



Fire Facilities Inc.
BCFD/Cartersville Joint Training Facility
Cartersville, GA
Five Year Inspection - Structural Evaluation
RSE Project: 23906

Owner:

Bartow County Fire Department

Owner Address:

5435 Highway 20, Cartersville, GA 30121
Latitude, Longitude: [34.2036 N, -84.7920 W]

Training Tower Manufacturer:
Fire Facilities Inc

Inspected By:
Jeremy Z. Squires, EIT

Inspection Date:
28th April 2023

Report Date:
13th June 2023

Client:

Tracey McFadden, Chief
Bartow County Fire Department

Project Address:

180 Paga Mine Road, Cartersville, GA 30121
Latitude, Longitude: [34.1357 N, -84.7831 W]

Seal:





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1.0 General Information/Scope of Services

Response Structural Engineers, Inc. (RSE) has conducted this visual structural evaluation to assess the structural integrity of the fire training tower and make recommendations. NFPA 1403 (2018 Edition) requires that the structural integrity of the live fire training structure shall be evaluated and documented annually by the building owner or AHJ (authority having jurisdiction). If visible structural defects are found, such as cracks, rust, spalls, or warps in structural floors, columns, beams, walls, or metal panels, the building owner shall have a follow-up evaluation conducted by a licensed professional engineer with live fire training structure experience and expertise, or by another competent professional as determined by the building owner or AHJ.

Follow-up Inspection Program

The follow-up inspection program complies that with NFPA 1403 sections 6.2.6.1 includes the following:

- Complete service carried out by a licensed professional engineer with live fire training structure experience and expertise.
- Visual inspection of the exposed areas of the foundation and slab.
- Visual inspection of the exterior of the tower.
- Visual inspection of all exposed structural elements.
- Visual inspection of all thermal linings.
- Visual inspection of all doors and window shutters including hardware.
- Visual inspection of stairs, ladders and fire escapes.
- Recommendations for repairs, maintenance or improvements.
- A formal report with photographs documenting the findings.

Non-Gas-Fired/Five Year Inspection Program

In addition to the annual and follow-up inspection required by NFPA 1403, a more in-depth five- year inspection program is required for non-gas-fired fire training structures.

The structural integrity of the live fire training structure shall be evaluated and documented by a licensed professional engineer with live fire training structure experience and expertise, or by another competent professional as determined by the AHJ, at least once every 5 years. Part of the live fire training structure evaluation shall include, at least once every five years, the removal and reinstallation of a representative area of thermal linings (if any) to allow for inspection of the hidden conditions behind the linings.

Note: RSE does not provide inspections for calcium aluminate refractory structural concrete (i.e., structures with concrete walls, or concrete beams/columns). Concrete coring is not provided as part of this inspection program. Coring is only required on concrete structures with calcium aluminate refractory structural concrete.

Additional Note: NFPA 1403 also requires the owner of the fire training structure to visually inspect for damage and document this damage before each use to ensure the safety of the trainees.

The structural evaluation was conducted in accordance with procedures, practices, and standards generally accepted for visual observations and evaluations of structures. Visual observations are useful for determining the general conditions of the structure, however, there may be hidden deterioration or damage that was not detected during this visual assessment since no actual testing was completed. The findings and recommendations contained within this report are based upon the data and information provided to and



observed by RSE at the time of completion of this report only. The only items evaluated are listed within this report or the Scope of Services and it shall not be implied that any other items were included or assessed.

2.0 Tower Description

The tower evaluated is a live fire training tower (burn building) used by the fire department as indicated on the title page of this report. The structure is a Wesco Model W-2/Battalion Chief and was designed by Fire Facilities, Inc (FFI). The structure is a 2½ story building and is approximately 59' long by 22' wide at the first floor. This structure consists of a residential section, a single-story annex section, and a control room section. The residential section is 35' long, 22' wide, and 24' tall to the gabled eave. The annex section is approximately 14' long, 22' wide, and 10' tall while the control room section is 10' long, 12' wide, and 8' tall.

The primary structural system consists of structural steel columns and beams, while the secondary structural system is comprised of light gage joists covered with 18-gage metal floor decks. The floor system of the upper levels also consists of two inches of nonstructural cover above the 18-gage metal floor decks. A light gage curtain wall system incorporates the exterior walls in the residential section while a load-bearing light gage wall system is utilized in the single-story annex section and the control room section.



Overall View of the Fire Facilities Inc. Structure



3.0 Background

The following table is based on interview questions during the time of inspection for the fire training tower. The information provided in this table gives an indication of the general care and condition of the burn building. The typical expectation is that more damage will exist in the structure if there are one or more of the following occurrences: excessive temperatures (>1850 F at burn rooms/>600 F at burn areas), frequent training evolutions, misuse, lack of supervision, no temperature data logging records kept, damaged thermal protection prior to burning, and no routine maintenance.

Question	Answer
Date of inspection, location, temperature	28 th April 2023. Cartersville, GA. 79 Degrees, Partly Cloudy.
Names of people present during this questionnaire	Training Captain C. Edge
Number of live fire training evolutions per year (day of which at least one live fire training evolution has been conducted)*	Approximately 30 per year. Last burn date was October of 2022.
Date the tower was inspected previously	November 2 nd , 2016.
Date the tower was initially put into service	2009.
Temperature range during live fire training evolution including maximum temperatures	Average: 500 F Peak: 800 F
Pyrometer type (alarms and data logging or their own logbook)	Pyrometer system not functional. No temperature data provided. Handheld thermometer used during evolutions. Evolutions
Type of fuel (propane or Class A)	Untreated Wood Pallets Used at 2 nd Floor and Annex Burn Rooms
Type of burn room liner system	24 Ga Corrugated SS Wall Panels over 2" Deep Westec Insulation Over Metal Studs
Current damage or safety concerns	2 nd Floor Burn Room Damage to Burn Room Walls
Supervision of your departments training	Captain C. Edge
Past repairs and/or maintenance plan	Replaced some of the ceiling panels & temperature sensor in 2 nd floor burn room.
Other information	None.



4.0 Observations

Each item observed during the inspection has an observation, a recommended action, and a priority level. The priority levels are defined by four levels: high, medium (med.), low, or none (please see definitions below). Also, with select observations an asterisk follows to indicate photo available. These photos are in Appendix I and are listed in order of occurrence per this section.

- ✓ **High priority levels require immediate attention due to safety hazards and the facility shall not be used until the recommended action has been completed.**
- ✓ **Medium priority levels usually do not present an immediate safety hazard, but can cause further degradation of the fire training structure if recommended action is not accomplished in a timely manner.**
- ✓ **Low priority levels will not necessarily improve the fire training structure but will lead to an extended life of the structure and result in lower future maintenance costs.**
- ✓ **None usually is an observation that is noted but no recommended action is required except for future monitoring.**



4.1 General Observations – Visual

4.1.1 Exterior of Tower

Item	Observations/Recommendations	Priority
Condition of Exterior Wall Panels	<p>Observations:</p> <ol style="list-style-type: none"> Overall condition of panels showed little to no wear. Some areas show signs of minor rust marks along screw lines at various locations of building. Soot buildup at panels adjacent to burn room door and at eave adjacent to burn room door. <p>Recommendations:</p> <ol style="list-style-type: none"> Clean surfaces as recommended in Appendix III (Paint Care and Maintenance Manual). 1* Clean surfaces as recommended in Appendix III (Paint Care and Maintenance Manual). 1* 	<ol style="list-style-type: none"> Low Low
Condition of Exterior Stairs and Landings	<p>Observations:</p> <ol style="list-style-type: none"> Exterior stairs and landings showed minor wear. Minor corrosion at main exterior stair column base plates & stair bar grate treads. <p>Recommendations:</p> <ol style="list-style-type: none"> Remove corrosion via sand blasting and/or power tools. Paint this area with a ZRC 221 Cold Galvanizing Compound by ZRC Corporation or comparable galvanizing paint (1.5 mils minimum. 2*/3* 	<ol style="list-style-type: none"> Low

*Number indicates label of associated photos in Appendix I.

4.2 Structural Observations – Visual

4.2.1 Foundation

Item	Observations/Recommendations	Priority
Exposed Areas of Foundation/Slab -Cracking	<p>Observations:</p> <ol style="list-style-type: none"> Foundation slab and surrounding pavement are in good condition with minor hairline shrinkage cracks. <p>Recommendations:</p> <ol style="list-style-type: none"> As cracks grow to greater than ¼" in width and 2" deep; route, clean, and seal large cracks. Sealant should meet the requirements of ASTM D5893/D5893M. 4* 	<ol style="list-style-type: none"> Low

4.2.2 Red Iron/Structural Steel Issues

Item	Observations/Recommendations	Priority
Exposed Red Iron/Structural Steel at Base Plates/ Columns/Beams/ Plates -Rust -Corrosion	<p>Observations:</p> <ol style="list-style-type: none"> Rust onset occurring at various red iron column bases, columns, base plates & beams. Heavy build-up of soot at exposed red iron/structural steel adjacent to 2nd floor burn room. <p>Recommendations:</p> <ol style="list-style-type: none"> Prep area and re-paint with rust-resistant coating per Rustoleum spec provided in Appendix III. 5* Monitor condition of steel for corrosion & rusting. *6 	<ol style="list-style-type: none"> Low Low



4.2.3 Light Gage Interior Floor Panels/Joists

Item	Observations/Recommendations	Priority
Exposed Light Gage Interior Floor Panels/Joists -Rust -Corrosion	<p>Observations:</p> <ol style="list-style-type: none"> 1. Minor rust occurring at light gage joists at various locations below 2nd floor concrete deck. 2. Heavy soot build-up & areas of rust at 3rd floor light gage floor panels/joists adjacent to 2nd floor burn room. <p>Recommendations:</p> <ol style="list-style-type: none"> 1. Remove rust via sand blasting and/or power tools. Paint this area with a ZRC 221 Cold Galvanizing Compound by ZRC Corporation or comparable galvanizing paint (1.5 mils minimum). 7* 2. Remove rust per 1. Continue to monitor members exhibiting soot buildup for rust or corrosion. 8* 	<ol style="list-style-type: none"> 1. Low 2. Low

4.3 Non-Structural Observations – Visual

4.3.1 Fuel Storage

Item	Observations/Recommendations	Priority
Fuel Source Location	<p>Observations:</p> <ol style="list-style-type: none"> 1. Class A fuel source (Per section 3) being stored near burn Room. <p>Recommendations:</p> <ol style="list-style-type: none"> 1. Remove fuel sources from area adjacent to burn room door to ensure that fire will not spread into unwanted areas. *9 	<ol style="list-style-type: none"> 1. High
Rapelling Anchors	<p>Observations:</p> <ol style="list-style-type: none"> 1. Rapelling anchors and bolts at roof exhibiting rusting/corrosion. <p>Recommendations:</p> <ol style="list-style-type: none"> 1. Ensure covers are installed on the recessed rappelling anchors when not in use. Remove corrosion via hand tools. Paint with ZRC 221 Cold Galvanizing Compound by ZRC Corporation or comparable galvanizing paint (1.5 mils minimum). *9B 	



4.3.2 Burn Rooms

Item	Observations/Recommendations	Priority
Liner System in Annex Burn Room	<p>Observations:</p> <ol style="list-style-type: none"> Numerous areas show screws backing out or missing on the ceilings panels and trims. Minor warping of ceiling panels. <p>Recommendations:</p> <ol style="list-style-type: none"> Periodically tighten all burn room screws to prevent screws from backing out. Use #12x2" stainless steel screws to reattach ceiling Zee trims to panels. The #12 screws should be screwed into place to attach the panels to the zeeks in the proper location (See Appendix II & IV for installation instructions). 10* Monitor ceiling panels for future warping or corrosion. 11* 	<ol style="list-style-type: none"> High None.
Liner System in Burn Room #2 – 2 nd Floor	<p>Observations:</p> <ol style="list-style-type: none"> Heavy warping of all ceiling panels and trims and horizontal bulkhead panels. At some locations, ceiling trim is missing. Minor warping and discoloration of wall panels. Heavily warped wall panels & door trim at north west wall. <p>Recommendations:</p> <ol style="list-style-type: none"> Replace the Westec system on the entire ceiling and bulkhead along with corresponding ceiling and bulkhead trim. See drawings, Appendix IV. 12* Monitor wall panels for future for warping or corrosion. Replace wall panels & door trim at north west wall. See drawings, Appendix IV. 13* 	<ol style="list-style-type: none"> High. High.
Liner System in Burn Room #3 – 2 nd Floor	<p>Observations:</p> <ol style="list-style-type: none"> Minimal warping of wall panels, ceiling panels, and trims. Ceiling trims at various areas missing screws. <p>Recommendations:</p> <ol style="list-style-type: none"> Continue to monitor condition of panels and trim for future warping and discoloration. 14* Fasten ceiling trims to panels with #12 x 3/4" stainless steel hex head self drilling screws at 6 1/2" on center. 15* 	<ol style="list-style-type: none"> None. High.
Burn Room's Wall Studs/Insulation	<p>Observations:</p> <ol style="list-style-type: none"> At each burn room, multiple new penetrations were drilled. A scope camera was inserted into the wall cavities. Wall studs and Westec insulation were viewed. At those locations, studs appeared to show no signs of warping and insulation was intact. <p>Recommendations:</p> <ol style="list-style-type: none"> None. 16*/17* 	<ol style="list-style-type: none"> None.
Pyrometer System	<p>Observations:</p> <ol style="list-style-type: none"> The ceiling probes and Scout pyrometer are currently not being used. Captain Edge communicated the pyrometer needed new batteries. <p>Recommendations:</p> <ol style="list-style-type: none"> Install the required batteries to bring the system operational so heat data can be recorded. 	<ol style="list-style-type: none"> Medium.



Items not inspected – electrical, mechanical, and plumbing (i.e., sprinklers, standpipes, fans, etc.)

5.0 Summary

There is no visible evidence of any deficiencies in the structural integrity of the fire training tower. Structural repairs are not required to allow the continued use of this structure but general maintenance and repairs are required. The maintenance or repairs shown in section 4.0 (above) have been prioritized to ensure that a safe and low maintenance structure is attained. As stated previously, high priority items indicated in section 4.0 must be addressed and rectified before this tower can be used for any future training exercises.

Please note that the condition of the fire training tower will change with the first live fire training evolution conducted after the evaluation. The recommended actions for structural and non-structural items are intended to restore deteriorated areas to good condition in order to prolong the life of the burn trainers. This does not guarantee the burn trainers will remain in good condition for any particular period of time.



Appendix - Photos

1



Rust Marks Along Screw Lines at Exterior Wall Panels/Soot Buildup Adjacent to 2nd Floor Burn Room Door

2



Overall of Hot Dipped Galvanized Exterior Stair Structure

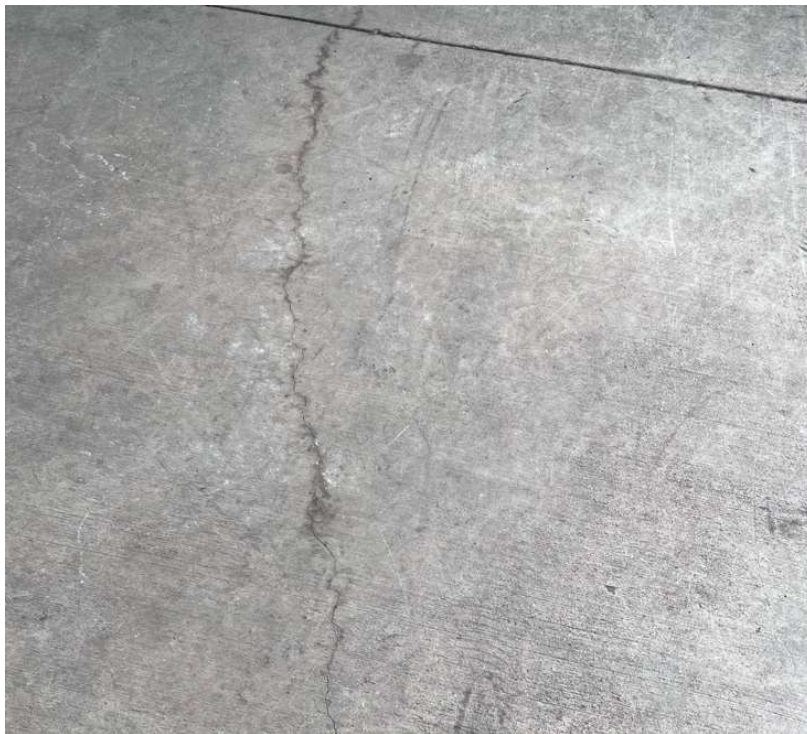


3



Rusting at Exterior Stair Column Baseplate/Rusting at Exterior Stair Grate Treads

4



Hairline Cracking at Exposed Foundation



5



First Floor Columns & Baseplates Exhibiting Rusting/Paint De-lamination

6



Structural Steel Adjacent to 2nd Floor Burn Room



7



Corrosion/Rusting of Light Gauge Joists Below 2nd Floor Concrete Deck

8



3rd Floor Floor Joists & Deck (Soot Buildup & Rust)



9



Fuel Source Stored Adjacent to 2nd Floor Burn Room

9B



Rusted Rapelling Anchor



10



Backed out & Missing Ceiling Trim Screws

11



Annex Burn Room w/ Minor Warped Ceiling Panels



12



Burn Room #2 Warped Ceiling Panels & Trim

13



Burn Room #2 Warped Ceiling Panels & Trim / Northwest Wall Panel Heavily Warped & Discolored



14



Burn Room #3 Ceiling Panels, Wall Panels & Trims

15



Burn Room #3 Corner Trim Missing Screws



16



Annex Burn Room – Light Gauge Metal Stud

17



Annex Burn Room Wall Insulation



Appendix II – Service Bulletin

Following these instructions will help keep both the Westec insulating stainless steel system and the Westemp insulating board/panel system in good working order.

The Westec stainless steel panels and trim need to be periodically inspected to ensure that the attachment screws are in place. This periodic inspection should be done after a slight, but noticeable, back-out of the screws begins to occur. These screws should be retightened (fully seated- careful not to strip out) to ensure that the panels and trims remain in place. Failure to follow this recommendation could allow premature degradation to the insulation materials behind the stainless steel covering.

The Westemp panels/boards also need to be periodically inspected to ensure both the attachment screws and washers are in place (with proper torque) and that cracks are not visible in the panels themselves. First ensure that the panel mounting screws are loose enough to allow for thermal expansion. This is done by holding the panel firmly against the wall and attempting to rotate the washers. If the washers won't move, loosen the screw until the washer is loose enough to rotate allowing for thermal expansion of the Westemp panel system (proper torque). Please note that some initial minor "spider" cracking of the panels will occur and this is normal. However, any panels that are cracked/punctured all the way through should be replaced prior to burning because they are no longer providing a thermal barrier for the protection of the structure itself. Generally, Westec panels require periodic retightening of all screws to prevent screws from backing out. Continue to monitor wall panels. If gaps larger than 1/4" begin to appear at panel laps or if the warping does not allow for proper attachment to supports behind the panels, the panels will need to be replaced.

Generally, Westemp panels should be replaced if a crack is wider than 1/16" deep or if a portion of the panel is missing to prevent heat damage to the structure itself. To maximize the life of the Westemp panels, they should be attached with #12 screws and large washers through predrilled 1/2" diameter holes (in the board) to allow for heat expansion and contraction. These attachment screws should be installed at a maximum of two feet on center in all directions with a minimum perimeter distance of 2" from the exterior edge of the panel.

Temperatures of the burn rooms must be continuously monitored to maintain levels below the maximum temperature rating or normal service temperatures of the insulation system. If retightening/reseating of the screws, along with required monitoring and documentation of burn temperatures within these burn rooms is followed, the burn room insulation systems will perform as intended and protect your fire training structure for years to come.

Updates for Westec Insulating Systems: FFI has researched and developed a new screw that will help prevent the back-out of screws. This screw will prolong the time required between tightening and therefore will require less maintenance. We will begin implementing this screw in the new burn rooms shipping out in the second half of 2011.

Updates for Temperature Monitoring: We now offer an improved data logging pyrometer to monitor temperatures within your burn rooms. The new pyrometer now has a download direct to an SD card, removing the need to install software on your computer. These files are date stamped and can be read via text software. Excel users can utilize the visual basic programming provided by FFI for ease of visual graphs and spreadsheets for creating training records. Other features added are an LED backlight, separate battery pack, improved hardware, and a more easily accessible cover removal.



Appendix III – Product Cut Sheets

Paint Cleaning and Care Manual

Care and Maintenance

of TRINAR®, CERAM-A-STAR®, POLYDURE® and ALUM-A-DURE® factory-applied finishes



The factory-applied functional or decorative finish is a baked-on coating designed to give trouble-free performance for years, with little service required.

This brochure serves as a guide to maintaining the aesthetic and protective properties of the coating. It is important to read this brochure thoroughly and completely before attempting to clean, touch-up or repaint factory-finished building panels.

It is the user or their agent's responsibility to select materials and implement procedures specific to the safe, proper and compliant use of cleaning agents, paints and solvents mentioned below.

Cleaning painted surfaces

While factory-applied finishes are so durable that they will last many years longer than ordinary paints, it is desirable to clean them thoroughly on a routine basis. Apparent discoloration of the paint may occur when it has been exposed in dirt-laden atmospheres for long periods of time. Slight chalking may also cause some change in appearance in areas of strong sunlight.

A good cleaning will generally restore the appearance of these coatings and render repainting unnecessary. An occasional light cleaning will also help maintain an aesthetically pleasing appearance.

To maintain the original finish of the coated product, the only regular maintenance necessary is that of annual washing. Mild solutions of biodegradable cleaner or household ammonia will aid in the removal of most dirt, and the following are recommended levels:

- 1.) One cup of Simple Green®, or other non-toxic biodegradable cleaner, which contain less than 0.5% phosphate, dissolved into two gallons of warm water. NOTE: The use of detergents containing greater than 0.5% phosphate is not recommended for use in general cleaning of building panels. NEVER BLEND CLEANSERS OR DETERGENTS WITH BLEACH.
- 2.) One cup of household ammonia dissolved into five gallons of water (room temperature).

Working from the bottom to the top of the coated panels, the panels may be washed with either solution. The use of a well-soaked cloth, sponge, brush (with very soft bristles) and clean water rinse is advised. Do not use a pressure washer.

We do not recommend the use of scouring powders or industrial solvents, since these agents may damage the film. Solvent-containing cleaners such as Fantastic®, however, are very effective and can be used without concern.

If mildew or other fungal growth is a problem and cannot be removed as outlined above, household bleach, mixed at a concentration of one cup of bleach to five gallons of water, along with one cup of a mild soap (e.g., Ivory) to aid wetting, is recommended.

Once the coated product is washed, thorough rinsing with clear water is necessary to eliminate the possibility of residue. Failure to remove all residues from these cleaning steps may damage the film.



Repainting of coated metal panels – including metal roofing building panels

To repaint your factory-finished metal panels, great care must be taken to prepare the factory-applied surface and to carefully assess the adhesion between this well-prepared surface and the coating to be used to repaint the surface.

Field painting of TRINAR, CERAM-A-STAR, POLYDURE and ALUM-A-DURE finishes often requires special considerations. Oil-based Alkyd house paint must not be applied over factory-applied finishes. This entire section must be carefully read before attempting field repainting of building panels.

A. Surface preparation

Any metal panel surface to be repainted must be properly prepared to assure the continued performance of the coating system. The following five problem areas must be addressed before the repainting process can begin:

1.) Dirt and mildew

Dirt, loose chalk and mildew must be removed as recommended by the cleaning method outlined in the section, "Cleaning Painted Surfaces." Heavier dirt accumulations, which must be addressed prior to repainting, may necessitate the use of a dilute solution of Spic and Span® (1 cup into 5 gallons of warm water). NOTE: Detergent containing greater than 0.5% phosphate is recommended only as a preparation prior to re-painting. Do not use such detergents for routine cleaning.

Always rinse the surface thoroughly to remove any of the agents used in the cleaning procedure. Residual cleaners left on the surface will damage the adhesion of the newly applied paint system.

2.) Surface imperfections

Minor scratches, which have not left the metal substrate exposed, can be lightly sanded or buffed to create a smoother surface. Care must be taken, however, not to expose the substrate. Once this exposed condition exists, the likelihood for rusting is greatly increased. Should the metal substrate be observed during this operation, see the following paragraph.

3.) Exposed metal and rust

Exposed metal minimum surface preparation is Hand Tool Cleaning per SSPC-SP2¹ and use of a primer specifically designed to protect any exposed galvanized steel metal from corrosion.¹ Care must be taken, however, not to destroy the galvanized surface. Before priming the metal panel, test for adequate intercoat adhesion (see Section 2 of the Repainting section). Allow sufficient time for the primer to dry before applying the topcoat.

For severely rusted metal panels the recommended preparation is SSPC-SP7¹ – Brush-Off Blast Cleaning. AkzoNobel's Water-Based Epoxy Maintenance Coat, or a maintenance primer designed for use on hot dipped galvanized steel, is recommended to protect the metal panel from further rusting.

4.) Additional surface preparation required for new metal panels

There may still be a layer of factory-applied wax on the surface of the metal panel if it has been installed within the last two years. This material is used to protect the panels during forming and transit, and failure to remove this material will result in poor intercoat adhesion with resultant peeling or flaking of the new coating.

To remove this wax, it will be necessary to lightly scuff the surface with a GRAY (not green) 3M Synthetic Steel Wool pad (equivalent to "000" steel wool) saturated with soapy water. A final wipe and rinse should be done using clean water only, to remove any loose dust or soapy film. Once this procedure is completed, perform the adhesion test in Appendix A to assure that acceptable adhesion is evident. If poor adhesion is still observed, repeat step #4.

It is imperative, of course, that the factory finish itself not be removed during this process. It is necessary to once again test the intercoat adhesion according to Appendix A. If the test results still indicate poor intercoat adhesion, DO NOT PROCEED! Contact your metal panel supplier immediately.

¹ AkzoNobel's Water-Based Epoxy Maintenance Coat, WA9C32800/GW9C32796 or equivalent primer specifically designed for adhesion to galvanized steel.

B. Repainting

1.) Paint

After the metal panels have been properly prepared, they must be coated within 24 hours. (See section D for coatings supplied by AkzoNobel for professional application) As an alternative, exterior acrylic latex DTM (direct to metal) paint may be used. Oil-based Alkyd house paint must not be applied over factory-applied finishes. Before repainting the metal panels, however, it is imperative that the intercoat adhesion be ascertained. See the following section.

2.) Testing for adequate intercoat adhesion

Only after the surface has been carefully prepared and the intercoat adhesion between the repaint material and the metal panels is known to be acceptable should you proceed in repainting your metal panels. Without sufficient intercoat adhesion, delamination after long term exposure may be encountered. (See Appendix A that describes a method to ascertain the intercoat adhesion properties.)



NOTE: It is the sole responsibility of the person doing the repainting to ascertain if acceptable intercoat adhesion is being achieved. AkzoNobel is not responsible for any intercoat adhesion failure or any other unsatisfactory condition result from field coating application to factory-painted panels, either immediately or over time.

3.) Minor scratch touch-up with CERAM-A-CRYL® II

Review section A for surface preparation requirements before using CERAM-A-CRYL II to touch-up minor defects.

Brush Application

CERAM-A-CRYL II coatings are formulated for fast drying and are not ideally suited for brush application in large areas. However, they can be used successfully for spot or scratch touch-up repair and for small area painting. Apply CERAM-A-CRYL II, as supplied, without reduction, as you would any other brushable coating. Work quickly to smooth out brush marks before the coating dries. Use EXP5050, Reducing solvent for cleanup.

4.) Minor scratch touch-up with TRINAR AQUA

Review section A for surface preparation requirements before using TRINAR AQUA to touch-up minor defects.

Brush Application

TRINAR AQUA coatings are formulated for fast drying and are not ideally suited for brush application in large areas. However, they can be used successfully for spot or scratch touch-up repair and for small area painting. Apply TRINAR AQUA, as supplied, without reduction, as you would any other brushable coating. Work quickly to smooth out brush marks before the coating dries. Use Methyl Ethyl Ketone solvent for cleanup.

WARNING: Enforce NO SMOKING and remove all sources of ignition when EXP5050, Reducing Solvent, CERAM-A-CRYL II and TRINAR AQUA coatings are used.

C. Additional precautions and other recommendations

CERAM-A-CRYL II and TRINAR AQUA coatings contain petroleum distillates. Wash hands thoroughly after use. Keep all containers away from heat, sparks and flame. Use only with adequate ventilation. Avoid breathing CERAM-A-CRYL II and TRINAR AQUA vapor or mist and prolonged or repeated contact with skin.

Keep closures tight and containers upright to prevent leakage. In case of spillage, absorb and dispose of all materials in accordance with applicable government regulations.

D. AkzoNobel repaint coatings

If you are considering repainting your building, a family of premium coatings has been developed by AkzoNobel to assure the long-term performance of your metal structure.

CERAM-A-CRYL II: silicone-modified acrylic topcoat

CERAM-A-CRYL II is a highly durable coating recommended for repainting non-corroded, weathered metal panels. The coating system is comprised of a Silicone-modified Acrylic coating, intended for use as a one-coat or two-coat material applied over factory-prepainted panels. Obtain a copy of the CERAM-A-CRYL II, Silicone-modified Acrylic Repaint Finish application guide for additional information.

TRINAR AQUA: fluoropolymer topcoat

TRINAR AQUA is an extreme high durability coating recommended for repainting non-corroded, weathered metal panels. The coating system

is comprised of a polyvinylidene fluoride polymer modified with acrylic, intended for use as a two-coat material applied over factory-prepainted panels. Obtain a copy of the TRINAR AQUA, Water-based Air-dry Fluoropolymer application guide for additional information.

Water-Based Epoxy Maintenance Coating – WA9C32800 and GW9C32796

Two component primer/sealer designed for application over prepainted and bare metal substrates. Maintenance Coat is recommended for sealing aged plastisol coatings, cut edge corrosion, priming metal building roofs and side walls. Intended to be topcoated with AkzoNobel CERAM-A-CRYL II or TRINAR AQUA topcoats. Obtain a copy of the Water-Based Epoxy Maintenance Coating application guide for additional information.

Gray Tiecoat – VA0C31630 and UC0C31631

Designed to provide optimum adhesion to newly erected metal panels. Gray Tiecoat is recommended for metal panels that have less than two years' exposure to the environment. Intended to be topcoated with AkzoNobel CERAM-A-CRYL II or TRINAR AQUA topcoats. Obtain a copy of the Gray Tiecoat application guide for additional information.

Appendix A - evaluating intercoat adhesion

- 1.) After properly cleaning the surface to be repainted, paint a 4" x 4" area with the repaint material according to the manufacturer's instruction. Allow to dry completely before proceeding.
- 2.) Use a utility knife to cut a two-inch "X" into the repaint coating.
- 3.) Place a three-inch strip of Scotch® 610 tape over the "X" and rub 10 times with heavy pressure leaving a half inch of tape free for removal.
- 4.) Pull the tape back over itself at a 180° angle.
- 5.) Examine the tape and the metal panel for any signs of paint removal.

If the tape removes more than 1/16" of the repaint material from the "X" cut, the intercoat adhesion is inadequate.

1 SSSP-SP2 – Hand Tool Cleaning

Hand Tool Cleaning removes all loose mill scale, loose rust and other detrimental foreign matter. It is not intended that adherent mill scale, rust and paint be removed by this process. Mill scale, rust and paint are considered adherent if they cannot be removed by lifting with a dull putty knife. Before hand tool cleaning, remove visible oil, grease, soluble welding residues and salts by the methods outlined in SSSP-SP1*. For complete instructions, refer to Steel Structures Paint Council Surface Preparation Specification No. 2.

2 SSSP-SP7 - Brush-Off Blast Cleaning

A Brush-Off Blast Cleaned surface when examined without magnification, shall be free of all visible oil, grease, dirt, dust, loose mill scale, loose rust and loose paint. Tightly adherent mill scale, rust and paint may remain on the surface. Mill scale, rust and coating are considered adherent if they cannot be removed by lifting with a dull putty knife. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSSP-SP1* or other agreed-upon methods. For complete instructions, refer to Joint Surface Preparation Standard SSSP-SP7/NACE NO. 4.

3 SSSP-SP1 – Solvent Cleaning

Solvent Cleaning is a method for removing all visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants. Solvent cleaning does not remove rust or mill scale. Change rags and cleaning solution frequently so that deposits of oil and grease are not spread over additional areas in the cleaning process. Be sure to allow adequate ventilation. For complete instructions, refer to Steel Structures Paint Council Surface Preparation Specification No. 1.



For more information, please contact:

Akzo Nobel Coatings Inc.
1313 Windsor Ave.
Columbus, OH 43211
614.294.3361



coilcoatings.akzonobel.com/us

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Revision Date: February 2021

01700_070-009



Red Iron Paint Spec

EPOXY RUST-OLEUM® 	TECHNICAL DATA	RO-51
9100 SYSTEM DTM EPOXY MASTIC		

DESCRIPTION AND USES

The 9100 System DTM Epoxy Mastic is a two-component, high solids epoxy coating for use in moderate to severe environments. It is specifically designed for application directly on sound rusted steel with minimum surface preparation. It can also be used on clean steel, galvanized metal, concrete (including concrete floors), previously coated and slightly damp surfaces. It may also be used for water immersion service, using the DTM Epoxy Mastic standard premix bases only with 9102402 Immersion Activator. (Note: Do not use for immersion service in potable water tanks). The DTM Epoxy Mastic can be used indoors or out. While exposure to sunlight and certain interior lighting conditions causes fading and chalking of all epoxy type coatings, these changes are cosmetic in nature only and film integrity and performance will not be adversely affected.

The 9100 System complies with USDA FSIS regulatory sanitation performance standards for food establishment facilities. This coating is impervious to moisture and easily cleaned and sanitized.

Epoxy coatings will yellow with age. This is most noticeable with interior applications of white or light colors which are not subjected to bleaching from Sunlight. Note: 9102402 Immersion Activator and 9104402 Fast-Cure Activator produce a semi-gloss finish. Also, using the 9104402 Fast-Cure Activator may result with a slight colorshift when compared with products using the 9101402 Standard Activator.

PRODUCTS

BASE COMPONENT

1-Gallon	5-Gallon	Description
9115402	—	Aluminum
9122402	—	Marlin Blue
9125402	—	Safety Blue
9133402	—	Safety Green
9145402	—	Equipment Yellow
9165402	—	Regal Red
9168402	—	Tile Red
9171402	9171300	Dunes Tan
9179402	—	Black
9182402	9182300	Silver Gray
9186402	9186300	Navy Gray
9192402	—	White
9144402	9144300	Safety Yellow
266693	266697	Buff

Made-to-Order only. Contact Rust-Oleum Customer Service for details.

PRODUCTS (cont.)

ACTIVATOR

1-Gallon	5-Gallon	Description
9101402	9101300	Standard Activator
9102402**	9102300	Immersion Activator
9103402	9103300	Low Temp Activator
9104402**	A910008300	Fast Cure Activator

** Not for use with tint bases.

TINT BASES

1-Gallon	5-Gallon	Description
9105405	—	Red
9106405	—	Yellow
9107405	9107375	Masstone
9108421	9108381	Deep
9109408	9109388	Light

Tint bases use the Rust-Oleum 2020 Colorants. Selected color formulas are available for use with Evonik 844 Colorants. Contact Rust-Oleum for the 844 formula book.

Agriculture Canada accepted: 9115, 9145, 9165, 9171, 9179, 9186, 9192 and 9101.

COMPANION PRODUCTS

RECOMMENDED PRIMERS

System is self-priming

COMPATIBLE PRIMERS

Extended Recoat Epoxy Primers (9300 System)

COMPATIBLE TOPCOATS

3700 System DTM Acrylic Enamel

3100 System Speedy-Dry DTM Acrylic Enamel

9400 System High Gloss Polyester Urethane***

9700 System 250 VOC Acrylic Polyester Urethane***

9800 System DTM Urethane Mastic***

***Do not use over 9115402 Aluminum



TECHNICAL DATA

9100 SYSTEM DTM EPOXY MASTIC

PRODUCT APPLICATION

ALL SURFACES: Remove all dirt, grease, oil, salt and chemical contaminants by washing the surface with Pure Strength® Cleaner/Degreaser item #3599402 or other suitable cleaner. Rinse with fresh water and allow to dry.

STEEL: Hand tool (SSPC-SP-2) or power tool (SSPC-SP-3) clean to remove loose rust, scale, and deteriorated previous coatings to obtain a sound rusted surface. For optimum corrosion resistance, abrasive blast to commercial grade SSPC-SP-6, with a blast profile of 1-2 mils (25-50 µ).

STEEL (IMMERSION): Abrasive blast clean to a minimum SSPC-SP-10 Near White Grade (NACE 2) and achieve a surface profile of 1.5-3 mils. All weld spatter must be removed along weld seams, rough welds should be ground smooth, and all sharp edges should be ground to a smooth radius.

PREVIOUSLY COATED: Previously coated surfaces must be sound and in good condition. Smooth, hard, or glossy finishes should be scarified by sanding or sweep blasting to create a surface profile. The DTM Epoxy Mastic is compatible with most coatings, but a test patch is suggested. **WARNING!** If you scrape, sand or remove old paint from any surface, you may release lead paint dust. **LEAD IS TOXIC. EXPOSURE TO LEAD DUST CAN CAUSE SERIOUS ILLNESS, SUCH AS BRAIN DAMAGE, ESPECIALLY IN CHILDREN. PREGNANT WOMEN SHOULD ALSO AVOID EXPOSURE.** Wear a NIOSH-approved respirator to control lead exposure. Carefully clean up with a wet mop or HEPA vacuum. Before you start, find out how to protect yourself and your family by contacting the U.S.EPA/Lead Information Hotline at 1-800-424-LEAD or log onto www.epa.gov/lead.

GALVANIZED METAL: Remove oil, dirt, grease and other chemical deposits with Pure Strength® Cleaner/Degreaser item #3599402 or other suitable cleaner. Remove loose rust, white rust or deteriorated old coatings by hand or power tool cleaning or brush off blasting. Rinse thoroughly with fresh water and allow to fully dry.

CONCRETE OR MASONRY: New concrete or masonry must cure 30 days before coating. Any concrete surface must be protected from moisture transmission from uncoated areas. Remove all loose, unsound concrete. Remove laitance and create a surface profile by either acid etching with Rust-Oleum 108402 Cleaning and Etch Solution, or by grinding. Surface sealers and curing agents must be removed by grinding.

APPLICATION

Airless spray is the preferred method of application. However, brush, roller, or air-atomized spray may also be used. Refer to table for thinning recommendations. For proper performance, a dry film thickness of 5-8 mils per coat is required. Excessive brushing or rolling may reduce film thickness. Apply a second coat if necessary to achieve the recommended film thickness.

PRODUCT APPLICATION (cont.)

Use the DTM Epoxy Mastic with 9101402 Standard Activator or 9104402 Fast Cure Activator at air temperatures between 50-120°F (10-49°C) and when the surface temperature is at least 5°F (3°C) above the dew point and less than 120°F (49°C). Low curing temperatures and/or condensation on the film while curing can affect appearance in the form of an amine blush. This can generally be removed with soap and water, however, in a case of extreme blushing, the performance of the coating may be slightly affected.

When application temperatures are between 40-60°F (5-15°C) and when the surface temperature is at least 5°F (3°C) above the dew point, use the DTM Epoxy Mastic with the 9103402 Low Temperature Activator. Do not apply the material if the temperature is expected to fall below 40°F in the first 24 hours of cure. At 40°F, full cure will be achieved in 7 days.

For water immersion service, use the DTM Epoxy Mastic with the 9102402 Immersion Activator. Do not use the 9102402 Immersion Activator with tint bases. This system may be used for both salt and fresh water; do not use for the inside of potable water tanks. Apply at air and surface temperatures between 60-100°F (15-38°C), when the surface temperature is at least 5°F (3°C) above the dew point, and when relative humidity is below 85%. Apply two coats alternating color between coats to ensure complete hide. Allow 7 days cure after application of the second coat before immersion.

NOTE: The 9104402 Fast Cure Activator may also be used in water immersion. Allow 7 days for full cure prior to beginning immersion service. Do not use tinted colors in water immersion.

NOTE: If using 9102 Immersion Activator or the 9103 Low Temp Activator and curing time exceeds 72 hours, the surface must be scarified by sanding, or other method, prior to application of an additional coat or other finish coating.

Pools

When used with 9102402 Immersion Activator, the DTM Epoxy Mastic premix bases can be used as a pool coating over existing epoxy pool coatings, new bare concrete, plaster, gunite, and fiberglass. The pool must be completely empty and dry before coating. After pool is emptied, this typically requires 7-10 days depending on temperature and humidity. To test the dryness of concrete, gunite or plaster pool surfaces, securely tape a 2 ft. by 2 ft. piece of clear plastic onto a horizontal and vertical surface at the deep end of the pool. Check after 24 hours. If water condensation is visible under the plastic, this is an indication that the surface is not completely dry, and NOT suitable for coating. Allow additional dry time and retest. Follow surface preparation, mixing and application instructions. Avoid painting in midday sun. Application is recommended early in the day or late in the afternoon when at least 2 hours of sunlight remain after completion of the job.



TECHNICAL DATA

9100 SYSTEM DTM EPOXY MASTIC

PRODUCT APPLICATION (cont.)

Allow minimum of 5-7 sunny days cure before filling pool. Early contact with water can cause premature fading, chalking and blistering. Super chlorinated water can cause a bleached out look. Sunlight and UV will cause chalking and fading. **Do not** use over: 1) chlorinated rubber, 2) synthetic rubber, 3) vinyl, 4) acrylic. See Note in Performance Characteristics Section on Page 3.

EQUIPMENT RECOMMENDATIONS

(Comparable equipment also suitable.)

BRUSH: Use a good quality natural or synthetic bristle brush.

ROLLER: Use a good quality lamb's wool or synthetic fiber (3/8-1/2" nap).

AIR-ATOMIZED SPRAY:

Method	Fluid Tip	Fluid Rate	Atomization Pressure
Pressure	0.055-0.070	10-16 oz./min.	25-60 psi
Siphon	0.055-0.070	—	25-60 psi
HVLP	0.043-0.070	8-10 oz./min.	10 psi (at tip)

AIRLESS SPRAY:

Fluid Pressure	Fluid Tip	Filter Mesh
1,800-3,000 psi	0.013-0.017	100

THINNING

Thinning is normally not required, except for air-atomized spray. For air-atomized spray application, thin only up to 10% by volume with 160402 Thinner after the components have been mixed. If the coating is going to be used in immersion service, 9102 or 9104 activator, then, use up to 10% 165402 Thinner for air-atomized spray and up to 5% of 165402 Thinner for airless spray.

NOTE: Addition of more than 10% of 160402 or 165402 Thinner will cause VOC to exceed 340 g/l. In this case, 333402 VOC exempt thinner can be used if needed.

MIXING

Both the base and activator components are highly pigmented. Mix each component thoroughly to ensure any settled pigment is re-dispersed before combining the components together. Combine at a 1:1 ratio by volume in a container large enough to hold the total volume. Mix thoroughly for 2-3 minutes. Power mixing is preferred. Do not mix more material than you plan to use within the listed pot life.

CLEAN-UP

Use 160402 or 165402 Thinner.

SHELF LIFE

Base components	3 years [†]
Activators	2 years [†]

[†]Unopened containers. Some settling may occur requiring mechanical mixing to redisperse pigment.

PERFORMANCE CHARACTERISTICS

System Tested

Topcoat: DTM Epoxy Mastic with 9101 Activator

PENCIL HARDNESS

METHOD: ASTM D3363

RESULT: B (7 days), 4H (30 days)

CONICAL FLEXIBILITY

METHOD: ASTM D522

RESULT: >32%

CYCLIC PROHESION

Rating 1-10, 10=best

METHOD: ASTM D5894, 2300 hours

RESULT: 10 ASTM D714 for blistering

RESULT: 10 ASTM D1654 for corrosion

IMPACT RESISTANCE (direct)

METHOD: ASTM D2794

RESULT: 160 in.-lbs.

TABER ABRASION

METHOD: ASTM D4060 CS-17 wheel, 500 g. load, 1000 cycles

RESULT: 125 mg loss

GLOSS

METHOD: ASTM D4587

RESULT: 80%

Refer to the Rust-Oleum Industrial Brands Catalog Form # 206275, for chemical and corrosion resistance.

NOTE: In swimming pool service, early chalking may occur if the water pH is outside the range of 7.2-7.6 and/or if the water temperature exceeds 100°F (38°C).

CAUTION: Exposure of the 9100 System during the curing stage of the coating to the by products of propane combustion may cause discoloration to occur. During application and curing, propane fueled fork lifts and other vehicles or propane fueled heaters should not be used in the area until the coating is fully cured. At least 72 hours.

**TECHNICAL DATA****9100 SYSTEM DTM EPOXY MASTIC****PHYSICAL PROPERTIES**

		9101 Activator	9102 Immersion Act.	9103 Low Temp. Act.	9104 Fast-Cure Act.
Resin Type		Aliphatic Amine converted Epoxy	Polyamide converted Epoxy	Aliphatic Amine converted Epoxy	Polyamide/modified Amine converted Epoxy
Inhibitive Pigment		Calcium Borosilicate	Calcium Borosilicate	Calcium Borosilicate	Calcium Borosilicate
Solvents		Xylene, Methyl Isobutyl Ketone, 1-Methoxy-2-propranol	Xylene, Methyl Isobutyl Ketone, 1-Methoxy-2-propranol	Xylene, Methyl Isobutyl Ketone, 1-Methoxy-2-propranol	Xylene, Methyl Isobutyl Ketone, 1-Methoxy-2-propranol
Weight^{††}	Per Gallon	11.4-12.6 lbs.	11.4-12.6 lbs.	9.3-10.4 lbs.	12.0-13.0 lbs.
	Per Liter	1.4-1.5 kg	1.4-1.5 kg	1.1-1.2 kg	1.4-1.6 kg
Solids^{††}	By Weight	86-89%	79-82%	78-81%	81-83%
	By Volume	78-81%	65-68%	72-75%	67-69%
Volatile Organic Compounds^{††}		<340 g/l (2.84 lbs./gal.)	<340 g/l (2.84 lbs./gal.)	<250 g/l (2.08 lbs./gal.)	<340 g/l (2.84 lbs./gal.)
Mixing Ratio		1:1 Act.:Base (by vol.)	1:1 Act.:Base (by vol.)	1:1 Act.:Base (by vol.)	1:1 Act.:Base (by vol.)
Recommended Dry Film Thickness (DFT) Per Coat		5-8 mils (125-200µ)	5-8 mils (125-200µ)	5-8 mils (125-200µ)	5-8 mils (125-200µ)
Wet Film to Achieve DFT (unthinned material)		6.5-10.5 mils (162.5-262.5µ)	7.5-12.0 mils (187.5-300µ)	7-11 mils (175-275µ)	7.5-12.0 mils (187.5-300.0µ)
Theoretical Coverage at 1 mil DFT (25µ)		1250-1300 sq. ft./gal. (30.8-32.0 m ² /l)	1045-1090 sq. ft./gal. (25.7-26.8 m ² /l)	1155-1200 sq. ft./gal. (28.4-29.5 m ² /l)	1075-1100 sq. ft./gal. (26.4-27.3 m ² /l)
Practical Coverage at Recommended DFT (assumes 15% material loss)		125-225 sq. ft./gal. (3.1-5.5 m ² /l)	100-175 sq. ft./gal. (2.5-4.3 m ² /l)	125-200 sq. ft./gal. (3.1-5.0 m ² /l)	115-190 sq. ft./gal. (2.8-4.7 m ² /l)
Induction Period		None required	30 min. (60 min. at 60-70°F)	None required	15 minutes
Pot Life^{†††}	2 gallons	2-4 hours at 70°F (21°C), 2 hours at 90°F (32°C)	1-2 hours at 90°F (32°C), <1 hour at 90°F (32°C)	2-4 hours at 70°F (21°C), 2 hours at 70°F (21°C)	3-5 hours at 60°F (15°C), 3 hours at 60°F (15°C)
	10 gallons	2 hours at 70°F (21°C)	<1 hour at 90°F (32°C)	2 hours at 70°F (21°C)	2 hours at 60°F (15°C)
Dry Times at 50% Relative Humidity	Tack-free	6-8 hours at 70°F (21°C)	12-24 hours at 50°F (10°C)	6-8 hours at 70°F (21°C)	16-20 hours at 40°F (5°C)
	Handle	6-12 hours at 70°F (21°C)	48-72 hours at 50°F (10°C)	8-14 hours at 70°F (21°C)	22-26 hours at 40°F (5°C)
	Recoat	16 hours to 1 year [†] 70°F (21°C)	72 hours to 1 year [†] 50°F (10°C)	16-72 hours at 70°F (21°C)	24 hours to 1 year [†] 70°F (21°C)
Dry Heat Resistance		300°F (149°C), Color may shift above 150°F (66°C)	300°F (149°C), 125°F (52°C); for immersion service Color may shift above 150°F (66°C)	300°F (149°C), Color may shift above 150°F (66°C)	300°F (149°C), Color may shift above 150°F (66°C)
Warning!		FLAMMABLE LIQUID AND VAPOR. HARMFUL IF INHALED. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY AFFECT THE BRAIN OR NERVOUS SYSTEM CAUSING DIZZINESS, HEADACHE OR NAUSEA. MAY CAUSE ALLERGIC SKIN REACTION. FOR INDUSTRIAL OR COMMERCIAL USE ONLY. REFER TO MATERIAL SAFETY DATA SHEET (MSDS) FOR ADDITIONAL INFORMATION.			

†† Activated material.

††† Pot life is affected by air temperature, amount of material activated and quantity of thinner used. Avoid activating large quantities at temperatures above 80°F (27°C). At temperatures above 90°F (32°C), the pot life of unthinned material in 5 gallon pails may be very short (less than one hour). In hot weather, thin activated material with 10% 160 Thinner or 165 Thinner for 9102 activated material. Final gloss maybe slightly higher for coating applied near the end of the potlife.

† If recoat time is extended, be sure the surface is clean and free of all contamination prior to coating. Actual environmental conditions may affect results, so a trial is suggested to ensure acceptable results.

The technical data and suggestions for use contained herein are correct to the best of our knowledge, and offered in good faith. The statements of this literature do not constitute a warranty, express, or implied, as to the performance of these products. As conditions and use of our materials are beyond our control, we can guarantee these products only to conform to our standards of quality, and our liability, if any, will be limited to replacement of defective materials. All technical information is subject to change without notice.



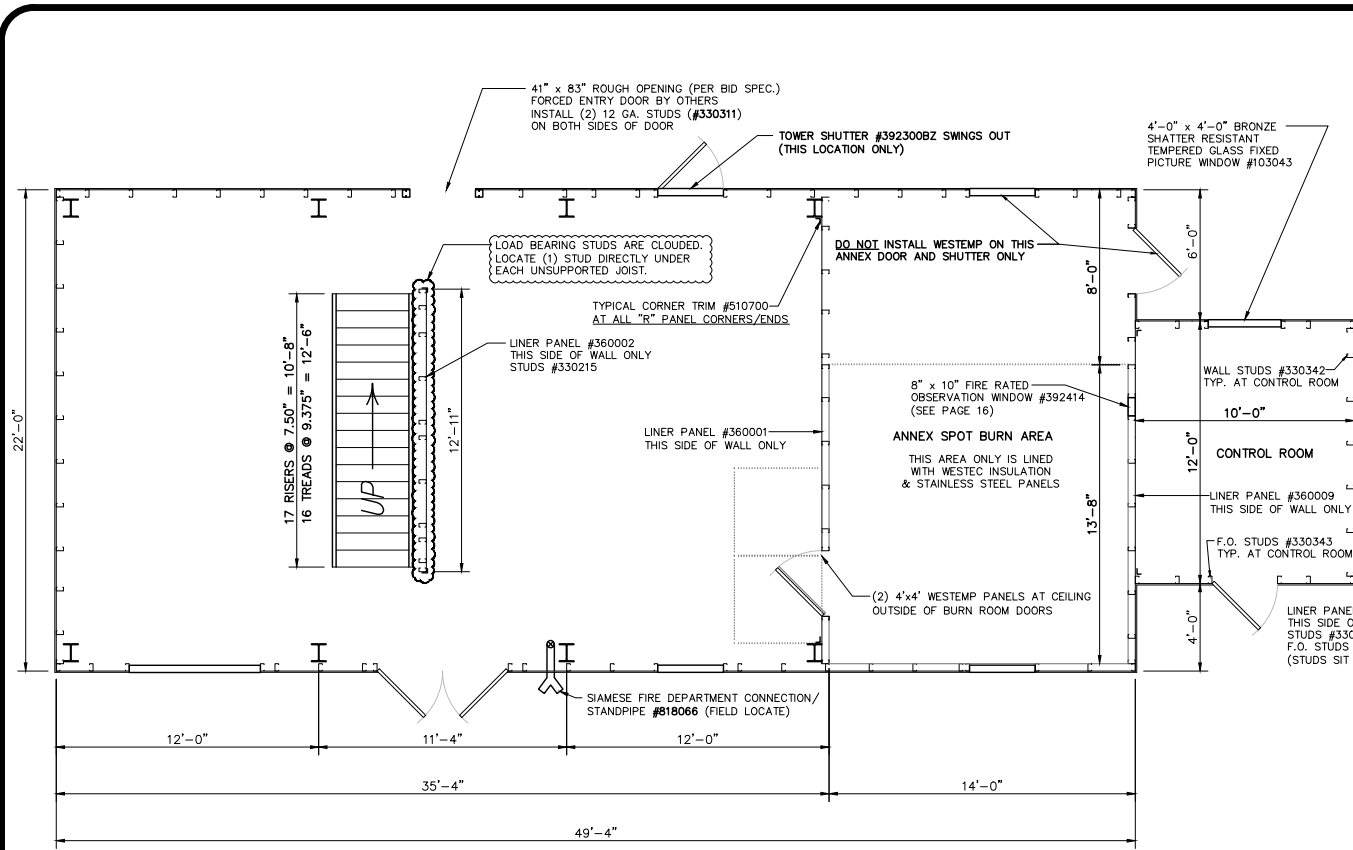
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Vernon Hills, Illinois 60061
An RPM Company

Phone: 877-385-8155
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Form: CS515
Rev.: 041014

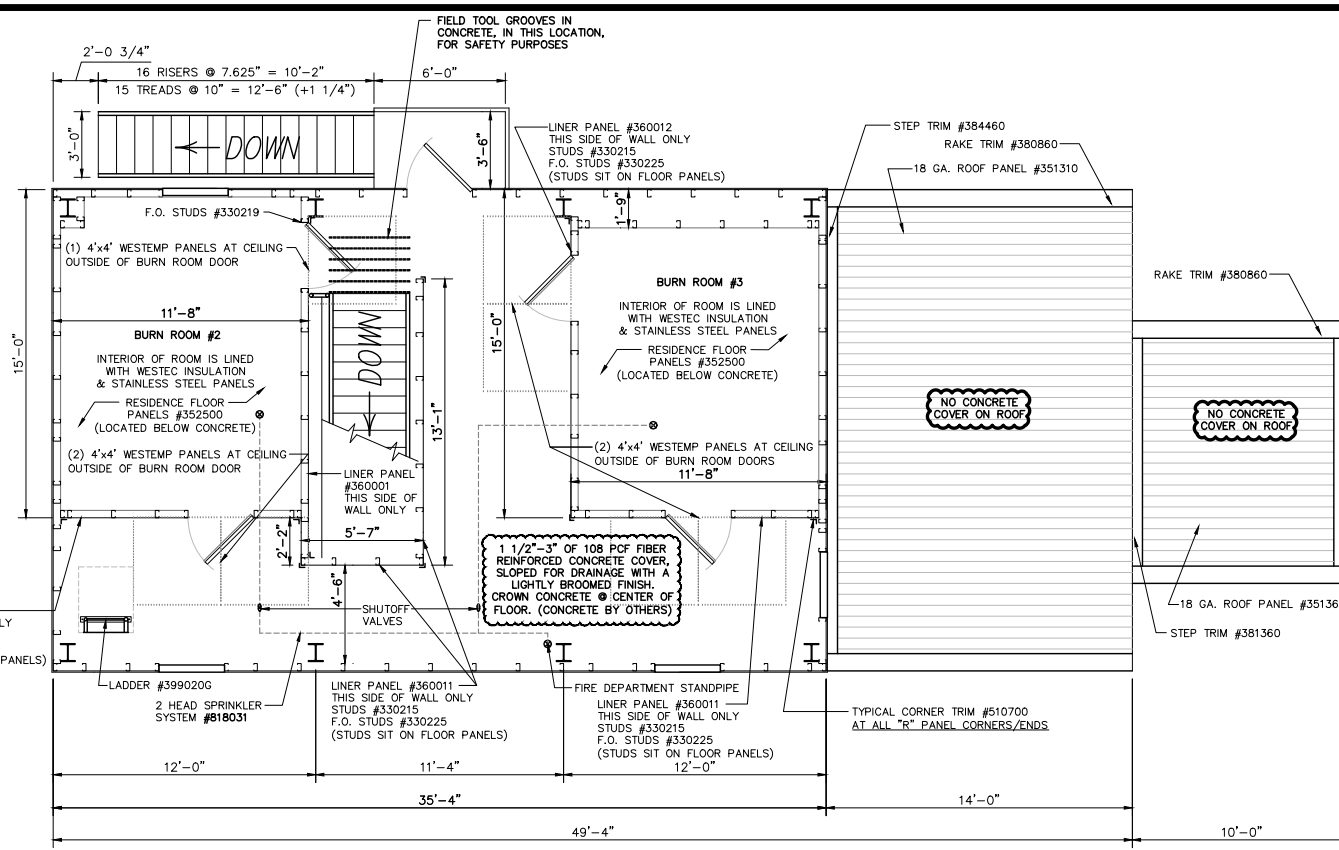


Appendix IV – Drawings – Fire Facilities Burn Room Details



FIRST FLOOR PLAN

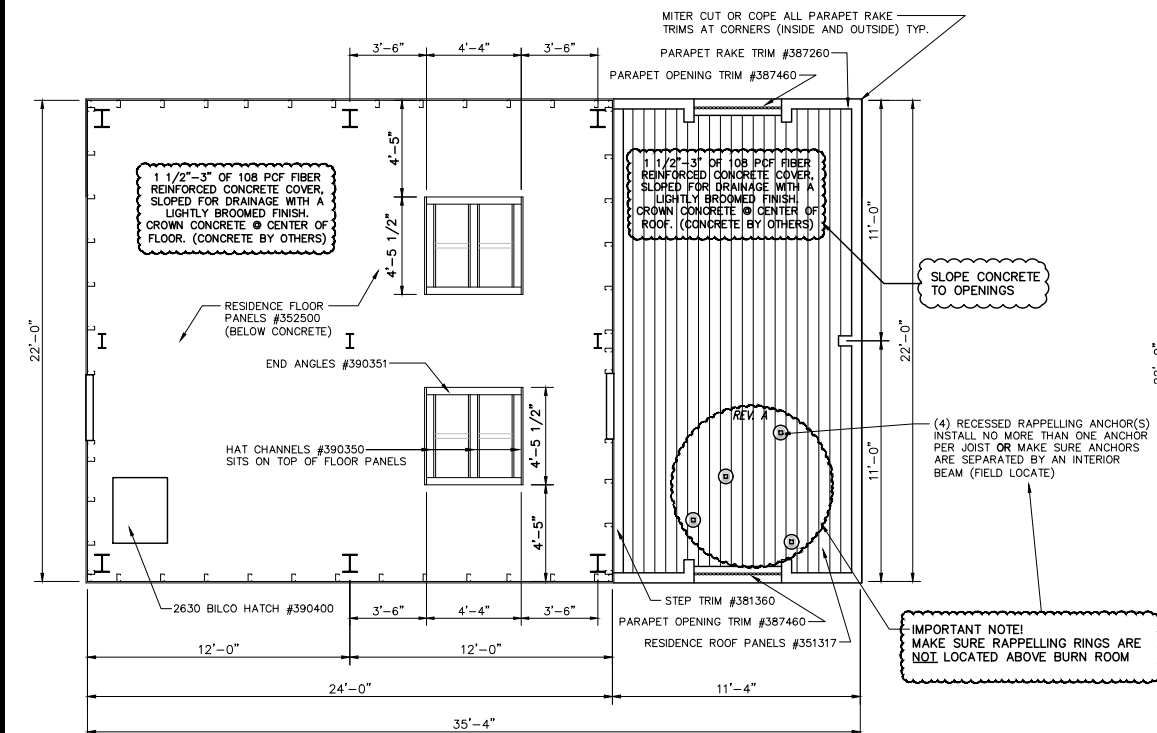
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SECOND FLOOR PLAN

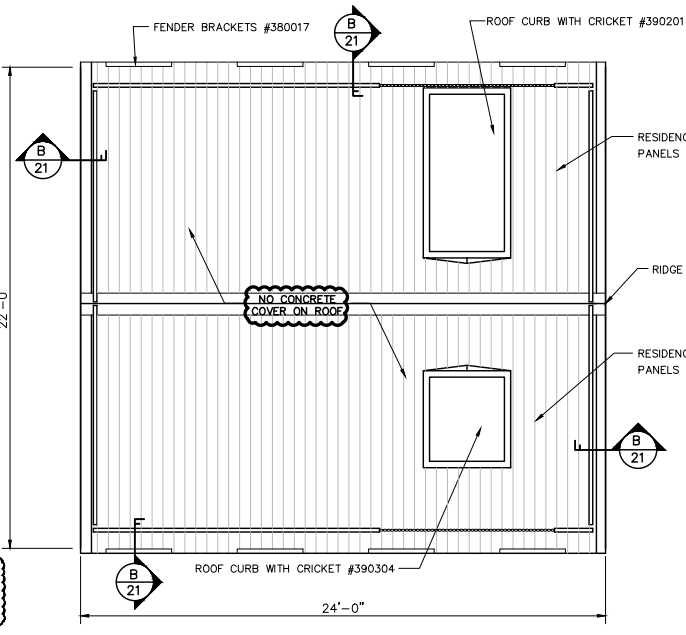
SCALE: 1/4" = 1'-0"

**NOTE: ALL SHUTTERS (#392100BZ) IN TOWER SWING IN, UNLESS OTHERWISE SHOWN
ALL SHUTTERS (#392300BZ) IN BURN ROOM AND ATTIC SWING OUT, UNLESS OTHERWISE SHOWN**



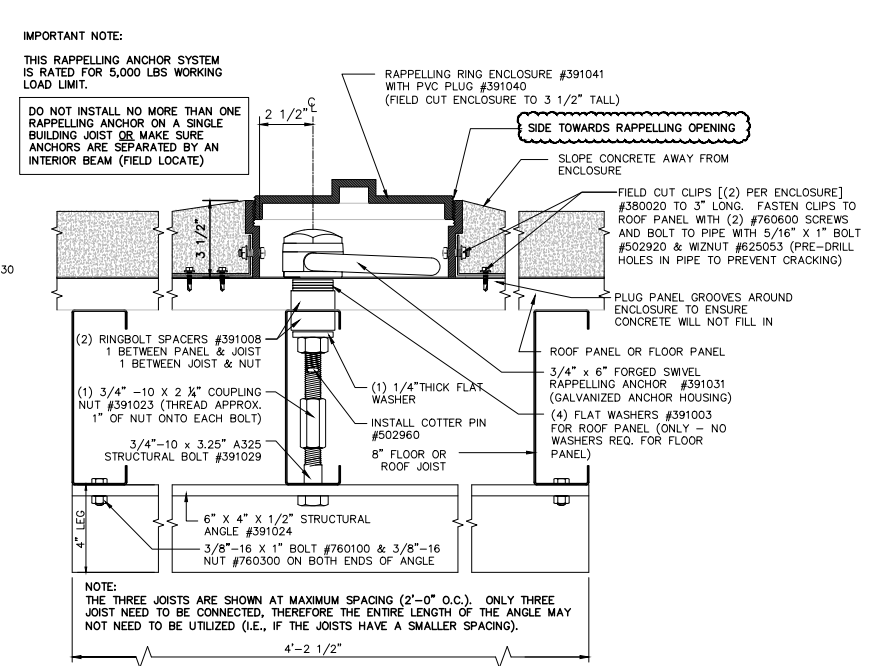
ATTIC FLOOR PLAN

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



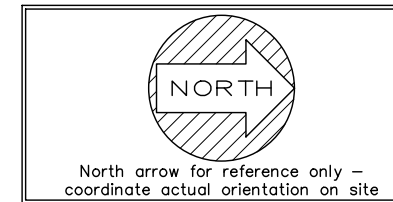
RESIDENCE ROOF PLAN

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



RECESSED RAPPELLING ANCHOR INSTALLATION DETAIL FOR CONCRETE

scale: 3" = 1'-0"



DESIGN LOADS:
 ROOF LIVE LOAD: 100 PSF
 FLOOR LIVE LOAD: 100 PSF
 WIND LOAD: 90 MPH; EXP C
 SEISMIC DESIGN CAT: C
 SITE CLASS: D
 DESIGN CODE: IBC 2006 & NFPA 1402

REVISIONS	by
REV. A 9/02/09 RAPPELLING RING NOTE	GWL

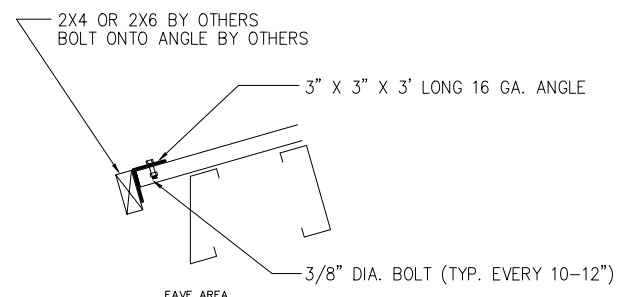
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WESCO MODEL WH-2
 CUSTOM
 CARTERSVILLE, GA

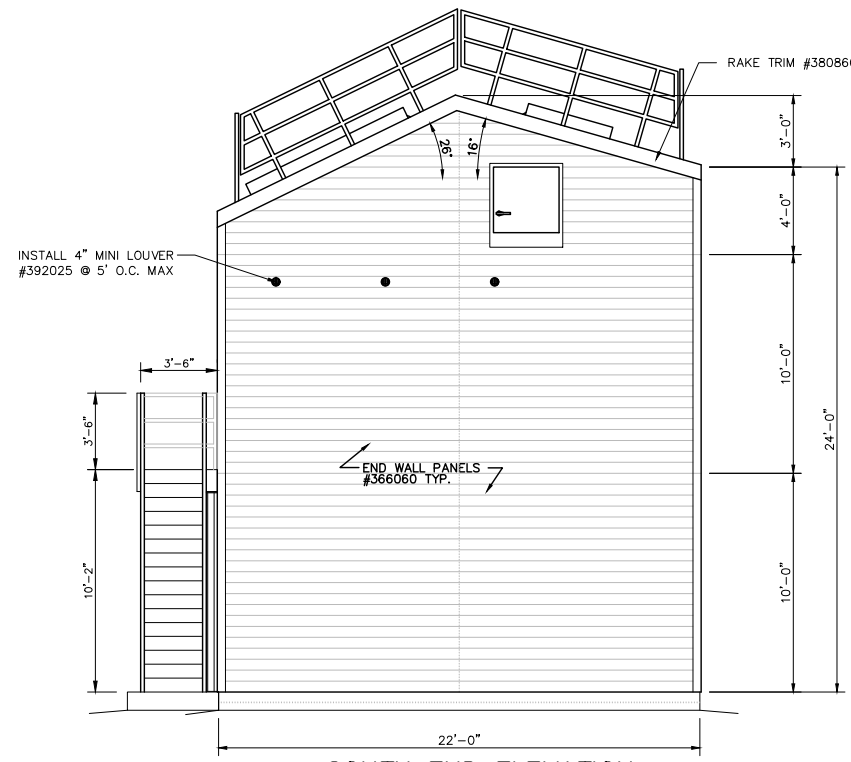
Job Description:
 Date: JULY 7, 2009
 Drawn by: GWL
 Checked by: SPW
 Scale: SHOWN
 Order No. FTE-509 \ 116324
 Sheet No.

REVISIONS	by



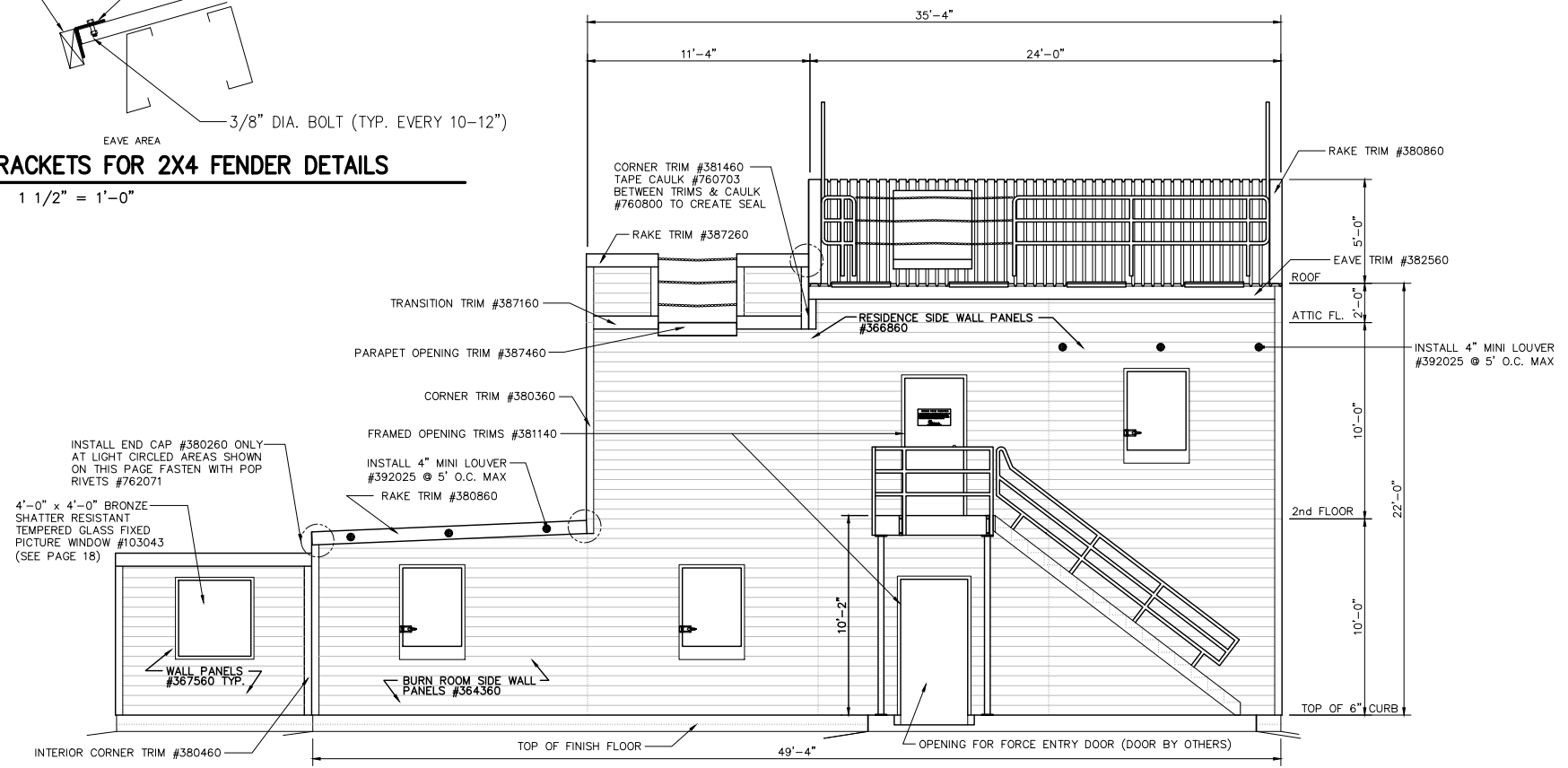
BRACKETS FOR 2X4 FENDER DETAILS

scale: 1 1/2" = 1'-0"



SOUTH END ELEVATION

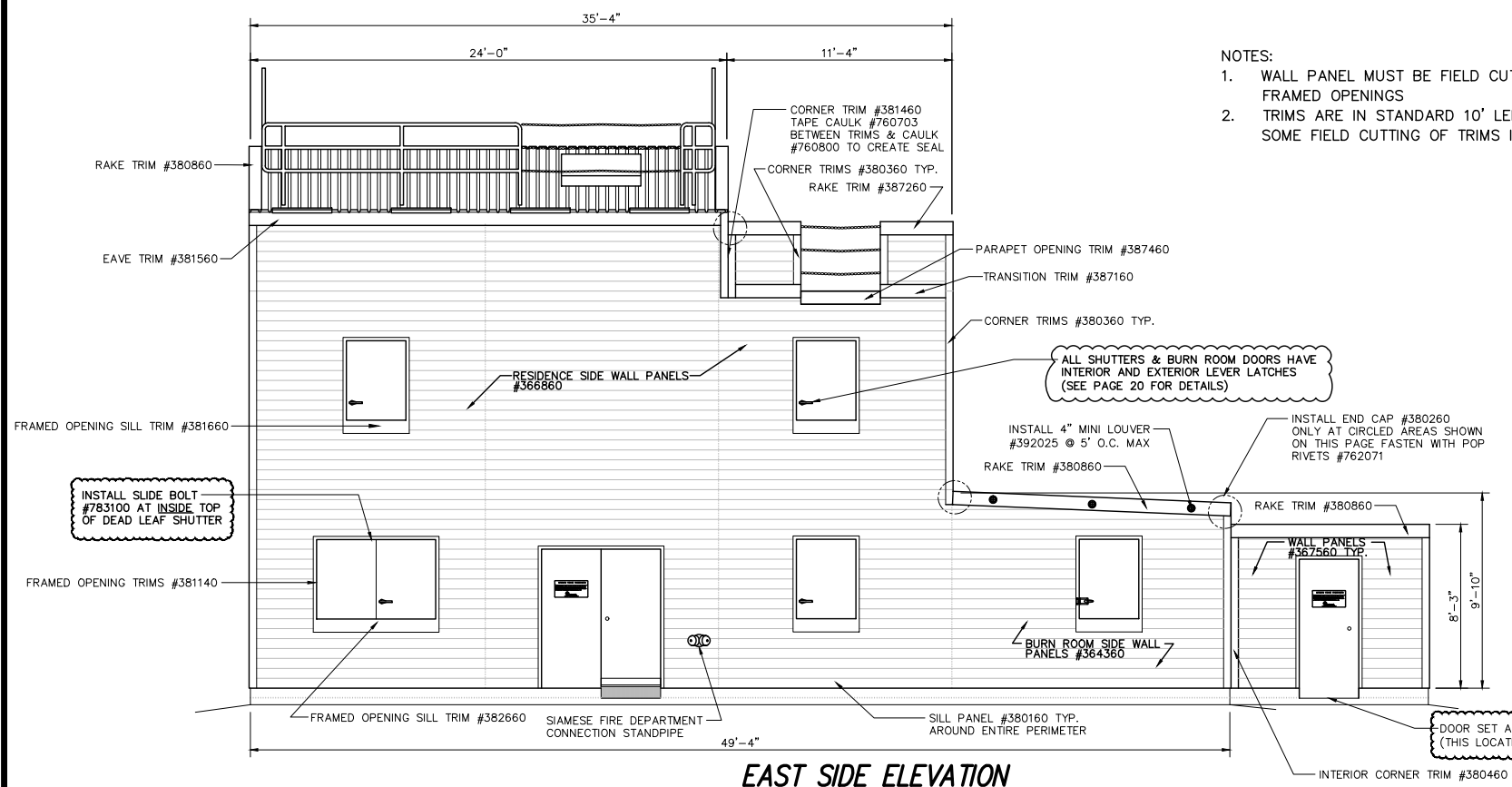
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WEST SIDE ELEVATION

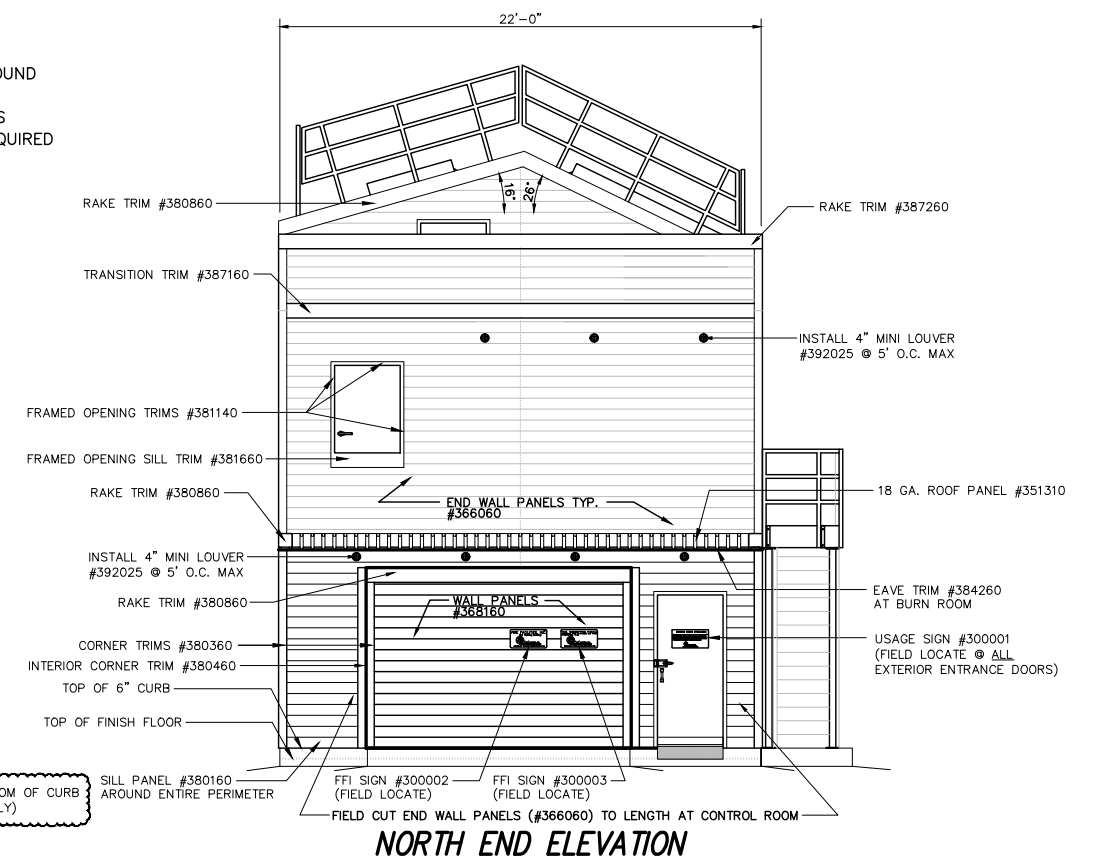
SCALE: 1/4" = 1'-0"

- NOTES:
1. WALL PANEL MUST BE FIELD CUT AROUND FRAMED OPENINGS
 2. TRIMS ARE IN STANDARD 10' LENGTHS SOME FIELD CUTTING OF TRIMS IS REQUIRED



EAST SIDE ELEVATION

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



NORTH END ELEVATION

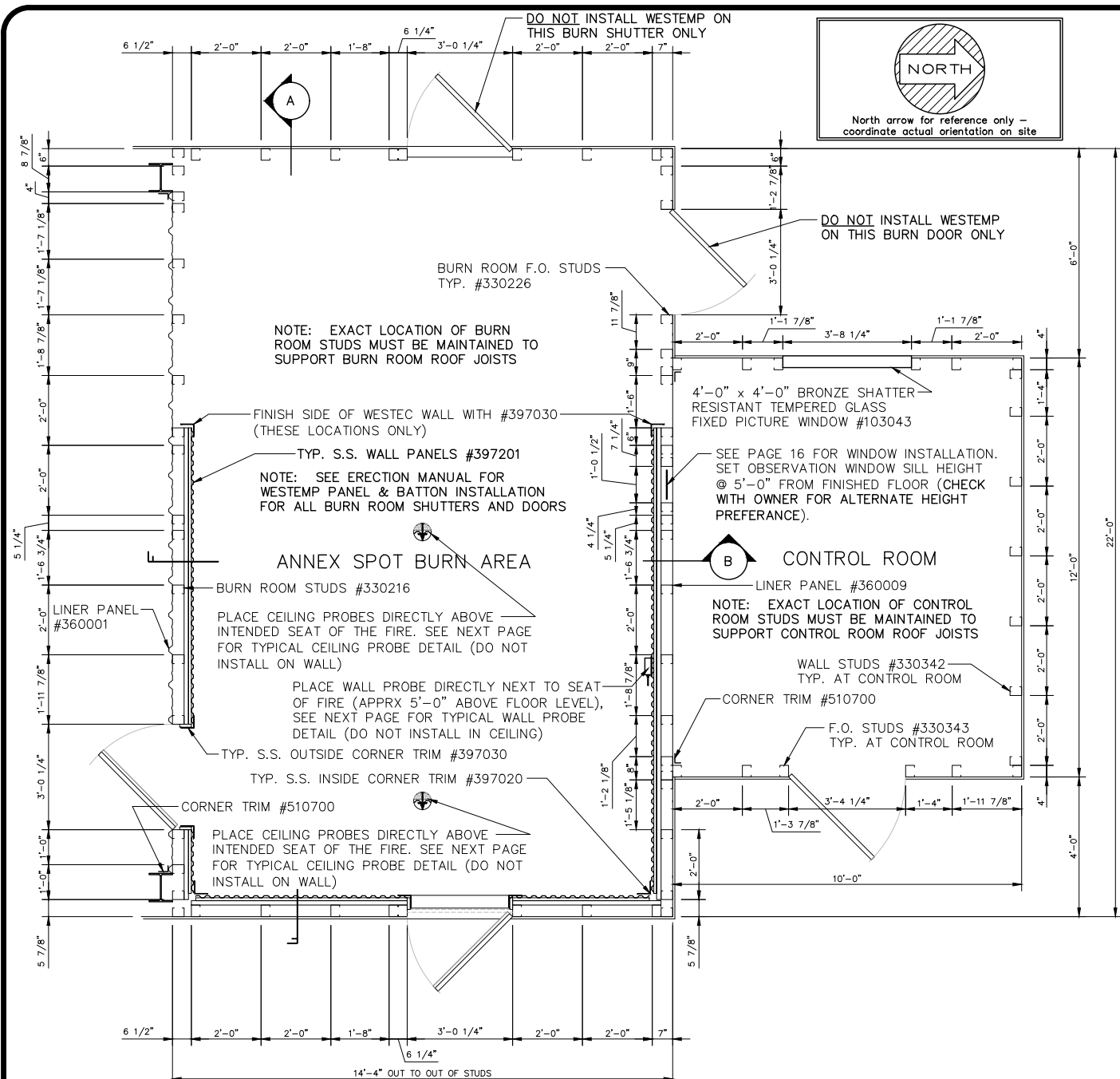
SCALE: 1/4" = 1'-0"

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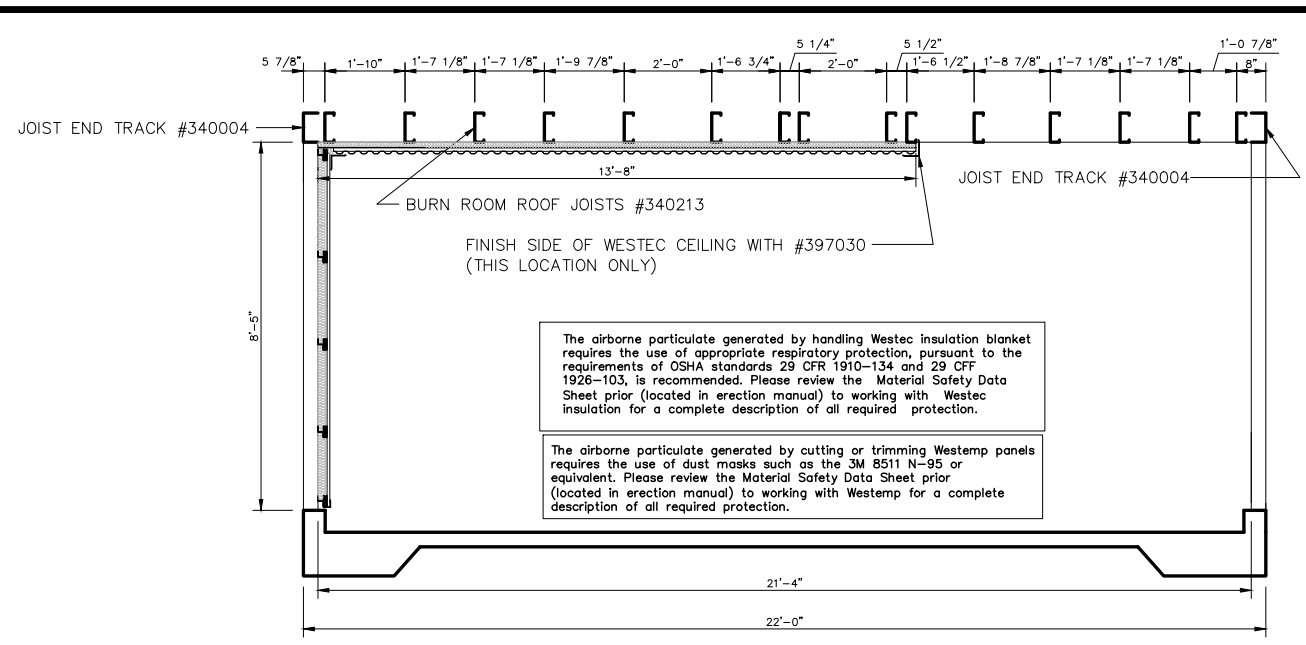
WESCO MODEL WH-2
 CUSTOM
 CARTERSVILLE, GA

Job Description:
 Date: JULY 7, 2009
 Drawn by: GWL
 Checked by: SPW
 Scale: SHOWN
 Order No. FTE-509 \ 116324
 Sheet No. ELEVATIONS



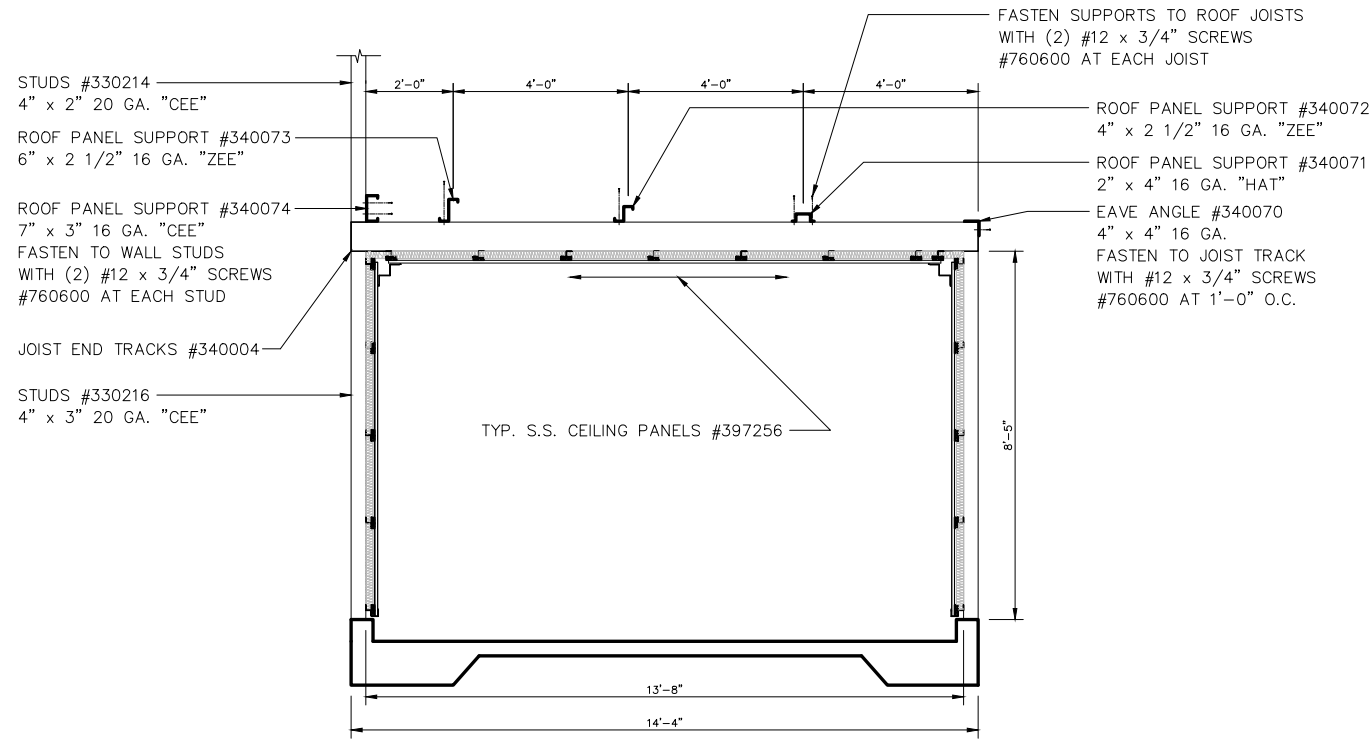
ANNEX SPOT BURN AREA PLAN & CONTROL ROOM STUD LOCATIONS

SCALE: 1/2" = 1'-0"



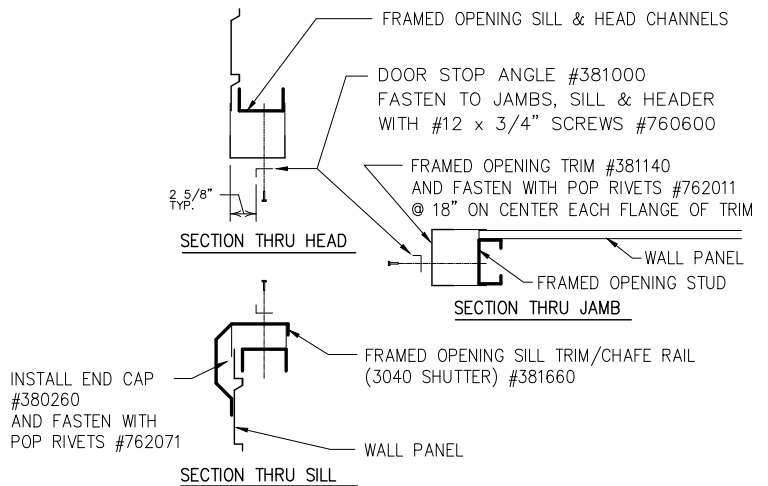
"A" SECTION THRU BURN ROOM

SCALE: 1/2" = 1'-0"



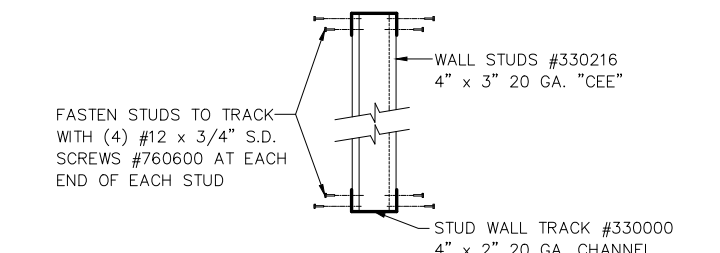
"B" SECTION THRU BURN ROOM ROOF

SCALE: 1/2" = 1'-0"



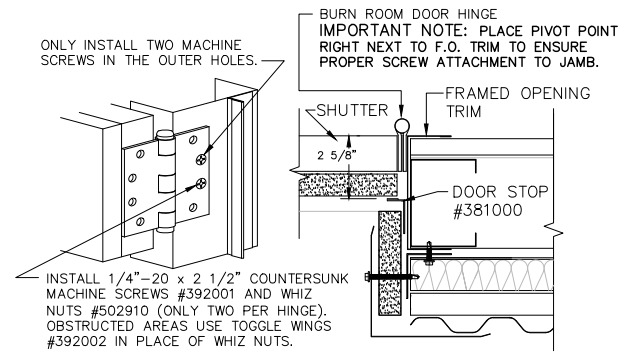
BURN RM. SHUTTER/SWING DOOR TRIM DETAILS

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



TYPICAL ANNEX/CONTROL ROOM STUD CONNECTION

scale: 1 1/2" = 1'-0"



SECTION THRU JAMB (BURN ROOM ONLY)

scale: 3" = 1'-0"

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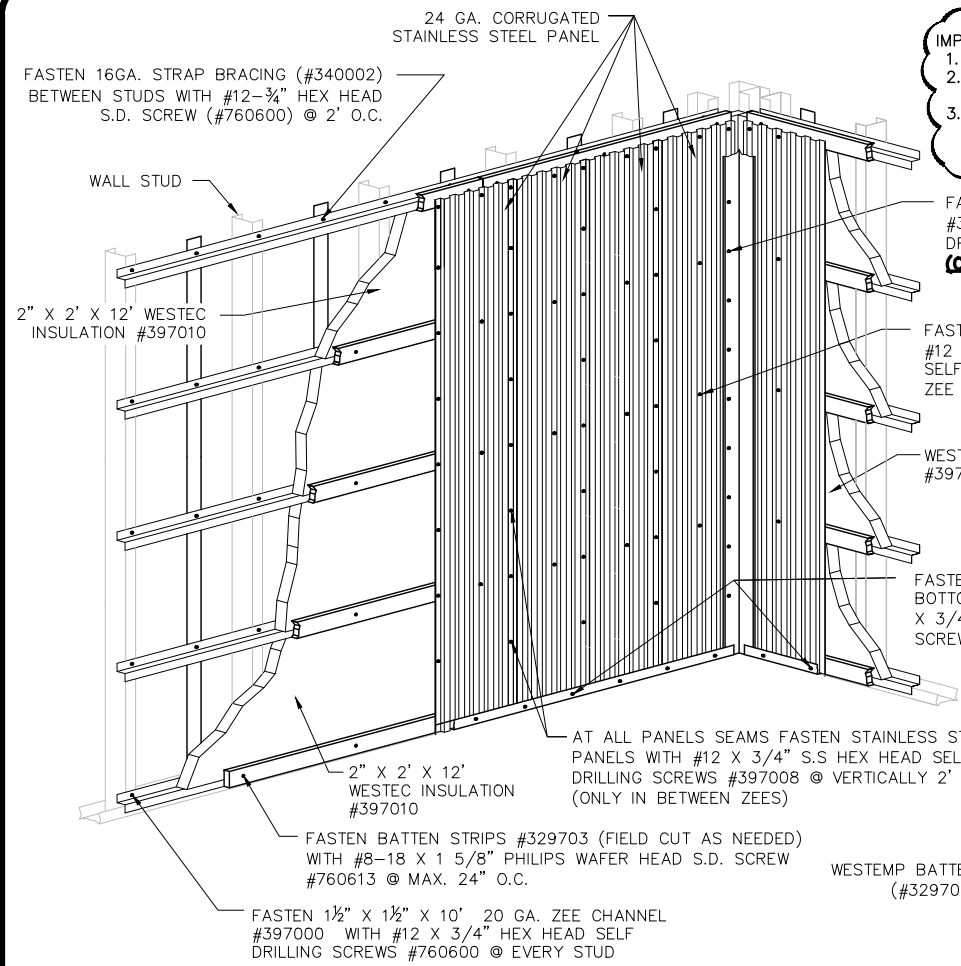
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WESCO MODEL WH-2
 CUSTOM
 CARTERSVILLE, GA

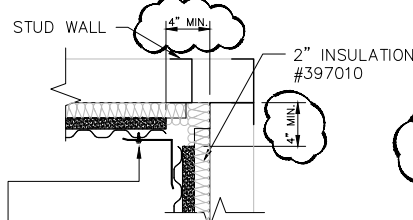
Job Description:
 Date: JULY 7, 2009
 Drawn by: GWL
 Checked by: SPW
 Scale: SHOWN
 Order No. FTE-509 \ 116324
 Sheet No.



ISOMERIC VIEW OF TYPICAL WALL & CORNER DETAIL

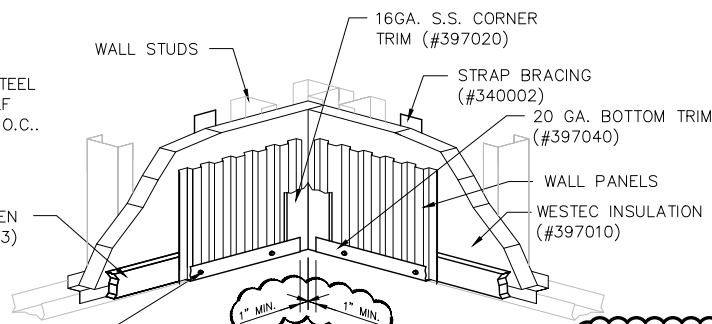
SCALE: 3/4" = 1'-0"

IMPORTANT NOTES:
 1. CEILING PANELS FASTEN EXACTLY THE SAME AS WALL PANELS.
 2. **ALL MIN GAPS SHOWN ON THIS PAGE MUST BE HELD TO ENSURE PANELS CAN EXPAND & CONTRACT TO PREVENT PREMATURE DAMAGE.**
 3. ZEE CHANNEL AND STRAP BRACING SHOULD ONLY BE FASTENED WITH **NON STAINLESS STEEL SCREWS (#760600)**. ONLY SCREWS DIRECTLY EXPOSED TO DIRECT FLAMES SHOULD BE STAINLESS STEEL (#397008 OR 397005)



PLAN VIEW OF TYPICAL WALL CORNER

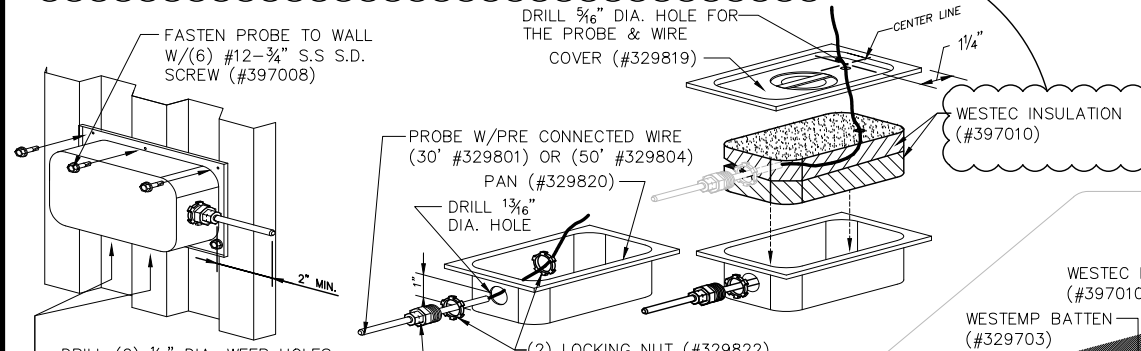
SCALE: 3" = 1'-0"



TYPICAL WALL BOTTOM CORNER DETAILS

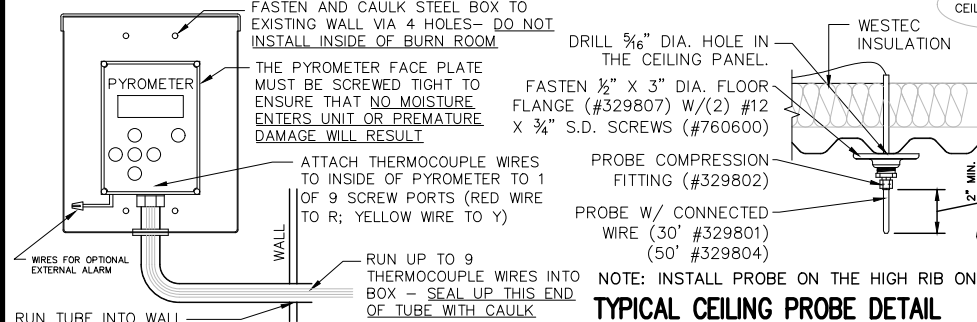
SCALE: 3" = 1'-0"

IMPORTANT NOTE:
 SANDWICH PROBE WITH 1" WESTEC INSULATION (PEEL 2" INSULATION #397010 IN HALF) HALF OF INSULATION ON BOTTOM OF PAN, PLACE WIRE AND COVER EXPOSED WIRE TOP WITH REMAINING HALF OF INSULATION THEN PLACE COVER.



TYPICAL WALL PROBE DETAIL (DO NOT INSTALL IN CEILING)

SCALE: 3" = 1'-0"

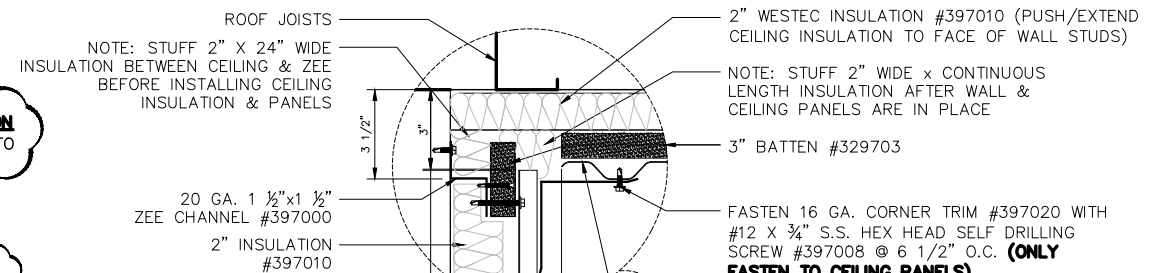


TYPICAL CEILING PROBE DETAIL (DO NOT INSTALL ON WALL)

SCALE: 3" = 1'-0"

TYPICAL WALL TOP CORNER DETAILS

SCALE: 3" = 1'-0"

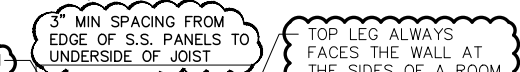


"A" SECTION THRU BURN ROOM

SCALE: 1/2" = 1'-0"

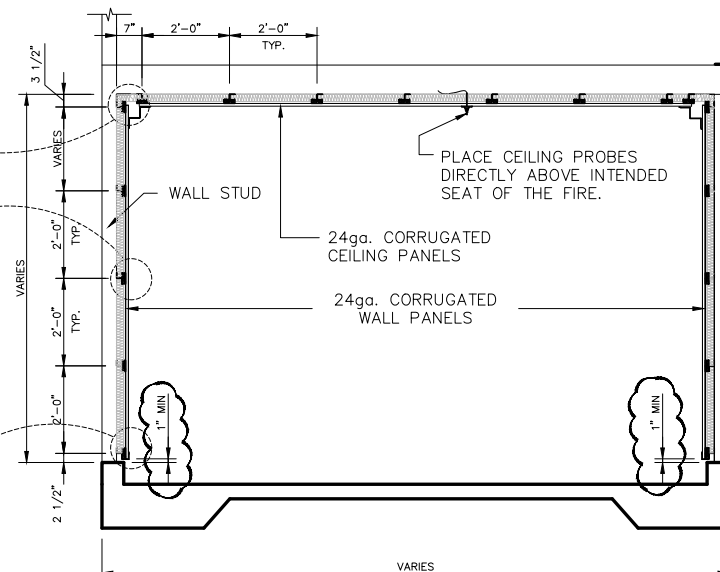
TYPICAL TRIM OVERLAP DETAIL

SCALE: 1 1/2" = 1'-0"



INSTALLATION PROCEDURE

1. INSTALL BURN SUPPORT ANGLE (#397015) AT THE CEILING/WALL CORNER BUT ONLY IN CORNERS WHERE A BOX TRIM WILL BE LOCATED (SEE SECTION "B" UPPER DETAILS)
2. INSTALL ALL (ZEE) CHANNELS FACING IN THE SAME DIRECTION, EXCEPT THE (ZEE) CHANNELS RIGHT NEXT TO THE WALLS. TOP LEG NEEDS TO FACE THE WALL (SEE DETAILS)
3. INSTALL ALL STRAP BRACING @ 2'-0" O.C. MAX. TO SUPPORT INSULATION ON WALLS & CEILING
4. INSTALL/RUN ALL THERMOCOUPLE WIRES.
5. INSTALL ALL INSULATION WALLS & CEILINGS.
6. INSTALL ALL 3" WESTEMP BATTENS.
7. INSTALL ALL WALL & CEILING PANELS.
8. INSTALL ALL 16ga. VERTICAL INSIDE CORNER TRIMS.
9. INSTALL ALL BOTTOM TRIM. (SEE DETAILS)
10. INSTALL ALL 16ga. HORIZONTAL INSIDE CORNER TRIMS. (SEE DETAILS)
11. INSTALL ALL 20ga. HORIZONTAL INSIDE BOX CORNER TRIM. (SEE DETAILS)
12. INSTALL ALL 16ga. OUTSIDE CORNER TRIM AROUND DOOR & WINDOWS.



"B" SECTION THRU BURN ROOM ROOF

SCALE: 1/2" = 1'-0"

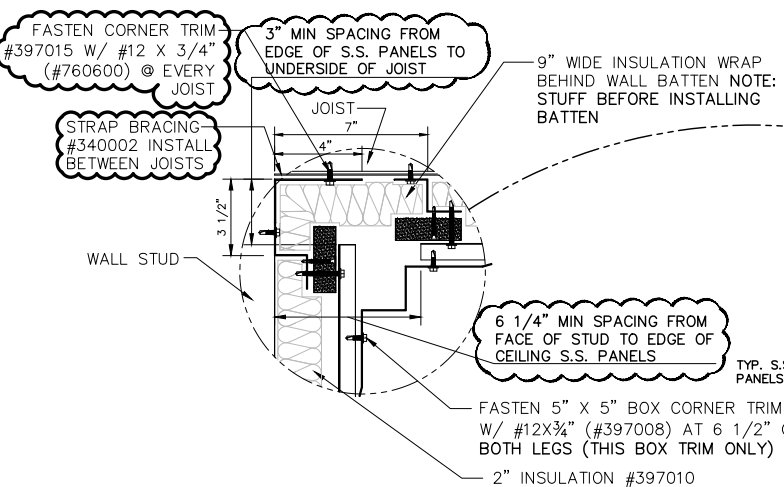
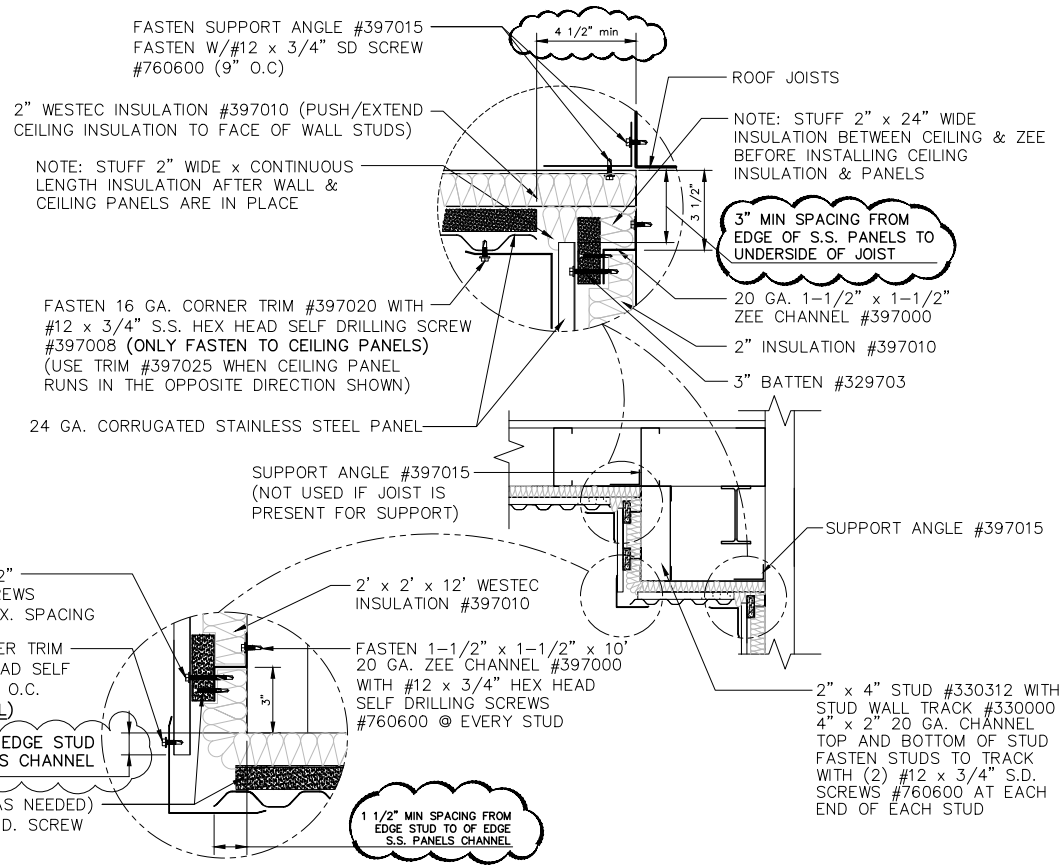
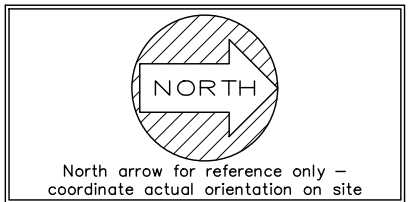
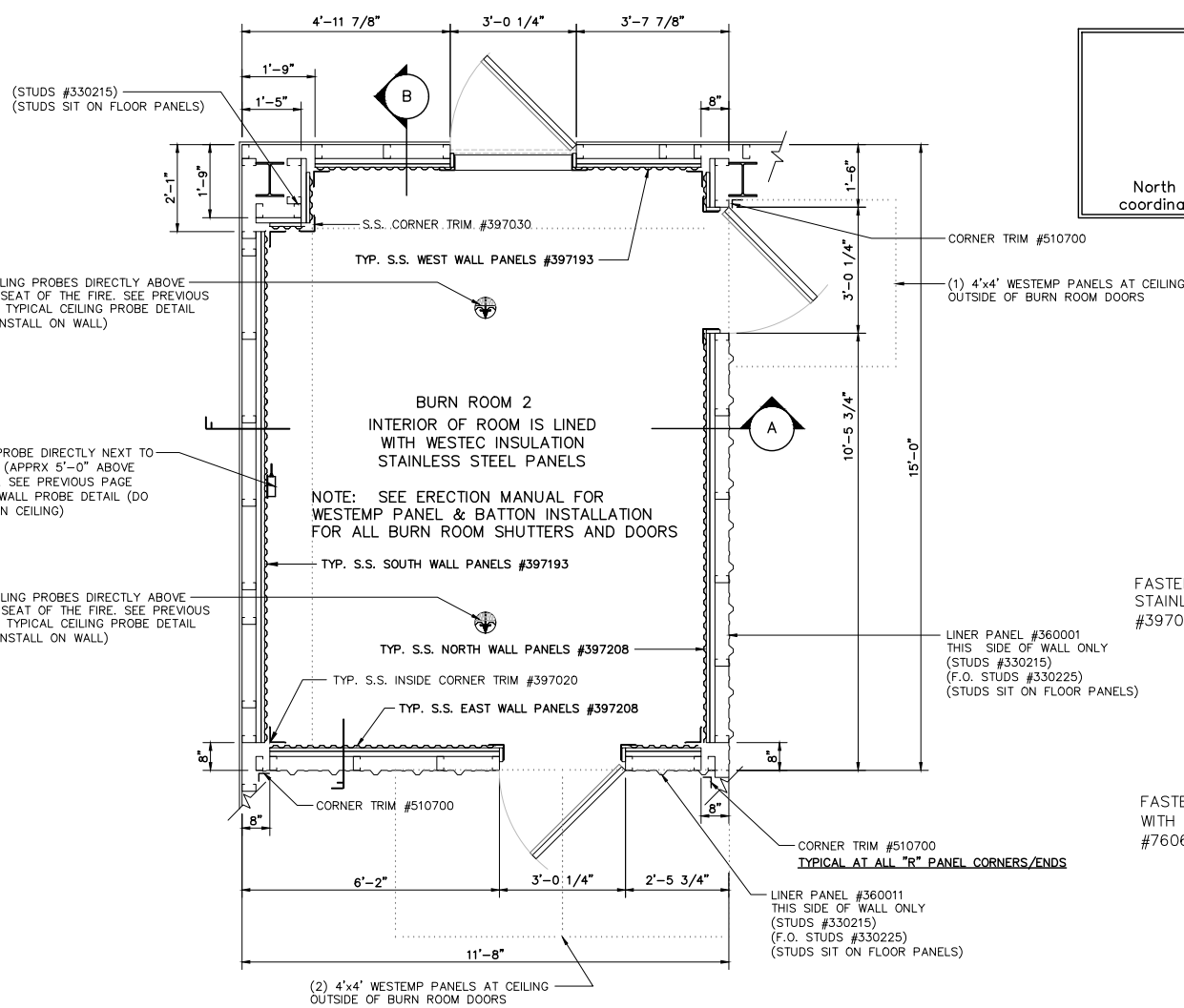
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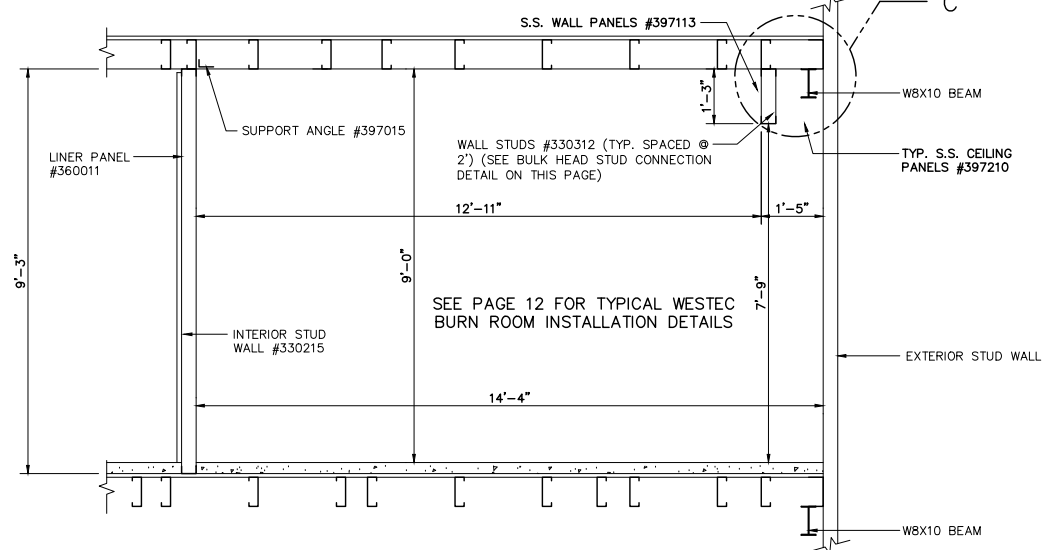
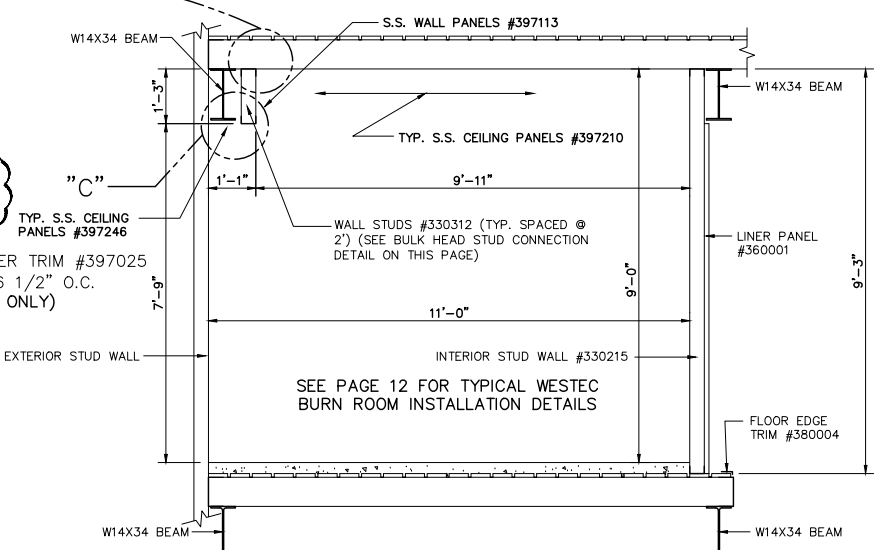
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Job Description	Scale
WESCO MODEL WH-2 CUSTOM CARTERSVILLE, GA	SHOWN
Date	JULY 7, 2009
Drawn by	GWL
Checked by	SPW
Order No.	FTE-509 \ 116324
Sheet No.	ANNEX BURN ROOM DETAILS



The airborne particulate generated by handling Westec insulation blanket requires the use of appropriate respiratory protection, pursuant to the requirements of OSHA standards 29 CFR 1910-134 and 29 CFR 1926-103, is recommended. Please review the Material Safety Data Sheet prior (located in erection manual) to working with Westec insulation for a complete description of all required protection.

The airborne particulate generated by cutting or trimming Westemp panels requires the use of dust masks such as the 3M 8511 N-95 or equivalent. Please review the Material Safety Data Sheet prior (located in erection manual) to working with Westemp for a complete description of all required protection.



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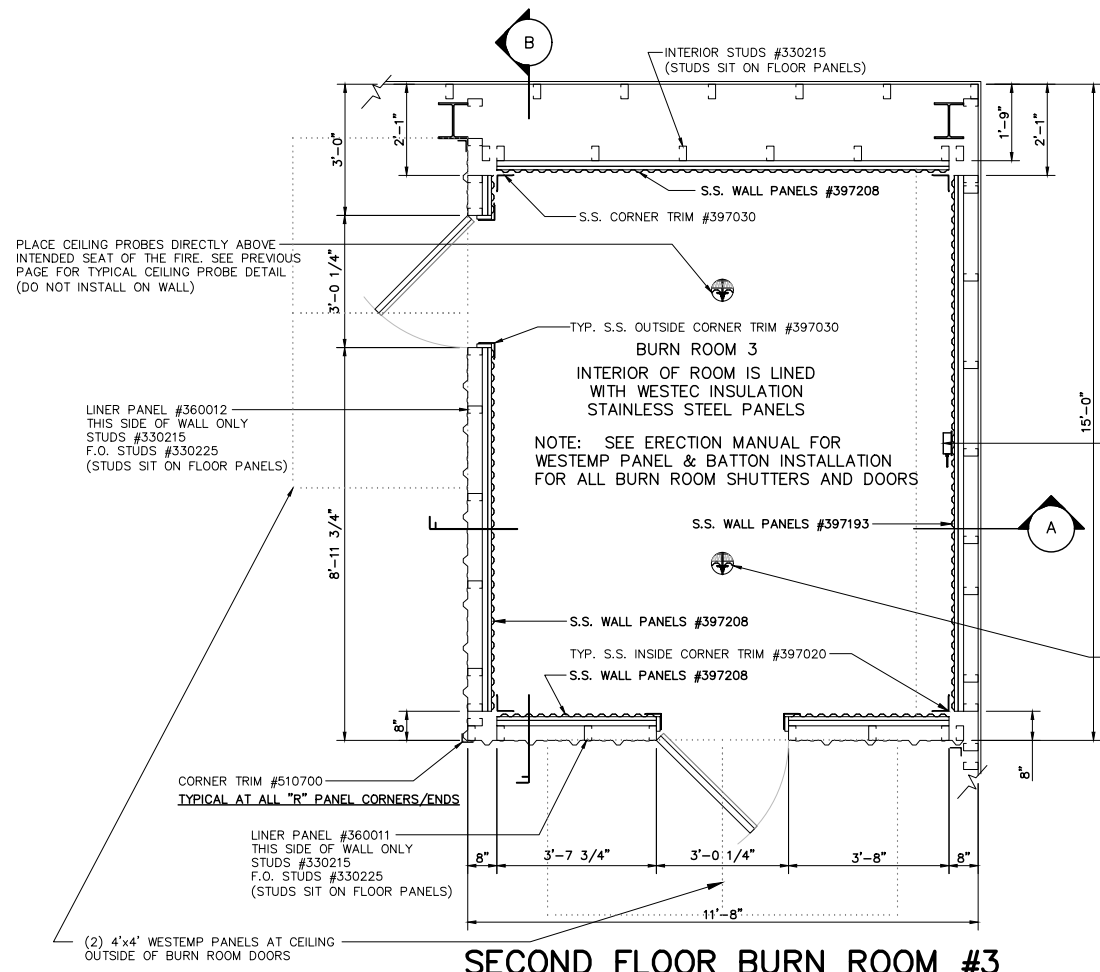
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WESCO MODEL WH-2
CUSTOM
CARTERSVILLE, GA

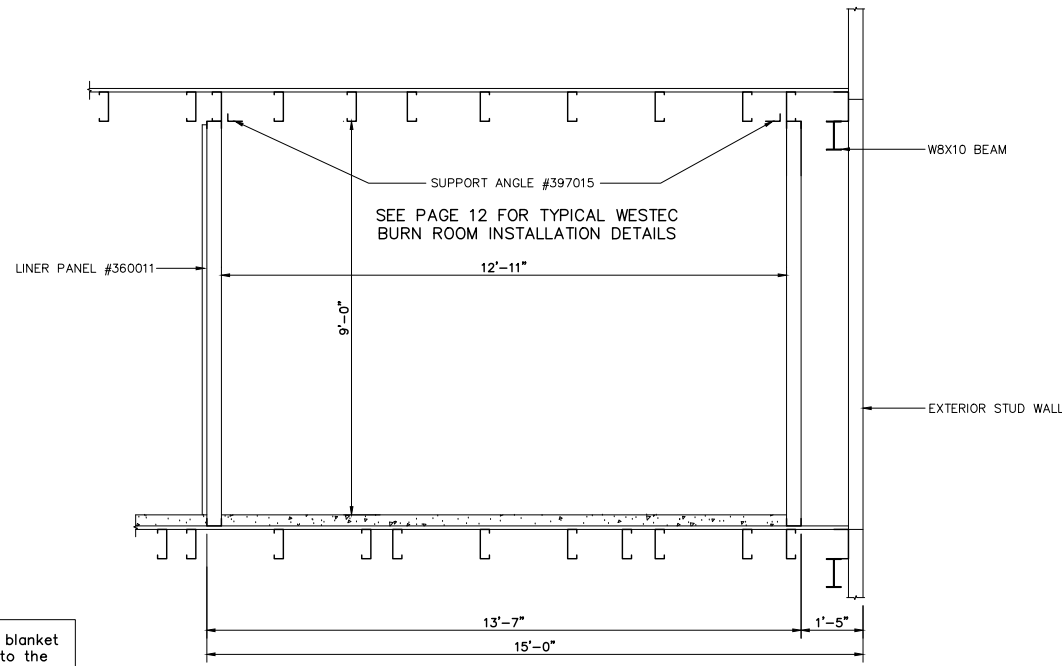
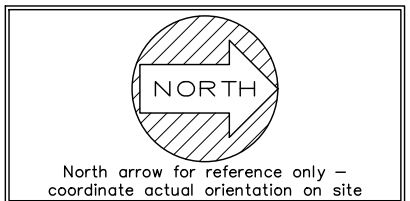
Job Description:
Date: JULY 7, 2009
Drawn by: GWL
Checked by:
Scale: SHOWN
Order No. FTE-509 \ #116324
Sheet No.

Sheet Title:
BURN ROOM DETAILS CONT.



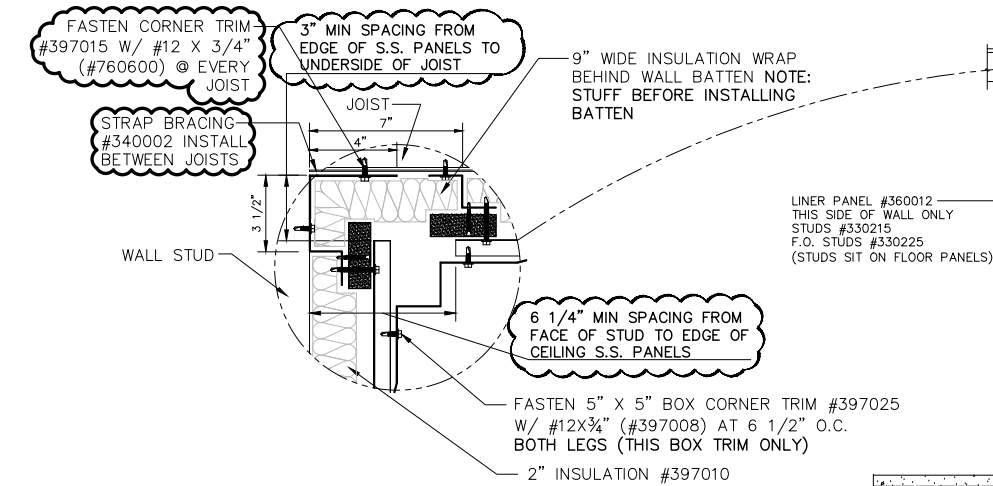
SECOND FLOOR BURN ROOM #3

scale: 1/2" = 1'-0"

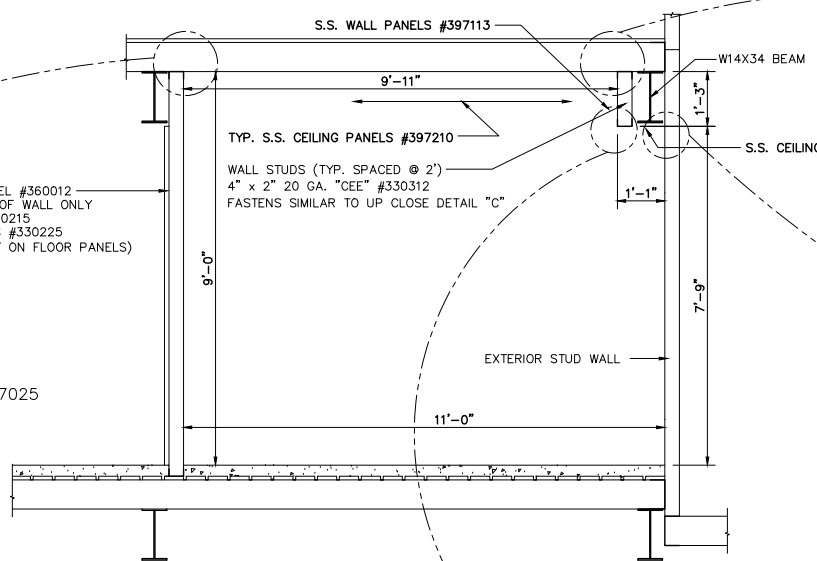


"B" SECTION THRU 2ND FLOOR BURN ROOM #3

scale: 1/2" = 1'-0"



BULK HEAD STUD CONNECTION

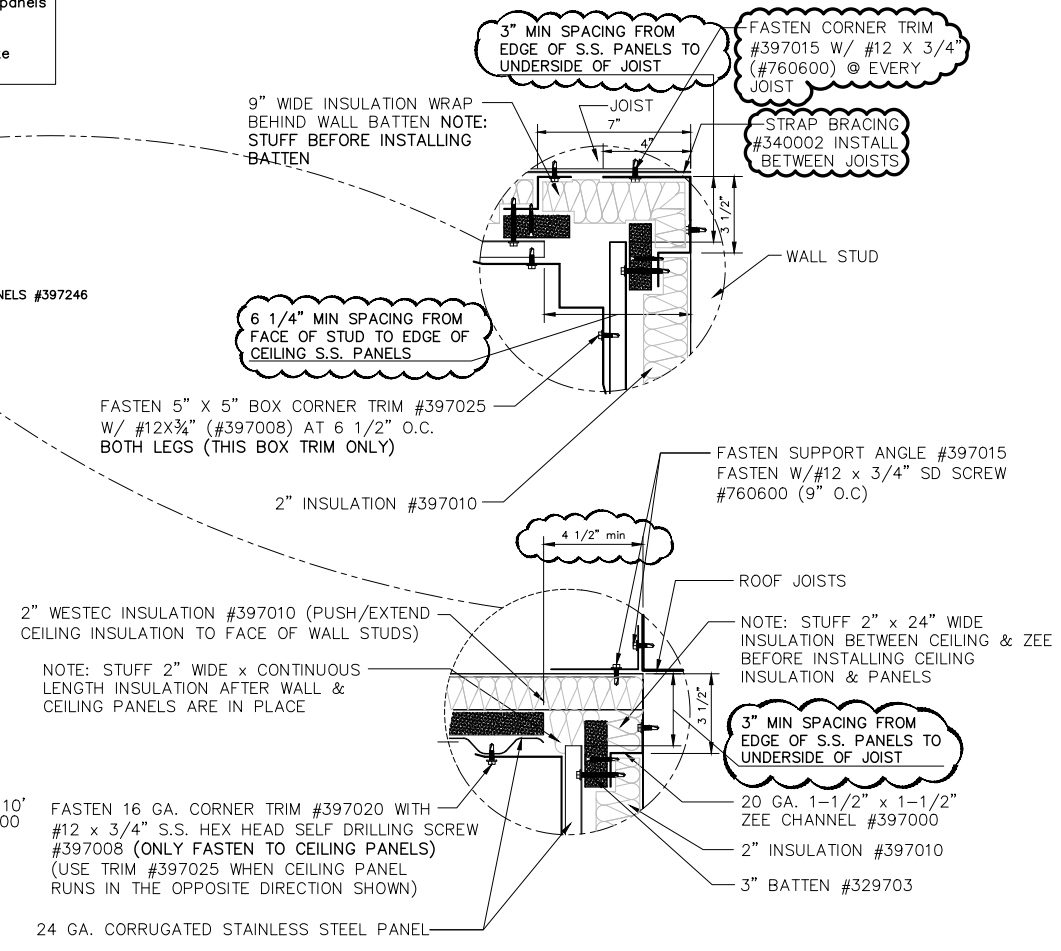


"A" SECTION THRU 2ND FLOOR BURN ROOM #3

scale: 1/2" = 1'-0"

The airborne particulate generated by handling Westec insulation blanket requires the use of appropriate respiratory protection, pursuant to the requirements of OSHA standards 29 CFR 1910-134 and 29 CFF 1926-103, is recommended. Please review the Material Safety Data Sheet prior (located in erection manual) to working with Westec insulation for a complete description of all required protection.

The airborne particulate generated by cutting or trimming Westemp panels requires the use of dust masks such as the 3M 8511 N-95 or equivalent. Please review the Material Safety Data Sheet prior (located in erection manual) to working with Westemp for a complete description of all required protection.

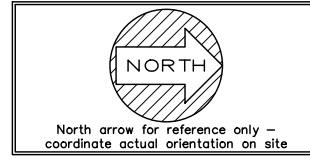
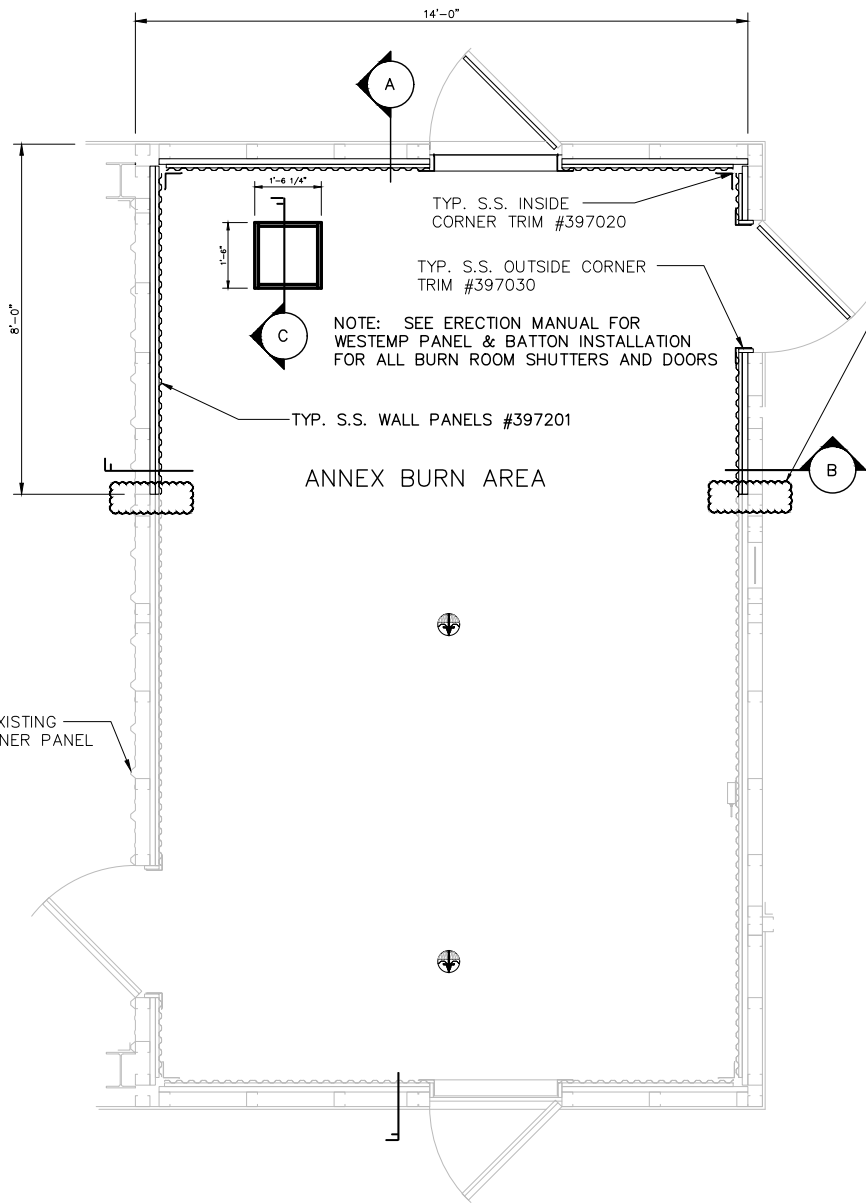


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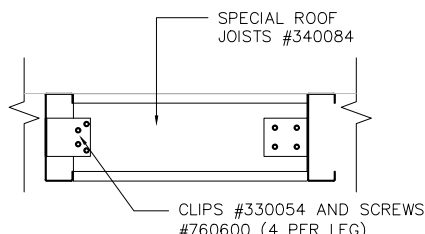
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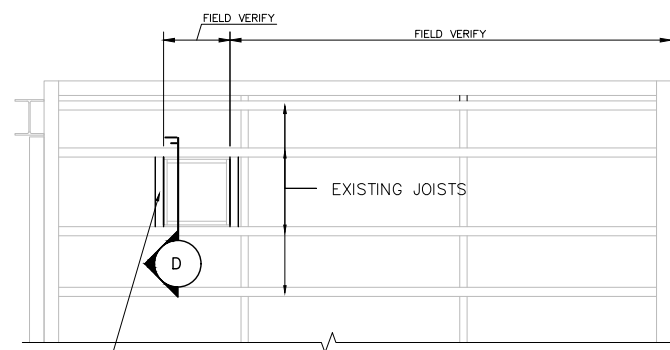
Job Description:	WESCO MODEL WH-2 CUSTOM CARTERSVILLE, GA
Date:	JULY 7, 2009
Drawn by:	GWL
Checked by:	SPW
Scale:	SHOWN
Order No.	FTE-509 \ #116324
Sheet No.	BURN ROOM 2 DETAILS



REMOVE EXISTING EDGE TRIM ON WALL AND CEILING + INSTEAD OVER LAP NEW PANEL ON EXISTING PANEL BY ONE CORRUGATION

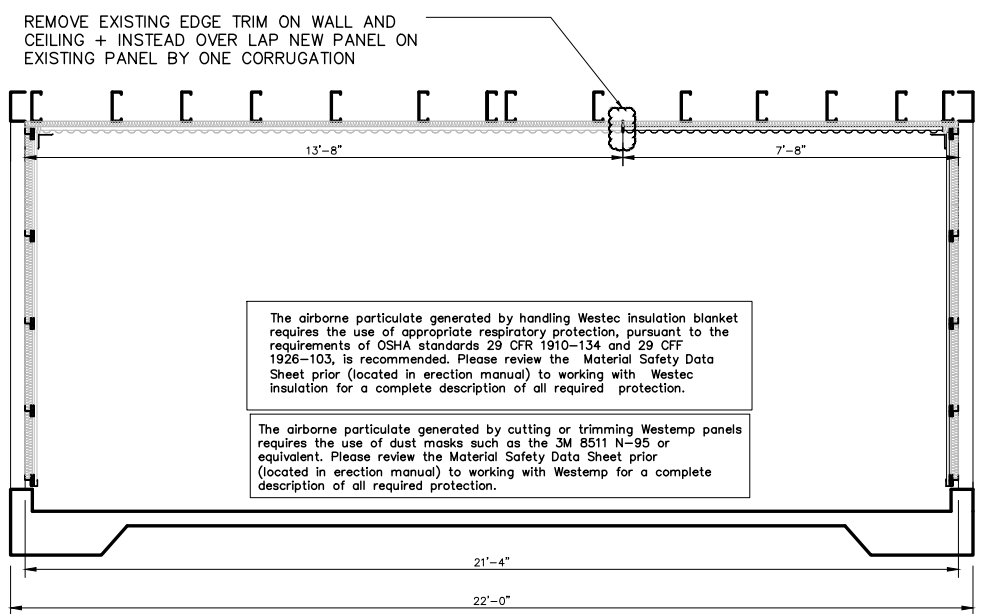


"D" SPECIAL ROOF JOISTS DETAIL



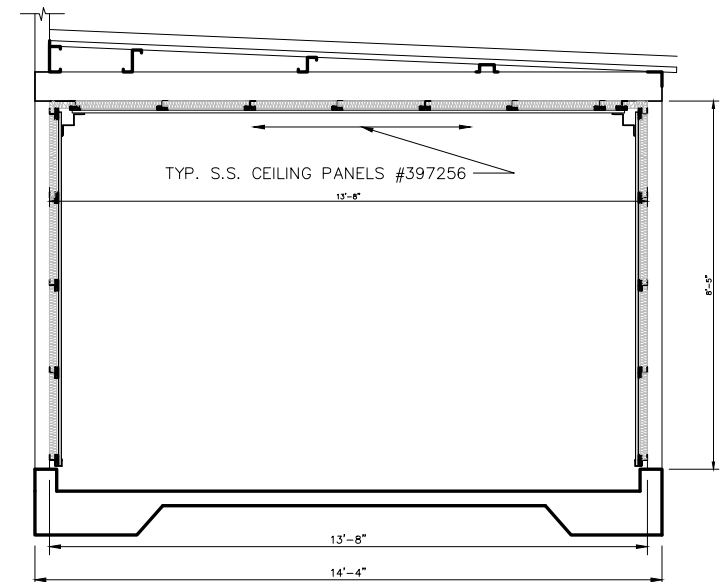
TYP. SPECIAL ROOF JOISTS #340084 FASTEN TO LONGITUDINAL JOISTS WITH CLIPS #330054 AND SCREWS #760600 (4 PER LEG OF ANGLE) (FIELD CUT MAY BE REQUIRED)

JOIST FRAMING DETAIL



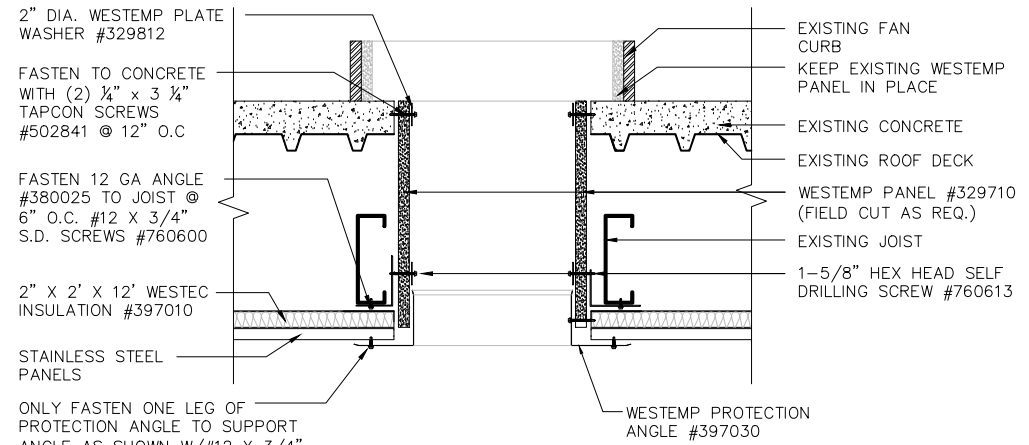
"A" SECTION THRU BURN ROOM

SCALE: 1/2" = 1'-0"



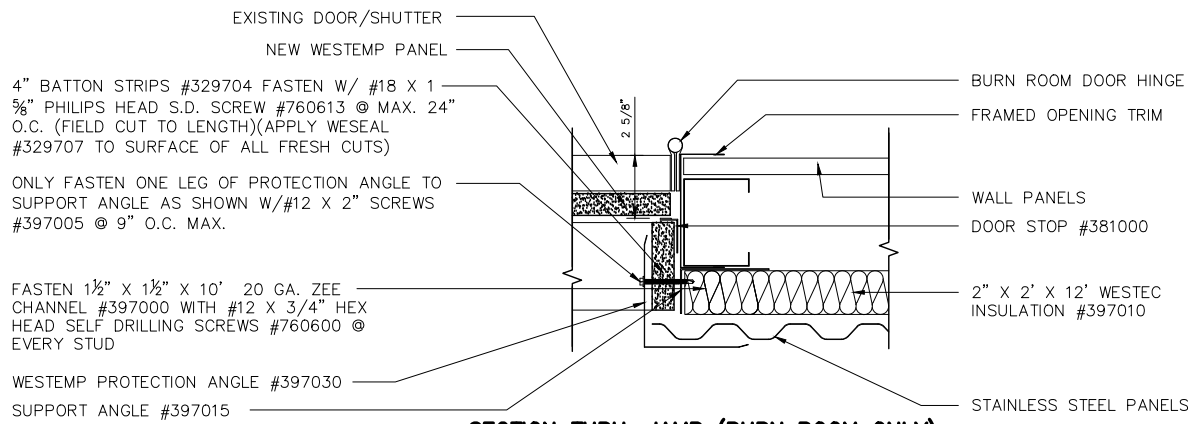
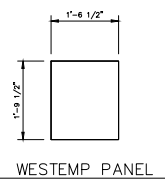
"B" SECTION THRU BURN ROOM ROOF

SCALE: 1/2" = 1'-0"



"C" SECTION THRU FAN CURB

SCALE: 1/2" = 1'-0"



SECTION THRU JAMB (BURN ROOM ONLY)

scale: 3" = 1'-0"

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WESCO MODEL WH-2

CUSTOM CARTERSVILLE, GA

Job Description: BURN ROOM DETAILS

Date: JULY 30, 2010

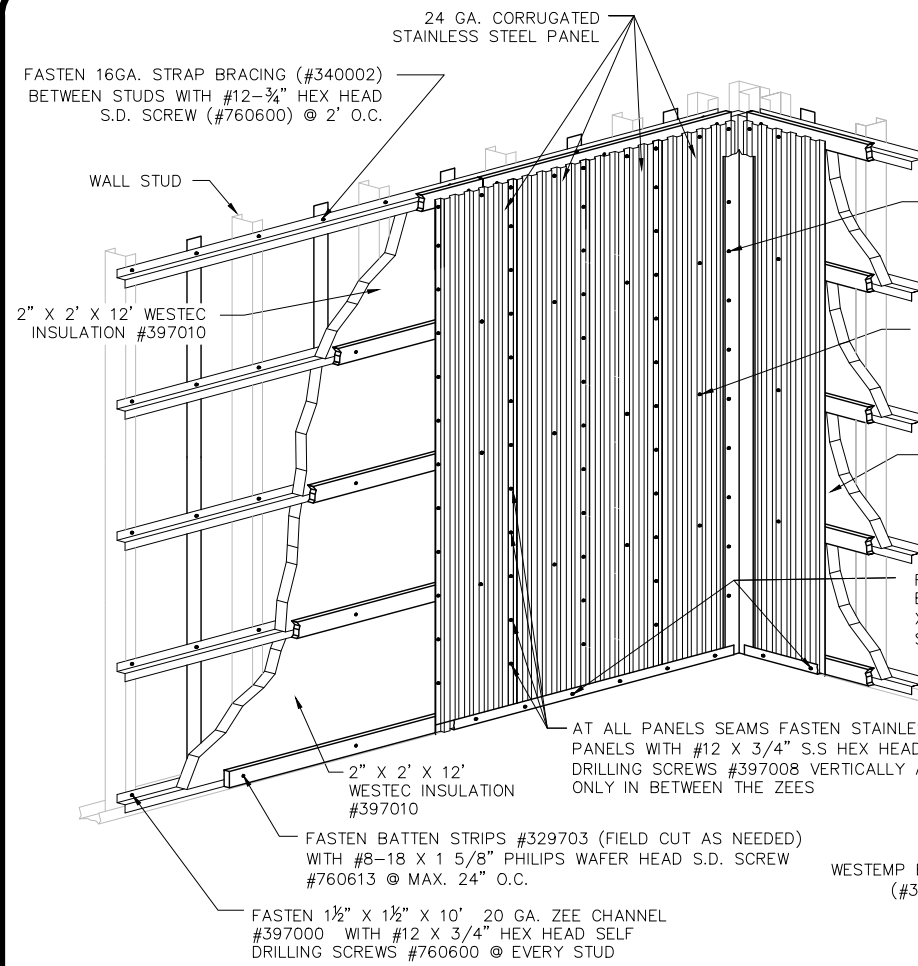
Drawn by: KAH

Checked by: SPW

Scale: SHOWN

Order No. WESTEC-115 / 127071

Sheet No.



ISOMERIC VIEW OF TYPICAL WALL & CORNER DETAIL

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

NOTE: WHEN FASTENING THE WESTEMP INSULATION PANEL, **DO NOT OVER TIGHTEN THE SCREWS.** A SLIGHT MOVEMENT OF THE PLATE WASHER UNDER THE SCREW HEAD IS DESIRABLE.

WASHER PLATE #329812
 PREDRILL 1/2" DIA. HOLES (9 PLACES)
 FASTEN WESTEMP & PLATES WITH #8-18 X 1-5/8" HEX HEAD SELF DRILLING SCREW #760613

48x36 WESTEMP PANEL #329701 (FIELD CUT PANEL IF NECESSARY)

48x36 WESTEMP PANEL #329701 (FIELD CUT PANEL IF NECESSARY)

SHUTTER WESTEMP

DOOR WESTEMP

FASTEN WESTEMP & PLATES WITH #8-18 X 1-5/8" HEX HEAD SELF DRILLING SCREW #760613

2" DIA. WESTEMP PLATE WASHER #329812

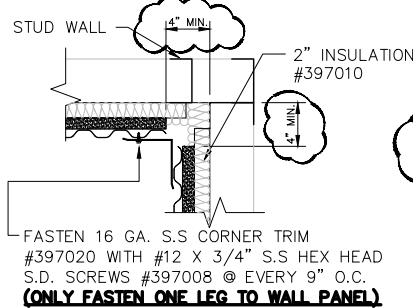
NOTE: INSTALL WASHER WITH SMOOTH EDGE DOWN

NOTE: A SUPPLY OF WESEAL IS PROVIDED. THIS NEEDS TO BE APPLIED TO ANY RAW EDGES EXPOSED AS THE RESULT OF CUTTING OR TRIMMING THE WESTEMP PANELS.

WESTEMP INSTALLATION ON SHUTTERS AND DOORS

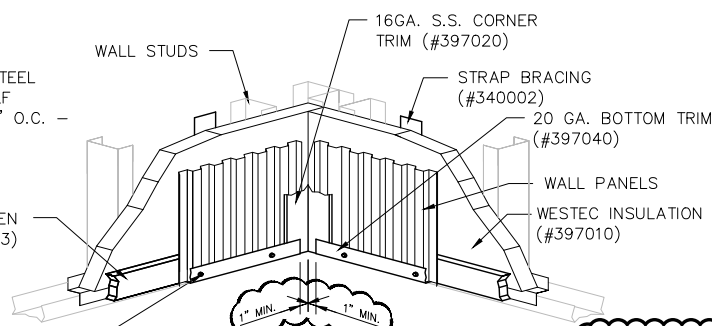
IMPORTANT NOTES:
 1. CEILING PANELS FASTEN EXACTLY THE SAME AS WALL PANELS.
 2. **ALL MIN GAPS SHOWN ON THIS PAGE MUST BE HELD TO ENSURE PANELS CAN EXPAND & CONTRACT TO PREVENT PREMATURE DAMAGE.**
 3. ZEE CHANNEL AND STRAP BRACING SHOULD ONLY BE FASTENED WITH **NON STAINLESS STEEL SCREWS (#760600)**. ONLY SCREWS DIRECTLY EXPOSED TO DIRECT FLAMES SHOULD BE STAINLESS STEEL (#397008 OR 397005)

NOTE: STUFF 2" X 24" WIDE INSULATION BETWEEN CEILING & ZEE BEFORE INSTALLING CEILING INSULATION & PANELS



PLAN VIEW OF TYPICAL WALL CORNER

SCALE: 3" = 1'-0"



TYPICAL WALL BOTTOM CORNER DETAILS

SCALE: 3" = 1'-0"

TRIMS AT THE TOP OF WALL PANELS ARE EITHER BOX OR 90 DEGREES AS SHOWN BELOW - **RULES OF THUMB: 1) ENDS OF CEILING PANELS ONLY USE BOX CORNER TRIMS 2) SIDES OF CEILING PANELS ONLY USE 90 CORNER TRIMS**

FASTEN 5" X 5" BOX CORNER TRIM #397025 W/ #12X3/4" (#397008) @ 6 1/2" O.C. BOTH LEGS (THIS BOX TRIM ONLY)

FASTEN 16GA. STRAP BRACING (#340002) IN BETWEEN JOIST WITH #12-3/4" S.D. SCREW (#760600) @ 2' O.C. TO TOP CORNER ANGLES AND ZEE CHANNELS

FASTENING CEILING PANEL SEE WALL & CORNER DETAILS FOR PATTERNS

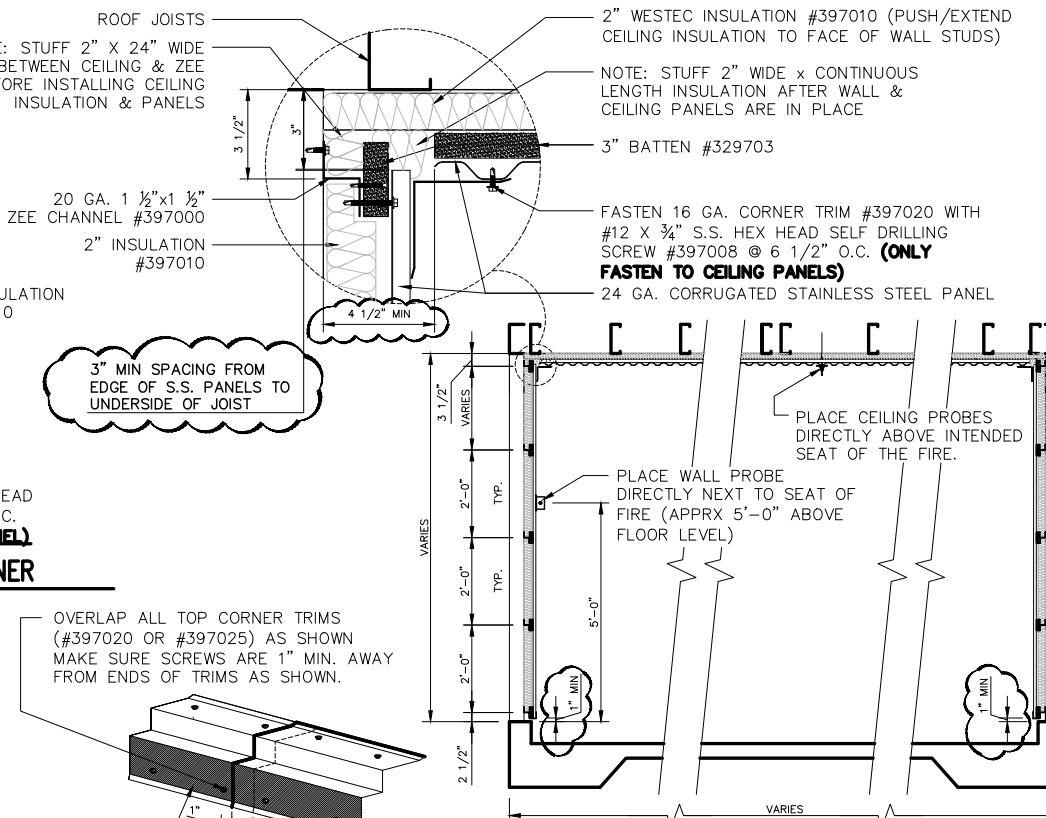
FASTEN 5" X 5" BOX CORNER TRIM (#397025) FASTEN W/ #12 X 3/4" S.S. HEX HEAD S.D. (#397008) @ 6 1/2" O.C. ON BOTH LEGS

FASTEN 16 GA. STAINLESS STEEL 90 DEGREE CORNER TRIM (#397020) WITH #12 X 3/4" S.S. HEX HEAD SELF DRILLING SCREWS (#397008) @ EVERY 6 1/2" O.C. (ONLY FASTEN ONE LEG TO PANEL AS SHOWN)

FASTENING WALL PANEL SEE WALL & CORNER DETAILS

TYPICAL WALL TOP CORNER DETAILS

SCALE: 3" = 1'-0"



"A" SECTION THRU BURN ROOM

SCALE: 1/2" = 1'-0"

TYPICAL TRIM OVERLAP DETAIL

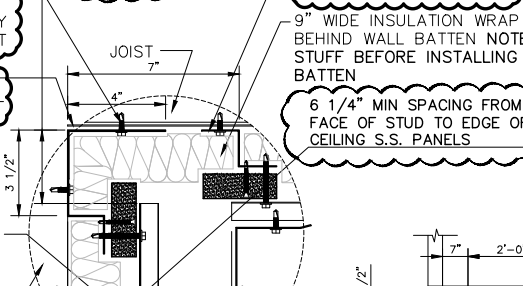
SCALE: 1 1/2" = 1'-0"

3" MIN SPACING FROM EDGE OF S.S. PANELS TO UNDERSIDE OF JOIST

TOP LEG ALWAYS FACES THE WALL AT THE SIDES OF A ROOM

9" WIDE INSULATION WRAP BEHIND WALL BATTEN NOTE: STUFF BEFORE INSTALLING BATTEN

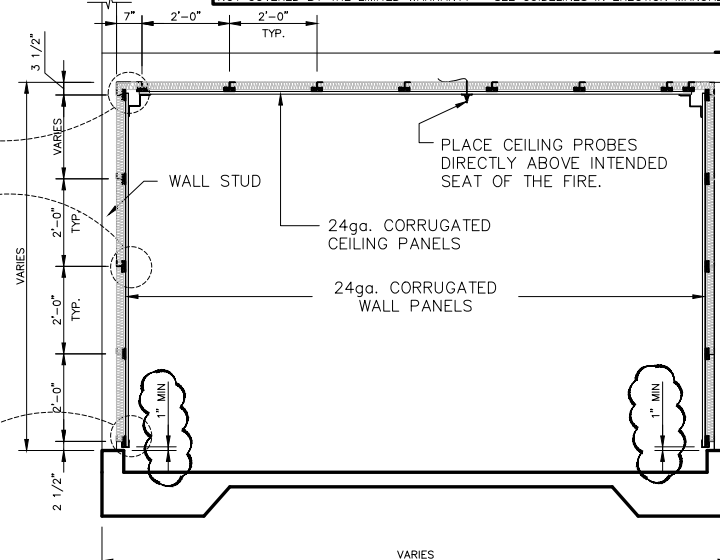
6 1/4" MIN SPACING FROM FACE OF STUD TO EDGE OF CEILING S.S. PANELS



INSTALLATION PROCEDURE

1. INSTALL BURN SUPPORT ANGLE (#397015) AT THE CEILING/WALL CORNER BUT **ONLY IN CORNERS WHERE A BOX TRIM WILL BE LOCATED** (SEE SECTION "B" UPPER DETAILS)
2. INSTALL ALL (ZEE) CHANNELS FACING IN THE SAME DIRECTION, EXCEPT THE (ZEE) CHANNELS RIGHT NEXT TO THE WALLS. TOP LEG NEEDS TO FACE THE WALL (SEE DETAILS)
3. INSTALL ALL STRAP BRACING @ 2'-0" O.C. MAX. TO SUPPORT INSULATION ON WALLS & CEILING
4. INSTALL/RUN ALL THERMOCOUPLE WIRES.
5. INSTALL ALL INSULATION WALLS & CEILINGS.
6. INSTALL ALL 3" WESTEMP BATTENS.
7. INSTALL ALL WALL & CEILING PANELS.
8. INSTALL ALL 16ga. VERTICAL INSIDE CORNER TRIMS.
9. INSTALL ALL BOTTOM TRIM. (SEE DETAILS)
10. INSTALL ALL 16ga. HORIZONTAL INSIDE CORNER TRIMS. (SEE DETAILS)
11. INSTALL ALL 20ga. HORIZONTAL INSIDE BOX CORNER TRIM. (SEE DETAILS)
12. INSTALL ALL 16ga. OUTSIDE CORNER TRIM AROUND DOOR & WINDOWS.

DAMAGE TO THE WESTEC SYSTEM CAUSED BY: THE MOUNTING OR PENETRATION OF EQUIPMENT (NOT SUPPLIED BY FFI) WHICH IMPEDES THE MOVEMENT OF THE LINER SYSTEM, OR THE FAILURE TO MONITOR TEMPERATURES AT THE BURN ROOM CEILING, IS NOT COVERED BY THE LIMITED WARRANTY - SEE GUIDELINES IN ERECTION MANUAL.



"B" SECTION THRU BURN ROOM ROOF

SCALE: 1/2" = 1'-0"

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WESCO MODEL WH-2
 CUSTOM
 CARTERSVILLE, GA

Job Description: ANNEX BURN ROOM DETAILS

Date: JULY 30, 2010

Drawn by: KAH

Checked by: SPW

Scale: SHOWN

Order No.: WESTEC-115 / 127071

Sheet No.:

02 of 02