

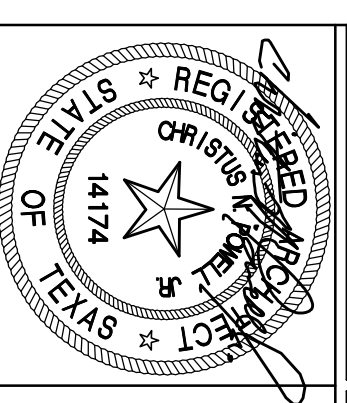
ARCHI•TECHNICS/3, INC.

ARCHITECTURE
URBAN DESIGN
INTERIORS
CONSTRUCTION MANAGEMENT

5555 West Loop South Suite 4000
Dallas, Texas 77401
TEL 713/868-0088 FAX 713/468-2613

HCC-STAFFORD FINE ARTS RENOVATION BUILDING B

**9910 CASH ROAD
STAFFORD, TEXAS 77477**



Date: 9/30/2011
Date:
Issued For Construction

ISSUED FOR CONSTRUCTION

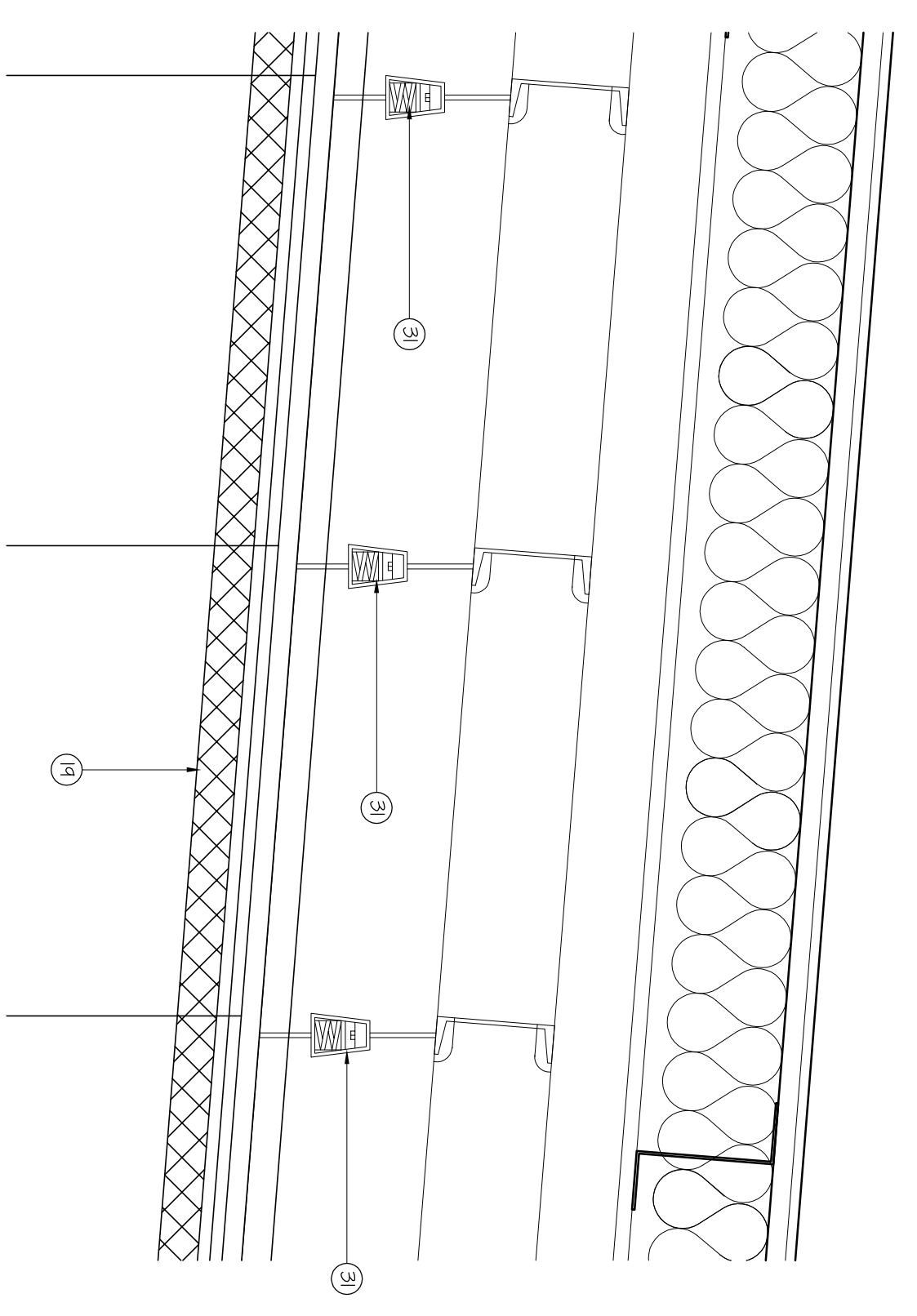
SHEET CONTENTS REFLECTED CEILING DETAILS
A.204 DATE: DRAWN BY:
CHECKED BY: 08250
SHT. OF FILE NO.

- 1 5/8" GYPSUM BOARD, (PAINTED)
- 2 METAL PANEL TO MATCH EXISTING PROFILE
- 3 3/8" METAL STUD FRAMING
- 4 8" METAL STUDS (HEAVY GAUGE). REFER TO STRUCTURAL DRAWINGS FOR SUGGESTED SPACING
- 5 8" C- SHAPED PURLIN
- 6 SCHEDULED OVERHEAD DOOR
- 7 EXISTING STEEL STRUCTURE - RIBD FRAME
- 8 R-30 THERMAL BATT INSULATION
- 9 SCHEDULED DOOR AND FRAME
- 10 SCHEDULED STOREROOM SYSTEM SHIM AS REQUIRED.
- 11 WAVEFORM MONORAIL CANTORIES BY PFG. MFG.
- 12 REPLACE METAL ROOF PANEL AS REQUIRED. PROFILE AND COLOR TO MATCH EXISTING.
- 13 METAL FASCIA TRIM TO MATCH EXISTING FASCIA TRIM PROFILE
- 14 SCHEDULED PARTITION TYPE REFER TO FLOOR PLAN FOR TYPE DESIGNATION.
- 15 NEW METAL GUTTER TO MATCH EXISTING GUTTER PROFILE AND FINISH.
- 16 SCHEDULED CEILING, REFER TO ROOM FINISH SCHEDULE
- 17 SOUND DIFFUSERS, BARREL SHAPE BY WALL TECHNOLOGY MFG.
- 18 SELECT SOUND, BLACK ACOUSTIC BOARD, OVER CORNING MFG.
- 19 21 LAYERS OF 5/8" TYPE "X" GYP. BOARD
- 20 EXISTING METAL PANEL TO REMAIN, (PAINT)
- 21 METAL THRESHOLD SET IN MASTIC
- 22 METAL FLASHING
- 23 CONTINUOUS BACKER ROD AND SEALANT
- 24 ALUMINUM SUB-SILL (ANODIZED FINISH)
- 25 8" SOUND BATT INSULATION
- 26 8" METAL STUD FRAMING
- 27 OVERHEAD DOOR GUIDE
- 28 3" SOUND BATT INSULATION
- 29 EXISTING STEEL PIPE COLUMN
- 30 ISOLATION CEILING HANGER, MASON INDUSTRIES, INC.
- 31 2" HAT CHANNEL
- 32 SUSPENDED PIPE GRID. REFER AV.01, AV.02, AV.03 FOR DETAILS
- 33 SCHEDULED BASE
- 34 ACOUSTICAL PANELS MOUNTED TO SCHEDULED PARTITION.
- 35 STRUCTURAL SUPPORT FRAMING. REFER TO STRUCTURAL FOR DETAILS.
- 36 OVERHEAD ROLLING DOOR MOUNTED TO EXISTING STRUCTURE. REFER STRUCTURAL FOR DETAILS.

DETAILS

SCALE: 3/4" = 1'-0"

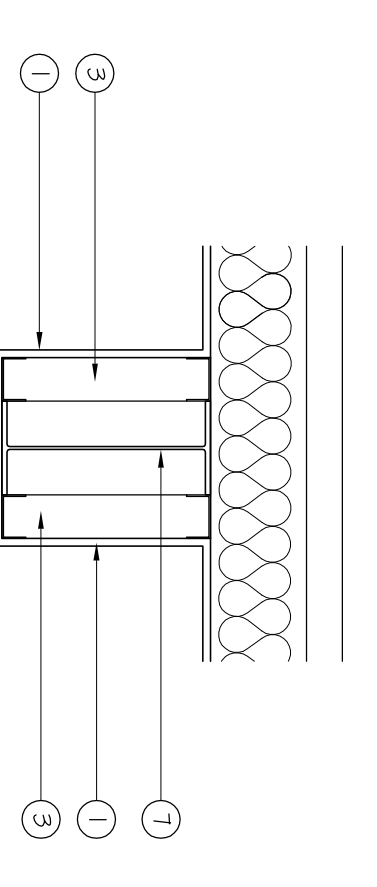
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DETAILS

SCALE: 3/4" = 1'-0"

DETAILS

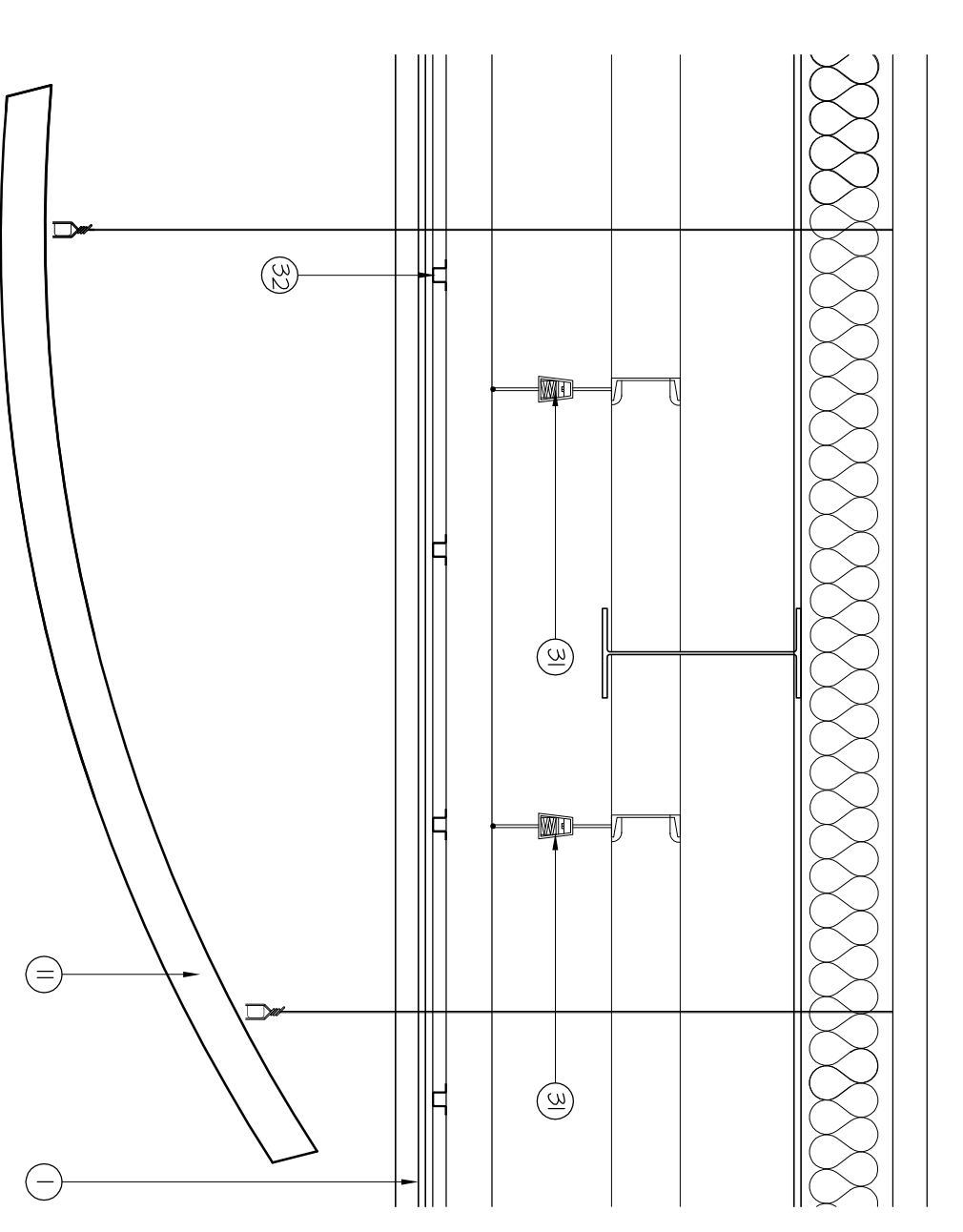


NOTES TO DRAWINGS

DETAILS

SCALE: 3/4" = 1'-0"

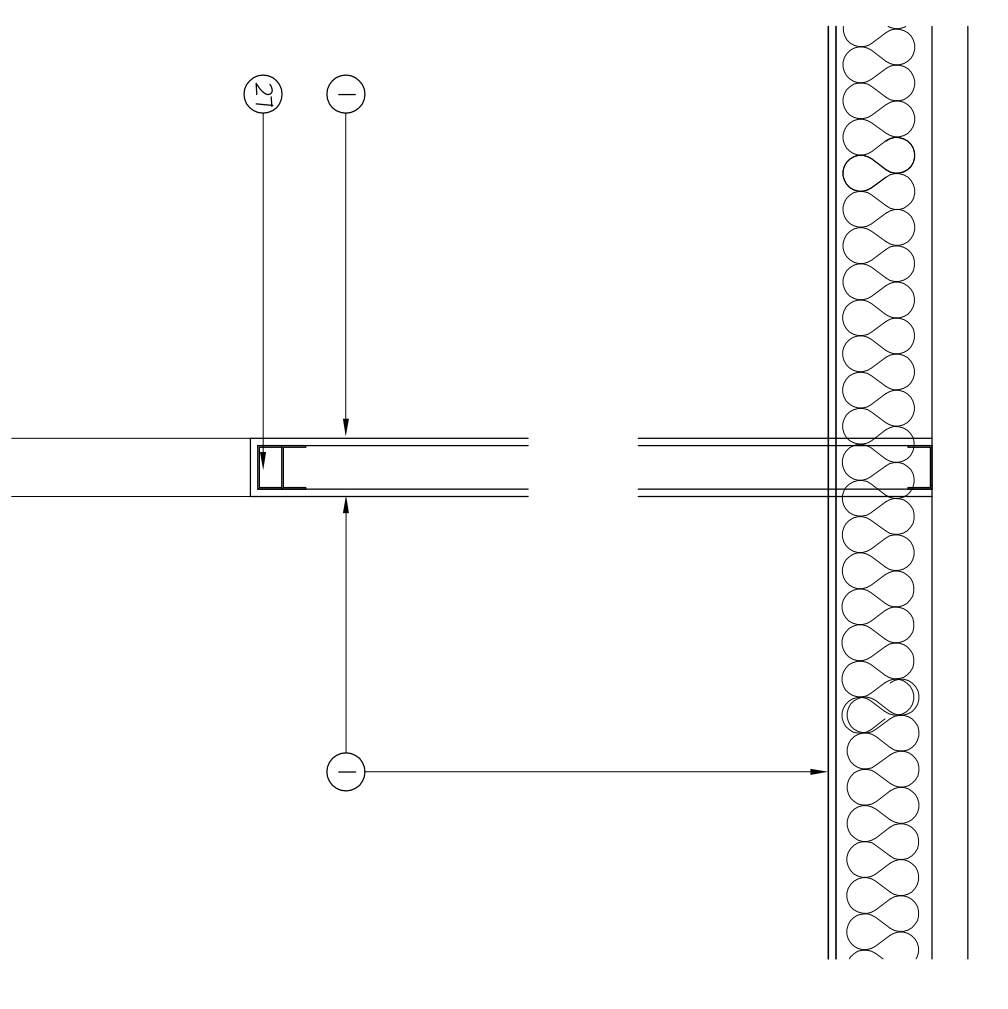
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DETAILS

SCALE: 3/4" = 1'-0"

DETAILS

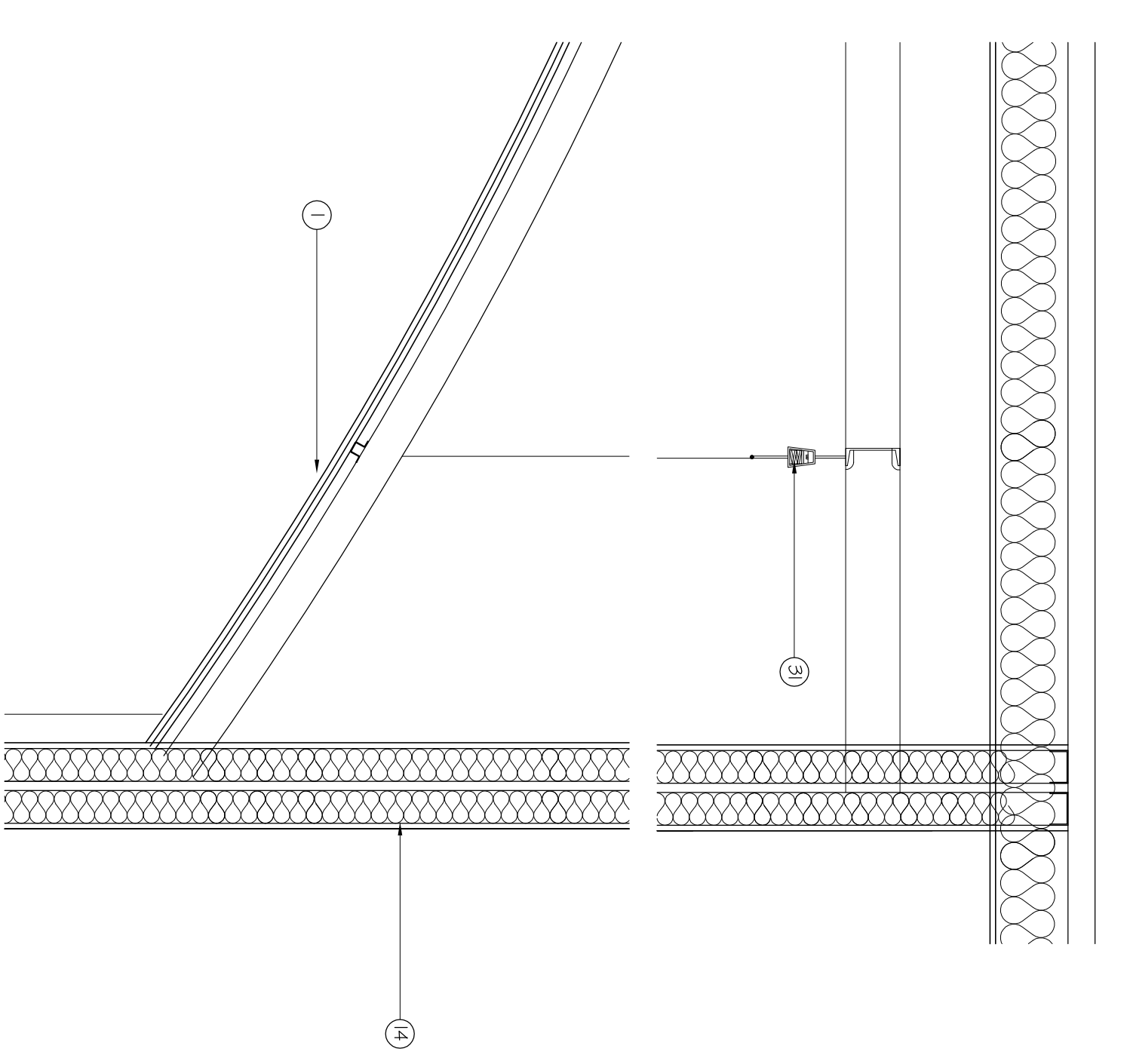


GENERAL NOTES

DETAILS

SCALE: 3/4" = 1'-0"

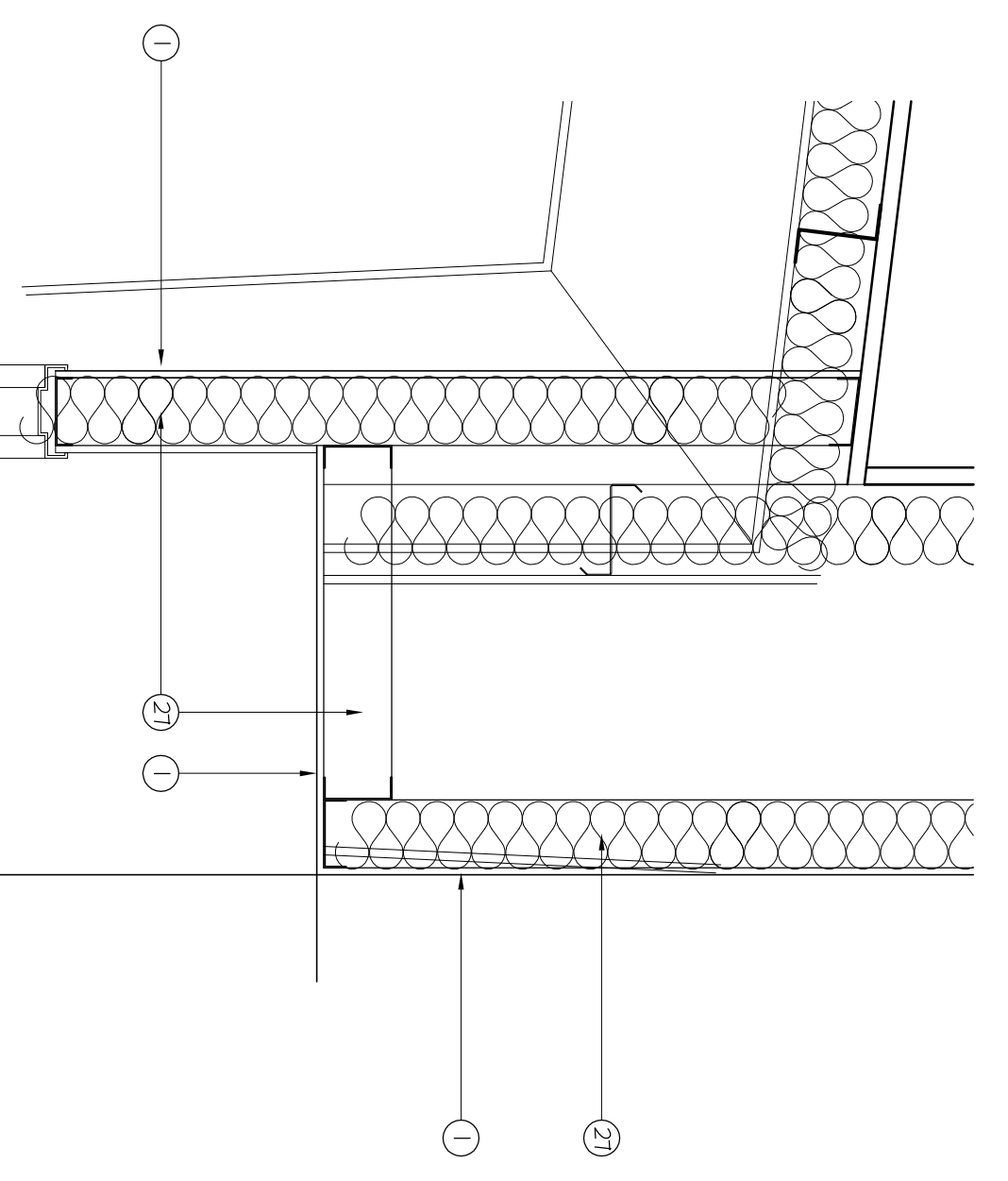
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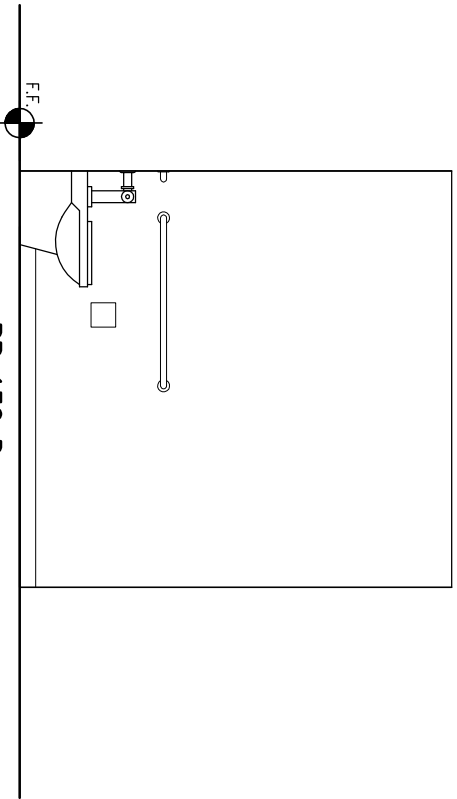


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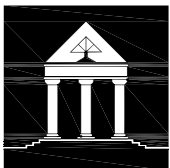
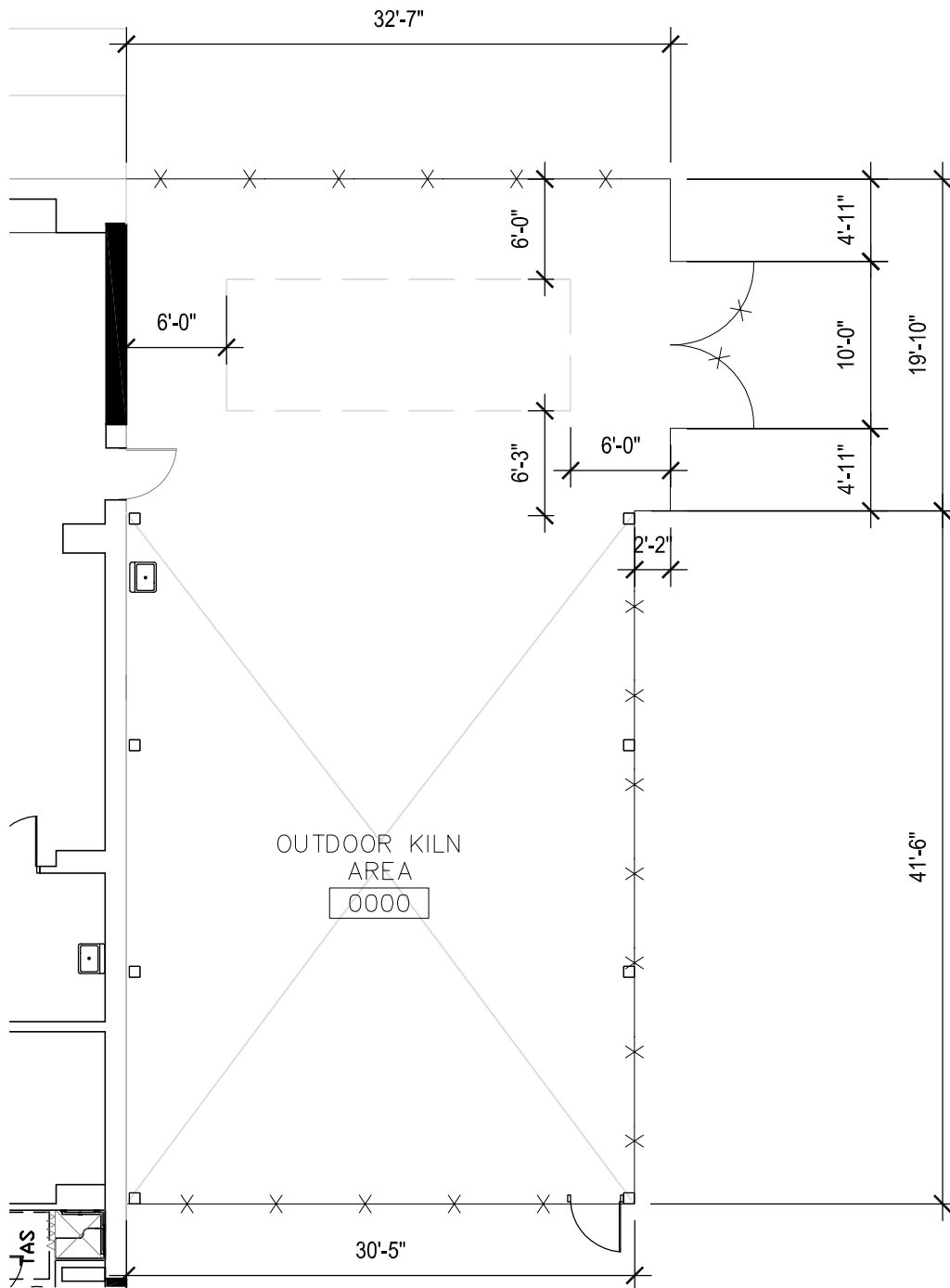
DETAILS





F.F.

RR 130 D



**HCC - Stafford
Fine Arts Renovation - Building B**

ARCHI*TECHNICS/3, INC.
5555 West Loop South Suite #400 Bellaire, Texas
77401TEL 713/868-0088 FAX 713/468-2613

| | |
|-------------|---------------------------|
| Scale: | $\frac{3}{32}'' = 1'-0''$ |
| Subject: | Fence @ Chiller Area |
| Date: | Oct. 20, 2011 |
| Drawn: | C. Mitchell |
| Project No. | 09250 |

SECTION 12 61 00 – FIXED AUDIENCE SEATING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Auditorium fixed audience seating with the following:
 - 1. Upholstered chairs.
 - 2. Self-rising seat mechanisms.
 - 3. Fixed standard mounting.

1.2 ALLOWANCES

- A. Furnish fixed audience seating upholstery fabric as part of allowance; refer to Division 01 Section "Allowances." Provide custom fabric as directed by the Owner or Architect.

1.3 REFERENCES

- A. American Standard Test Materials (ASTM):
 - 1. ASTM C 423 – Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
 - 2. ASTM E 795 – Standard Practices for Mounting Test Specimens During Sound Absorption Tests.
 - 3. ASTM F 851: Test Method for Self-Rising Seat Mechanisms.
- B. American National Standards Institute (ANSI)/Business and Institutional Furniture Manufacturers Association (BIFMA):
 - 1. ANSI A208.2 – Medium Density Fiberboard (MDF) for Interior Applications.
 - 2. ANSI/BIFMA X5.1 2002 – Office Furnishings - General-Purpose Office.
 - 3. ANSI/BIFMA X5.4-2005 – Office Furnishings – Lounge Seating.
- C. State of California, Department of Consumers Affairs, Bureau of Home Furnishings and Thermal Insulation:
 - 1. California Technical Bulletin 117 – requirements, Test Procedures and Apparatus for Testing Flame Retardance of Resilient Filling Materials Used in Upholstered Furniture.
 - 2. California Technical Bulletin 133 – Flammability Test Procedure for Seating Furniture for Use in Public Occupancies.
- D. Code of Federal Regulations:
 - 1. 16 CFR 1610.61 – Clarification of Flammability Standard for Clothing Textiles (CS 191-53).
- E. Hardwood Plywood and Veneer Association (HPVA):
 - 1. HPVA HP-1 – Hardwood and Decorative Plywood.
- F. National Electrical Manufacturers Association (NEMA):
 - 1. NEMA LD 3 – High Pressure Decorative Laminates.
- G. National Fire Protection Association:
 - 1. NFPA 70 – National Electrical Code (NEC).

- H. Underwriters’ Laboratories, Inc. (UL) and Underwriters’ Laboratories of Canada (ULC):
 - 1. Requirements for listing and labeling of products.

1.4 PERFORMANCE REQUIREMENTS

Specifier: Wenger's perforated seat bottom is acoustically designed to provide more consistent room acoustics whether fully or partially occupied. Retain one of three subparagraphs below with related data corresponding to the specified model series.

- A. Acoustically Enhanced Fixed Audience Seating Acoustic Properties, Basis of Design Unit: Tested to ASTM-C, two rows of four seats spaced 36 inches apart. Seats are J mounted, shown at 1/3 octave center frequencies.
 - 1. Wenger Series 100: Tested to ASTM-C, two rows of four seats spaced 36 inches apart. Seat are J mounted, shown at 1/3 octave center frequencies.

| | <u>125</u> | <u>250</u> | <u>500</u> | <u>1000</u> | <u>2000</u> | <u>4000</u> |
|--------------------------------------|------------|------------|------------|-------------|-------------|-------------|
| <u>Sound Absorption Per Unit</u> | | | | | | |
| Occupied | 4.66 | 7.13 | 7.75 | 8.04 | 8.36 | 8.82 |
| Unoccupied | 3.44 | 5.71 | 5.34 | 4.43 | 4.21 | 4.50 |
| <u>Sound Absorption, sabins/unit</u> | | | | | | |
| Occupied | 37.29 | 57.08 | 61.98 | 64.35 | 66.85 | 70.55 |
| Unoccupied | 27.55 | 45.67 | 42.71 | 35.41 | 33.67 | 36.01 |

1.5 ACTION SUBMITTALS

- A. Product Data: Provide for all products furnished under this Section. Include dimensions and profiles, electrical connections, wood and metal finishes, and details of construction.
- B. Shop Drawings: Include plans, elevations, sections and details. Show overall plan of fixed seating including aisle spacing and seating layout. Include row to row spacing, row lettering, and chair numbering sequence. Show floor plan and details of ADA/ABA compliance in plan and section. Show method of attachment including anchors and other devices.
 - 1. Show fabric selection.
- C. Samples for Initial Selection
 - 1. Fabric choices.
 - 2. Wood finish selections.
 - 3. Metal coatings color selections.
- D. Samples For Verification: Provide manufacturer's samples of the following:
 - 1. Exposed metal component finishes.
 - 2. Plywood panel finish.
 - 3. Row lettering and seat numbering plaques: Provide full size plaques showing base material and lettering font.

1.6 INFORMATIONAL SUBMITTALS

- A. Product Certificates: Provide manufacturer's certification of flame-retardant treatment (if required).

- B. Cleaning and Maintenance Information: Provide instructions for cleaning, adjusting, repairing, and replacing fixed audience seating.
- C. Warranty: Copy of manufacturer's warranty.

1.7 QUALITY ASSURANCE

- A. Source Limitations: Obtain fixed audience seating and accessories from single source from single manufacturer.
- B. Fire-Test-Response Compliance:
 - 1. Fabric: Class 1 according to DOC CS 191 and 16 CFR 1610.61, tested according to California Technical Bulletin 117.
- C. Electrical Components: Listed and labeled as defined in NFPA 70, by UL or other qualified testing agency acceptable to authorities having jurisdiction.
- D. Regulatory Requirements: Provide fixed audience seating to comply with accessibility requirements, including with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities" **[and] [ICC/ANSI A117.1]**.
- E. Mockups: Build mockups to set standards for fabrication. Show fabric selection, wood and metal finishes selections and aesthetic effect.
 - 1. Configuration: A typical two-seat unit with aisle and row seat.
 - 2. Approved mockups will be returned to the manufacturer upon request, and may become part of Project if in as-manufactured condition at time of Substantial Completion.
- F. Field Dimensioning: After approval of submittals and mockup but prior to fabrication, confirm dimensions of fixed audience seating space, including features that will affect installation. Confirm location of electrical rough-in.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's unopened packaging with manufacturer's labels attached.
- B. Handle fixed audience seating during installation to prevent damage. Replace any seating damaged during installation.

1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install seating until spaces are fully enclosed and wet work is complete and dry, overhead work is complete, and temporary or permanent HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels for the remainder of the construction period.

- B. Where fixed audience seating is anchored to new concrete, allow for curing of concrete before seating is delivered.

1.10 COORDINATION

- A. Coordinate with details of fixed audience seating with affected work of other sections. Communicate special requirements of fixed audience seating attachment to floor and connection to electrical service.
- B. Coordinate locations of electrical junction boxes.

1.11 WARRANTY

- A. Special Warranty: Manufacturer's written warranty indicating manufacturer's intent to repair or replace components of audience seating that fail in materials or workmanship.
 - 1. Failures include, but are not limited to, the following:
 - a. Fracturing or breaking of unit components which results from normal wear and tear and normal use other than vandalism.
 - b. Delamination or other failures of glue bond of components.
 - c. Warping of components not resulting from leaks, flooding, or other uncontrolled moisture or humidity.
 - 2. Damage from deliberate destruction and vandalism is excluded.
 - 3. Warranty Period for fixed audience seating: Five years from date of Substantial Completion.

1.12 EXTRA MATERIALS

- A. Furnish the following extra materials from the same manufacturing run as the original products that match products installed. Package with protective coating and identified with product labels.
 - 1. Full-size units of the following seating components equal to 5 percent of amount installed for each type and finish installed, but no fewer than **[two]** units:
 - a. Seat backs and cushions.
 - b. Fully assembled full size fixed audience seating units.
 - c. Electrical devices.

PART 2 - PRODUCTS

- 2.1 Basis of Design: Fixed Audience Seating is based upon products of the following manufacturer.
 - 1. Wenger Corporation, Owatonna, MN; Telephone: (800) 493-6437; Email: info@wenger.com; Website: www.wengercorp.com.

2.2 MATERIALS AND FINISHES

- A. Hardwood Lumber: Clear Beech, plain-sawn or sliced.

Specifier: Options in two paragraphs below are required for LEED credit and are available from most manufacturers at additional cost.

- B. Beech Veneer Hardwood Plywood: HPVA HP-1, 11-ply, AA-grade, rotary cut [, **made with formaldehyde-free adhesives**]. The seat back must be a minimum of 11-ply .75 thick plywood. The seat bottom must be a minimum of 5-ply .50 thick plywood. Plywood edges are stained to match the veneered faces. The armrests shall be solid wood.
- C. Medium Density Fiberboard: ANSI A208.2, Grade MD [, **made with formaldehyde-free binder**].
- D. Wood Finishes: Manufacturer's standard finish and stain [**Custom color and pattern**].
- E. Metal Finishes: Manufacturer's standard baked-on powder coating.
 - 1. Color: As selected from manufacturer's standard colors.
- F. High-Pressure Decorative Laminate: NEMA LD-3, Grade VGS.
- G. Cushion Foam: Flexible, cellular, molded, contoured polyurethane foam.
- H. Row Numbering Plaques, Seat Numbering Plaques, and Donor Plaques: brass alloy with black lettering.
- I. Aisle Lighting: Manufacturer's standard round fixture [**with row indicator**], with [**yellow**] [**white**] [**warm white**] LED bulbs, 12VDC.

2.3 FIXED AUDIENCE SEATING

- A. Fixed Audience Seating: Audience seating with wood grain polyester resin standards, upholstered back and seat with foam cushions, hardwood plywood seat back acoustically-perforated hardwood plywood seat bottom, and hardwood arm rest, and self-lifting seats with acoustically-dampened lift mechanism.
 - 1. Basis of Design: **Wenger Corporation Series 200.**
 - a. Chair Mounting Standards: Wood grain polyester resin finish on a MDF core panel with formed steel mounting shoe, floor-attached.
 - b. Upholstery: Flame-retardant Treated
 - c. Color and Pattern: [As selected from manufacturer's standard colors] [Maroon , Interweave Pattern].
 - d. Seat:
 - 1) Plywood Bottom: .50 thick minimum 5-ply hardwood veneer plywood, acoustically-perforated.
 - 2) Cushion foam: High resiliency polyurethane is a minimum of 2.5 thick.
 - 3) Width: [**19 inch (483 mm)**] [**20 inch (508 mm)**] [**21 inch (533 mm)**] [**22 inch (559 mm)**] [**23 inch (584 mm)**] [**As indicated**].
 - e. Back:
 - 1) Plywood Back: .75 thick 11-ply hardwood veneer plywood. Plywood less than .75 thick will not be acceptable.
 - 2) Cushion foam: High resiliency polyurethane is a minimum of 1.5 thick. Back cushion is shaped to provide a 2.5 minimum thickness lumbar support for long-term comfort.
 - 3) Pitch: Standard degrees of 18, 22 and 26.

- f. Armrest: Solid hardwood with rounded corners for a stylish appearance.
- g. Wood Stain color: 1239 Nepal Teak Laminate
- h. Seat Lift Device: Self-lifting torsion spring and damper mechanism. A gravity self-lifting mechanism or a self-lifting system without a damper mechanism will not be acceptable.
- i. Aisle lighting.

2.4 FABRICATION

- A. Fabricate floor standards to fit slope of floor so that standards are plumb and maintain chairs at the required relationship to the vertical.
- B. Upholstery: Fabricate upholstered chairs with fabric free of creases and wrinkles. Install warp and woof of fabric and pattern in consistent direction.

2.5 FINISHES

- A. Baked Enamel Powder-Coat Finish: Immediately after cleaning and pretreating, electrostatically apply manufacturer's standard, baked-polymer, and thermosetting powder finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates with Installer to verify conditions meet requirements for seating installation.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install seating units level, plumb, true; and with pitch of seating as indicated on the shop drawings.
- B. Install seating units with mounting standards aligned from the last to first row as indicated. Vary seat **[widths]** **[spacing]** **[both width and spacing]** to optimize spectator sight lines.
- C. Install rows with smooth curvature.
- D. Adjust seating so that operating hardware works smoothly and quietly.
- E. Install wiring ready for final connections. Align wiring connections with rough-in installation.

3.3 ADJUSTING AND CLEANING

- A. Adjust hardware and automatic lifters.

- B. Clean and vacuum seating standards and fabrics.
- C. Touch up marred surfaces. Replace seating units that are not acceptable to Architect.

END OF SECTION



**Raba
Kistner**

Engineers, Geologists, Hygienists and Environmental Scientists

GEOTECHNICAL ENGINEERING STUDY

FOR

**HCC - STAFFORD FINE ARTS RENOVATION
9910 CASH ROAD
STAFFORD, TEXAS**



San Antonio, TX



Austin, TX



Brownsville, TX



El Paso, TX



Houston, TX



McAllen, TX



Mexico



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Houston, TX 77042
(713) 996-8990 • FAX (713) 996-8993
www.rkci.com
TBPE Firm F-3257

R-K Project No. AHA11-009-00
June 13, 2011

Mr. Glenn Jarrett
Houston Community College
3100 Main Street
Houston, Texas 77002

**RE: Geotechnical Engineering Study
HCC - Stafford Fine Arts Renovation
9910 Cash Road
Stafford, Texas**

Dear Mr. Jarrett:

Raba-Kistner Consultants Inc. (R-K) is pleased to submit this report of our Geotechnical Engineering Study for the above referenced project. This study was performed in accordance with **R-K** Proposal PHA11-013, dated April 4, 2011. Authorization for this study was received by our firm on June 13, 2008. However, our field study was delayed until July 4, 2008 to accommodate local building official's concerns. The purposes of this study were to explore and evaluate subsurface soil conditions at the project site and to develop geotechnical engineering recommendations for design and construction of the proposed building expansion.

We appreciate the opportunity to be of service to you on this project. Should you have any questions about the information presented in this report, or if we may be of additional assistance on the materials testing-quality control program during construction, please call us.

Very truly yours,

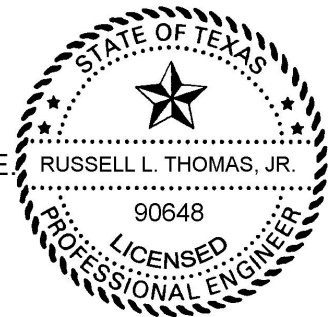
RABA-KISTNER CONSULTANTS, INC.

Yvonne L. Garcia, E.I.T.
Graduate Engineer

Russell L. Thomas, Jr., P.E.
Senior Project Manager

YLG/RLT

Attachments
Copies Submitted: Above (3-Bound, 1-Electronic)



June 13, 2011

GEOTECHNICAL ENGINEERING STUDY

For

**HCC - STAFFORD FINE ARTS RENOVATION
9910 CASH ROAD
STAFFORD, TEXAS**

Prepared for

HOUSTON COMMUNITY COLLEGE
Houston, Texas 77002

Prepared by

RABA-KISTNER CONSULTANTS, INC.
Houston, Texas

R-K PROJECT NO. AHA11-009-00

June 13, 2011

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- Vicinity Map
- Boring Location Map
- Log of Borings
- Key to Terms and Symbols
- Results of Soil Sample Analyses
- Important Information About Your Geotechnical Engineering Report

INTRODUCTION

Raba-Kistner Consultants Inc. (R-K) has completed the authorized subsurface exploration and foundation analysis for the planned addition to the HCC - Stafford Fine Arts Renovation campus located at 9910 Cash Road in Stafford, Texas. This report briefly describes the procedures utilized during this study and presents our findings along with our foundation recommendations. Construction considerations and/or guidelines are also presented in this report.

PROJECT DESCRIPTION

We understand Houston Community College plans to renovate Building B at their 9910 Cash Road campus in Stafford, Texas. A vicinity map of the project site is presented on Figure 1. Based on discussions with the design team, we understand the front canopy of the existing structure is planned to be replaced. In addition, a new theater is planned within the structure. As part of this new theater, a small mezzanine area will be constructed. The theater and mezzanine are anticipated to require new foundations in the form of strip footings along the existing walls.

Although original foundation plans have not been located, based on a visual reconnaissance of the site and the nature of the structure, we have assumed the steel columns are supported by either spread or drilled pier foundations and that the interior is supported by a slab-on-grade system.

The structural engineer stated that the mezzanine will be lightly loaded and that the new canopy is planned to be similar in size to the existing canopy. We do not anticipate any grade changes will be required for the planned renovation.

PURPOSE AND SCOPE

The purpose of this study was to explore and evaluate subsurface soil conditions and to provide geotechnical engineering recommendations for the design and construction of the proposed building renovations. The scope of this study included drilling and sampling a total of two soil borings (one for the canopy and one for the mezzanine), performing laboratory testing, performing engineering analyses, and preparing an engineering report.

LIMITATIONS

This engineering report has been prepared in accordance with accepted geotechnical engineering practices in the Houston metropolitan area by Geotechnical firms completing similar work under similar circumstances and is meant for the use of Houston Community College (Client) and their representatives for the design purposes. This report is not intended for use in determining construction means and methods and may not contain sufficient information for purposes of other parties or other uses.

The recommendations presented in this report are based on the data obtained from soil borings drilled during this study, our understanding of the project information provided to us, and the assumption that site grading will result in only minor changes in the proposed site elevations. If the information described in this report is incorrect, altered, or if new information is available, we should be retained to review and modify our recommendations (if necessary).

This report may not reflect the actual variations of the subsurface conditions across the subject site. The nature and extent of variations across the subject site may not become evident until construction commences. The construction process itself may also alter subsurface conditions. If variations appear evident at the time of construction, it may be necessary to reevaluate our recommendations after performing on-site observations and tests to establish the engineering impact of the variations.

The scope of our Geotechnical Engineering Study does not include an environmental assessment of the air, soil, rock, or water conditions either on or adjacent to the site. No environmental opinions are presented in this report.

If final grade elevations are significantly different from those discussed in this report (more than plus or minus 1 foot) or structure locations are changed, then our office should be informed about these changes. If needed and/or desired, we will reexamine our analyses and make supplemental recommendations.

BORINGS AND LABORATORY TESTS

Subsurface conditions at the site were evaluated by drilling two borings (B-1 through B-2) at the locations shown on the Boring Location Map, Figure 2. The locations and distances of borings were obtained by using a measuring wheel at right angles from existing site features and therefore, should be considered approximate. All borings were drilled using a self-propelled geoprobe. Both borings were drilled through existing concrete. Upon completion of drilling, cement grout was used to backfill the borings and to patch the existing concrete. During drilling operations, the following soil samples were collected:

| Type of Sample | Number Collected |
|------------------------------------|-------------------------|
| Relatively Undisturbed Shelby Tube | 24 |

Selected portions of the samples were sealed to reduce moisture loss, labeled, packaged, and transported to our laboratory for subsequent testing and classification. The geotechnical engineering properties of the strata were evaluated by the laboratory tests tabulated in the following table:

| Type of Test | Number Conducted |
|--------------------------|-------------------------|
| Natural Moisture Content | 24 |
| Atterberg Limits | 4 |

| Type of Test | Number Conducted |
|----------------------------|------------------|
| Percent Passing Sieve #200 | 4 |
| Pocket Penetrometer | 20 |
| Hand-Held Torvane | 19 |

The results of all laboratory tests are presented in graphical and numerical form on the boring logs presented on Figures 3 and 4. A key to terms and symbols used on the logs is presented on Figure 5. The results of soil sample analyses are presented on Figure 6 for ease of reference.

Samples will be retained in our laboratory for 30 days after submittal of this report. Other arrangements may be provided at the request of the Client.

GENERAL SITE CONDITIONS

SITE DESCRIPTION

The project is located within Houston Community College's Cash Road campus in Stafford, Texas (Key Map 569-M). The campus consists of several one-story metal structures and several paved parking and roadway areas. The campus lies within a light commercial area and is bound to the south by Cash Road and to the east, north, and west by light commercial development. The majority of the site is developed. However, small landscaped areas including old trees were located throughout the campus. The site appears to be relatively flat with storm water structures for drainage.

REGIONAL GEOLOGY

The Gulf Coastal Plain overlies the attenuated southern margin of the North American continent. During the early Paleozoic, a continental margin extended from southwestern Texas to Mississippi and Georgia that was deformed later in the Paleozoic, forming the Ouachita Orogenic belt^{1,2}. In the early to mid Mesozoic Era, the orogenic belt was rifted apart, forming the Gulf of Mexico, a broad band of transitional continental crust and areas of discrete rift valleys^{2,3}. Major rifting ended by the Late Jurassic and vast salt deposits formed over the rifted crust from excessive evaporation.

Subsequent history of the Gulf of Mexico consists of thermal subsidence of the rifted crust forming normal faults and allowing the young Atlantic Ocean to spill into the Gulf, and large-scale rapid

¹ Aronow, S., 1994, Geomorphology and Surface Geology of Harris County and Adjacent Parts of Brazoria, Fort Bend, Liberty, Montgomery, and Waller Counties, Texas, Department of Geology, Lamar University, Beaumont, TX.

² Morrison, 1991, Quaternary Nonglacial Geology : Conterminous U.S., Chp 19, Quaternary Geology of the Gulf of Mexico Coastal Plain, The Geological Society of America, Inc.

³ Chowdhury, A., Turco, M., 2007, Geology of the Gulf Coast Aquifer, Texas.

infilling with clastics into the deep water, followed by carbonate shelf and shelf edge sedimentation, which initiated salt diapir activity². The Balcones and Luling-Mexia-Talco fault zones rim the Gulf of Mexico basin and are dominated by normal faults that run parallel to the trend of the Ouachita orogenic belt^{1,2}.

Continental river-systems began forming in the late Mesozoic and early Cenozoic in response to the Laramide Orogeny and deposition of 6,000 to 9,000 meters of clastic sediment (mostly undercompacted mud) led to regional syndepositional normal faulting (i.e., growth faults) and local shale diapirism^{2,3}. The thick deltaic depocenters near Houston during the Paleocene and Eocene and south Texas during the Eocene and Oligocene has caused flexural tilting of the entire Gulf Coastal Plain province, leading to dissection of the coastal plain².

Sediments deposited on the coastal plain during the Miocene through the Pleistocene periods were mainly deposited rapidly under a fluvial-deltaic to shallow-marine environment^{1,3,4}. The sediments were derived from highlands thrust up during the Laramide Orogeny and subsequent erosion. Geographic location of the various fluvial systems remained relatively persistent, but the location of the depocenters shifted several times as numerous sea-level changes along with natural basin subsidence, produced discontinuous beds of sand, silt, clay, and gravel in thick sediment accumulations².

Numerous Quaternary growth faults parallel the Gulf Coast and control sediment accumulation and dispersal patterns during deposition¹. Often these Quaternary age faults have surface expressions varying in degrees with older faults having a less pronounced expression. The entire surficial geology of the Gulf Coast is covered by a smooth, low-lying mosaic of lithofacies that gradually rise from sea level in the east to as much as 900 feet in the north and west¹. Several major rivers dissect the Gulf Coast and flow nearly perpendicular into the Gulf of Mexico where they empty their sediment loads, forming deltaic plains and depositional lobes. The surface and near-surface sediments (Cenozoic to Holocene age) dip gulfward at less than two degrees and crop out in gulf-parallel bands consisting of several formations^{1,4}.

Local Geology

The Beaumont Formation is the youngest coast-parallel Pleistocene unit in the Texas Gulf Coast and is often referred to as the Beaumont Clays². Most of the Beaumont was deposited as an overlapping group of fluvial or deltaic plains by ancestors of modern streams now draining into the Gulf of Mexico. Relict stream channels are sharply incised into the Beaumont surface and exhibit steep, ungraded margins that change downdip from high to low sinuosity, suggesting proximity to the ancestral river mouths^{1,3}.

Flat, uneroded, poorly drained surfaces are abundant throughout the Beaumont and the surface displays a relict fluvial and deltaic depositional pattern including barrier islands, beach, mudflat, and lagoonal deposits crossed by well-defined paleo-meander-belt ridges and floodbasins, deposited by the precursors of the modern streams (i.e., Trinity, Brazos, Colorado) as they coalesced and shifted along the coast³. The higher topographic ridges (Qbs), usually less than 10

⁴ Anderson, J., Rodriguez, A., 1999, AAPG Field Trip – Late Quaternary Clastic Depositional Systems of the Texas Coast and Continental Shelf, Department of Geology & Geophysics, Rice University, Houston, TX.

feet, are generally underlain with sandy and loamy soils and display relict meandering stream patterns, in both isolated fragments and in continuities of several miles¹. The floodbasin areas (Qbc) are generally the sites of clay-rich vertisols that expand and contract upon wetting and drying, often producing a micro-relief complex of depressions and ridges referred to as a gilgai topography¹. The meander ridges display a microrelief in the form of small shallow undrained depressions but much of the gilgai topography has been obliterated from anthropogenic influences (i.e., row-crop tillage, pasture improvement, land-levelling). In the subsurface of the Beaumont, striated shiny shear planes (slickensides) occur and are an indicator of buried surfaces^{1,3,5}.

The fluvial and deltaic sands in the Beaumont consist of fine to very fine sand, and silty and clayey sands. The clay, silty clay and sandy clay content suggest that it is largely the product of a suspended-load stream deposited by floodwaters of subsequent, adjacent active meander-belts¹. Some of the finer-grained deposits may also be the upper portions of upward-fining sequences of point-bar deposits.

The Beaumont series consist of very deep, poorly drained, very slow permeable soils that are subdivided into the following:

Beaumont Formation Qbs – is located in areas consisting of the higher topographic ridges consisting of fine quartz sand, silt, and minor fine gravel, intermixed and interbedded. The sediment is indicative of relict meandering stream channels, point-bars, crevasse-splays, and natural levee ridge deposits. The meander-belt ridge deposits are poorly defined and are approximately 3-6 feet higher than the surrounding interdistributary silt and clay floodbasins of the Beaumont Formation (Qbc).

Beaumont Formation Qbc – is located in the floodbasin areas and are generally clay-rich vertisols exhibiting expansion and contraction with increased and decreased moisture. Soil texture is clay or silty clay throughout with an average clay content of 45 to 60 percent. Undisturbed areas have a gilgai microrelief of 4 to 15 inches. When dry, the Qbc Formation has the tendency to form cracks ½ inch to more than 1 inch wide at the surface and extend to a depth of greater than 12 inches. The cracks typically remain open for less than 60 cumulative days due to the shrink/swell potential of the clays.

Natural Hazards

R-K evaluated fault locations based on a desktop review of literature, public maps, documented surface faults in our library as well as field observations of the project site. There were no references to faults within or near the project site found during our literature review, nor were visual signs of active faulting observed during our site visits. The closest known faults appears to be part of the Blue Ridge salt dome, which is located approximately 2½ miles southeast of the project site. As such, we do not recommend that a Phase I fault study be initiated by the CLIENT.

⁵ Young, S., Knox, P. 2010, Hydrostratigraphy of the Gulf Coast Aquifer from the Brazos River to the Rio Grande, Texas Water Development Board Report.

SEISMIC COEFFICIENTS

Based upon a review of Section 1613 *Earthquake Loads* of the 2006 International Building Code, the following information has been summarized for seismic considerations associated with this site.

- Site Class Definition (Table 1613.5.2): **Class D**. Based on the exploratory borings conducted for this investigation and our experience with these soils, the upper 100 feet of soil may be characterized as a stiff soil profile.
- Mapped Maximum Considered Earthquake Ground Motion for a 0.2 sec., Spectral Response Acceleration (Figure 1613.5(1)): **$S_s = 0.087g$** . Note that the value taken from Figure 1613.5(1) is based on Site Class B and must be adjusted per 1613.5.3.
- Mapped Maximum Considered Earthquake Ground Motion for a 1 sec., Spectral Response Acceleration (Figure 1613.5(2)): **$S_1 = 0.035g$** . Note that the value taken from Figure 1613.5(2) is based on Site Class B and must be adjusted per 1613.5.3.
- Value of Site Coefficient (Table 1613.5.3(1)): *from worksheet* **$F_a = 1.6$** .
- Value of Site Coefficient (Table 1613.5.3(2)): *from worksheet* **$F_v = 2.4$** .

The Maximum Considered Earthquake Spectral Response Accelerations are as follows:

- 0.2 sec., adjusted based on equation 16-37: *from worksheet* **$S_{ms} = 0.138g$** .
- 1 sec., adjusted based on equation 16-38: *from worksheet* **$S_{m1} = 0.085g$** .

The Design Spectral Response Acceleration Parameters are as follows:

- 0.2 sec., based on equation 16-39: *from worksheet* **$S_{Ds} = 0.092g$** .
- 1 sec., based on equation 16-40: *from worksheet* **$S_{D1} = 0.056g$** .

Based on the parameters listed above, Tables 1613.5.6(1) and 1613.5.6(2), and calculations performed using a Java program titled, "Seismic Hazard Curves and Uniform Hazard Response Spectra" published by the United States Geological Survey (USGS), the Seismic Design Category for the short period response accelerations and the 1 second response accelerations is **A** for all occupancy categories.

STRATIGRAPHY

The subsurface conditions encountered at the boring locations are shown on the boring logs, Figures 3 and 4. The boring logs should be consulted for boring specific (detailed) stratigraphic information. These boring logs represent our interpretation of the subsurface conditions based on the field logs, visual examination of field samples by our personnel, and laboratory test results of selected field samples. Each stratum has been designated by grouping soils that possess similar physical and engineering characteristics. The lines designating the interfaces between strata on the boring logs represent approximate boundaries. Transitions between strata may be

gradual.

Both borings were drilled through existing concrete. Boring B-1 was drilled through the floor slab and Boring B-2 was drilled through the sidewalk. The floor slab and sidewalk were 5-½ and 5 inches thick, respectively with a plastic moisture barrier separating the subgrade soils.

Below the concrete a thin layer of clayey sands (SC) and silty sands (SM) were observed to depths of about 1 to 2 feet. Sandy fat clays (CH) and sandy lean clays (CL) were observed to a depth of about 7 to 9 feet. Below the cohesive soils, clayey sands were observed to the boring termination depths of about 12 feet. Typical inclusions within the Pleistocene clays included ferrous nodules.

Soil Properties

Laboratory and field testing were performed on representative samples of the soil strata encountered during our field drilling operations. Laboratory testing primarily focused on the plasticity characteristics of the near-surface soils and shear strength characteristics of the foundation soils.

Water Content Soil moisture contents measured within the cohesive soils ranged from about 8 to 36 percent. Moisture contents within the zone of seasonal moisture variation (the top ten feet) generally ranged from about 15 to 20 percent and were 1 to 4 percentage points above their respective plastic limits, indicating a relatively wet condition.

Plasticity Index The plasticity index (PI) is an indication of the amount of clay present in the soil and the mineralogical nature of the clay. Generally, soils with a PI greater than about 20 are subject to significant shrink-swell movements with moisture variations. PI values ranged from 9 to 36, indicating low to very highly plastic soils.

Soil Consistency Hand penetrometer measurements were taken at 1-ft intervals in the cohesive soil samples. Values ranging from ¼ tsf (firm) to greater than 2.5 tsf (hard) were recorded.

Shear Strength A hand-held Torvane was used to measure the undrained shear strength of the majority of cohesive soil samples. These undrained shear strength values varied from 0.1 to 2.5 tsf.

DEPTH-TO-WATER

Borings were drilled using dry-push techniques in an attempt to measure depth-to-water in the open boreholes. Free water was not observed in any of the borings. All boring excavations were backfilled upon completion of work; no borings were allowed to remain open overnight for additional water level readings due to the proximity of pedestrian walkways.

It should be noted that depth-to-water levels may fluctuate at any given time due to seasonal variations in rainfall and surface runoff, especially during extended periods of heavy rainfall or dry weather. Because of future development of adjacent properties, variations could also

develop as a result of construction activities, leaky water lines, or other unnatural conditions which may affect localized hydraulic conditions.

FOUNDATION ANALYSIS

Based on the results of our field investigation, laboratory testing, and experience, we believe the soils at this site are suitable for supporting the proposed renovations. The following sections provide a discussion with respect to reducing the potential vertical movements associated with shrink/swell behavior with changes in moisture conditions.

EXPANSIVE SOIL-RELATED MOVEMENTS

Estimates of anticipated ground movements due to swelling of the underlying soils at the site were analyzed for slab-on-ground construction using the empirical procedure, Texas Department of Transportation (TxDOT) Tex-124-E, Method for Determining the Potential Vertical Rise (PVR). A PVR value less than **about 1 inch** was estimated for the stratigraphic conditions encountered in our borings, assuming final grade is close to the existing ground surface encountered at the time of our study. A surcharge load of 1 psi (concrete slab and sand cushion), an active zone of 10 feet, and average moisture conditions (based on in-situ moisture compared to Atterberg limits test data) were assumed in estimating the above PVR value.

The TxDOT method of estimating expansive soil-related movements is based on empirical correlations utilizing the measured plasticity indices and assuming typical seasonal fluctuations in moisture content. If desired, other methods of estimating expansive soil-related movements are available, such as estimations based on swell tests and/or soil-suction analyses. However, the performance of these tests and the detailed analysis of expansive soil-related movements were beyond the scope of the current study. It should also be noted that actual movements can exceed the calculated PVR values due to isolated changes in moisture content (such as due to leaks, landscape watering) or if water seeps into the soils to greater depths than the assumed active zone depth due to deep trenching or excavations.

PVR REDUCTION OPTION

Based on a calculated PVR value of less than 1 inch, we do not anticipate the need for remedial measures to reduce the potential for shrink/swell movements with variations in the moisture content of the subgrade soils at this site.

FOUNDATION RECOMMENDATIONS

FOUNDATION OPTIONS

The foundations for the proposed building must satisfy three basic and independent criteria. First, the bearing pressure transmitted to the foundation soils must not exceed the ultimate soil bearing capacity reduced by an appropriate factor of safety. Second, settlement due to compression of the foundation soils during the life of the structure should not be of such magnitude as to cause

damage to the building nor to impair its use or appearance. Third, the potential shrink/swell of the soils should not impair the performance of the foundation due to vertical movement of the foundation. Foundations must be designed to satisfy each of these requirements in order to perform adequately.

The following recommendations are based on the data obtained from our field and laboratory studies, our experience with geotechnical conditions similar to those at this site, and our engineering design analyses.

The following alternatives are available for this project:

Mezzanine

- Shallow, strip footings

Canopy

- Shallow, spread footings

SITE GRADING

Site grading plans can result in changes in almost all aspects of foundation recommendations. We have prepared all foundation recommendations based on the final grade being close to the existing ground surface and the stratigraphic conditions encountered at the time of our study. If site grading plans differ from those discussed herein by more than plus or minus 1 foot, **R-K** must be retained to review the site grading plans prior to bidding the project for construction. This will enable **R-K** to provide input for any changes in our original recommendations that may be required as a result of site grading operations or other considerations.

SHALLOW FOOTINGS

The proposed renovations may be supported on conventional and/or isolated spread footings bearing on undisturbed, natural soils. All footings should extend at least 24 inches below the lowest adjacent finished grade. Lowest adjacent finished grade may be taken as the bottom of the interior slab-on-grade or the finished exterior grade, excluded landscape topsoil, whichever is lower.

Strip footings (having a width of at least 18 inches) used to support the planned mezzanine would be capable of supporting maximum allowable bearing pressures of 2,300 pounds per square foot (psf) for dead loads, 3,500 psf for combined dead and live loads, and 4,600 psf for all loads including wind. These allowable bearing pressures are based upon factors of safety of 3, 2, and 1½ for dead loads, dead plus live loads, and total loads including wind loads, respectively.

Spread or combined footings (having a width of at least 3 feet) used to support the canopy columns would be capable of supporting maximum allowable bearing pressures of 3,000 pounds per square foot (psf) for dead loads, 4,500 psf for combined dead and live loads, and 6,000 psf for

all loads including wind. These allowable bearing pressures are based upon factors of safety of 3, 2, and 1½ for dead loads, dead plus live loads, and total loads including wind loads, respectively.

These maximum allowable bearing pressures are net values; the weight of the footing may be neglected for design purposes. All footings located adjacent to utility trenches should have their bearing surfaces below an imaginary 1:1 (horizontal: vertical) plane projected upward from the bottom edge of the trench to the footing.

All continuous footings should be reinforced with top and bottom steel to provide structural continuity and to permit spanning of local irregularities. Footing excavations should be kept moist by regular sprinkling with water to prevent desiccation. It is essential that we observe the footing excavations before the reinforcing steel is placed.

Resistance to Uplift Loads

The ultimate uplift capacity of spread and strip footings is limited to the weight of the footing plus the weight of any soil directly above the footing. We recommend an effective unit weight of 120 pcf for soil and 150 pcf for concrete be used to compute the ultimate uplift capacity. We also recommend reducing the ultimate capacity by a factor of 1.2 as an allowable uplift capacity.

Resistance to Lateral Loads

Resistance of spread and strip footings to lateral loads can be provided by adhesion acting on the base of the footing and by some passive resistance of the soil adjacent to the footing. For design purposes, the resistance due to adhesion and passive soil pressure may be assumed to develop simultaneously. For concrete foundations placed in good contact with undisturbed natural cohesive soil, the allowable base adhesion may be taken as 250 psf.

Estimated Settlement

Detailed settlement analyses for the recommended shallow foundations were outside the scope of this study. However, we estimate total settlement to be on the order of 1 inch. Differential settlement is estimated to be on the order of ½ inch.

These estimates are based on the assumption that the foundations act as isolated foundations, that is, the clear spacing between the foundation is equal to or greater than the width or diameter of the foundation. In addition, we believe any fill used to raise grade will settle about 1 to 2 percent of its height due to its own weight prior to construction of the foundation systems.

In addition, the loads imparted by the mezzanine foundations may affect nearby existing foundations. Additional discussion of these affects is presented in the *Proximity to Existing Foundations* section of this report.

FOUNDATION CONSTRUCTION CONSIDERATIONS

SITE DRAINAGE

Drainage is an important key to the successful performance of any foundation. Good surface drainage should be established prior to and maintained after construction to help prevent water from ponding within or adjacent to the structure foundations and to facilitate rapid drainage away from the foundations. Failure to provide positive drainage away from the structure can result in localized differential vertical movements in soil supported foundations and floor slabs.

To help control drainage in the vicinity of the structure, we recommend that roof/gutter downspouts and landscaping irrigation systems not be located adjacent to the building foundation. Where a select fill overbuild is provided outside of the floor slab/foundation footprint, the surface should be sealed with an impermeable layer (pavement or clay cap) to reduce infiltration of both irrigation and surface waters. Careful consideration should also be given to the location of water bearing utilities, as well as to provisions for drainage in the event of leaks in water bearing utilities. All leaks should be immediately repaired.

SITE PREPARATION

Site preparation within the footprint of the new footings should consist of the removal of surficial concrete, moisture barrier, and other deleterious materials (such as debris, organic material, etc.). Clean cuts may be used to form the new footings. Normal proofrolling processes are impractical for this renovation project. As such, exposed subgrades should be evaluated by the Geotechnical Engineer-of-Record by using an ASTM Dynamic Cone Penetrometer (DCP) in accordance with the procedures presented by George F. Sowers, Ph.D. and Charles S. Hedges, P.E., in their paper "Dynamic Cone for Shallow In-Situ Penetration Testing" prepared for the ASTM Fifth Pacific Area National Meeting in Seattle, Washington on October 31, 1965.

Weak or soft areas identified during DCP evaluation should be removed and replaced with suitable, compacted select fill, free of organics, oversized materials, and degradable or deleterious materials or lean concrete.

PROXIMITY TO EXISTING FOUNDATIONS

Based on our current understanding of this project, we expect that in select areas new foundations installed during the proposed construction will likely be located near existing foundations. We have not been provided with detailed information regarding the location of proposed foundations relative to existing foundations or the dimensions and depths of the existing foundations. Care should be taken to prevent undermining existing foundations during the construction of new foundations.

The locations, depths, and sizes of existing footings should be reviewed to evaluate the effect of placing new footings adjacent to existing footings. In general, to avoid undermining existing footings, new footings should be placed above a line drawn at a 45-degree angle from the toe of the existing footing. Placing new footings above this line will **not** limit overlapping stresses nor the

additional settlements that could result from overlapping stresses. The effects of placing new footings adjacent to existing foundations should be evaluated on a case-by-case basis.

If it is determined during the recommended structural survey that the structural integrity of any of the existing foundations is questionable, we can provide recommendations for the retrofitting of the questionable existing footings. Furthermore, once a final foundation layout is chosen we would be pleased to review the plans prior to construction activities. A preconstruction-review may assist in recognizing potential hazards such as locations susceptible to undermining. Furthermore, we recommend that the Geotechnical Engineer-of-record or his qualified representative be present on site during foundation installation near existing foundation locations.

SUITABILITY OF EXCAVATED MATERIALS AS FILL

In general, soils encountered within the anticipated excavation depth should be suitable for reuse in areas outside the building pads as non-structural fill only. This excludes topsoil, strippings, organic laden soils, and undercut materials.

SELECT FILL

Select fill may be used for backfilling activities. We recommend using low plasticity cohesive soils for select fill. Select fill should have a liquid limit of less than 40 (preferably less than 35), and a plasticity index between 10 and 20. Select fill should be free of deleterious matter and should have an effective clod diameter less than 2 inches. Select fill should be placed in 6- to 8-inch-thick loose lifts and uniformly compacted to 95 percent of the maximum dry density as determined by ASTM D 698. We recommend using hand-operated compaction equipment and 4-inch-thick loose lifts adjacent to foundations and in confined areas. Furthermore, select fill placed in confined areas and adjacent to foundations and below-grade walls should be uniformly compacted to between 92 to 95 percent of the maximum dry density at a moisture content of 1 percent "dry" to 3 percent "wet" of optimum as determined by ASTM D 698.

FOUNDATION EXCAVATIONS

Shallow foundation excavations should be observed by the Geotechnical Engineer-of-Record or his/her qualified representative prior to placement of reinforcing steel and concrete. This is necessary to confirm that the bearing soils at the bottom of the excavations are similar to those encountered in our borings and that excessive loose materials and/or water are not present in the excavations. If soft pockets of soil are encountered in the foundation excavations, they should be removed and replaced with flowable fill or lean concrete up to the design foundation bearing elevations.

EXCAVATION SLOPING AND BENCHING

If utility trenches or other excavations extend to or below a depth of 5 feet below construction grade, the contractor or others shall be required to develop a trench safety plan to protect personnel entering the trench or trench vicinity. The collection of specific geotechnical data and the development of such a plan, which could include designs for sloping and benching or various types of temporary shoring, is beyond the scope of the current study. Any such designs

and safety plans shall be developed in accordance with current OSHA guidelines and other applicable industry standards.

To assist in preparing an excavation safety plan, we have classified the soils encountered at this site based on the data collected during this study. The surficial cohesive soils encountered at this site are classified as Type "B" soils under current Occupational Safety and Health Administration (OSHA) regulations pertaining to excavations. In excavations penetrating these soils, the sloping and benching schemes specified for Type "B" soils under the OSHA regulations require that the excavation sidewalls be sloped no steeper than 1:1 (horizontal: vertical). The naturally deposited granular soils at the site are classified as Type "C", per OSHA. Excavations penetrating Type "C" soils should not have sidewall slopes steeper than 1½:1.

CONSTRUCTION RELATED SERVICES

CONSTRUCTION MATERIALS TESTING AND OBSERVATION SERVICES

As presented in the attachment to this report, *Important Information About Your Geotechnical Engineering Report*, subsurface conditions can vary across a project site. The conditions described in this report are based on interpolations derived from a limited number of data points. Variations will be encountered during construction, and only the geotechnical design engineer will be able to determine if these conditions are different than those assumed for design.

Construction problems resulting from variations or anomalies in subsurface conditions are among the most prevalent reasons on construction projects which often lead to delays, change orders, cost overruns, claims, and disputes. These variations and anomalies can best be addressed if the Geotechnical Engineer-of-Record, **R-K**, is retained to perform construction observation and testing services during the construction of the project. This is because:

- **R-K** has an intimate understanding of the geotechnical engineering report's findings and recommendations. **R-K** understands how the report should be interpreted and can provide such interpretations on site, on the client's behalf.
- **R-K** knows what subsurface conditions are anticipated at the site.
- **R-K** is familiar with the goals of the owner and project design professionals, having worked with them in the development of the geotechnical work scope. This enables **R-K** to suggest remedial measures (when needed) which help meet the owner's and the design teams' requirements.
- **R-K** has a vested interest in client satisfaction, and thus assigns qualified personnel whose principal concern is client satisfaction. This concern is exhibited by the manner in which contractors' work is tested, evaluated and reported, and in selection of alternative approaches when such may become necessary.

- **R-K** cannot be held accountable for problems which result due to misinterpretation of our findings or recommendations when we are not on hand to provide the interpretation which is required.

BUDGETING FOR CONSTRUCTION TESTING

Appropriate budgets need to be developed for the required construction testing and observation activities. At the appropriate time before construction, we advise that **R-K** and the project designers meet and jointly develop the testing budgets, as well as review the testing specifications as it pertains to this project.

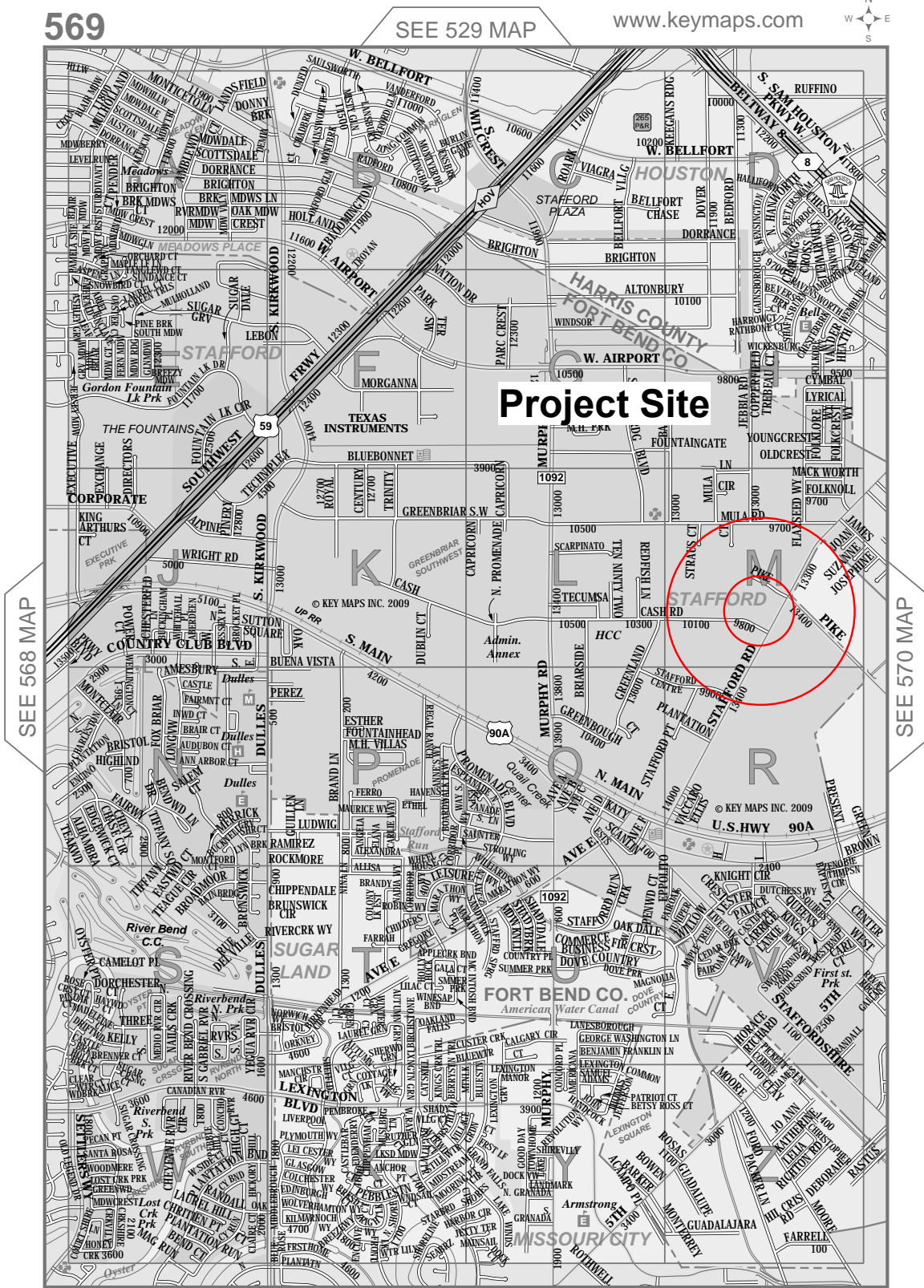
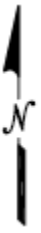
Once the construction testing budget and scope of work are finalized, we encourage a preconstruction meeting with the selected contractor to review the scope of work to make sure it is consistent with the construction means and methods proposed by the contractor. **R-K** looks forward to the opportunity to provide continued support on this project, and would welcome the opportunity to meet with the Project Team to develop both a scope and budget for these services.

* * * * *

The following figures are attached and complete this report:

| | |
|--|---------------------------------|
| Figure 1 | Vicinity Map |
| Figure 2 | Boring Location Map |
| Figures 3 and 4 | Logs of Borings |
| Figure 5 | Key to Terms and Symbols |
| Figure 6 | Results of Soil Sample Analyses |
| Important Information About Your Geotechnical Engineering Report | |

ATTACHMENTS



SEE 568 MAP

SEE 570 MAP

SEE 609 MAP

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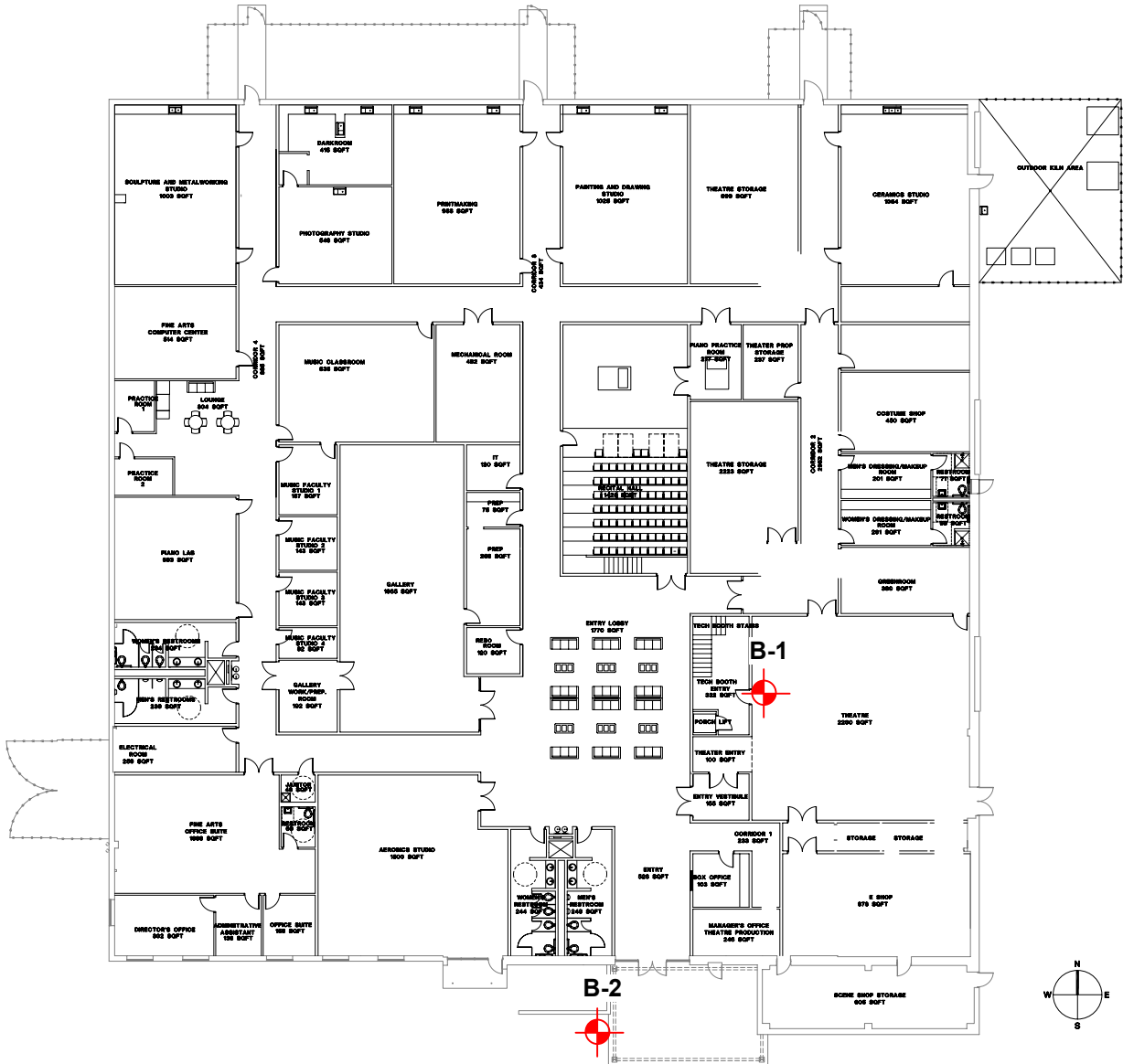
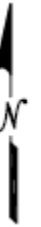
Note: Key Map used with permission.

FIGURE 1



3602 Westchase
Houston, Texas 77042
(713) 996-8990 TEL
(713) 996-8993 FAX
www.rkci.com

VICINITY MAP
HCC-STAFFORD FINE ARTS RENOVATION
9910 CASH ROAD
STAFFORD, TEXAS



Note: Boring locations are approximate.
Site plan provided by client.

FIGURE 2

BORING LOCATION MAP

HCC-STAFFORD FINE ARTS RENOVATION
9910 CASH ROAD
STAFFORD, TEXAS

LOG OF BORING NO. B-1
HCC-Stafford Fine Arts Renovation
9910 Cash Road
Stafford, Texas



DRILLING METHOD: Hydraulic Push

LOCATION: See Figure 1

| DEPTH, FT | SYMBOL | SAMPLES | DESCRIPTION OF MATERIAL | BLOWS PER FT | UNIT DRY WEIGHT, pcf | SHEAR STRENGTH, TONS/FT ² | | | | PLASTICITY INDEX | % -200 | |
|-----------|--------|---------|--|--------------|----------------------|--------------------------------------|-----|-----|-----|------------------|--------|-----|
| | | | | | | 0.5 | 1.0 | 1.5 | 2.0 | | | 2.5 |
| | | | CONCRETE (5-1/2 inches) | | | | | | | | | |
| | | | CLAYEY SAND (SC) loose, red-brown | | | | | | | | 9 | 22 |
| | | | FAT CLAY (CH) stiff, gray and red-brown with sand seams | | | | | | | | | |
| | | | SANDY FAT CLAY (CH) stiff to very stiff, gray and yellow-brown with ferrous nodules | | | | | | | | 36 | 60 |
| 5 | | | | | | | | | | | | |
| 10 | | | CLAYEY SAND (SC) medium dense, gray | | | | | | | | | |
| 10 | | | Boring Terminated | | | | | | | | | |
| 15 | | | NOTES: 1. Free water was not observed during drilling. 2. Cement grout used to backfill. | | | | | | | | | |
| 20 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | |

NOTE: THESE LOGS SHOULD NOT BE USED SEPARATELY FROM THE PROJECT REPORT

| | | |
|--------------------------------|---------------------------------|--------------------------------|
| DEPTH DRILLED: 12.0 ft | DEPTH TO WATER: Dry | PROJ. No.: AHA11-009-00 |
| DATE DRILLED: 5/27/2011 | DATE MEASURED: 5/27/2011 | FIGURE: 3 |

LOG OF BORING NO. B-2
HCC-Stafford Fine Arts Renovation
9910 Cash Road
Stafford, Texas



DRILLING METHOD: Hydraulic Push

LOCATION: See Figure 1

| DEPTH, FT | SYMBOL | SAMPLES | DESCRIPTION OF MATERIAL | BLOWS PER FT | UNIT DRY WEIGHT, pcf | SHEAR STRENGTH, TONS/FT ² | | | PLASTICITY INDEX | % -200 | | | | | |
|-----------|--------|---------|--|--------------|----------------------|--------------------------------------|-----|-----|------------------|--------|-----|-----|-----|-----|-----|
| | | | | | | 0.5 | 1.0 | 1.5 | | | 2.0 | 2.5 | 3.0 | 3.5 | 4.0 |
| | | | | | | PLASTIC LIMIT | | | | | | | | | |
| | | | | | | WATER CONTENT | | | | | | | | | |
| | | | | | | LIQUID LIMIT | | | | | | | | | |
| | | | | | | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | | |
| 0 - 5 | | | CONCRETE (5 inches) | | | | | | | | | | | | |
| 5 - 7 | | | SILTY SAND (SM) loose, yellow-brown with sandy lean clay pockets and ferrous nodules | | | | | | | | | | | | |
| 7 - 10 | | | SANDY LEAN CLAY (CL) hard to very stiff, gray to dark gray with ferrous nodules | | | | | | | | | | | 31 | 69 |
| 10 - 12 | | | CLAYEY SAND (SC) medium dense, gray with silt pockets | | | | | | | | | | | 21 | 44 |
| 12 - 13 | | | Boring Terminated | | | | | | | | | | | | |
| 15 - 35 | | | NOTES: 1. Free water was not observed during drilling. 2. Cement grout used to backfill. | | | | | | | | | | | | |

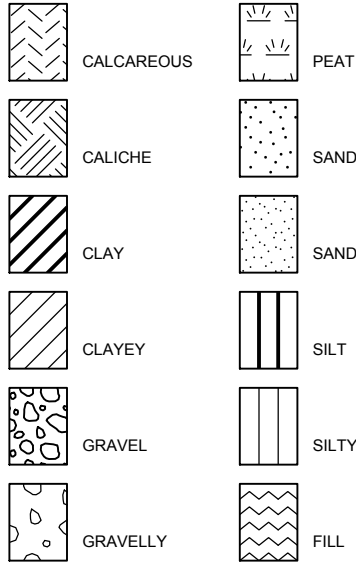
NOTE: THESE LOGS SHOULD NOT BE USED SEPARATELY FROM THE PROJECT REPORT

| | | |
|--------------------------------|---------------------------------|--------------------------------|
| DEPTH DRILLED: 12.0 ft | DEPTH TO WATER: Dry | PROJ. No.: AHA11-009-00 |
| DATE DRILLED: 5/27/2011 | DATE MEASURED: 5/27/2011 | FIGURE: 4 |

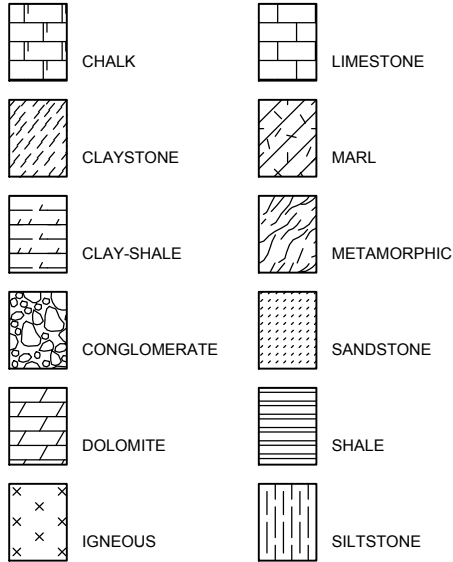
KEY TO TERMS AND SYMBOLS

MATERIAL TYPES

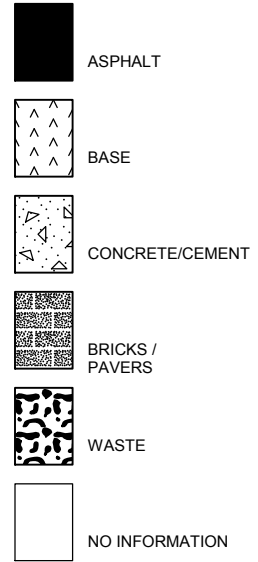
SOIL TERMS



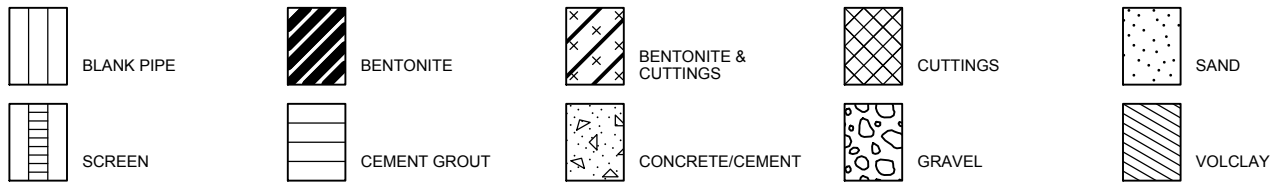
ROCK TERMS



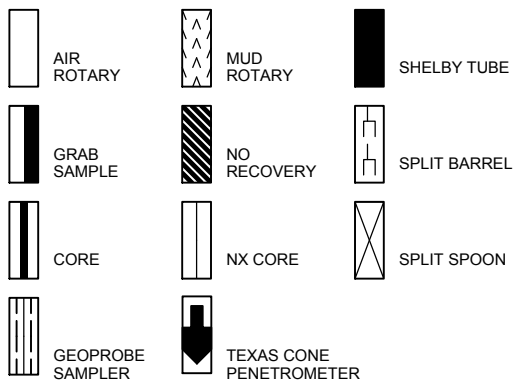
OTHER



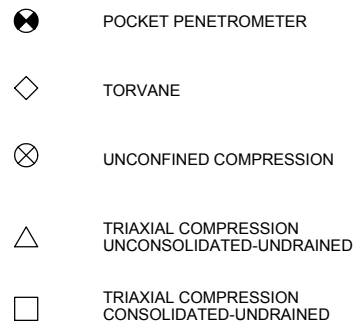
WELL CONSTRUCTION AND PLUGGING MATERIALS



SAMPLE TYPES



STRENGTH TEST TYPES



NOTE: VALUES SYMBOLIZED ON BORING LOGS REPRESENT SHEAR STRENGTHS UNLESS OTHERWISE NOTED

KEY TO TERMS AND SYMBOLS (CONT'D)

TERMINOLOGY

Terms used in this report to describe soils with regard to their consistency or conditions are in general accordance with the discussion presented in Article 45 of SOILS MECHANICS IN ENGINEERING PRACTICE, Terzaghi and Peck, John Wiley & Sons, Inc., 1967, using the most reliable information available from the field and laboratory investigations. Terms used for describing soils according to their texture or grain size distribution are in accordance with the UNIFIED SOIL CLASSIFICATION SYSTEM, as described in American Society for Testing and Materials D2487-06 and D2488-00, Volume 04.08, Soil and Rock; Dimension Stone; Geosynthetics; 2005.

The depths shown on the boring logs are not exact, and have been estimated to the nearest half-foot. Depth measurements may be presented in a manner that implies greater precision in depth measurement, i.e 6.71 meters. The reader should understand and interpret this information only within the stated half-foot tolerance on depth measurements.

RELATIVE DENSITY

COHESIVE STRENGTH

PLASTICITY

| <u>Penetration Resistance Blows per ft</u> | <u>Relative Density</u> | <u>Resistance Blows per ft</u> | <u>Consistency</u> | <u>Cohesion TSF</u> | <u>Plasticity Index</u> | <u>Degree of Plasticity</u> |
|--|-----------------------------|------------------------------------|--------------------|-------------------------|-----------------------------|---------------------------------|
| 0 - 4 | Very Loose | 0 - 2 | Very Soft | 0 - 0.125 | 0 - 5 | None |
| 4 - 10 | Loose | 2 - 4 | Soft | 0.125 - 0.25 | 5 - 10 | Low |
| 10 - 30 | Medium Dense | 4 - 8 | Firm | 0.25 - 0.5 | 10 - 20 | Moderate |
| 30 - 50 | Dense | 8 - 15 | Stiff | 0.5 - 1.0 | 20 - 40 | Plastic |
| > 50 | Very Dense | 15 - 30 | Very Stiff | 1.0 - 2.0 | > 40 | Highly Plastic |
| | | > 30 | Hard | > 2.0 | | |

ABBREVIATIONS

| | | |
|------------------------------------|---|----------------------------------|
| B = Benzene | Qam, Qas, Qal = Quaternary Alluvium | Kef = Eagle Ford Shale |
| T = Toluene | Qat = Low Terrace Deposits | Kbu = Buda Limestone |
| E = Ethylbenzene | Qbc = Beaumont Formation | Kdr = Del Rio Clay |
| X = Total Xylenes | Qt = Fluvial Terrace Deposits | Kft = Fort Terrett Member |
| BTEX = Total BTEX | Qao = Seymour Formation | Kgt = Georgetown Formation |
| TPH = Total Petroleum Hydrocarbons | Qle = Leona Formation | Kep = Person Formation |
| ND = Not Detected | Q-Tu = Uvalde Gravel | Kek = Kainer Formation |
| NA = Not Analyzed | Ewi = Wilcox Formation | Kes = Escondido Formation |
| NR = Not Recorded/No Recovery | Emi = Midway Group | Kew = Walnut Formation |
| OVA = Organic Vapor Analyzer | Mc = Catahoula Formation | Kgr = Glen Rose Formation |
| ppm = Parts Per Million | EI = Laredo Formation | Kgru = Upper Glen Rose Formation |
| | Kknm = Navarro Group and Marlbrook Marl | Kgrl = Lower Glen Rose Formation |
| | Kpg = Pecan Gap Chalk | Kh = Hensell Sand |
| | Kau = Austin Chalk | |

PROJECT NO. AHA11-009-00

RESULTS OF SOIL SAMPLE ANALYSES

PROJECT NAME: HCC-Stafford Fine Arts Renovation
 9910 Cash Road
 Stafford, Texas

FILE NAME: AHA11-009-00.GPJ

6/13/2011

| Boring No. | Sample Depth (ft) | Blows per ft | Water Content (%) | Liquid Limit | Plastic Limit | Plasticity Index | USCS | Dry Unit Weight (pcf) | % -200 Sieve | Shear Strength (tsf) | Strength Test |
|------------|-------------------|--------------|-------------------|--------------|---------------|------------------|------|-----------------------|--------------|----------------------|---------------|
| B-1 | 0.0 to 1.0 | | 12 | | | | | | | | |
| | 1.0 to 2.0 | | 8 | 23 | 14 | 9 | SC | | 22 | | |
| | 2.0 to 3.0 | | 36 | | | | | | | 0.70 | TV |
| | 3.0 to 4.0 | | 26 | | | | | | | 0.90 | TV |
| | 4.0 to 5.0 | | 21 | | | | | | | 0.63 | PP |
| | 5.0 to 6.0 | | 19 | 51 | 15 | 36 | CH | | 60 | 1.00 | TV |
| | 6.0 to 7.0 | | 15 | | | | | | | 1.50 | TV |
| | 7.0 to 8.0 | | 15 | | | | | | | 1.00 | TV |
| | 8.0 to 9.0 | | 14 | | | | | | | 0.80 | TV |
| | 9.0 to 10.0 | | 17 | | | | | | | 0.20 | TV |
| | 10.0 to 11.0 | | 21 | | | | | | | 0.10 | TV |
| | 11.0 to 12.0 | | 25 | | | | | | | | |
| B-2 | 0.0 to 1.0 | | 13 | | | | | | | | |
| | 1.0 to 2.0 | | 11 | | | | | | | 2.50 | TV |
| | 2.0 to 3.0 | | 18 | | | | | | | 2.50 | TV |
| | 3.0 to 4.0 | | 16 | 46 | 15 | 31 | CL | | 69 | 2.50 | TV |
| | 4.0 to 5.0 | | 16 | | | | | | | 1.75 | TV |
| | 5.0 to 6.0 | | 15 | | | | | | | 1.80 | TV |
| | 6.0 to 7.0 | | 16 | | | | | | | 2.50 | TV |
| | 7.0 to 8.0 | | 17 | 34 | 13 | 21 | SC | | 44 | 2.50 | TV |
| | 8.0 to 9.0 | | 20 | | | | | | | 0.70 | TV |
| | 9.0 to 10.0 | | 18 | | | | | | | 0.30 | TV |
| | 10.0 to 11.0 | | 22 | | | | | | | 0.10 | TV |
| | 11.0 to 12.0 | | 22 | | | | | | | 0.10 | TV |

PP = Pocket Penetrometer TV = Torvane UC = Unconfined Compression FV = Field Vane UU = Unconsolidated Undrained Triaxial
 CU = Consolidated Undrained Triaxial

Important Information About Your Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply the report for any purpose or project except the one originally contemplated.*

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,

- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that

have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely on Your ASFE-Member Geotechnical Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.



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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Overhead coiling service doors.

1.2 RELATED SECTIONS

- A. Section 05500 - Metal Fabrications: Support framing and framed opening.
- B. Section 06200 - Finish Carpentry: Wood jamb and head trim.
- C. Section 08710 - Door Hardware: Product Requirements for cylinder core and keys.
- D. Section 09900 - Painting: Field applied finish.
- E. Section 16130 - Raceway and Boxes: Conduit from electric circuit to door operator and from door operator to control station.
- F. Section 16150 - Wiring Connections: Power to disconnect.

1.3 REFERENCES

- A. ASTM A 653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- B. ASTM A 666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- C. ASTM A 924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- D. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- F. NEMA MG 1 - Motors and Generators.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. Overhead coiling service doors:
 - 1. Wind Loads: Design door assembly to withstand wind/suction load of 20 psf (958 Pa) without damage to door or assembly components.
 - 2. Operation: Design door assembly, including operator, to operate for not less than 20,000 cycles.
- B. Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.
- C. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc. acceptable to authority having jurisdiction as suitable for purpose specified.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Details of construction and fabrication.
 - 4. Installation instructions.
- C. Shop Drawings: Include detailed plans, elevations, details of framing members, anchoring methods, required clearances, hardware, and accessories. Include relationship with adjacent construction.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
- F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- G. Operation and Maintenance Data: Submit lubrication requirements and frequency, and periodic adjustments required.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five years experience in the fabrication and installation of security closures.
- B. Installer Qualifications: Installer Qualifications: Company specializing in performing Work of this section with minimum three years and approved by manufacturer.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
 - 3. Refinish mock-up area as required to produce acceptable work.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.
- C. Store materials in a dry, warm, ventilated weather-tight location.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 COORDINATION

- A. Coordinate Work with other operations and installation of adjacent materials to avoid damage to installed materials.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Overhead Door Corp., 2501 S. State Hwy. 121, Suite 200, Lewisville, TX 75067. ASD. Tel. Toll Free: (800) 275-3290. Phone: (469) 549-7100. Fax: (972) 906-1499. Web Site: www.overheaddoor.com. E-mail: sales@overheaddoor.com.
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 OVERHEAD COILING SERVICE DOORS

- A. Light Commercial Doors: Overhead Door Corporation, 600 Series Coil-Away Service Doors.
 - 1. Curtain: Interlocking roll-formed galvanized steel slats, flat crown profile type CAW, 26 gauge for widths up to 12 feet 4 inches (3.75 m), 24 gauge for widths up to 16 feet (4.88 m). End of each slat shall be locked from lateral movement by a staking lock system. (Galvanized alternate malleable end locks.)
 - 2. Finish:
 - a. Curtain slats and hood shall be galvanized in accordance with ASTM A 653 and receive rust-inhibitive, roll coating process, including 0.2 mils thick baked-on prime paint, and 0.6 mils thick baked-on polyester top coat.
 - b. Non-galvanized exposed ferrous surfaces shall receive one coat of rust-inhibitive primer.
 - c. Top Coat Color:
 - 1) White polyester top coat.
 - 3. Weather seals: Vinyl bottom seal.
 - 4. Bottom Bar: Extruded aluminum.
 - 5. Guides: Roll-formed galvanized steel shapes attached to continuous galvanized steel wall angle.
 - 6. Brackets: Galvanized steel to support counterbalance and curtain.
 - 7. Counterbalance: Helical torsion spring type housed in a steel tube or pipe barrel and supporting the curtain with deflection limited to 0.03 inch per foot of span. Spring tension shall be adjustable.
 - 8. Hood: Not Required.
 - 9. Hood: 24 gauge galvanized steel with intermediate supports as required.
 - 10. Manual Operation:
 - a. Chain hoist for doors over 100 SF.

11. Electric Motor Operation: Provide UL listed electric operator, size as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - a. Sensing Edge Protection:
 - 1) N/A.
 - b. Operator Controls:
 - 1) Push-button operated control stations with open, close, and stop buttons.
 - 2) Controls for interior location.
 - 3) Controls for exterior location.
 - 4) Controls surface mounted.
 - c. Special Operation:
 - 1) Vehicle detector operation.
 - 2) Card reader control.
 - 3) Commercial light package.
 - d. Motor Voltage: 115/230 single phase, 60 Hz.
12. Locking:
 - a. Cylinder lock for electric operation.
13. Wall Mounting Condition: Face-of-wall.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify opening sizes, tolerances and conditions are acceptable.
- B. Examine conditions of substrates, supports, and other conditions under which this work is to be performed.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- E. Coordinate installation of electrical service with Section 16150. Complete wiring from disconnect to unit components.

- F. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07900.
- G. Install perimeter trim and closures.
- H. Instruct Owner's personnel in proper operating procedures and maintenance schedule.

3.4 ADJUSTING

- A. Test for proper operation and adjust as necessary to provide proper operation without binding or distortion.
- B. Adjust hardware and operating assemblies for smooth and noiseless operation.

3.5 CLEANING

- A. Clean curtain and components using non-abrasive materials and methods recommended by manufacturer.
- B. Remove labels and visible markings.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

3.6 PROTECTION

- A. Protect installed products until completion of project.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Upcoiling Security Grilles, power operated.

1.2 RELATED SECTIONS

- A. Section 05500 - Metal Fabrications: Support framing and framed opening.
- B. Section 06200 - Finish Carpentry: Wood jamb and head trim.
- C. Section 08332 - Overhead Coiling Counter Doors.
- D. Section 08710 - Door Hardware: Product Requirements for cylinder core and keys.
- E. Section 16130 - Raceway and Boxes: Conduit from electric circuit to grille operator and from grille operator to control station.
- F. Section 16150 - Wiring Connections: Power to disconnect.

1.3 REFERENCES

- A. ASTM A 653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- B. ASTM A 666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- C. ASTM A 924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- D. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- E. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).
- F. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- G. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC.
- H. NEMA MG 1 - Motors and Generators.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.

- C. Shop Drawings: Include detailed plans, elevations, details of framing members, required clearances, anchors, and accessories. Include relationship with adjacent materials.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
- F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five years experience in the fabrication and installation of security closures.
- B. Installer Qualifications: Company specializing in performing Work of this section with minimum three years and approved by manufacturer.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Install in areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship and installation is approved by Architect.
 - 3. Refinish mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.
- C. Store materials in a dry, warm, ventilated weathertight location.

1.7 COORDINATION

- A. Coordinate Work with other operations and installation of adjacent finish materials to avoid damage to installed materials.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Overhead Door Corp., 2501 S. State Hwy. 121, Suite 200, Lewisville, TX 75067. ASD. Tel. Toll Free: (800) 275-3290. Phone: (469) 549-7100. Fax: (972) 906-1499. Web Site: www.overheaddoor.com. E-mail: sales@overheaddoor.com.
- B. Substitutions: Permitted.

- C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 UNCOILING SECURITY GRILLES

- A. Overhead Coiling Metal Grilles: Overhead Door Corporation 671 Series.
1. Curtain: Horizontal 5/16 inch (7.8 mm) diameter rods with network of vertically interlocking links to form a pattern. Bottom bar extruded aluminum tubular shape.
 - a. Material:
 - 1) Stainless Steel.
 - b. Vertical Rod Spacing:
 - 1) 2 inches (51 mm) on center.
 - c. Horizontal Link Spacing:
 - 1) 6 inches (152 mm) on center.
 - d. Pattern:
 - 1) Straight lattice; horizontal spacing 4-1/2 inches (114 mm) on center.
 2. Finish:
 - a. Stainless Steel: No. #4 finish.
 3. Guides:
 - a. Guides face mounted on adjacent construction.
 4. Brackets: Minimum 3/16 inch (4.8 mm) steel to support barrel, counterbalance and hood as applicable.
 5. Counterbalance: Helical torsion spring type housed in a steel tube or pipe barrel, supporting the curtain with maximum deflection of 0.03 inches per foot of span. Counterbalance adjustable by means of an adjusting tension wheel.
 6. Hood:
 - a. Stainless steel.
 7. Electric Motor Operation: Provide UL listed electric operator, size as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
 - a. Sensing Edge Protection:
 - 1) Electric sensing edge.
 - b. Operator Controls: Control stations with open, close, and stop functions.
 - 1) Key operation.
 - 2) Surface mounting.
 - 3) For interior location.

- c. Emergency Egress Device: Interior flush mounted handle mechanism to automatically open grille part way to permit passage even if power is not available.
- 8. Locking:
 - a. Cylinder lock for electric operation with interlock switch.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify opening sizes, tolerances and conditions are acceptable.
- B. Examine conditions of substrates, supports, and other conditions under which this work is to be performed.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- E. Coordinate installation of electrical service with Section 16150. Complete wiring from disconnect to unit components.
- F. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07900.
- G. Install perimeter trim and closures.

3.4 ADJUSTING

- A. Test security grilles for proper operation and adjust as necessary to provide proper operation without binding or distortion.
- B. Adjust hardware and operating assemblies for smooth and noiseless operation.

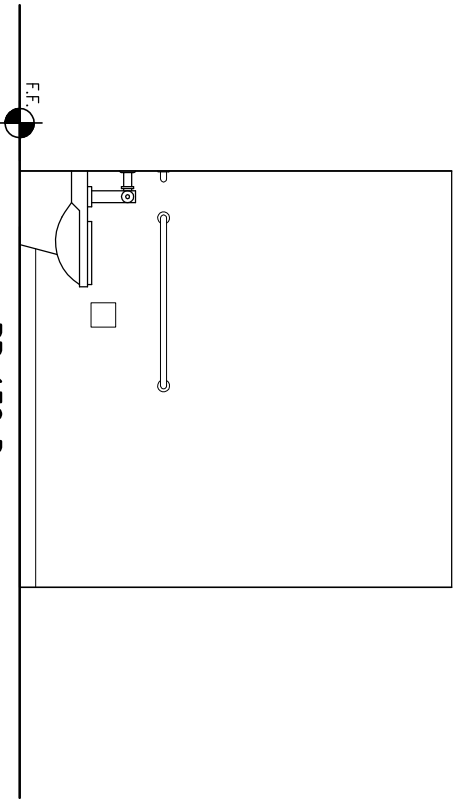
3.5 CLEANING

- A. Clean curtain and components using non-abrasive materials and methods recommended by manufacturer.
- B. Remove labels and visible markings.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

3.6 PROTECTION

- A. Protect installed products until completion of project.

END OF SECTION



F.F.

RR 130 D

THE LOCKER ROOM

» Request a Quote

- Lockers
- Benches
- Locks
- Repair Parts
- Lockers FAQ

THE RESTROOM

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THE WAREHOUSE

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- Mezzanine
- Wire Partitions
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- In Plant Offices
- Cabinets and Furniture
- FAQ

THE OTHER STUFF

- ADA Compliant
- Bleachers
- Custom Metal Shop

ADA Locker Room Bench



[Back to List](#)

Now: \$300.00

SKU: ADABENCH

Qty: 1

- sizes:**
- 48" L x 24" W x 17.5" H (\$300.00)
 - 42" L x 20" W x 17.5" H (\$340.00)

- Pedestal Color:**
- Champagne - In Stock
 - Gray - In Stock

[Add to Cart](#)

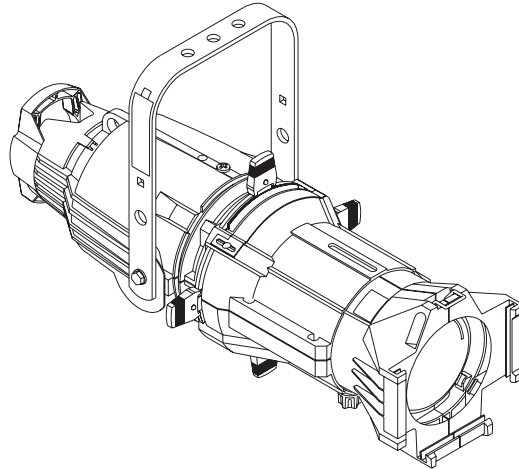
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- **IN STOCK & READY TO SHIP**
- Two sizes to choose from - same price
- ADA Compliant
- Selected Hardwood Tops With Radius On All Sides
- Two Coat Lacquer Finish On Wood
- Seat Height is 17-1/2" high
- Heavy duty floor mounted pedestals with powder coat finish
- Hardware supplied to mount pedestals to tops
- Pedestals must be anchored to the floor
- **Additional pedestal colors** available from production, please call or **Contact Us** for more information.
- ADA and so-called "Barrier Free" guidelines are set by the Federal Government and are sometimes modified by regional or local, lower level government agencies. Please check with your architect or these agencies to confirm that this product applies to your guide lines.



100V 115/120V 230/240V

Ellipsoidal Series



SPECIFICATIONS

PHYSICAL

- Rugged, die cast aluminum construction
- Rotating shutter assembly $\pm 25^\circ$
- 20 gauge stainless steel shutters in a tri-plane assembly
- Interchangeable lens tubes with smooth-running teflon guides provide nine user-fit field angle options
- Thermally insulated rear handle
- High impact, thermally insulated knobs and shutter handles
- Two accessory slots and a top mounted, gel frame retainer
- Steel yoke with two mounting positions
- Positive locking single-clutch fixture body
- Slot for glass or stainless steel patterns
- Wide accessory slot with sliding cover for motorized pattern devices or optional iris
- UL and cUL Listed

ELECTRICAL

- 115-240V, 50/60Hz
- High temperature 3-conductor 36" leads in a glass fiber outer sleeve
- Supports ETC Dimmer Doubling™ technology

LAMP

- 750W maximum
- HPL — compact tungsten filament contained in a krypton-filled quartz envelope (see table for suitable lamp types)
- Patented filament geometry makes for extremely efficient light collection and transmission
- Integral die cast aluminum heat sink lamp base

SPECIFICATIONS

OPTICAL

- Re-optimized optical system for improved photometric performance and field uniformity
- Projector-quality, high contrast aspheric lens
- Optional enhanced definition lens tube available for even higher image quality
- Faceted borosilicate reflector with dichroic cold mirror coating removes greater than 90% infrared radiation (heat) and reflects greater than 95% of visible light
- Reflector secured with anti-vibration shock mounts
- Lens(es) secured with anti-vibration shock mounts
- Tool free, positive locking X, Y and Z lamp centering adjustments, unaffected by relamping
- Beam edge continually adjustable hard-to-soft
- Interchangeable lens barrels permit selection of 5°, 10°, 14°, 19°, 26°, 36°, 50°, 70° and 90° field angles as well as 19°, 26°, 36°, and 50° EDLT lenses

ORDERING INFORMATION

Source Four

| MODEL | DESCRIPTION |
|-------|-------------------------|
| 450 | 50° ellipsoidal (black) |
| 450-1 | 50° ellipsoidal (white) |

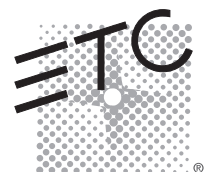
ETC Source Four are supplied with C-clamp, color frame and 3' (96cm) leads as standard

Connector Designation

Use Suffixes below to specify Factory-Fitted Connector type

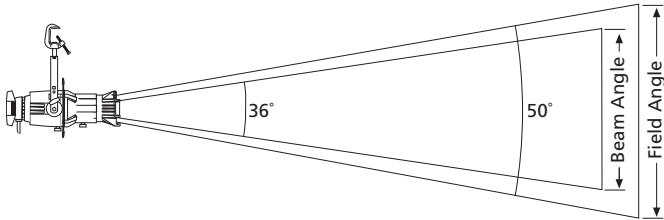
| MODEL | DESCRIPTION |
|-------|--|
| -A | Parallel-blade U-ground connector |
| -B | Two-pin and ground, 20 amp connector |
| -C | Grounded, 20 amp, twistlock connector |
| -M | Dimmer Doubling Connector (NEMA L515P) |

See back page for Source Four Accessories



PHOTOMETRICS

Photometric data below is measured with an HPL 750W/115V 300hr lamp. To convert data when using any other HPL lamp, use the lumen or candela multiplying factors (Lm MF or Cd MF) for that specific lamp, listed in the Lamps table in this datasheet. For lumen data, multiply by the Lm MF. For candela or footcandle data, multiply by the Cd MF.



| | | | | |
|---------------------------|--------------|-------------|---------------|---------------|
| Throw Distance (d) | 10' 3m | 15' 4.6 | 25' 7.6m | 30' 9.1m |
| Field Diameter | 9.3' 2.8m | 14' 4.3m | 23.3' 7.1m | 27.9' 8.5m |
| Illuminance (fc) | 457 | 203 | 73 | 51 |
| Illuminance (lux) | 4,914 | 2,184 | 786 | 546 |

Source Four 50°(cosine)

| Degree | Candela | Field Lumens | Beam Lumens | Efficiency | Lumens per watt |
|--------|---------|--------------|-------------|------------|-----------------|
| 50° | 45,650 | 13,980 | 8,600 | 63.8% | 18.6 |

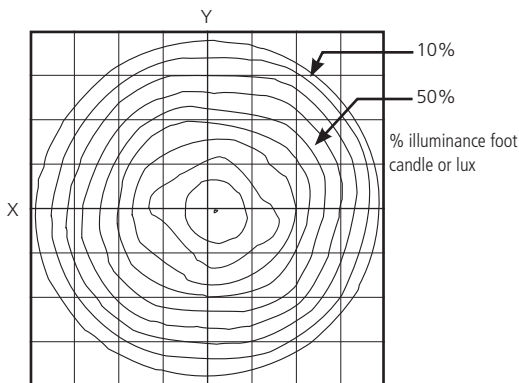
Metric Conversions: For Meters multiply feet by .3048
For Lux multiply footcandles by 10.76

To determine center beam illumination in footcandles at any throw distance, divide candela by the throw distance squared.

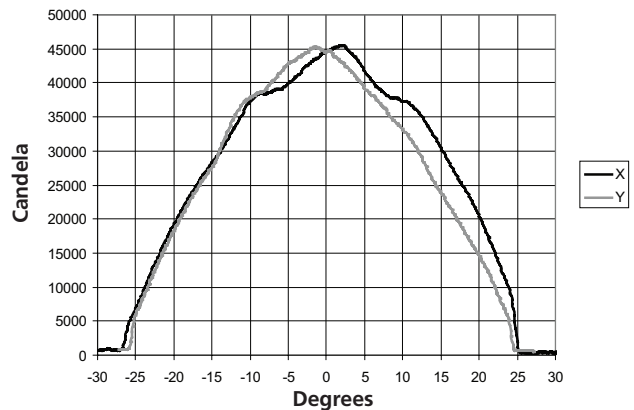
For Field diameter at any distance, multiply distance by .93

For Beam diameter at any distance, multiply distance by .65

Iso-Illuminance Diagram
(Flat Surface Distribution)



Cosine Candela Plot



Complete IES photometry data files (LM-63-02 format) may be downloaded from the ETC website.

Go to <http://www.etcconnect.com/downloads.asp>

Ellipsoidal Series

L A M P S

To determine Candela (Cd) or Lumens (Lm) for any other HPL lamp, multiply the Candela or Lumen value by the appropriate multiplying factor (CdMF or LmMF) shown for that lamp in the table below.

| ETC Part # | Lamp Code | Watts | Volts | Initial Lumens | Color Temp. K | Average Rated Life | 50° Cd MF | 50° Lm MF |
|------------|---------------|-------|-------|----------------|---------------|--------------------|-----------|-----------|
| RT116 | HPL 750/115** | 750 | 115 | 21,900 | 3,250 | 300 | 1.00 | 1.00 |
| RT196 | HPL 750/115X | 750 | 115 | 16,400 | 3,050 | 1,500 | .64 | .74 |
| RT113 | HPL 575/115** | 575 | 115 | 16,520 | 3,250 | 300 | .79 | .76 |
| RT114 | HPL 575/115X | 575 | 115 | 12,360 | 3,050 | 2,000 | .56 | .56 |
| RT142 | HPL 375/115 | 375 | 115 | 10,540 | 3,250 | 300 | .66 | .49 |
| RT143 | HPL 375/115X | 375 | 115 | 8,500 | 3,050 | 1,000 | .46 | .36 |
| N/A | HPL 750/120 | 750 | 120 | 21,900 | 3,250 | 300 | 1.00 | 1.00 |
| N/A | HPL 750/120X | 750 | 120 | 16,400 | 3,050 | 1,500 | .64 | .74 |
| RT115 | HPL 575/120 | 575 | 120 | 16,520 | 3,250 | 300 | .79 | .76 |
| RT171 | HPL 575/120X | 575 | 120 | 12,360 | 3,050 | 2,000 | .56 | .56 |
| | | | | | | | | |
| RT112 | HPL 550/77* | 550 | 77 | 16,170 | 3,250 | 300 | .81 | .75 |
| RT117 | HPL 550/77X* | 550 | 77 | 12,160 | 3,050 | 2,000 | .59 | .56 |
| | | | | | | | | |
| RT160 | HPL 750/230** | 750 | 230 | 19,750 | 3,200 | 300 | .74 | .75 |
| N/A | HPL 750/230X | 750 | 230 | 15,600 | 3,050 | 1,500 | .46 | .59 |
| RT129 | HPL 575/230** | 575 | 230 | 14,900 | 3,200 | 400 | .61 | .60 |
| RT138 | HPL 575/230X | 575 | 230 | 11,780 | 3,050 | 1,500 | .45 | .45 |
| RT154 | HPL 375/230X | 375 | 230 | 7,800 | 3,050 | 1,000 | .34 | .31 |
| N/A | HPL 750/240 | 750 | 240 | 19,750 | 3,200 | 300 | .74 | .75 |
| N/A | HPL 750/240X | 750 | 240 | 15,600 | 3,050 | 1,500 | .46 | .59 |
| RT130 | HPL 575/240 | 575 | 240 | 14,900 | 3,200 | 400 | .58 | .60 |
| RT139 | HPL 575/240X | 575 | 240 | 11,780 | 3,050 | 1,500 | .42 | .45 |
| RT155 | HPL 375/240X | 375 | 240 | 7,800 | 3,050 | 1,000 | .34 | .31 |

Source Four is rated for 750W maximum

*77 Volt HPL lamps are for use with ETC Dimmer Doubling technology only

**Photometric data was prepared using a production fixture and the Prometric CCD measurement system. Fixture adjusted for cosine distribution and tested with calibrated lamp at rated voltage. All data normalized to nominal lamp lumens in accordance with IES LM-73-04. Testing performed at ETC West, Hollywood, CA. All other multiplying factors extrapolated from primary test data.

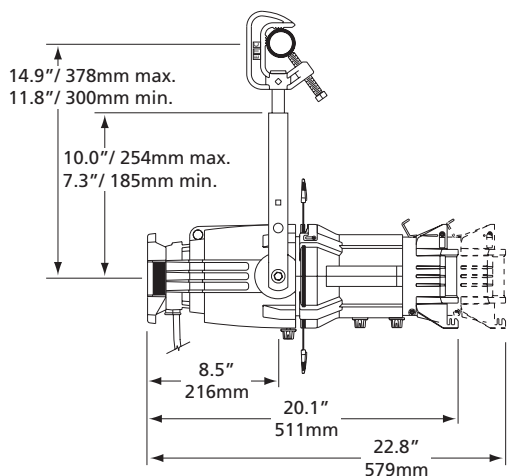
For links to photometry file downloads (IES LM-63-02 format) go to www.etconnect.com

HPL Specified Tolerances: Watts +/- 5%, Lumens +/-7%, Average life +/-10%, Color Temperature +/- 50K

"N/A" lamps are not available for purchase from ETC. Contact your Dealer for purchase.

Ellipsoidal Series

PHYSICAL



Source Four Weights*

| MODEL | WEIGHT | | SHIPPING WEIGHT | |
|-------|--------|-----|-----------------|-----|
| | lbs | kgs | lbs | kgs |
| 50° | 14 | 6.4 | 20 | 9.1 |

*Includes 2.3 lbs for C-clamp

ORDERING INFORMATION

Continued from front page...

Source Four Accessories

| MODEL | DESCRIPTION |
|-----------|--|
| 450LT | 50° lens tube with lens installed (black) |
| 450LT-1 | 50° lens tube with lens installed (white) |
| 450EDLT | 50° Enhanced Definition Lens Tube complete (black) |
| 450EDLT-1 | 50° Enhanced Definition Lens Tube complete (white) |
| 400CC | C-clamp (included) |
| 400PH-A | Pattern holder (A size) |
| 400PH-B | Pattern holder (B size) |
| 400PH-G | Glass pattern holder |
| 400SC | Safety cable |
| 400RS | Drop-in iris |
| 400CF | Colorframe (6.25") (included) |
| 400DN | Donut (6.25") |
| 400TH | Top hat |
| 400HH | Half hat |
| 400GE | Gel extender |
| 407GE | Conical gel extender |
| 407CF | 7.5" Square color frame (required for 14°, 70°, 90° and 407GE) |
| 400FB | Source Four fixture body, single clutch |

Note: For colors other than black or white, please call ETC.

Source Four products are protected by one or more of the following patents:

| | |
|---------|---|
| U.S. | USRE36,3316, US5,345,371, US6,092,914 and US5,775,799 |
| U.K. | GB0592589, GB0673488, 99930527.9* |
| Germany | DE0592589, GB0673488, 99930527.9* |
| Japan | JP2,501,772 |

* European patent application number

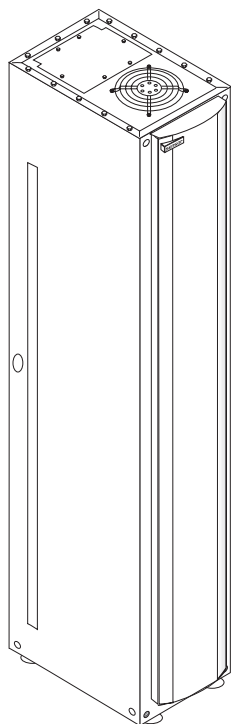


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100V 120V

Sensor+ Series



GENERAL INFORMATION

Sensor+ dimming systems provide high density, professional features and exceptional reliability for lighting applications that require the best the entertainment industry can offer.

APPLICATIONS

- Professional and educational theatre
- Production studios
- Concert and performance halls
- Themed retail and dining
- Multi-use Convention Centers
- Houses of Worship

FEATURES

- High dimmer density
- Up to two 2.4kW dimmers per module
- 6, 12, 24, and 48 module racks available
- Rugged industrial construction
- Installation flexibility
- Adaptable modular design
- 100,000A Short Circuit Current Rating (SCCR)
- Advanced configuration editing built into rack
- Stores up to 128 Presets in memory
- Direct Ethernet control signal input
- Two DMX512 inputs
- Standard system and rack monitoring with diagnostic reporting
- Supports ETC Dimmer Doubling™
- All racks UL and cUL LISTED

ACCESSORIES

- SmartLink® Button Stations and SmartLink TimeClock
- Dimmer Doubler
- Sound Suppression Hood
- Floor pedestal for 24-module rack
- Document holder

ORDERING INFORMATION

Installation Racks

| MODEL | DESCRIPTION |
|---------|-------------------------------------|
| SR48+ | Sensor+ 48 Module Rack |
| SR24+ | Sensor+ 24 Module Rack |
| SR12+ | Sensor+ 12 Module Rack |
| SR6+ | Sensor+ 6 Module Rack |
| SR24+1P | Sensor+ 24 Module Single Phase Rack |
| SR12+1P | Sensor+ 12 Module Single Phase Rack |
| SR6+1P | Sensor+ 6 Module Single Phase Rack |

Rack Options*

| MODEL | DESCRIPTION |
|----------|--|
| AT48 | Amp-Trap fuse option for 48-module rack |
| AT24 | Amp-Trap fuse option for 24-module rack |
| AT12 | Amp-Trap fuse option for 12-module rack |
| BK48 | Bussing kit for 2 – 48-module racks |
| BK24 | Bussing kit for 2 – 24-module racks |
| BK12 | Bussing kit for 2 – 12-module racks |
| AUX30-48 | 30" Auxiliary Rack(s) for 48-module rack |
| AUX19-48 | 19" Auxiliary Rack(s) for 48-module rack |
| AUX19-24 | 19" Auxiliary Rack(s) for 24-module rack |
| AUX19-12 | 19" Auxiliary Rack(s) for 12-module rack |

*Vibration Reduction mounts available for all Sensor+ racks. Contact ETC for details
 Note: Power feeds above 800A up to 2000A require addition of a 30" auxiliary rack.

Rack Accessories

| MODEL | DESCRIPTION |
|-----------|--|
| SSSh24-48 | Sensor+ Sound Suppression Hood – large |
| SSSh6-12 | Sensor+ Sound Suppression Hood – small |
| Pedestal | Floor pedestal for 24-module rack |
| DH | Document Holder |

SmartLink Accessories

| MODEL | DESCRIPTION |
|---------|--|
| S-LPB | SmartLink Power Board for Sensor+ Racks* |
| S-10005 | SmartLink 5-Button Station* |
| S-10010 | SmartLink 10-Button Station* |

*One SmartLink Power Board required for station support.
 S-LPB supports up to four stations.
 Only one S-LPB may be enabled in a system.



SPECIFICATIONS

GENERAL

- Racks available in four sizes
 - SR6+ 6 modules, 12 dimmers maximum
 - SR12+ 12 modules, 24 dimmers maximum
 - SR24+ 24 modules, 48 dimmers maximum
 - SR48+ 48 modules, 96 dimmers maximum
- Dual density (two dimmers per module), single density and half density dimmer modules available
- Operating temperature: 0-40°C / 32-104°F
 - Dimmer room HVAC systems must at all times maintain the specified ambient temperature at the dimmer rack.
 - Dimming systems operating within 10 degrees F of the upper or lower temperature limits must strictly follow installation and operation guidelines to operate reliably.
- Relative humidity: 30-90% non-condensing
- All racks UL and cUL LISTED
- UL924 LISTED for Bypass operation

MECHANICAL

- Rugged 16-gauge steel construction
- Fine-textured, scratch-resistant, epoxy paint
- SR6+ and SR12+ uses wall mount installation
- SR24+ can be wall or pedestal mounted
- SR48+ is floor mounted
- Top and bottom conduit access through removable panels (SR48+) or knockouts (SR6+, SR12+, and SR24+)
- No tools required for module removal or installation
- Keyed module slots prevent insertion of inappropriate module types
- Front access to all wiring and terminations
- Full height locking door
- Electrostatic air filter easily removed from door for periodic cleaning
- High efficiency cooling system with airflow sensor
- High visibility LED status beacon

ELECTRICAL

- SR6+, SR12+ and SR24+ accept:
 - Three phase 120/208 VAC
 - Single phase 120/240 VAC
 - SR48+ accepts
 - Three phase 120/208 VAC
 - Line feed frequencies from 47-63Hz
 - Line feed voltage range is 91-139 VAC*
 - Load terminals accept up to #4 AWG (16mm²) wire (see chart)
 - Short Circuit Current Rating: 100.000A RMS symmetrical @ 240VAC
 - Auxiliary equipment racks and custom switchgear/distribution available (Call ETC for details)
- *Note:Suggested max main transformer tap 135V to allow for line fluxuation.

CONTROL ELECTRONICS

- Sensor+ Control Electronics Module (CEM+)
- Single Ethernet control signal input
- Two DMX512 inputs
- Standard diagnostic reporting via browser-based interface or DimStat software
- Supports Dimmer Doubling™
- Supports SmartLink® control of presets

OPTIONS

- Advanced Features™ dimmer-specific load and diagnostic reporting
- Amp-Trap® fuses to allow feeding individual racks from oversize mains
- Bus kits available
- Vibration reduction kits available for all racks
- SmartLink Power Board
- SmartLink TimeClock

ADDITIONAL INFORMATION

Compatible Dimmer Modules

| SENSOR STANDARD MODULES | |
|--------------------------------|--|
| MODEL | DESCRIPTION |
| D15/D20 | Dual 15A/20A Dimmer Module – 350µS |
| D15E/D20E | Dual 15A/20A Dimmer Module – 500µS |
| D50AF | Single 50A Dimmer Module – 500µS – AF |
| D100AF* | Half 100A Dimmer Module – 500µS – AF |
| SENSOR SPECIAL PURPOSE MODULES | |
| L10 | Dual 10A Low Wattage Dimmer Module |
| L10F | Single 10A Low Wattage Fluorescent Dimmer Module |
| D15F/D20F | Single 15A/20A Fluorescent Dimmer Module |
| R15/R20 | Dual 15A/20A Relay Module |
| CC15/CC20 | Dual 15A/20A Constant Circuit Breaker Module |
| AFM | Air Flow Module |

*Half-density modules use two module slots

Control Modules

| MODEL | DESCRIPTION |
|-------|------------------------------|
| CEM+ | Control Electronics Module + |

Load Wiring Lug Capacity

| CONNECTION | WIRE SIZE |
|-----------------------------|---------------------------------|
| 10A, 15A, 20A, and 50A lugs | 4 AWG Max. (16mm ²) |
| 100A lugs | 2/0 Max. |

Primary Feed Lug Capacity

| CONNECTION | WIRE SIZE |
|------------|------------------------|
| SR48+ | Dual 600 kcmil – 2 AWG |
| SR24+ | Dual 350 kcmil – 4 AWG |
| SR12+ | Dual 250 kcmil – 6 AWG |
| SR6+ | Single 2/0 – 14 AWG |

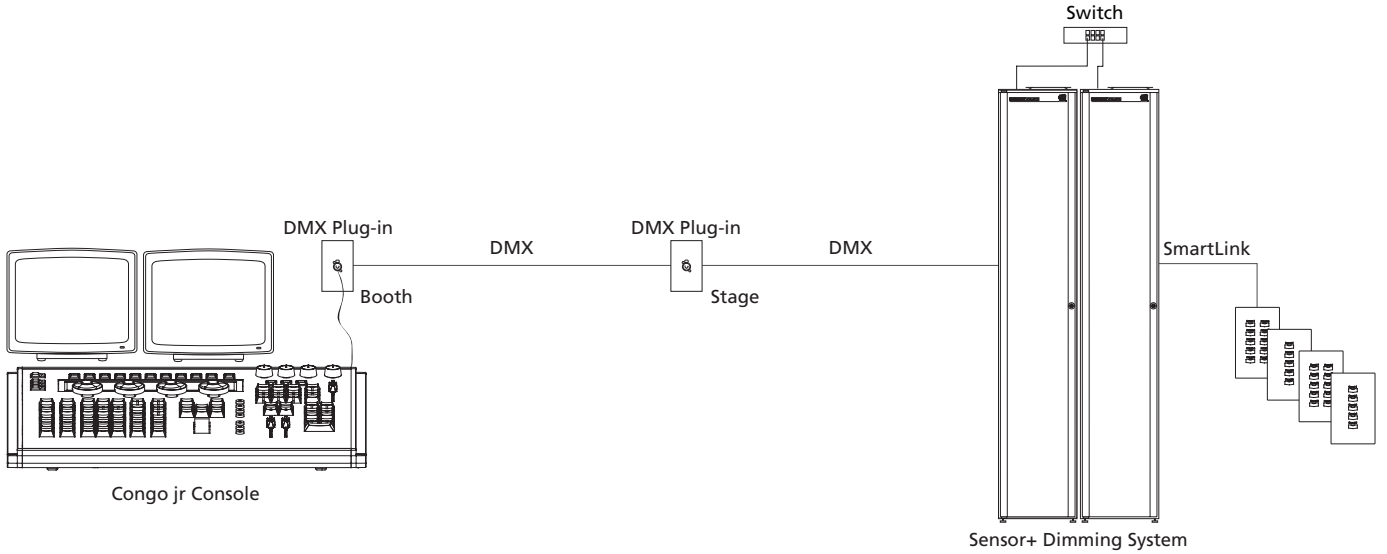
Sound Pressure Level (dBA)

| MODEL | dBA @ 1000Hz (1kHz)* | |
|-------|----------------------|-------------|
| | WITHOUT | WITH SSSh** |
| SR48+ | 37.0 | 30.9 |
| SR24+ | 40.2 | 34.0 |
| SR12+ | 41.8 | 33.8 |
| SR6+ | 26.0 | 21.4 |

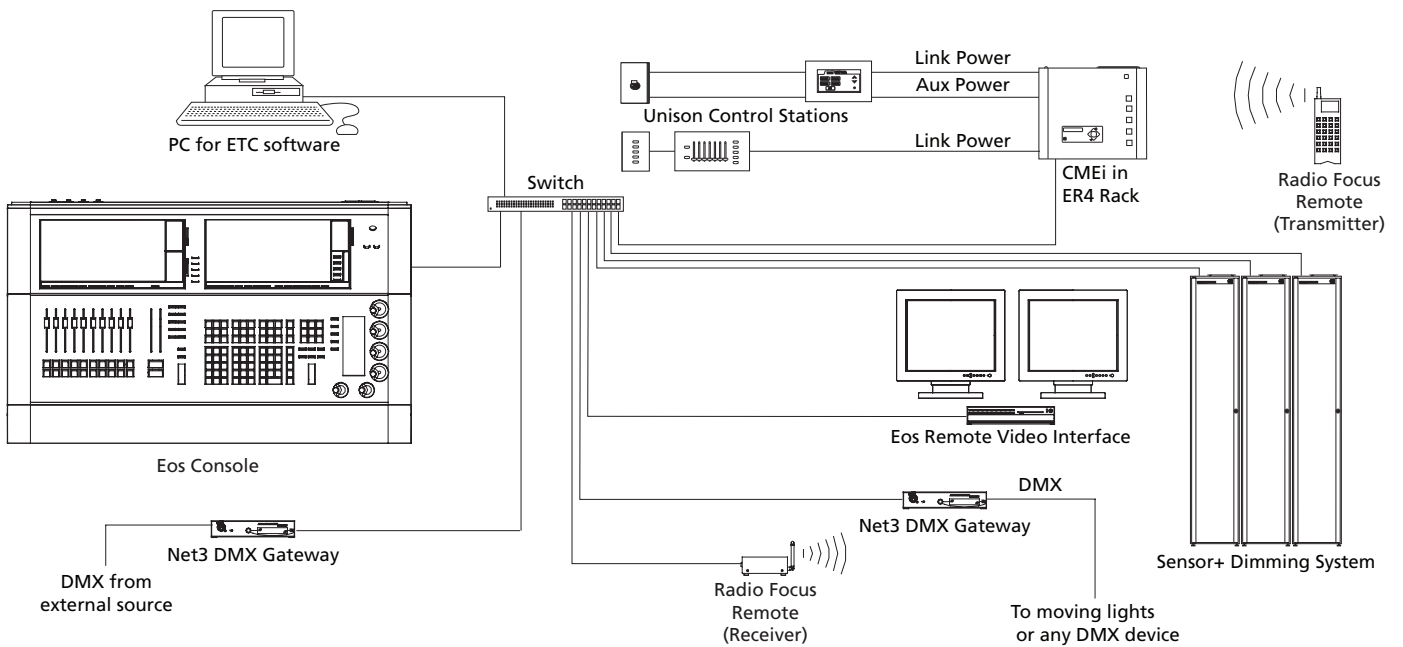
*dBA values for each Sensor rack measured at 1 meter. Visit www.etconnect.com for full spectrum dBA ratings.

**Sensor Sound Suppression Hood (SSSh)

TYPICAL SYSTEM RISER



TYPICAL NETWORK RISER



PHYSICAL

Empty Dimmer Rack Weights

| MODEL | WEIGHT | | SHIPPING WEIGHT | |
|----------------|--------|-----|-----------------|-----|
| | lbs | kgs | lbs | kgs |
| SR48+ | 188 | 86 | 198 | 90 |
| SR48+ Door* | 31 | 14 | 35 | 16 |
| SR24+ | 107 | 49 | 115 | 53 |
| SR24+ Door* | 17 | 8 | 20 | 9 |
| SR12+ | 45 | 21 | 50 | 23 |
| SR12+ Door* | 11 | 5 | 14 | 6.5 |
| SR6+ with Door | 36 | 16 | 45 | 21 |

*Rack doors ship separately

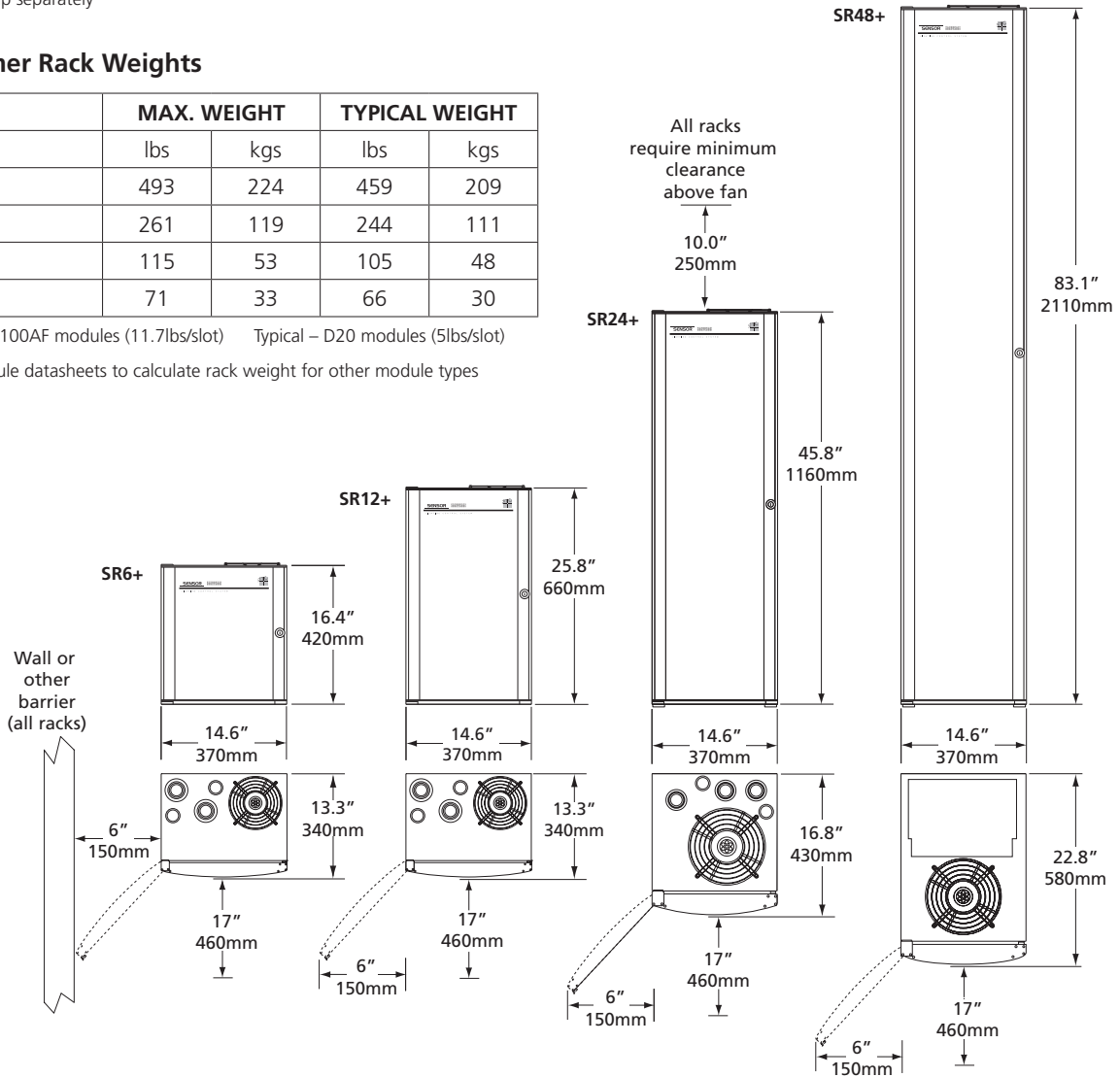
Installation Rack Dimensions

| MODEL | HEIGHT | | WIDTH | | DEPTH | |
|-------|--------|------|--------|-----|--------|-----|
| | inches | mm | inches | mm | inches | mm |
| SR48+ | 83.1 | 2110 | 14.6 | 370 | 22.8 | 580 |
| SR24+ | 45.8 | 1160 | 14.6 | 370 | 16.8 | 430 |
| SR12+ | 25.8 | 660 | 14.6 | 370 | 13.3 | 340 |
| SR6+ | 16.4 | 420 | 14.6 | 370 | 13.3 | 340 |

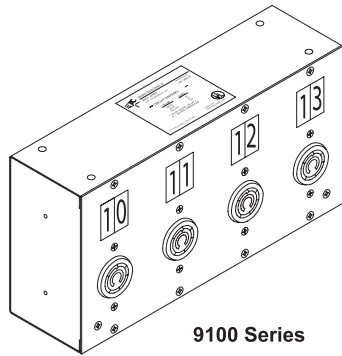
Full Dimmer Rack Weights

| MODEL | MAX. WEIGHT | | TYPICAL WEIGHT | |
|-------|-------------|-----|----------------|-----|
| | lbs | kgs | lbs | kgs |
| SR48+ | 493 | 224 | 459 | 209 |
| SR24+ | 261 | 119 | 244 | 111 |
| SR12+ | 115 | 53 | 105 | 48 |
| SR6+ | 71 | 33 | 66 | 30 |

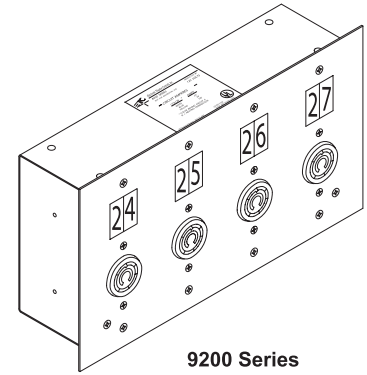
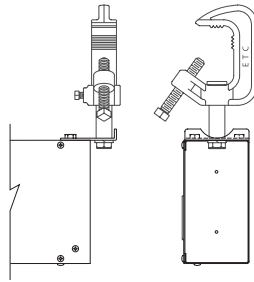
*Maximum – D100AF modules (11.7lbs/slot) Typical – D20 modules (5lbs/slot)
Refer to module datasheets to calculate rack weight for other module types



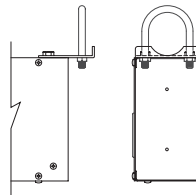
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 Sensor® products protected by one or more of the following U.S. Patent Numbers 5,323,088, 5,352,088, 7,233,112, 7,019,469, 6,849,943, and 6,002,563; European Number 060333372; German 69203609.



9100 Series



9200 Series



GENERAL INFORMATION

Outlet boxes are designed for surface or recess mounting in theatres, television studios and other spaces for distribution of lighting circuits.

- FEATURES** Surface and recess mounting available
 1, 2, 3, 4, 5, 6, and 8 connectors
 Panel mount connector Options:
 Edison (20A)
 Stage Pin (20, 60 and 100 amp)
 Grounded Twist-Lock (20A)
- Over- and Under-hung U-bolt and C-clamp pipe mount options available
- UL and cUL Listed
- PHYSICAL** Fabricated from 18-gauge steel with 16-gauge covers and 14-gauge end caps
 Finished with fine-textured, scratch-resistant, black powder coat
 2" or 3/4" labels with white numbers on black background (sized to match product)
 Pin outlets spaced on 1.25" or 3" centers
 Edison or Twist-Lock outlets spaced on 3" centers only

| | # of Outlets | Back box Dimensions | 9100 Panel Widths | 9200 Panel Widths |
|-------------|--------------|---------------------------|-------------------|-------------------|
| PIN 1.25" | 1 | 3" W x 6.25" H x 3.25" D | 3" | 4" |
| | 2,3,4 | 6" W x 6.25" H x 3.25" D | 6" | 7" |
| | 5,6 | 9" W x 6.25" H x 3.25" D | 9" | 10" |
| | 8 | 12" W x 6.25" H x 3.25" D | 12" | 13" |
| Other 3.00" | 1,2 | 6" W x 6.25" H x 3.25" D | 6" | 7" |
| | 3,4 | 12" W x 6.25" H x 3.25" D | 12" | 13" |
| | 5,6 | 18" W x 6.25" H x 3.25" D | 18" | 19" |
| | 8 | 24" W x 6.25" H x 3.25" D | 24" | 25" |

ORDERING INFORMATION

Standard Surface Mount Outlet Boxes

| Outlet Qty | Edison | Pin 3" | Pin 1.25" | Twistlock |
|------------|--------|--------|-----------|-----------|
| 1 | 9101A | 9101B | 9101BD | 9101C |
| 2 | 9102A | 9102B | 9102BD | 9102C |
| 3 | 9103A | 9103B | 9103BD | 9103C |
| 4 | 9104A | 9104B | 9104BD | 9104C |
| 5 | 9105A | 9105B | 9105BD | 9105C |
| 6 | 9106A | 9106B | 9106BD | 9106C |
| 8 | 9108A | 9108B | 9108BD | 9108C |

Standard Recessed Mount Outlet Boxes

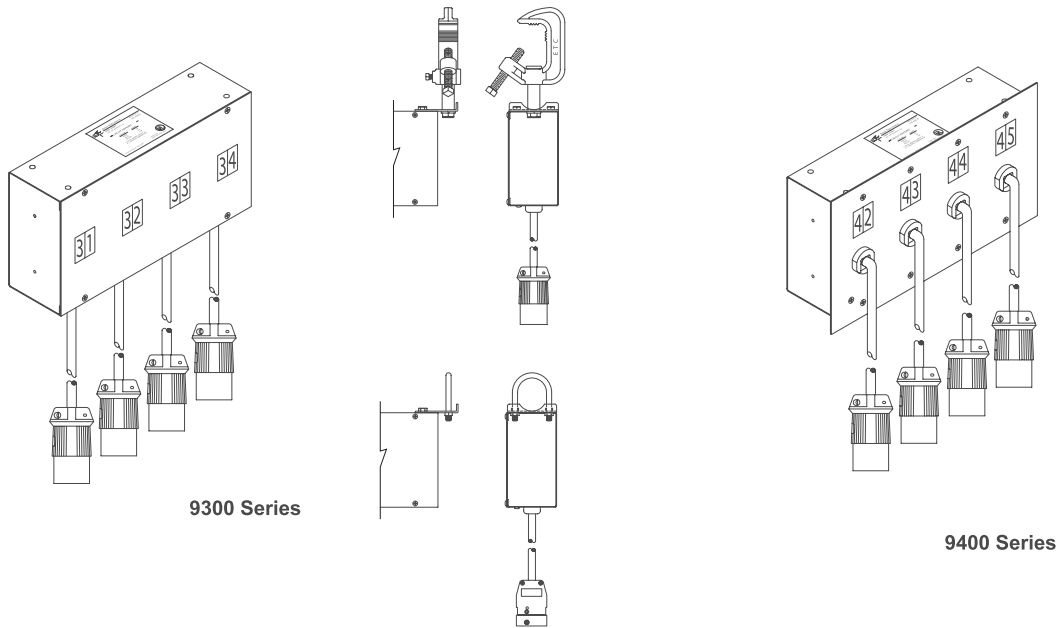
| Outlet Qty | Edison | Pin 3" | Pin 1.25" | Twistlock |
|------------|--------|--------|-----------|-----------|
| 1 | 9201A | 9201B | 9201BD | 9201C |
| 2 | 9202A | 9202B | 9202BD | 9202C |
| 3 | 9203A | 9203B | 9203BD | 9203C |
| 4 | 9204A | 9204B | 9204BD | 9204C |
| 5 | 9205A | 9205B | 9205BD | 9205C |
| 6 | 9206A | 9206B | 9206BD | 9206C |
| 8 | 9208A | 9208B | 9208BD | 9208C |

To any 9100 series box, add "-U" (U-Bolt) or "-C" (C-clamp) after the connector type to indicate pipe mount option. For example, 9104B-U indicates surface mount, 4-outlet box with stage pin connectors and U-bolt pipe mounting kit.



Pigtail Boxes

Distribution Series



9300 Series

9400 Series

GENERAL INFORMATION

Pigtail boxes are designed for surface or recess mounting in theatres, television studios and other spaces for distribution of lighting circuits.

FEATURES

Surface and recess mounting available
 1, 2, 3, 4, 5, 6, and 8 connectors
 18", 24" and 36" pigtails standard
 Connector Options:
 Edison (20A)
 Stage Pin (20, 60 and 100 amp)
 Grounded Twist-Lock (20A)
 Over- and Under-hung U-bolt and C-clamp pipe mount options available
 UL and cUL Listed

PHYSICAL

Fabricated from 18-gauge steel with 16-gauge covers and 14-gauge end caps
 Finished with fine-textured, scratch-resistant, black powder coat
 2" or 3/4" labels with white numbers on black background (sized to match product)
 Pin pigtails spaced on 1.25" or 3" centers
 Edison or Twist-Lock pigtails spaced on 3" centers only

| | # of Pigtails | Back box Dimensions | 9300 Panel Widths | 9400 Panel Widths |
|----------------|---------------|---------------------------|-------------------|-------------------|
| PIN 1.25" | 1 | 3" W x 6.25" H x 3.25" D | 3" | 4" |
| | 2,3,4 | 6" W x 6.25" H x 3.25" D | 6" | 7" |
| | 5,6 | 9" W x 6.25" H x 3.25" D | 9" | 10" |
| | 8 | 12" W x 6.25" H x 3.25" D | 12" | 13" |
| Other 3.00" | 1,2 | 6" W x 6.25" H x 3.25" D | 6" | 7" |
| | 3,4 | 12" W x 6.25" H x 3.25" D | 12" | 13" |
| | 5,6 | 18" W x 6.25" H x 3.25" D | 18" | 19" |
| | 8 | 24" W x 6.25" H x 3.25" D | 24" | 25" |

ORDERING INFORMATION

Standard Surface Mount Pigtail Boxes

| Outlet Qty | Edison | Pin 3" | Pin 1.25" | Twistlock |
|------------|--------|--------|-----------|-----------|
| 1 | 9301A | 9301B | 9301BD | 9301C |
| 2 | 9302A | 9302B | 9302BD | 9302C |
| 3 | 9303A | 9303B | 9303BD | 9303C |
| 4 | 9304A | 9304B | 9304BD | 9304C |
| 5 | 9305A | 9305B | 9305BD | 9305C |
| 6 | 9306A | 9306B | 9306BD | 9306C |
| 8 | 9308A | 9308B | 9308BD | 9308C |

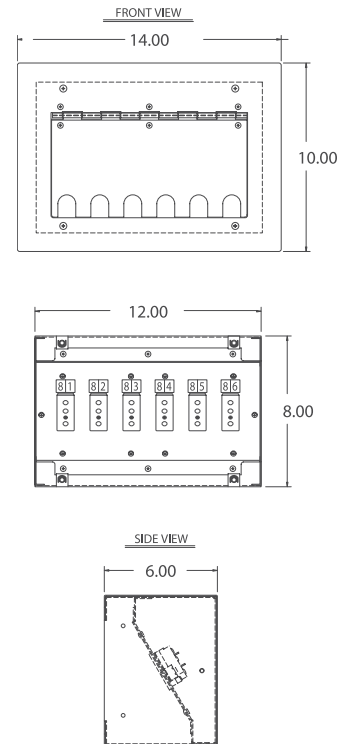
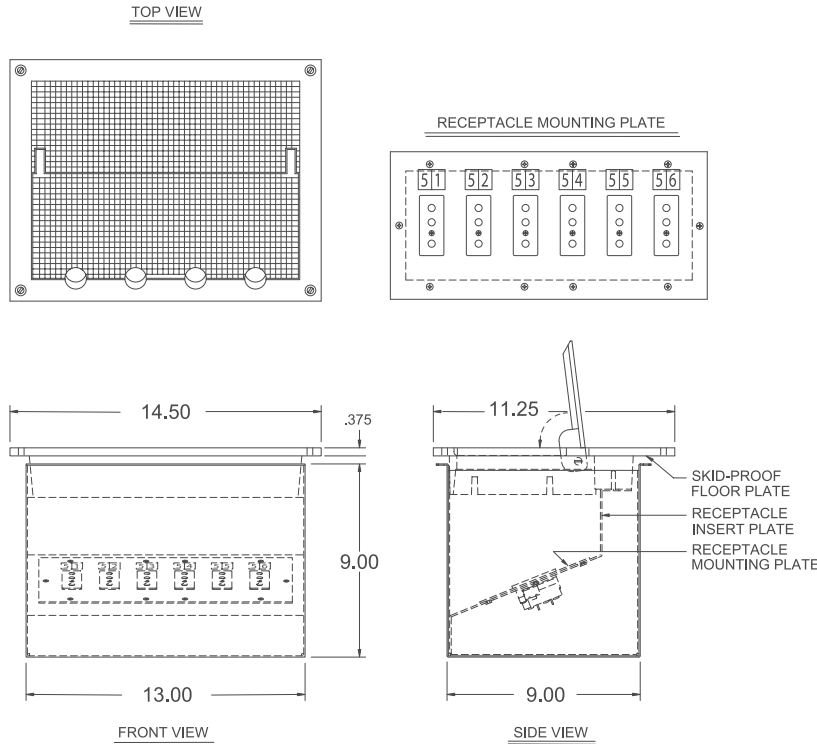
Standard Recessed Mount Pigtail Boxes

| Outlet Qty | Edison | Pin 3" | Pin 1.25" | Twistlock |
|------------|--------|--------|-----------|-----------|
| 1 | 9401A | 9401B | 9401BD | 9401C |
| 2 | 9402A | 9402B | 9402BD | 9402C |
| 3 | 9403A | 9403B | 9403BD | 9403C |
| 4 | 9404A | 9404B | 9404BD | 9404C |
| 5 | 9405A | 9405B | 9405BD | 9405C |
| 6 | 9406A | 9406B | 9406BD | 9406C |
| 8 | 9408A | 9408B | 9408BD | 9408C |

To any 9300 series box, add "-U" (U-Bolt) or "-C" (C-clamp) after the connector type to indicate pipe mount option. For example, 9304B-U indicates a surface mount box with 4-18" pigtails and stage pin connectors plus a U-bolt pipe mounting kit.

Floor/Wall Pockets

Distribution Series



GENERAL INFORMATION

Floor and Wall Pockets are designed for recess mounting in floors and walls of theatres, television studios and other spaces for distribution of lighting circuits.

| | |
|---------------------|--|
| FEATURES | 1, 2, 3, 4, 5, and 6 connectors Connector Options: Edison (20A) Stage Pin (20, 60 and 100 amp) Grounded Twist-Lock (20A) UL and cUL Listed enclosure |
| FLOOR POCKET | 3/8" cast iron hinged cover with a non-skid tread pattern and cable notches 3/4" labels with white numbers on black background |
| WALL POCKET | Fabricated from 18-gauge steel with 16 gauge covers Finished with fine-textured, scratch-resistant, black powder coat 3/4" reverse-screened white-on-black polycarbonate adhesive labels |

ORDERING INFORMATION

Standard Floor Pockets

| Model# | Description |
|--------|---|
| 8501 | Floor pocket, 1 outlet |
| 8502 | Floor pocket, 2 outlets |
| 8503 | Floor pocket, 3 outlets |
| 8504 | Floor pocket, 4 outlets |
| 8505 | Floor pocket, 5 outlets – Pin & Edison only |
| 8506 | Floor pocket, 6 outlets – Pin only |

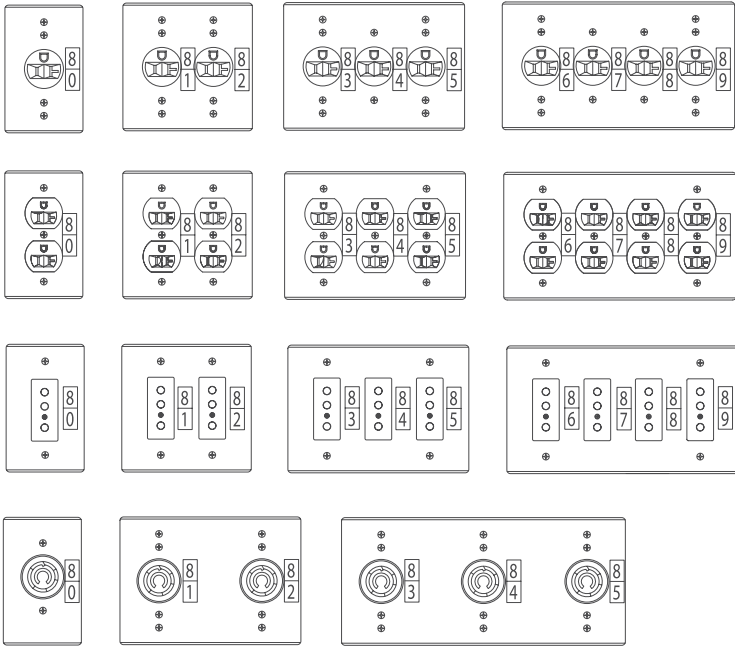
Standard Wall Pockets

| Model# | Description |
|--------|--|
| 9601 | Recess Wall pocket, 1 outlet |
| 9602 | Recess Wall pocket, 2 outlets |
| 9603 | Recess Wall pocket, 3 outlets |
| 9604 | Recess Wall pocket, 4 outlets |
| 9605 | Recess Wall pocket, 5 outlets – Pin only |
| 9606 | Recess Wall pocket, 6 outlets – Pin only |

Add **A** (Edison), **B** (Stage Pin) or **C** (Twist lock) to part number to indicate connector type. For example, 9504B indicates a floor pocket with 4 stage pin connectors. Part numbers refer to 20A outlets; consult factory for alternate configurations.

NEMA Panels

Distribution Series



GENERAL INFORMATION

An alternative to surface and recessed outlet boxes, NEMA Panels are designed for recessed mounting in discreet small spaces or existing back boxes – balcony rails and orchestra pits.

NEMA panels are designed for use with customer-supplied industry standard electrical back boxes.

FEATURES
 1, 2, 3, and 4 connectors
 20A Connector Options:
 Edison
 Stage Pin
 Grounded Twist-Lock

PHYSICAL
 UL and cUL Listed
 Fabricated of .125 aluminum
 Finished with fine-textured, scratch-resistant, black powder coat
 Custom finishes available
 3/4" labels with white numbers on black background
 Surface mount back box available (3.5" deep)

ORDERING INFORMATION

Standard NEMA Outlet Panels

| Model# | Description | RACO Back Box Part # |
|--------|-----------------------------|----------------------|
| 9801B | Stage Pin Panel, 1 outlet | 695 |
| 9802B | Stage Pin Panel, 2 outlets | 696 |
| 9803B | Stage Pin Panel, 3 outlets | 697 |
| 9804B | Stage Pin Panel, 4 outlets | 698 |
| 9801C | Twist-Lock Panel, 1 outlet | 695 |
| 9802C | Twist-Lock Panel, 2 outlets | 697 |
| 9803C | Twist-Lock Panel, 3 outlets | 699 |
| 9801A | Edison Panel, 1 outlet | 695 |
| 9802A | Edison Panel, 2 outlets | 696 |
| 9803A | Edison Panel, 3 outlets | 697 |
| 9804A | Edison Panel, 4 outlets | 698 |



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- Snakeworks
- Interface Devices
- Effects Devices
- Plateworks
 - Loaded Stainless Steel
 - Loaded Black Anodized Aluminum
 - Loaded Clear Anodized Aluminum
 - Loaded Engraved Stainless Steel
 - Loaded Engraved Black Anodized Aluminum
 - Loaded Engraved Clear Anodized Aluminum
 - Unloaded Stainless Steel
 - Unloaded Black Anodized Aluminum
 - Unloaded Clear Anodized Aluminum
 - Blank Plates
 - Straight Plates
 - CPB2 Connector Plates
 - FP2 Connector Plates
 - FP4 Connector Plates
 - FP6 Connector Plates
 - Lamacoid Markers
- Bulk
- Momentum

Dealer Access

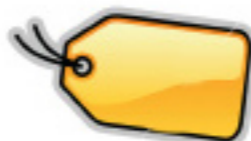
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Loaded Black Anodized Aluminum

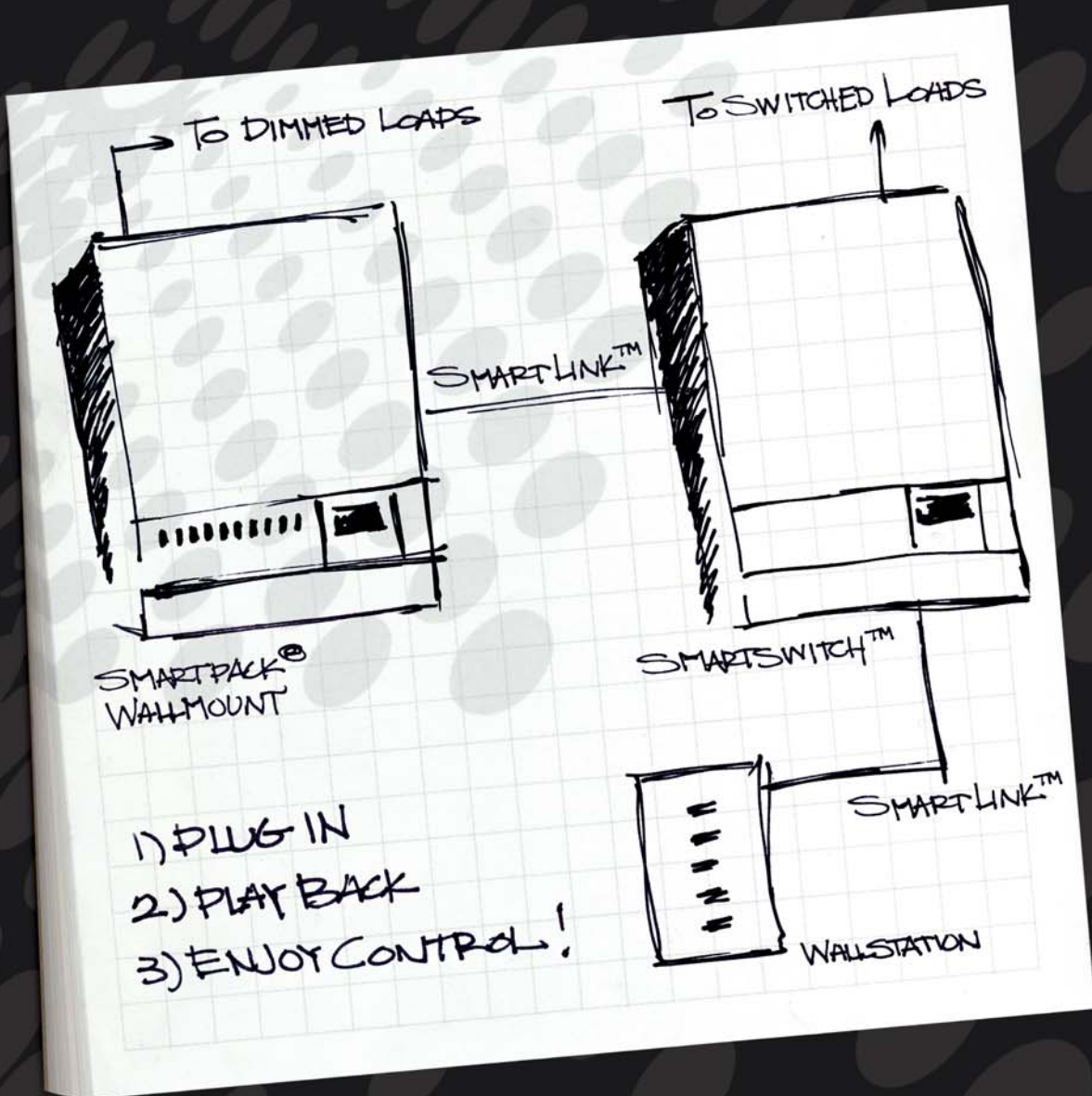
Loaded Wall Plates

Black Anodized Aluminum



| Model | Description |
|----------|------------------------------|
| WPBA1004 | 1 GANG BAA W/ 1 XLR-F |
| WPBA1006 | 1 GANG BAA W/ 1 TRS |
| WPBA1007 | 1 GANG BAA W/ 2 TRS |
| WPBA1008 | 1 GANG BAA W/ 2 XLR-M |
| WPBA1009 | 1 GANG BAA W/ 1 NL4MP |
| WPBA1010 | 1 GANG BAA W/ 2 NL4MPS |
| WPBA1012 | 1 GANG BAA W/ 1 RCA |
| WPBA1013 | 1 GANG BAA W/ 2 XLR-F |
| WPBA1014 | 1 GANG BAA W/ 1 XLR-M |
| WPBA1015 | 1 GANG BAA W/ 1 F |
| WPBA1016 | 1 GANG BAA W/ 2 F |
| WPBA1017 | 1 GANG BAA W/ 1 TRS |
| WPBA1018 | 1 GANG BAA W/ 2 TRS |
| WPBA1019 | 1 GANG BAA W/ 1 BNC |
| WPBA1020 | 1 GANG BAA W/ 2 BNCS |
| WPBA1021 | 1 GANG BAA W/ 2 RCAS |
| WPBA1025 | 1 GANG BAA W/ 1 XLR-F |
| WPBA1026 | 1 GANG BAA W/ 2 XLR-F |
| WPBA1027 | 1 GANG BAA W/ 1 XLR-M |
| WPBA1028 | 1 GANG BAA W/ 2 XLR-M |
| WPBA1039 | 1 GANG BAA W/ 1 BNC |
| WPBA1040 | 1 GANG BAA W/ 2 BNCS |
| WPBA1042 | 1 GANG BAA W/ 1 XLR-F |
| WPBA1043 | 1 GANG BAA W/ 2 XLR-F |
| WPBA1049 | 1 GANG BAA W/ 1 5PIN XLR-F |
| WPBA1050 | 1 GANG BAA W/ 1 5PIN XLR-M |
| WPBA1055 | 1 GANG BAA W/ 1 XLR-F, 1 TRS |
| WPBA1056 | 1 GANG BAA W/ 2 RJ45S |
| WPBA1057 | 1 GANG BAA W/ 1 RJ45 |
| WPBA1058 | 1 GANG BAA W/ 1 VGA |
| WPBA1059 | 1 GANG BAA W/ 1 9PIN |

| | |
|----------|-----------------------------------|
| WPBA1059 | 1 GANG BAA W/ 1 9PIN |
| WPBA1060 | 1 GANG BAA W/ 1 S-VIDEO |
| WPBA1061 | 1 GANG BAA W/ 1 S-VIDEO, 2 RCAS |
| WPBA1062 | 1 GANG BAA W/ 1 COMBO |
| WPBA1063 | 1 GANG BAA W/ 2 COMBO |
| WPBA1064 | 1 GANG BAA W/ 1 USB |
| WPBA1065 | 1 GANG BAA W/ 2 USBS |
| WPBA1066 | 1 GANG BAA W/ 1 XLR-F, 1 XLR-M |
| WPBA1067 | 1 GANG BAA W/ FIREWIRE |
| WPBA1068 | 1 GANG BAA W/ 1 VGA, 1 3.5MM |
| WPBA1069 | 1 GANG BAA W/ 1 NEUTRIK F-XLR FLA |
| WPBA1070 | 1 GANG BAA W/ 2 NEUTRIK F-XLR FLA |
| WPBA2009 | 2 GANG BAA W/ 2 LATCHLESS F-XLR |
| WPBA2010 | 2 GANG BAA W/ 2 M-XLR |
| WPBA2011 | 2 GANG BAA W/ 4 LATCHLESS F-XLR |
| WPBA2012 | 2 GANG BAA W/ 4 M-XLR |
| WPBA2015 | 2 GANG BAA W/ 2 PLASTIC F-XLR |
| WPBA2016 | 2 GANG BAA W/ 2 PLASTIC M-XLR |
| WPBA2017 | 2 GANG BAA W/ 4 PLASTIC F-XLR |
| WPBA2018 | 2 GANG BAA W/ 4 PLASTIC M-XLR |
| WPBA2021 | 2 GANG BAA W/ 2 LOCKING TRS |
| WPBA2023 | 2 GANG BAA W/ 4 LOCKING TRS |
| WPBA2024 | 2 GANG BAA W/ 4 TRS |
| WPBA2027 | 2 GANG BAA W/ 2 F |
| WPBA2028 | 2 GANG BAA W/ 2 FLUSH BNC |
| WPBA2029 | 2 GANG BAA W/ 4 F |
| WPBA2030 | 2 GANG BAA W/ 4 FLUSH BNC |
| WPBA2032 | 2 GANG BAA W/ 2 SPEAKONS |
| WPBA2033 | 2 GANG BAA W/ 4 SPEAKONS |
| WPBA2034 | 2 GANG BAA W/ 2 F-XLR |
| WPBA2035 | 2 GANG BAA W/ 4 F-XLR |
| WPBA2036 | 2 GANG BAA W/ 4 BNCS |
| WPBA2040 | 2 GANG BAA W/ 2 F-XLR & 2 TRS |
| WPBA3001 | 3 GANG BAA W/ 3 F-XLR |
| WPBA3002 | 3 GANG BAA W/ 6 F-XLR |
| WPBA3003 | 3 GANG BAA W/ 3 M-XLR |
| WPBA3004 | 3 GANG BAA W/ 6 M-XLR |



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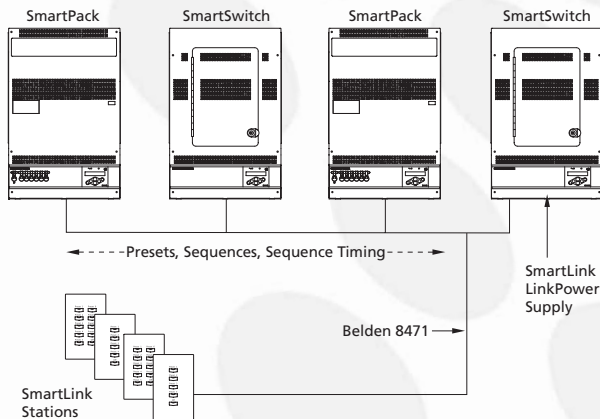
SmartLink offers simple but powerful connectivity with Echelon Link Power protocol for up to four wall stations. Activate lighting presets and sequences at the touch of a button.

SmartLink is topology free, polarity free. No DMX wiring required. No computer or external devices necessary. No programming. Ready to go — just plug and play for simple architectural lighting control.

And the best thing? SmartLink's system functionality is *free* with SmartLink-enabled devices like ETC's SmartSwitch™ or SmartPack®!

- ▶ Plug and play — out-of-the-box operation for presets
- ▶ Simple, on-station dipswitch to access sequences and presets
- ▶ Topology-free wiring — t-tap, star, daisy chain or combination
- ▶ Polarity free — stop chasing crossed wires and start using your system!

Typical system with wall stations



PRODUCTS

SmartSwitch Relay Panel

| Model# | Description |
|-------------|--|
| SS-121P-LPS | Panel with 12 - 20A Single Pole Relays and Link Power Supply |
| SS-121P | Panel with 12 - 20A Single Pole Relays |
| SS-241P-LPS | Panel with 24 - 20A Single Pole Relays and Link Power Supply |
| SS-241P | Panel with 24 - 20A Single Pole Relays |
| SS-LPS | SmartSwitch Link Power Supply kit |

SmartPack Wallmount Dimming Packs

| Model# | Description |
|-------------|---|
| SL620W-LPS | Wallmount with 6 -20A dimmers and Link Power Supply |
| SL620W | Wallmount with 6 -20A dimmers |
| SL1210W-LPS | Wallmount with 12-10A dimmers and Link Power Supply |
| SL1210W | Wallmount with 12-10A dimmers |
| SL-LPS | SmartPack Wallmount Link Power Supply kit |

SmartLink Stations

| Model# | Description |
|---------|------------------------------|
| S-10005 | SmartLink 5-button Station* |
| S-10010 | SmartLink 10-button Station* |

* Stations require one Link Power Supply per system.
 Maximum of four stations per Link Power Supply, one supply per system.
 Maximum 1500-foot system bus wire length.
 Belden 8471 cable recommended.

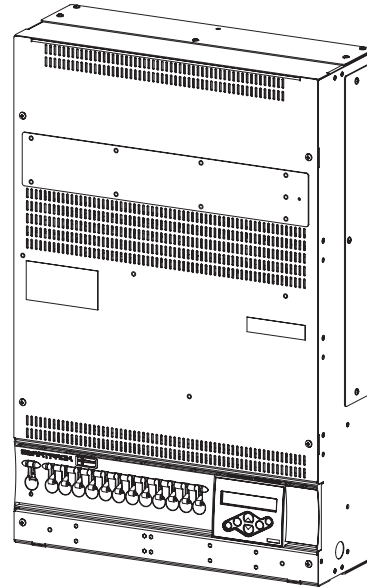
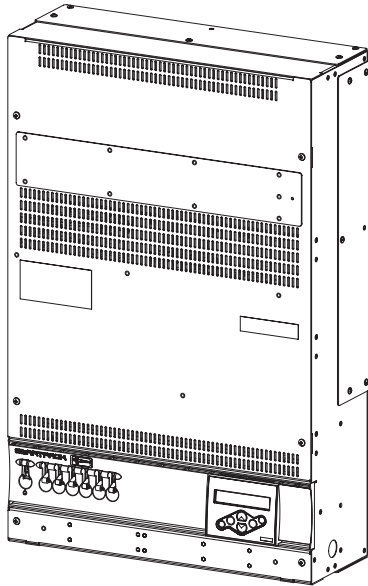


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115/120V

Smart Solutions™ Series



GENERAL INFORMATION

The extreme functionality of the SmartPack built into a compact affordable wall mount unit. This small wall mount pack provides easy operation and reliability as well as quiet performance. SmartPack Wall Mount comes standard with SmartLink® control. When used with the optional LinkPower Supply, the system allows up to four SmartLink Stations to be connected for remote operation of presets and sequences.

APPLICATIONS

- Ballrooms
- Restaurants
- Churches
- Multi-purpose rooms
- Small corporate meeting rooms
- Small performance spaces

FEATURES

- 6 or 12 dimmer units available
- Capable of dimming multiple load types: incandescent, low voltage, 2-wire fluorescents
- Versatile control via DMX-512 and/or SmartLink
- DMX addressing and softpatch via keypad
- Built-in presets (32) and sequencer with programmable fade and hold times allows stand-alone operation
- SmartLink provides synchronization of presets and sequence across multiple packs
- Optional LinkPower Supply powers four stations
- Auto-Restart function returns unit to previous state when power is cycled
- Control-power switch puts unit in stand-by mode
- Multi-language capability – English, Spanish, German and French
- Fully rated magnetic circuit breakers
- Bypass contact input instantly switches selected loads on, while switching others off
- Full compliance with UL, cUL, FCC and CE regulations

ORDERING INFORMATION

SmartPack Wall Mount

| MODEL | DESCRIPTION |
|-------------|---|
| SL620W | 6 x 20A SmartPack Wall Mount |
| SL620W-LPS | 6 x 20A SmartPack Wall Mount with LinkPower Supply |
| SL1210W | 12 x 10A SmartPack Wall Mount |
| SL1210W-LPS | 12 x 10A SmartPack Wall Mount with LinkPower Supply |

SmartPack Wall Mount Accessories

| MODEL | DESCRIPTION |
|----------|------------------------|
| SMPK-RRM | Rack Mount Kit (rails) |

SmartLink Accessories

| MODEL | DESCRIPTION |
|---------|----------------------------------|
| S-LPS | LinkPower Supply Kit |
| S-10005 | SmartLink 5-Button Station* |
| S-10010 | SmartLink 10-Button Station* |
| S-ATC | SmartLink Astronomical TimeClock |

*Stations require one LinkPower Supply per system. Only one LinkPower Supply allowed per system. Four stations supported.



SPECIFICATIONS

GENERAL

- Approvals and Certifications:
 - Underwriters Laboratories tested and Listed to the following standards:
 - UL508 (File: E152039)
 - Complies with ESTA DMX512-A Standards

ELECTRICAL

- Maximum feed capacity:
 - 3 x 40A, Three Phase, 4-wire & ground
 - 2 x 60A, Single Phase, 3-wire & ground
- Easily switches from single phase to three phase
- Input voltage Range from 85 – 140VAC, 47 – 63 Hz
- Input lugs rated for up to 2AWG
- Standard output connection via DIN Rail spring terminals, rated for up to 8AWG
- Fully rated magnetic circuit breakers to eliminate nuisance tripping
- High quality 200µs toroidal filters
- Modular SCR and bonded heat sink assembly with superior surge, thermal transfer, and short-circuit immunity
- 2500V isolation between control and power components

CONTROL WIRING

- Removable terminals for DMX512, SmartLink and Contact Input rated for maximum of 12AWG wire

MECHANICAL

- 16-gauge steel construction
- Fine-textured, scratch resistant paint
- Removable knockout panels with pass-through plenum for side-by-side or top-to-bottom mounting configurations (sides, top and bottom)
- Full front access (side clearance not required)
- Optional rack mount kit (requires 15U spacing)
- Recessed control connectors and protected circuit breakers

THERMAL

- Ambient operation temperature between 32°F (0°C) and 95°F (35°C)
- Humidity between 30 – 95% (non-condensing)
- Fan-forced airflow from bottom to top
- Low noise temperature controlled fan
- Efficiency = 96% or better, maximum dissipation 3% of connected load (Max. 3,100 BTUs)

USER INTERFACE

- High-contrast 20-character by 2-line backlit LCD
- 6-button blue phosphorescent keypad
- Power status indicator LED (Blue)
- DMX status indicator LED (Green)

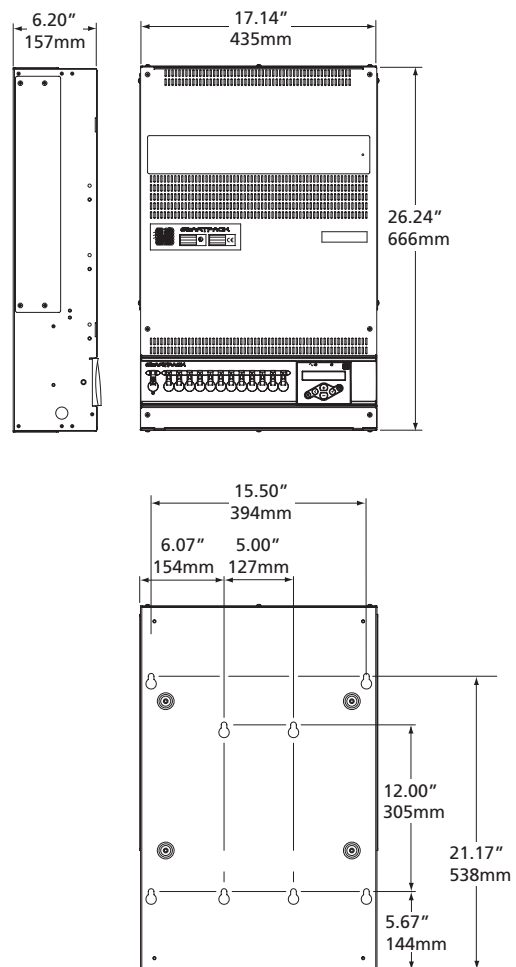
PHYSICAL

SmartPack Wall Mount Dimensions

| MODEL | HEIGHT | | WIDTH | | DEPTH | |
|---------|--------|-----|--------|-----|--------|-----|
| | inches | mm | inches | mm | inches | mm |
| SL620W | 26.24 | 666 | 17.14 | 435 | 6.2 | 157 |
| SL1210W | 26.24 | 666 | 17.14 | 435 | 6.2 | 157 |

SmartPack Wall Mount Weight

| MODEL | WEIGHT | |
|---------|--------|-------|
| | lbs | kgs |
| SL620W | 46.2 | 20.96 |
| SL1210W | 48.0 | 21.77 |

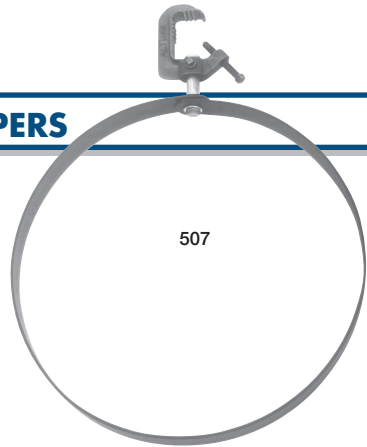


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SmartLink® products protected by US and International patents pending

SCENERY BUMPERS

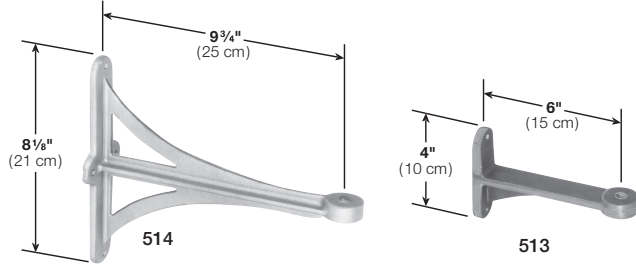
Scenery bumpers, when mounted to a batten pipe, prevent anything mounted on the batten from interfering with scenery or curtains when the batten is raised or lowered. Black epoxy sandtex, electrostatic application.



Catalog No. Description
507 18" Diameter w/510 Pipe Clamp

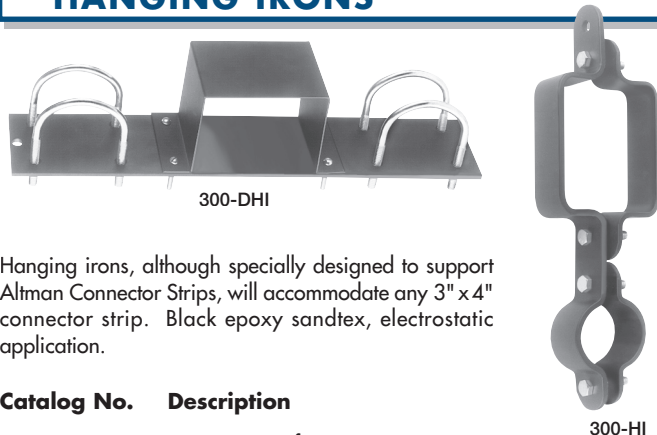
WALL BRACKETS

Wall brackets are designed for attaching fixtures to scenery or other sturdy vertical structures. They are provided with a 1/2"-13 attachment bolt with washers. Textured aluminum finish.



Catalog No. Description
513 Large Cast Aluminum w/Four 1/4" Wall Mounting Holes
514 Small Cast Aluminum w/Two 1/4" Wall Mounting Holes

HANGING IRONS

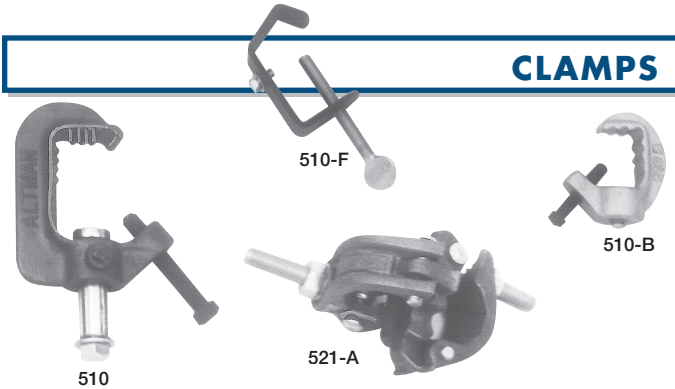


Hanging irons, although specially designed to support Altman Connector Strips, will accommodate any 3" x 4" connector strip. Black epoxy sandtex, electrostatic application.

Catalog No. Description
300-HI Hanging Iron for 3" x 4" connector strips (pipe mounts below)
300-DHI Double Hanging Iron for 3" x 4" Connector Strips (pipe mounts above & below)

Specifications subject to change without notice

CLAMPS



Pipe clamps, or "C-clamps" are used for attaching stage luminaires or other equipment to pipe or tubular truss. The 510-2, the 521-A, and the 521-S clamps are designed specifically for securing one pipe to another. The 529 clamp is used to attach large diameter stage cable to a pipe.

Catalog No. Description
510 Malleable Iron: for 3/4" to 1 1/2" Pipe
 Includes 1/2"-13 Fixture Attachment Bolt
510-L 510 Pipe Clamp w/Long Fixture Attachment Bolt
510-HD Heavy Duty Malleable Iron: for 1/2" to 2" Pipe
 Includes 1/2"-13 Fixture Attachment Bolt
510-HDL 510-HD Pipe Clamp w/Long Fixture Attachment Bolt
510-F Light Duty Flat Steel: for 1/4" to 1 1/2" Pipe
 Includes 1/4"-20 Fixture Attachment Bolt
510-2 Double 510 Pipe Clamps. Two clamps secured Back-to-Back to a Common Stud
521-A Right Angle Clamp: for 1 1/4" to 1 1/2" Pipes
521-S Multiple Angle Swiveling Clamp: for 1 1/4" to 1 1/2" Pipes
529 Cast Aluminum: for 3/4" to 1 3/4" Cable and 1" to 1 1/2" Pipe

STANDARD PIPE DIMENSIONS

| Nominal Pipe Size | 1/2" | 3/4" | 1" | 1 1/4" | 1 1/2" | 2" |
|-------------------|------|------|------|--------|--------|-------|
| Outside Diameter | .84 | 1.05 | 1.32 | 1.66 | 1.90 | 2.375 |
| Inside Diameter | .62 | .82 | 1.05 | 1.38 | 1.61 | 2.067 |

CABLE CRADLES

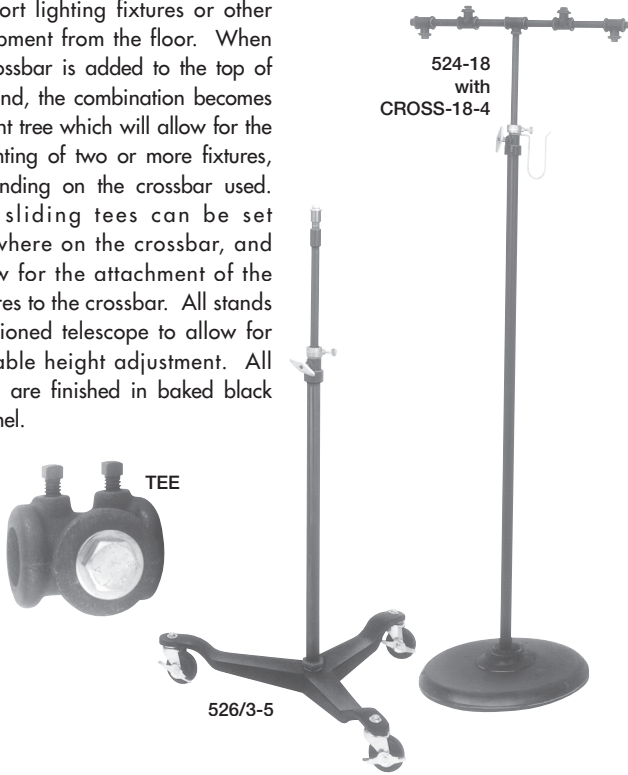
Cable cradles are used to support heavy stage cable from a batten pipe, while simultaneously preventing the cable from entering horizontal sight lines from the house, or audience area, to the stage. Textured aluminum finish.



Catalog No. Description
512 Cast Aluminum: for 3/4" to 1 1/4" Cable
512-L Large Cast Aluminum: for 1 1/4" to 2 1/4" Cable

STANDS, CROSSBARS & TEES

Adjustable Stands are used to support lighting fixtures or other equipment from the floor. When a crossbar is added to the top of a stand, the combination becomes a light tree which will allow for the mounting of two or more fixtures, depending on the crossbar used. The sliding tees can be set anywhere on the crossbar, and allow for the attachment of the fixtures to the crossbar. All stands mentioned telescope to allow for variable height adjustment. All items are finished in baked black enamel.



| Catalog No. | Description |
|-------------------|--|
| 524-18 | Adjustable 5' to 9' Telescoping w/B-18 Base |
| 525-18 | Adjustable 3' to 5' Telescoping w/B-18 Base |
| 526/3-5 | Adjustable 3' to 5' Telescoping w/B-3-CB Base |
| 526/5-9 | Adjustable 5' to 9' Telescoping w/B-3-CB Base |
| CROSS-18-2 | 18" w/ Two Sliding Tees (w/ 1/2"-13 bolt & washer) |

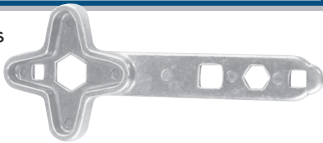
Longer lengths available in 6" increments. To order longer lengths, substitute the number of inches for "-18" (60" max.).

Additional Tees (w/bolt & washer) available. To order, substitute the number of sliding tees (w/bolt & washer) desired for "-2".

| | |
|------------|--|
| TEE | Cast Iron Sliding Tee for 1/2" Pipe Includes 1/2" -13 Fixture Attachment Bolt |
|------------|--|

STAGEHAND WRENCH

The stagehand wrench accommodates the most commonly used bolt heads and T-handles found on theatrical luminaires and equipment.



| Catalog No. | Description |
|---------------|---------------------------------------|
| WRENCH | Altman Multi-purpose Stagehand Wrench |

BASES

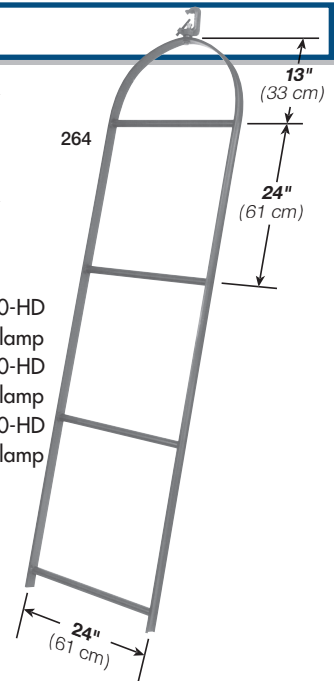


Bases are generally used in conjunction with standard iron pipe to create a variety of stands or supports. The B-10 base is generally used without pipe, that is, a fixture is directly mounted to the base. Bases may also be used as weights or counterweights. All items are finished in baked black enamel.

| Catalog No. | Description |
|---------------|--|
| B-50 | 50 lbs. 22 3/8" Dia. Cast Iron, Threaded for 1 1/2" Pipe |
| B-18 | 25 lbs. 18" Dia. Cast Iron, Threaded for 1" Pipe |
| B-3-CB | 3 Legged w/Casters, Threaded for 1 1/4" Pipe |
| B-10 | 8 lbs. 10" Dia. Cast Iron, w/ 1/2" -13 Attachment Bolt |

LIGHT LADDERS

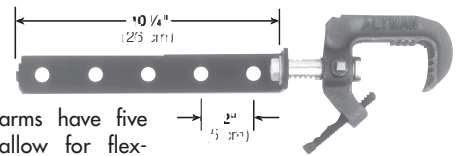
Ladders are constructed of steel bar stock channel stringers welded to schedule 40 steel pipe rungs. They are used to hang a group of luminaires from a single heavy duty pipe clamp. Baked black enamel finish.



| Catalog No. | Description |
|-------------|--|
| 262 | 2 Rung Ladder w/510-HD Heavy Duty Pipe Clamp |
| 263 | 3 Rung Ladder w/510-HD Heavy Duty Pipe Clamp |
| 264 | 4 Rung Ladder w/510-HD Heavy Duty Pipe Clamp |

HANGING ARMS

Supplied in pairs, hanging arms are used to attach borderlights no longer than 10' in length to batten pipes. Altman hanging arms have five holes spaced 2" apart to allow for flexibility in mounting borderlights. Black epoxy, electrostatic application finish.



| Catalog No. | Description |
|-------------|---------------------------------------|
| 508 | 10" 5-Position w/510 Pipe Clamp, pair |

Specifications subject to change without notice

PRODUCT CATALOG

> [Lamp Protection](#) > [Wire Lamp Guards and Grounding Kit](#)

Wire Lamp Guards and Grounding Kit

Wire lamp guards with universal collars help prevent breakage and theft. A wide variety of types and sizes is available to fit your diverse needs. Heavy-duty, 10 or 12-gauge, zinc-plated construction ensures long life.

- Meets OSHA requirements
- Easy to install
- Vinyl coated versions available
- Rust-resistant zinc plating with chromate finish
- Clamp type guards for vapor-tight fixtures available
- Spot welded steel wire ensures long life



2200-2200-A



V-2100



1433



V-1433



1435-6



1438



1438-1

Wire Lamp Guards

| Wire Lamp Guards | Collar Dia. | Cat No. 100 Watt Bulb | Cat No. 200 Watt Bulb |
|---|-------------------|-----------------------|-----------------------|
| GRIPON® guards w/o reflectors | 1 1/2" | 2100-2100-A | 2200-2200-A |
| Vinyl coated GRIPON® guards w/o reflectors | 1 1/2" | V-2100 | V-2200 |
| PROTECTOR "O" guards; open bottom heavy-duty | 1 1/2" | 1433 | 1434 |
| Vinyl coated PROTECTOR "O" guards | 1 1/2" | V-1433 | V-1434 |
| Trap only to close bottom of 1433 and 1434 | -- -- | 2932 | 2933 |
| Closed bottom wall and receptacle lamp guards | 3 1/2" | 1438 | -- -- |
| Cage for utility light* | 3 1/2" | 1435-6 | -- -- |
| Guards for PAR and R-38 lamps | 1 11/16" - 2 5/8" | 1438-1 | -- -- |
| Guards for vapor-tight fixtures | 3 3/4" (1435-1) | 1435-1 | 1435-3† |

* See Incandescent and Fluorescent Utility Lights.
Plastic cages available; see String-O-Light Accessories and Replacement Parts.
† 300 watt type PS25 lamp only.

Grounding Kits For Wire Lamp Guards

To ensure that your lamps are grounded, and comply with NEC and OSHA requirements, the McGill grounding kit supplies a metal fastener and 12" wire to connect wire lamp guards to a grounding circuit.

- Meets OSHA requirements
- Meets NEC requirements

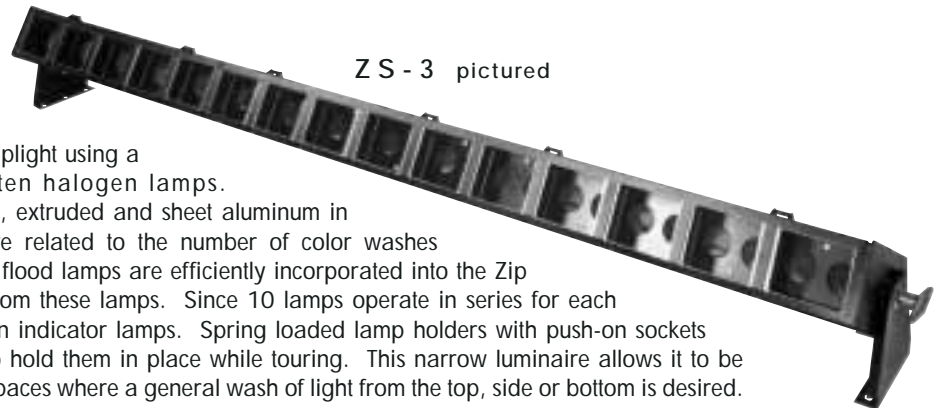
| | Cat. No. |
|---------------|----------|
| Grounding kit | 9995 |



McGILL *...The Professional's Choice*

McGill Electrical Product Group
9377 W. Higgins Road
Rosemont, IL 60018
sales@mcgillelectrical.com

Fixture Type:



The Zip Strip is a U.L. listed multi-lamp striplight using a wide range of 12 volt MR-16 tungsten halogen lamps. This luminaire is manufactured of die-cast, extruded and sheet aluminum in four standard lengths. These lengths are related to the number of color washes desired. Narrow spot, medium and wide flood lamps are efficiently incorporated into the Zip Strip without trapping appreciable light from these lamps. Since 10 lamps operate in series for each color circuit, lamp failure is noted by neon indicator lamps. Spring loaded lamp holders with push-on sockets provide secure positioning of the lamps to hold them in place while touring. This narrow luminaire allows it to be used on closely spaced battens or in tight spaces where a general wash of light from the top, side or bottom is desired.

Specifications subject to change without notice

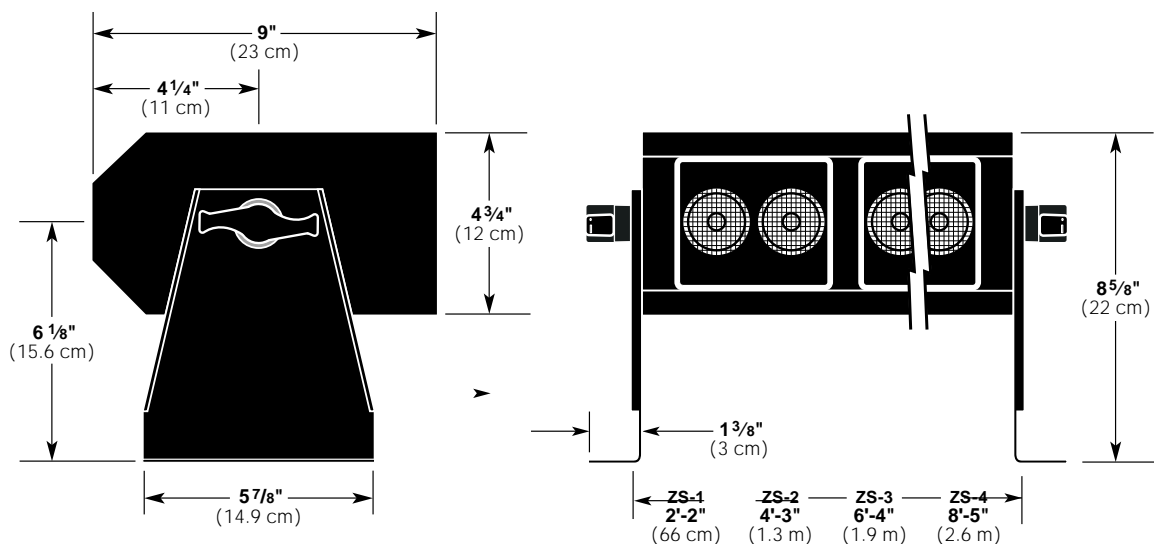
750 WATTS Per Circuit

MR-16

ZIP STRIP

Features

- Rugged lightweight die-cast, extruded, and sheet aluminum construction
- Spring loaded lamp holder and push-on 2 pin socket
- Neon indicator lamps to identify lamp failure
- Large lamp ports to minimize light trapping
- Compartmented for color separation
- Uses wide variety of MR-16 lamps
- Narrow profile
- Multiple circuit units have 36" feed through lead wires per circuit
- Safety screen provided
- Color frames and safety cable included
- U.L., c.U.L., and CE listed for 750 watts per circuit
- Made in the USA



Specifications

Housing: Die-cast extruded, and sheet aluminum construction.

Materials: Construction employs all corrosion-resistant materials and hardware.

Socket: GX5.3, with heat shield.

Rating: 120/240 volts AC/DC operation, 6.3/3.1 amps per circuit, 750 watts per circuit maximum. 75 watt maximum lamps. Note: 240 volt units require special wiring.

Cable: 36" Teflon and/or silicone-fiberglass leads encased in black fiberglass sleeving. ZS-2, ZS-3, and ZS-4 are feed through wired.

Access Door: Hinged, can be opened without use of tools.

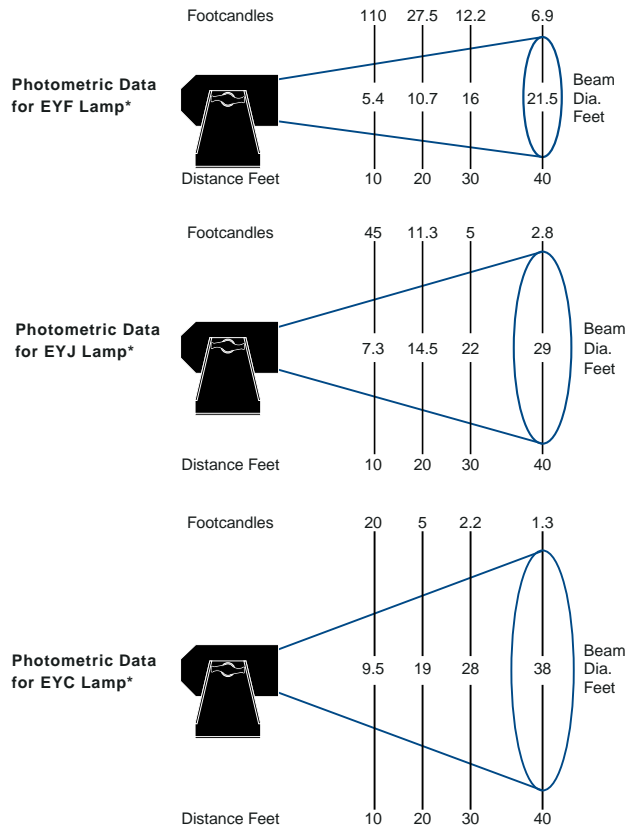
Safety Screens: Stainless steel.

Accessories: Each pair of lamps accepts one color frame.

Trunnions: Rigid 16 gauge steel, double trunnions for supporting two fixtures optional.

Finish: Baked black enamel.

Weight: Approx; 15 lbs. (6.8 kg.) for ZS-1.
Approx; 30 lbs. (13.5 kg.) for ZS-2.
Approx; 45 lbs. (20.3 kg.) for ZS-3.
Approx; 60 lbs. (27 kg.) for ZS-4.



* All photometric data for single lamp only.
Actual photometrics dependent on total number of lamps in fixture.
Beam intensities compound due to overlapping of beam patterns

| ACCESSORIES Supplied with Luminaire | |
|--|---|
| ZS-CF | Color Frame (one frame per pair of lamps) |
| ZS-FT | Floor Trunnions, pair |
| SC-36-BK | Safety Cable with Spring Clip |

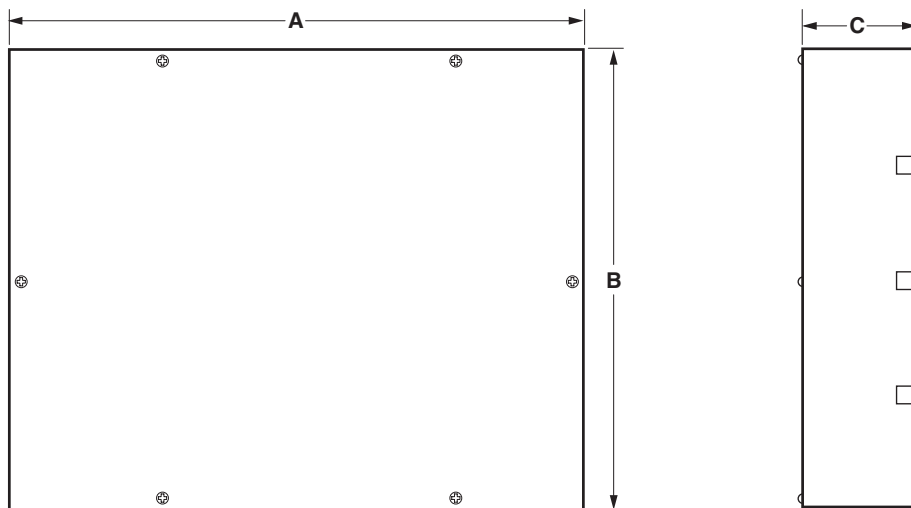
| ADDITIONAL ACCESSORIES | |
|---------------------------|---|
| 508 | Hanging Arm and Clamp, pair |
| ZS-DFT | Double Floor Trunnions, pair (supports two Zip Strips) |
| ZS-CFT | Castered Floor Trunnions, pair |
| 510 | Malleable Iron Pipe Clamp |

When ordering **ZIP STRIPS**, specify the hardware.
ZS-FT Floor Trunnions are standard equipment.

LAMP DATA

| Lamp Type | Watts | Candlepower (Candela) | Color Temp (°k) | Volts | Rated Life (Hours) | Field Angle (Degrees°) | Beam Angle (Degrees°) |
|-------------|-------|-----------------------|-----------------|-------|--------------------|------------------------|-----------------------|
| EYF | 75 | 11,000 | 3050 | 12 | 4000 | 30° | 14° |
| EYJ | 75 | 4,500 | 3050 | 12 | 4000 | 40° | 25° |
| EYC | 75 | 2,000 | 3050 | 12 | 4000 | 51° | 40° |
| FPA | 65 | 11,000 | 3000 | 12 | 3000 | 30° | 14° |
| FPC | 65 | 4,500 | 3000 | 12 | 3000 | 40° | 27° |
| FPB | 65 | 2,000 | 3000 | 12 | 3000 | 51° | 38° |
| EXT | 50 | 9,000 | 3050 | 12 | 5000 | 30° | 13° |
| EXZ | 50 | 2,500 | 3050 | 12 | 5000 | 40° | 24° |
| EXK | 50 | 2,000 | 3050 | 12 | 5000 | 46° | 32° |
| EXN | 50 | 1,500 | 3050 | 12 | 5000 | 52° | 40° |
| EYR/EYS/EZY | 42 | 11,000 | 3000 | 12 | 3500 | 26° | 10° |
| EYS | 42 | 2,700 | 3000 | 12 | 5000 | 36° | 20° |
| EYP | 42 | 1,000 | 3000 | 12 | 4000 | 44° | 36° |
| EZX | 20 | 8,000 | 2900 | 12 | 3000 | 20° | 8° |
| ESX | 20 | 3,200 | 2900 | 12 | 4000 | 30° | 12° |
| BBF | 20 | 1,000 | 2900 | 12 | 3000 | 40° | 24° |
| BAB | 20 | 450 | 2900 | 12 | 4000 | 48° | 36° |

Distribution Equipment Gridiron Junction Boxes Designed for theatrical and studio applications



Leviton's Distribution Equipment is designed for use in theaters, television studios and other spaces where the distribution of power to lighting circuits is required. Our Distribution Equipment offers standard and complete custom options for any configuration. Leviton's Gridiron Junction Boxes provide a convenient place to terminate large numbers of conduits/circuits, providing the transition to multi-conductor cable or other requirements. Wire Mesh Safety Grips are available as an accessory and are required when using these junction boxes in environments where cable exits the box by methods other than EMT conduit.

FEATURES

- 16 gauge steel box and cover plate
- NEMA-1 screw cover enclosure
- Both hot and neutral terminals for each circuit
- Molded barrier terminal blocks accept #8 through #22 AWG wire with provision for circuit numbering
- Black industrial finish
- Available with 20A terminal standard, (2) for each circuit, 60A, 100A terminals and low voltage data termination available on custom configurations.
- UL Listed # E41104
- Limited 2-year warranty
- Knockouts punched by installer
- Write-on strip for installer labeling

ORDERING INFORMATION

Fill in the number of 20A circuits required from the chart below. Corresponding box dimensions are indicated in the right-hand column.

| Cat. No. | Maximum Number of 20A Circuits | Dimensions (in.) A x B x C |
|----------|--------------------------------|----------------------------|
| TDG00-6 | 6 | 12 x 8 x 4 |
| TDG00-13 | 13 | 18 x 10 x 4 |
| TDG00-21 | 21 | 24 x 12 x 4 |
| TDG00-34 | 34 | 24 x 15 x 6 |
| TDG00-63 | 63 | 30 x 24 x 6 |
| TDG00-87 | 87 | 36 x 24 x 6 |

Order example: TDG00-6, indicates a 12x8x4 size gridiron junction box with 6-20A circuits.

Write on labels provided for circuit labeling.

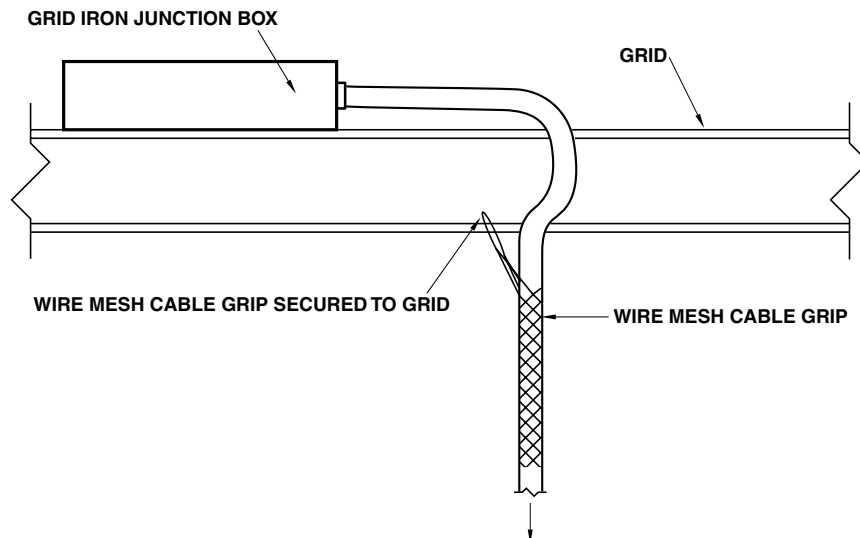
SPECIFICATION SUBMITTAL

| | | |
|-------------------------------------|--|----------------------|
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| JOB NUMBER: <input type="text"/> | <input type="text"/> | <input type="text"/> |

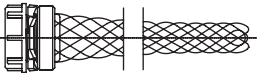
Product Specifications

Gridiron Junction Boxes

EXAMPLE INSTALLATION CONFIGURATION



ACCESSORIES



Single Weave Galvanized Steel Mesh

| CAT. NO. | CABLE DIA. RANGE (INCHES) | NPT SIZE (INCHES) | MESH LENGTH @ NOMINAL DIA. (INCHES) | MINIMUM DISTANCE BETWEEN GRIPS (INCHES) |
|----------|---------------------------|-------------------|-------------------------------------|---|
| L7501 | 0.22-0.32 | 1/2 | 4 | 1-1/4 |
| L7502 | 0.30-0.43 | 1/2 | 4-1/2 | 1-1/4 |
| L7503 | 0.40-0.54 | 1/2 | 5-1/2 | 1-1/4 |
| L7504 | 0.52-0.73 | 3/4 | 5-1/2 | 1-1/2 |
| L7505 | 0.70-0.97 | 1 | 8 | 1-7/8 |
| L7506 | 0.94-1.25 | 1-1/4 | 9 | 2-3/8 |
| L7507 | 1.20-1.50 | 1-1/2 | 11 | 2-5/8 |
| L7508 | 1.40-1.75 | 2 | 13 | 3-1/4 |
| L7509 | 1.62-2.00 | 2-1/2 | 13-1/2 | 3-5/8 |
| L7511 | 2.00-2.45 | 2-1/2 | 13-1/2 | 3-5/8 |



Offset Eye, Split Lace, Single Weave

| CAT. NO. | CABLE DIA. RANGE (INCHES) | APPROX. BREAK STRENGTH* | LENGTH (INCHES) BALE (DIM. A) | MESH (DIM. M) |
|----------|---------------------------|-------------------------|-------------------------------|---------------|
| L9601 | 0.50-0.61 | 770 | 4 | 11 |
| L9602 | 0.62-0.74 | 960 | 4 | 11 |
| L9603 | 0.75-0.99 | 960 | 4 | 14 |
| L9604 | 1.00-1.24 | 1,680 | 5 | 15 |
| L9605 | 1.25-1.49 | 1,680 | 5 | 16 |
| L9606 | 1.50-1.74 | 1,680 | 5 | 18 |
| L9607 | 1.75-1.99 | 2,640 | 8 | 20 |
| L9608 | 2.00-2.49 | 3,760 | 8 | 22 |
| L9609 | 2.50-2.99 | 3,760 | 8 | 24 |
| L9611 | 3.00-3.49 | 5,040 | 9 | 26 |
| L9612 | 3.50-3.99 | 5,040 | 9 | 28 |



Locking Bale, Split Lace, Single Weave

| CAT. NO. | CABLE DIA. RANGE (INCHES) | APPROX. BREAK STRENGTH* | LENGTH (INCHES) BALE (DIM. A) | MESH (DIM. M) |
|----------|---------------------------|-------------------------|-------------------------------|---------------|
| L9621 | 0.50-0.61 | 770 | 18 | 11 |
| L9622 | 0.62-0.74 | 1,150 | 18 | 11 |
| L9623 | 0.75-0.99 | 1,320 | 18 | 14 |
| L9624 | 1.00-1.24 | 1,920 | 18 | 15 |
| L9625 | 1.25-1.49 | 1,920 | 18 | 16 |
| L9626 | 1.50-1.74 | 1,920 | 18 | 18 |
| L9627 | 1.75-1.99 | 3,150 | 18 | 20 |
| L9628 | 2.00-2.49 | 3,360 | 18 | 22 |
| L9629 | 2.50-2.99 | 3,360 | 18 | 24 |

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Building a Connected World

G-7525/F6-NSK

1.01 POWER DISTRIBUTION – OUTLET AND PIGTAIL BOXES

A. General

1. Connectors shall be available as 20A, 50A and 100A grounded stage pin, 20A twist lock and 20A “U” ground (dual rated “T-slot”); other connectors shall be available as specified.
2. Pigtails shall be three-wire type “SOW” rubber jacketed cable sized for the maximum circuit ampacity.
3. Pigtails with 20 amp stage pin connectors shall be terminated using 12 gauge 4 way indent crimp (with inspection window) type where the wire is inserted and crimped directly in the socket.
4. Terminations for pigtail connectors shall utilize feed- through terminals individually labeled with corresponding circuit numbers.
 - a. 20 amp circuits shall use screwless tension clamp terminals listed for 20 – 8 gauge wire.
 - b. 50 amp circuits shall use compression terminals listed for 10 – 1 gauge wire.
 - c. 100 amp circuits shall use compression terminals listed for 8 – 2/0 gauge wire.
 - d. Terminals that place a screw directly on the wire are not acceptable.
5. Outlet and pigtail boxes shall be supplied with appropriate brackets and hardware for mounting as shown on the drawings
 - a. Standard mounting options shall include pipe or wall mounting
 - b. Brackets shall be made from ASTM A 36 steel
 - c. Hardware shall be ASTM A307 grade 5.
6. A low voltage distribution system shall be available to incorporate DMX, Ethernet or other protocols as specified in the power distribution box.
 - a. A voltage barrier shall be used to separate the low voltage wiring for the electrical circuits.
7. Power distribution equipment shall be Underwriter Laboratories (UL) and Canadian Underwriter Laboratories (cUL) LISTED.

B. Physical

1. Outlet and pigtail boxes shall be 6.25” H x 3.3” D and fabricated from 18 gauge galvanized steel and finished in black fine-texture powder coat paint.
 - a. Covers shall be fabricated from 16-gauge galvanized steel
2. Outlet and pigtail boxes shall be available in any length specified in increments of 3-inches with a maximum length of up to 3-feet.

3. Pigtails and outlets shall be spaced on 18" centers, or as otherwise specified.
4. Outlets shall be mounted on individual 3" panels.
5. Circuits shall be labeled with 1.25" lettering.
 - a. Circuit labeling options shall include:
 - 1) Circuits shall be labeled on the front side of the connector strip with white lettering on black background labels.
 - 2) Circuits shall be labeled on front and back sides of the connector strip with white lettering on black background labels.
 - 3) Circuits shall be labeled on the front side of the connector strip with engraved lamicoïd labels utilizing white lettering on black background labels.
 - 4) Circuits shall be labeled on the front and rear sides of the connector strip with engraved lamicoïd labels utilizing white lettering on black background labels.
 - 5) Circuits shall be labeled on one side of the connector strip using individual circuit cover plates with lettering engraved in the cover and filled with the specified color.
 - 6) Circuits shall be labeled using specified labeling per plans and drawings
6. Outlet and pigtail boxes shall support optional LED indicators to indicate the presence of power at each local circuit. The indicator shall be red in color and mounted in outlet or pigtail box.
 - a. The LED indicator shall be mounted in the lower right corner of the outlet panel
 - b. The LED indicator shall be mounted in the bottom of the outlet or pigtail box directly below the outlet panel.
 - c. The LED indicator shall be mounted in the cover plate directly below the circuit label for pigtail circuits

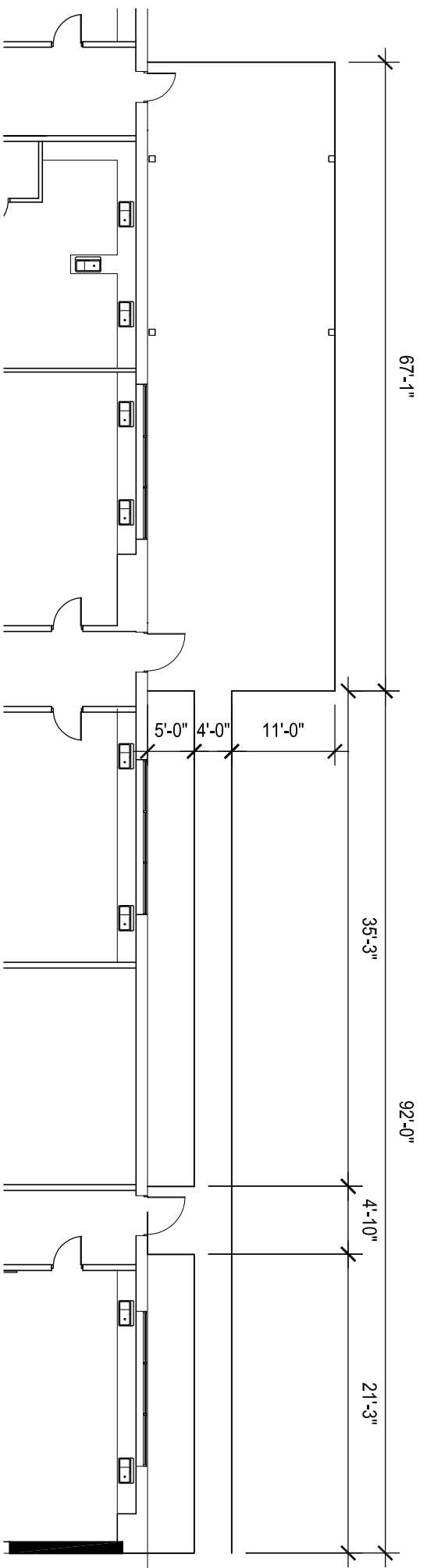
1.01 POWER DISTRIBUTION – JUNCTION BOXES

A. General

1. Gridiron junction boxes shall be fabricated from 16-gauge cold rolled steel with 14 gauge end panels.
2. Junction boxes shall be finished with fine-textured, scratch-resistant, black powder coat.
 - a. Boxes for 30 circuits or less shall be 14”H x 14”W x 4”D
 - b. Boxes for 31 to 60 circuits shall be 14”H x 28”W x 4”D.
3. Junction boxes shall include mounting brackets and hardware
4. Cover(s) shall be 16-gauge cold rolled steel and hinge to allow installer to orient the hinged door to open in any horizontal direction.
5. Cover(s) shall be attached with machine screws and Tinnerman retainer nuts.

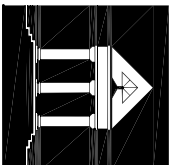
B. Electrical

1. Wiring terminations shall be made using feed through terminals individually labeled with corresponding circuit numbers.
 - a. 20 amp circuits shall use screwless tension clamp terminals listed for 20 – 8 gauge wire.
 - b. 50 amp circuits shall use compression terminals listed for 10 – 1 gauge wire.
 - c. 100 amp circuits shall use compression terminals listed for 8 – 2/0 gauge wire.
 - d. Terminals that place a screw directly on the wire are not acceptable.
2. Gridiron junction boxes shall be Underwriter Laboratories (UL) and Canadian Underwriter Laboratories (cUL) LISTED.
3. A low voltage distribution system shall be available to incorporate DMX, Ethernet or other protocols as specified with the gridiron junction box.
 - a. Low voltage junction boxes shall attach to gridiron junction boxes to simplify wiring to a discrete device
 - b. Low voltage signals shall enter the junction box via a strain relief or connector mounted in a separate low voltage terminal box on the top or bottom of the gridiron junction box.
 - c. Up to four low voltage cables shall be supported for each junction box location.



HCC - Stafford
Fine Arts Renovation - Building B

ARCHITECTURICS3, INC.
5555 West Loop South Suite #400 Bellare, Texas
77401 TEL 713/868-0088 FAX 713/468-2613



Scale: 1/16" = 1'-0"
Subject: New Walkway
Date: Oct. 20, 2011
Drawn: C. Mitchell
Project No. 09250
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