finishes are available.

Height - The system is available in the following standard heights: 8', 9', 10' and 12'. Systems over 8' tall may have spliced panels depending upon the panel construction or finish.

STARRSPACE 3500 CLEANROOM WALL SYSTEM

TABLE OF CONTENTS

General:

The Pre-Engineered cleanroom wall system shall be SS3500 as manufactured by Starrco Company, Incorporated, St. Louis, MO. Starrco has been designing and manufacturing pre-engineered wall systems since 1965.

Wall Panels:

DL Panels - Wall panels shall be a sandwich type construction with ½" vinyl covered gypsum board laminated to both sides of 2" thick noncombustible 1 lb. density expanded polystyrene core. Total panel thickness is 3". Panel carries a Class A flame spread rating when tested in accordance to ASTM-E-2768. Insulation value R-11.

Optional Finishes:

Optional wall coverings include painted aluminum, painted steel, fiberglass reinforced plastic (FRP), Melamine, cork, PVC, etc.

Framework:

Wire Studs - Studs shall be extruded from 6063 aluminum alloy with T6 temper. Wire studs allow for electrical, data processing and communication lines to be run vertically in a raceway accessible from a removable cover plate. Stud is a two piece design that allows it to act as a structural column on rooms with long clear spans and load-bearing roofs. The design also gives the system the capability of removing a panel without disturbing the adjacent panels.

Floor and Ceiling Track - Track shall be extruded from 6063 aluminum alloy with T6 temper. Track shall be precut and mitered to eliminate need for field cutting. Overall thickness of system at floor and ceiling track is 3-7/16"

Finish - The aluminum extrusions are available in White, Khaki or Grey baked on painted finish. Special color finishes are available.

Height - The system is available in the following standard heights: 8', 9', 10', 12', 14' & 16'. Taller walls are available. Systems over 8' tall may have spliced panels depending upon the panel construction or finish.

Doors:

Doors shall be 3068 20 gauge commercial grade steel door with insulated core. Each door is equipped with 1 ½ pair of 4 ½" x 4 ½" ball bearing hinges and a stainless steel key-in knob commercial grade (ANSI A156-2) lever handle lockset. The top half of the door shall be glazed with 1/4" tempered safety glass.

The doorframe for all three systems shall be 18-gauge steel, three-piece frame, mortised to accept hinges.

Other Doors Available Upon Request

GENERAL SPECIFICATIONS

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Windows:

Fixed window shall be nominal 4' wide x 3' high. Window is glazed at the factory with 1/4" tempered safety glass in an extruded aluminum frame. The 1/4" tempered glass complies with ASTM C 1048 and ANSI Z97.1-1984.

Ceiling:

Suspended ceiling consists of cleanroom rated 2' x 4' white vinyl faced gypsum tiles supported in an intermediate duty white painted gasketed steel grid. The ceiling tiles have a CAC Rating of 35-39 and are Class A noncombustible.

Dust Cover:

Dust cover shall be 22 gauge, type B, 1 ½" ribbed steel deck, prime painted gray. The dust cover is not designed for storage load unless noted otherwise. When load-bearing deck is required, the roof deck and structural steel components shall be pre-engineered to meet the loading requirements.

Electrical:

(All electrical materials supplied by Starrco are U.L. listed and meet N.E.C. requirements).

Electric package consists of 2' x 4' T8 four lamp fluorescent troffer type gasketed and sealed light fixtures, 120v duplex receptacles, 120v light switch and a 125-amp load center with appropriate circuit breakers. Electric package does not include lamps or wire.

Pre-Engineered Quick-Tric electric components are available as an option.

Options:

Starrco cleanrooms are available with a variety of optional features to meet specific needs and requirements of the application. Options may include HEPA filtration, precision air conditioning, sealed pass-thrus, filtered air return grilles, etc.

Chapter 12

USER APPLICATIONS

Starrco Pre-Engineered Office Systems Offer Speed

Metal Construction News
February 1999
The Voice Of The Industry

Industry News

Bryan Carey

A printing company in San Antonio, TX, is growing rapidly and wants to add a mailing department. A manufacturer in Highland, IL, wants to enclose sensitive equipment from the noise, heat and dust of manufacturing. A special electronic materials manufacturer in Toledo, OH, needs to add five enclosures for various production operations.

What do they have in common? Each company is expanding and needs additional office space or enclosures in a hurry. Their solution—pre-engineered modular office systems from Starrco.

Starrco's modular office systems are designed to be installed in one fourth the time of permanent construction and save as much as 50% on total project cost. This is accomplished by pre-engineering the office where the material is pre-cut and mitered to fit the application. A wide variety of materials, finishes and colors allows the owner, architects and contractors the freedom to design offices from high profile administrative offices to two-story industrial applications.

Clear Visions in San Antonio, TX, installed a two-story pre-engineered Starrco office system over a two-day weekend. Jim Alley, Clear Vision's director of operations said, "We were looking at $48-$52 per sq. ft. for conventional construction, plus considerable down time that we simply could not afford.

"For a business like ours, the dust and debris of conventional construction is much too intrusive to our work flow. With the Starrco pre-engineered structure, we completed the two-story office for $31.25 per sq. ft. and in two days."

Alley added, "The modular design provided an excellent work environment. It was completed in a fraction of the time required by conventional construction and with far less intrusion to our work force."

Sem-Com in Toledo, OH, manufactures special glass electronic

Starrco modular work space, such as the one above, is designed to be comfortable and functional.

STARRCO

materials. It needed to add five separate enclosures to house production facilities such as a batch room and grinding rooms. The company chose Starrco primarily for the "speed and cleanliness of installation," according to Larry Lohman, Sem-Com's project coordinator. Starrco took only two weeks to complete all five structures.

Each structure was customized to provide as much as 15' clear inside height, .75 PSF load bearing for storage and special space saving sliding doors. Lohman estimated it would have taken at least two months to complete the project with stick built construction. "Our operation could not tolerate the dust and pollution of stick built construction," Lohman said.

Lohman noted another advantage of the pre-engineered system was the tax savings. Because all Starrco modular offices can be fully dismantled, reassembled and relocated, they are classified as tangible property and qualify for seven-year depreciation.

"Starrco gave us what we wanted in special features and timing. They were very responsive and followed through on all its commitments," Lohman added.

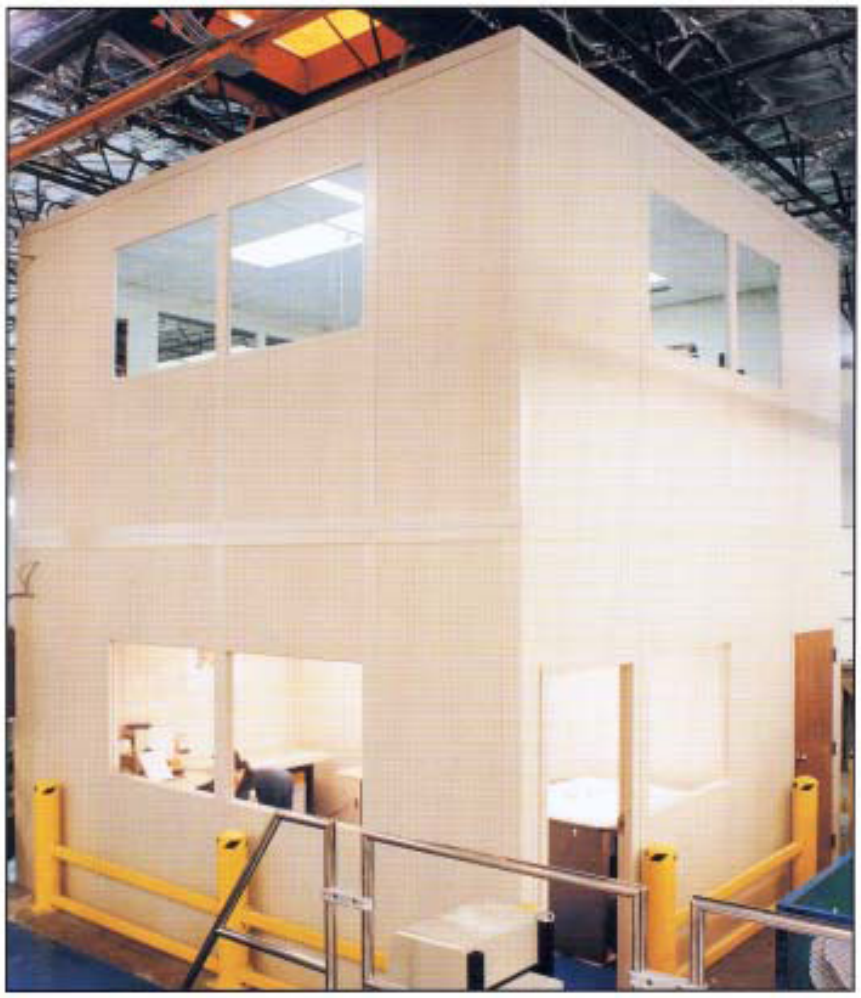
B-Line Systems Inc. in Highland, IL, used a Starrco pre-engineered system to add four new offices with one being installed on top of an existing mezzanine. The project added a total of 600 sq. ft. of new office space.

Supervisors were already occupying the space on top of the mezzanine, but were exposed to the manufacturing noise, heat and dust. This meant their equipment; computers, phones, desks and electronic equipment were also exposed. The objective of B-Line Systems' project was to build a comfortable, clean, work environment for the supervisors without interrupting the manufacturing process or the supervisors. With the heat of summer quickly approaching, speed was the first priority on the project.

Starrco met a tight manufacturing and installation deadline. The first site visit took place on June 8th, where project measurements were confirmed. The order was placed on June 11th. All materials were delivered to B-Line Systems 8 days later on June 19th. Weekend installation began on Saturday, June 20th, and was completed by Monday morning, when the supervisors moved into their four new offices with no interruption in production. The total cost of the project was $18,400.

Bryan Carey, president of Starrco said the secret to the rapidly growing success of its pre-engineered concept is that it provides, "speed, speed and speed." He added, "Our customers can't afford the disruption of permanent construction. They need us to do manufacturing at Starrco and quickly install the structure at their facility with minimal interruption to work flow or the environment."

"Pre-engineering gives the customer substantial savings over stick-built construction by reducing installation time, taxes and the total project cost," Carey added. "Plus pre-engineered offices also give the customer flexibility to make changes in the future: moving the structure, adding on to it or re-configuring the space. This cannot be done with traditional construction."



Clear Visions completed this pre-engineered two-story office (above) over a two-day weekend.

DACO OPENS WINDOW ON COMMUNICATION

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DACO Corporation (Kent, WA) knew that six weeks would be a tight deadline to supply and install a two-story modular office, but when a window manufacturer from Tacoma, Washington, called upon them for a quote request they didn't miss a beat.

DACO's Vice President of Sales Steve Duffield and Territory Manager Chris Andrus worked with Starrco Company's Bryan Carey, president, and Daryl Carlson, vice president of manufacturing, to develop a proposal for the customer which included a quote for the modular building and electrical HVAC. DACO added the cost of carpeting, sprinklers and installation, and took a proposal to the customer—within 24 hours. Quick reaction to the customer's quote request and a careful needs analysis of the customer's project resulted in a project cost that included everything the customer wanted and nothing more. DACO won the contract, leaving them with just four weeks to get the job done.

Four weeks might seem tight to the people doing the work, but it can be a lot more worrisome for the customer who is paying for it to get done. "The customer was concerned about the ability of Starrco and DACO to meet the deadline. Starrco's Carey spoke directly with the customer and assured him that Starrco could meet his timeline and reconfirmed his belief in DACO's ability to install the product in time," Duffield says.

Starrco developed the drawings, came up with engineered calculations, manufactured and shipped the product while DACO installed the system, all within the requested time frame. DACO's Duffield says, "A big part of our success was the constant communication between Chris Andrus, Starrco and the customer.

Communication made this project successful, along with fast response to a need. The $85,000 sale of a 24 ft. x 48 ft. two-story modular office system was completed in May 2004.

WHY OVERSTOCK.COM CHOSE A STARRCO MODULAR BUILDING

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Overstock.com was building a second warehouse in Salt Lake City and needed an electronic repair space that would be 12,000 square feet. Starrco, working with our dealer in Salt Lake, Hoj Engineering, was able to design, fabricate, and deliver the prefabricated enclosure within 5 weeks of receiving the order.

The 12,000 square foot enclosure required only 2 weeks to assemble once it was delivered to the jobsite, including wiring the lights, outlets and switches. The overall cost of the enclosure, including assembly, came in at less than $20 per square foot.

From a two-wall structure to a two-story multiple office complex, every Starrco modular office system comes with the Starrco Advantage:

- Each project begins with a careful needs assessment. The enclosure is then designed and engineered to precisely fit your application.
- Tax advantages and significant cost savings over conventional construction.
- The flexibility to easily and conveniently expand, reconfigure or relocate your Starrco modular enclosure when your needs change.
- Raceways are built in to allow quick installation of electrical, telephone and computer wiring.
- Aluminum track and posts are more durable and will not rust or corrode.
- A two-piece wall stud design allows panels to be easily removed or replaced.
- Detailed CAD drawings along with individually labeled components make your installation fast, easy and completed in a fraction of the time of conventional construction.
- All materials are pre-cut, mitered and completely finished.
- Installation is completed quickly, with minimal mess, dust and disruption to your operation.

When you choose the Starrco Advantage, you'll get a custom-designed modular office system that is pre-engineered and manufactured specifically for your needs.

Chapter 13

DEALER BULLETINS

STARRCO DEALER BULLETIN

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STARRCO CREATES INNOVATIVE NEW DOOR FRAME DESIGN

Starrco has redesigned the steel doorframe for our in-plant offices. This revolutionary design is unique in its ability to combine the convenience and speed of a traditional drywall frame with the strength and durability of a welded steel frame.

The new STARRFrame is still a three-piece design but it now locks into the wire stud framing. This virtually eliminates the flexing and twisting that occurs when drywall type frames are used on an in-plant office. By creating a solid connection inside the studs, the frame is locked into position and can withstand the stress of extremely active doors without twisting or "racking".

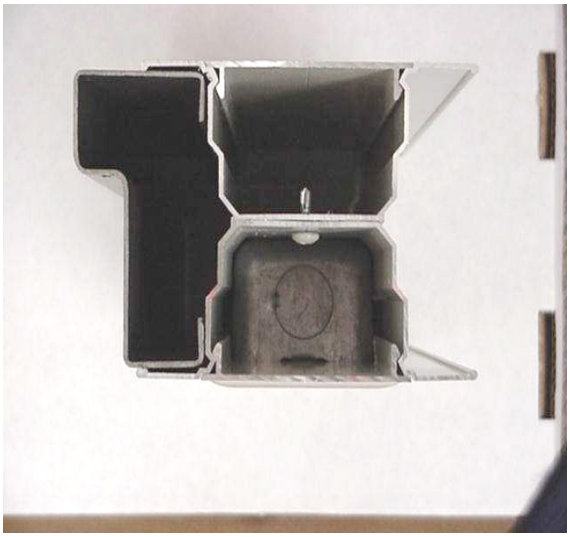
In addition to the structural enhancements, the new STARRFrame significantly improves the aesthetics of the office. The low profile design is flush with the wall surface eliminating the 1/2" projection that occurs with a traditional drywall frame.

The STARRFrame is fabricated in three pieces from 18 gauge steel with the hinge locations mortised and reinforced with a welded 7 gauge back plate. The frame is notched and tabbed for ease of installation. Door silencers (mutes) are included as a standard item.

To get more information about this innovative new doorframe design, contact your Territory Manager or call us here at the factory.

Don't forget that Starrco also manufactures guardhouses and security booths!

Finished Frame Front View
Note that the frame is virtually invisible



Detail View of Frame & Wire Stud

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You can reach us toll free @ 800/325-4259 or contact us via e-mail at starrco@starrco.com

STARRCO STACKS UP WITH A UNIQUE SOLUTION FOR GENERAL MOTORS

General Motors had a request. They wanted a 16' x 32' two story team center for their Mansfield, OH facility. They wanted an office that could be assembled quickly and cleanly with a minimum of labor required at the jobsite. Their goal was to get a unit that could be put together by GM's maintenance personnel without disrupting their production cycle.

Starrco's Vice President of Manufacturing, Daryl Carlson, offered GM a unique solution. He proposed a modular office system that would ship to the jobsite pre-assembled in eight 8' x 16' stackable sections. Each section would be assembled on a forkliftable steel base. The sections would be pre-wired and include stub outs for sprinkler lines and plumbing. Daryl designed each section so that it would easily connect together minimizing the amount of time required to assemble the complete office at the jobsite. The bases included specially designed guides so they would slip together.

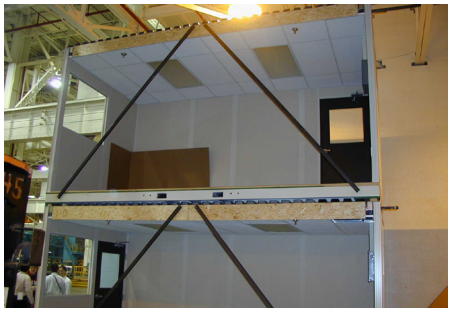
The lower sections were assembled using Starrco's SS3500-DL wall system. The upper sections used our SS3000-DL wall system. The 3" thick DL panels gave GM a wall system that was completely non-combustible and offered excellent sound control capabilities. The roof system was designed with a special connecting splice that allowed the ceilings for each section to be attached to each other without the need for on site fabrication or cutting. All the electric was done with our Quick-Tric modular wiring package so that each section's electrical components could be connected together without an electrician being required.

The individual sections were labeled so GM's personnel could easily determine the installation sequence. Each base included reinforced forklift pockets to allow them to unload and move each section. The bases on the upper sections were specially designed to distribute the floor load out to the load bearing walls of the lower sections.

Because of the unique eight piece design, General Motors was able to maneuver the units around their manufacturing equipment and assemble it without disrupting the production of materials. Starrco provided a factory trained jobsite supervisor to assist GM's personnel with putting the office sections together. The assembly of the entire two story office took less than two days.

Unique Applications for Modular Construction

Room sections being set in place at jobsite



Room sections with temporary bracing

Room sections being test fitted at factory

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STARRCO SAVES GM TIME AND MONEY

General Motors had a problem. They needed a 16' x 32' team center for their Mansfield, OH facility that could be assembled quickly, cleanly and with a minimum of labor required at the jobsite. Their goal was to get a unit that could easily be put together by GM's maintenance personnel without disrupting their production cycle.

Starrco's Vice President of Manufacturing, Daryl Carlson, offered GM a unique solution. He proposed a modular office that would ship to the jobsite pre-assembled in four 8' x 16' sections. Each section would be assembled on a forkliftable steel base. The sections would be pre-wired and include stub outs for sprinkler lines and plumbing. Daryl designed each section so that it would easily connect together minimizing the amount of time required to assemble the complete office at the jobsite. The bases included specially designed guides so they would slip together.

The sections were assembled using Starrco's SS3000-DL wall system. The DL panels gave GM a wall system that was completely non-combustible and offered excellent sound control capabilities. The roof system was designed with a special connecting splice that allowed the ceilings for each section to be attached to each other without the need for on site fabrication or cutting. All the electric was done with our Quick-Tric modular wiring package so that each section's electrical components could be connected together without an electrician being required.

The individual sections were labeled so GM's personnel could easily determine the installation sequence. Each base included reinforced forklift pockets to allow GM to unload and move each section.

Because of the unique four piece design, General Motors was able to maneuver this unit around their manufacturing equipment and assemble it without disrupting their production process. The assembly of the unit took less than four hours.

Unique Applications for Modular Construction

Individual section w/temporary bracing

Two sections being test fitted at factory

Interior view of assembled unit

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Installers Say Starrco Is The Best!

In a recent nationwide survey conducted among independent installers, Starrco placed first in all categories when compared with other office manufacturers.

The blind survey asked the installers to rank each company in six separate categories. The rating system went from 5 (best) to 1 (worst).

The categories were:

- Consistently sends all material ordered
- Ease of installation
- Speed of installation
- Quality of drawings provided
- Quality of material and hardware provided
- Responsiveness to questions or problems

To be considered for the survey, an installer had to have assembled at least three different brands of offices. Sixty percent of the respondents had worked with six or more office manufacturers.

Starrco ranked first in all six categories! We received an overall rating of 28.1 out of a possible 30 points available. (The next closest competitor had a rating of 24.8).

An interesting result of the survey was that several installers indicated that they actually price the jobs differently depending upon which office manufacturer's product is being supplied. Those installers consider the ease and speed of installation when figuring up a price for a customer. It is an old adage but time is money. If an installer can complete a job faster with a specific product, they are going to charge less for that product.

Starrco has worked very hard to make our systems easy to assemble. The components are all precut, the floor and ceiling track cut and mitered and all of the components are labeled making part identification quick and easy.
Check with your installation company to make sure you are getting the full benefit for supplying the products ranked the very best by installers – STARRCO!

Starrco has upgraded our light fixtures to the new energy efficient type with electronic ballasts!

WE VALUE YOUR FEEDBACK!
Please let us know what you think of this bulletin or any of Starrco's products and services.
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Starrco Upgrades Fire Test For Walls

Starrco recently had our DL wall system tested again for fire resistance and smoke development.

We wanted to upgrade the wall test from the original ASTM E-84 test that we had conducted on the panels in 1996.

We selected the far more rigorous ASTM E-2768 test for this round. Both tests measure the flame spread and smoke development of a product. The difference is that the ASTM E-2768 tests lasts for a full 30 minutes while the ASTM E-84 test only runs for 10 minutes.

The results of the test were great. The DL wall system (the panels are tested with the aluminum wire studs) was found to have a flame spread of only 5 and a smoke developed index of 10. This means our wall system is rated as Class A!

For comparison purposes, the flame spread rating index runs from 0 to 200. That makes our rating of 5 extremely low. Our DL wall system will not contribute fuel to a fire in a customer's facility.

Just as important, the smoke developed index runs from 0 to 450. Our 10 rating is significant because limiting the amount of smoke in that a material creates in a fire is critical.

The testing was performed by Guardian Fire Testing Laboratories. Guardian is a nationally recognized laboratory certified as an Inspection Agency, Product Certification Agency and Testing Laboratory by the ANSI/ASQ National Accreditation Board.

Copies of the fire test are available.

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Useless Facts:
The original formula for Coca-Cola made the popular soft drink green in color.

Chapter 14

PRE-ASSEMBLED BUILDINGS

Engineering Specifications

General:

Starrco's pre-assembled buildings are designed to provide years of maintenance free service. The structural members are either aluminum or steel with a rust retardant finish. Walls, ceiling and floor have a solid impact resistant core with a durable aluminum or vinyl covered finish. Windows and sliding doors are aluminum finish, swing doors are commercial grade steel.

The model number of the building indicates it's approximate size. (i.e. Model #46 is 49" wide x 78" long). The overall height of the building will be a nominal 90" with an interior height of 82".

Structural:

The loading characteristics of the buildings are:

Snow Load: 30 PSF
Wind Load: 90 MPH
Floor Load: 50 PSF

Framework:

Structural members for corners are 3" x 3", ¼" aluminum angle. Structural members between panels are 4" x 2½", 3/16" aluminum "T" extrusion. Top frame will be 2 ½" x 2 ½", 3/16" aluminum angle. All aluminum structural members will be 6063 alloy, T6 temper, painted with grey enamel finish.

Panels:

Wall panels are a minimum ¾" thick sandwich construction. Exterior of panel is smooth white painted aluminum laminated to high density OSB board. Panel interior will be 1/8" gray vinyl covered hardboard. Panels will be caulked with a urethane sealant and fastened to structural members with plated screws.

Ceiling:

Ceiling panels are a minimum ¾" thick sandwich construction. Interior of panel is 1/8" white vinyl covered hardboard laminated to high density OSB board. Top of panel will have an aluminum vapor barrier.

Floor/Base:

The building base will be 4" structural steel channels, welded, with stringers on maximum 24" centers. Base includes forklift pockets. Steel channels will be painted with a rust inhibitive paint. Sub-flooring is two layers of 5/8" OSB board with aluminum vapor barrier laminated underneath. Finished floor will be commercial grade seamless vinyl.

Roof:

On buildings 4' wide or less, the roof will ship installed on the building. Installed roof consists of .060" EPDM membrane laminated to ceiling panels with aluminum gutters on all four sides.
On buildings larger than 4' wide, roof consists of corrugated aluminum pans. Perimeter of roof will be anodized aluminum gutters and fascia trim. Roof is shipped knocked-down, ready for on-site assembly by others.

Windows:

Windows will be single sliding aluminum with locking device. Sliding sections are glazed with 1/8" clear tempered safety glass. All window framing is white painted aluminum finish.

Doors (Swinging):

Door will be a commercial grade 3068 20ga. steel with a 1/8" tempered safety glass window in top half. Door includes 1 ½ pair of 4 ½" x 4 ½" ball bearing hinges and a stainless steel key-in-knob lockset. Door will be mounted on a painted aluminum door frame with wool pile weatherstrip. Door is painted white.

Doors (Sliding):

Door will be 6068 aluminum patio sliding type. Doors will be glazed with 3/16" tempered safety glass in upper section and have a solid panel in lower section. Keyed locking device with pull handle is included. All door parts have a painted aluminum finish. Buildings with a model number ending with "-1" indicate two sliding doors are included on the long walls.

Electrical:

Pre-wired electrical package includes one 125v duplex receptacle, one 230v single receptacle, fluorescent lighting, and one 125 amp circuit breaker box. All electrical components are UL listed and all wiring conforms to the National Electrical Code.

Options:

All Starrco pre-assembled buildings can be custom fitted to meet a variety of needs.

Available options include:

- Air Conditioning and Heating
- Exterior Lighting
- Thermal Insulation
- Custom Painted Exterior
- Special Glazing (Tinted, Insulated, Polycarbonate, etc…)
- Countertops and Shelving
- Standard or Thru-Wall Cash & Transaction Drawers
- Aluminum Tread Plate Flooring

General Notes:

- Maximum width available is 12'. Be aware that oversize load charges come into play on any shipment greater than 8' wide.
- Maximum height available is 9'. The standard height is 90" which provides an aproximate 6'10" interior height.
- The standard electric package for any size building includes only 1-120v outlet and 1-240v outlet. The quantity of lights varies depending on the size of the building. The electric package does **NOT** include a light switch. Light is operated with a pull chain.
- The size of each building is based upon the size of the sliding windows we stock for the buildings. We can make custom size buildings but there is a substantial price increase because we have to special order windows and draw the units from scratch.
- The layout of the buildings can have a substantial impact on the price. The standard layouts are the most economical. Something as simple as moving a door to one side by 12" could affect the price by several hundred dollars if it requires making a special size window or adding an intermediate post.
- The standard building panel has an R-value of 2.5 (we round up to 3). The majority of the buildings we sell do not include any extra wall insulation. The two main reasons are: 1) The windows or doors are going to be opened so often that insulation would do no good or 2) The customer realizes that buying wall insulation without upgrading to insulated glass is a waste of money.
- The standard base for our building is steel channel. This provides greater strength and durability. We have not experienced any problems with connecting our aluminum framework to the steel base. We use anodized aluminum and put a rust retardant aluminized paint on the steel base.
- We do not recommend using our building for chemical storage or hazardous material containment. Many chemicals require storage in buildings that must be one or two hour fire rated and have spill containment floors.

INSTALLATION OF STARRCO PRE-ASSEMBLED BUILDINGS

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Starrco suggests a minimum 8" thick concrete slab or 6" thick reinforced concrete slab. The slab should measure the same width and length as the roof of the building. For example, if a 4' x 6' building has a roof with a 12" overhang on all four sides, the slab should measure 6' x 8'. If the building does not have an overhang roof, make the slab 6" larger than the building.
(Please note that soil conditions and wind load criteria can impact local code requirements for the slab thickness. We suggest that local building officials be contacted regarding the specific requirements at the jobsite.)

Starrco's buildings ship with 4 - 3" x 3" anchor clips welded to the steel base. (The clips can be shipped loose for field installation if required). The building should be lagged to the concrete slab with anchor bolts at a minimum 3-1/2" imbedment.

THE BUILDING MUST BE LEVELED prior to final anchoring. Anchoring the building without leveling may cause problems with leaking, create problems with door locks or even affect the operation of the doors and windows.

Chapter 15

MISCELLANEOUS

BUILT TO CODE

Structural Performance

Starrco Pre-Engineered Modular Offices are designed to comply with structural requirements of the International Building Code (IBC) with regards to load-bearing design, roof deflection and lateral load resistance.
Starrco offices can also be designed to meet earthquake zone requirements.

Fire Protection

Starrco's DL wall systems have gypsum board panels and commercial grade 20ga. steel doors with 18ga. steel frames. All components of these systems are noncombustible. The sandwich panels have been tested in accordance to ASTM E-2768. The panels were found to comply with the requirements for Class A building materials with a flame spread of 5 and a smoke density of 10. Copies of the test results are available upon request.

Electrical

All electrical components are UL listed. The electrical handy box meets NEC (National Electric Code) requirements

Accessibility

ADA (Americans with Disabilities Act) compliant locksets are standard on all Starrco doors. Starrco's standard doors meet the width requirements for the ADA. Door closers and thresholds that are ADA approved are available upon request.

State Sealed Drawings

Drawings sealed with a professional engineer's stamp are available upon request. We can provide sealed drawings for all fifty states. Contact the factory for the cost of this service.

National Building Code Requirements

A common question regarding Starrco offices is do they meet building codes. Unfortunately, the current national building code (IBC-International Building Code) does not specifically address interior modular construction.

Starrco has tried to design our offices to meet the sections of the codes that most closely apply to interior structures. Listed below are the criteria we used in the design of our offices and the appropriate building code sections:

- All Starrco offices are designed to resist a 5 pound per square foot lateral load applied evenly to the office system. This means our office systems are structurally sound enough to handle the day to day stress and strain of a factory environment.
  (2009 IBC section 1607.13)

- Starrco's DL wall panels are manufactured with ½" vinyl faced gypsum board laminated to a 1 lb density noncombustible polystyrene core. The gypsum board creates a thermal barrier that protects the polystyrene foam during a fire.
  (2009 IBC section 2603.4)

- Starrco's DL wall panel was tested for extended duration surface burning characteristics in accordance to ASTME-2768. The panel was rated Class 'A' with a flame spread of 5 and smoke development of 10. Copies of the laboratory test results are available upon request.
  (2009 IBC section 803.1)

Please be aware that the local building code official has the final say as to whether or not our office system meets the local code requirements. The information above should help the official when reviewing our design. Starrco can also provide stamped engineering drawings if required by the local municipality. Contact the factory for the cost of this service.

Competitive Note: Be aware of modular office manufacturers who offer a panel constructed of steel laminated directly to a polystyrene core. This panel construction will NOT meet building codes. The steel does not offer a thermal barrier and will not protect the polystyrene core from the heat of a fire.

STARRGUARD SAFETY RAIL

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Protect your in-plant offices, machinery, traffic aisles, storage areas, conveyors, and more with Starrco's STARRGUARD SAFETY RAIL.

The Starrguard Safety Rail system is manufactured with formed steel rails and structural posts offering protection and safety for your personnel and equipment.
All the components are modular for easy installation and to allow future expansion should your needs change. The posts can be used for corners as well as straight sections. The rails are available in standard lengths but can easily be field cut if special sizes are required.

The list below shows the standard sizes and prices for the components.

PART NO.	DESCRIPTION	NET PRICE EACH	WEIGHT EACH
SSR-P16	16" Tall Steel Post	$120.00	34 lbs
SSR-P42	42" Tall Steel Post	$160.00	58 lbs
SSR-R4	4' Long Guardrail	$84.00	23 lbs
SSR-R6	6' Long Guardrail	$96.00	34 lbs
SSR-R8	8' Long Guardrail	$104.00	45 lbs
SSR-R10	10' Long Guardrail	$116.00	58 lbs
SSR-LO	Lift-Out Rail Section	Add $48.00 to any length rail	

Materials ship from St. Louis, MO.
All components are painted safety yellow.
Includes all bolts, connectors and floor anchor.
Special sizes and heights are available.
Contact the factory for information.

STARRGUARD SAFETY RAIL

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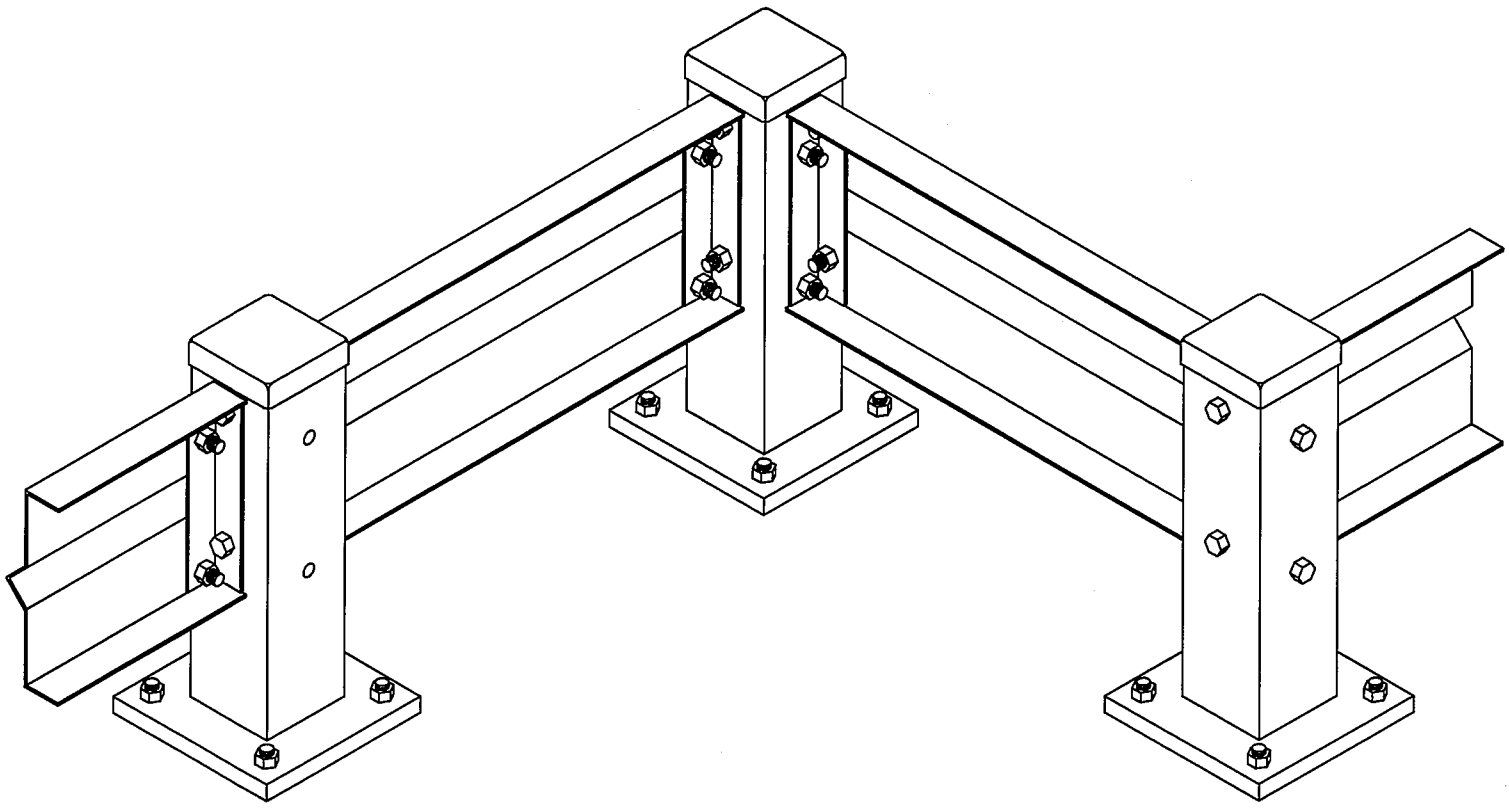

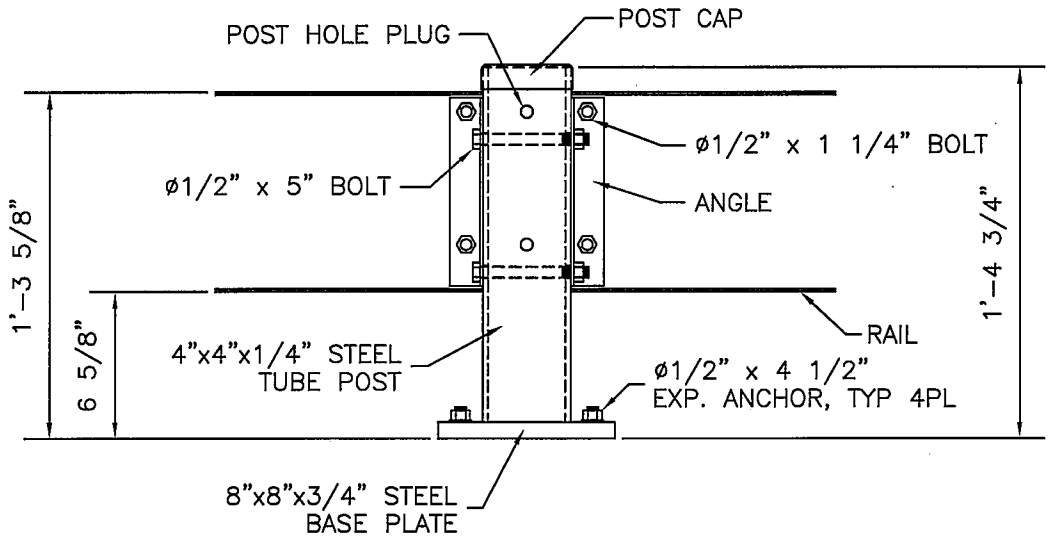

STARRGUARD SAFETY RAIL

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