DIVISION 13 – SPECIAL CONSTRUCTION

SECTION 13 34 19

METAL BUILDING SYSTEMS

***This specification is for Kelly Klosure System’s 4:12 pitch gable roof buildings with moment frames at 3’-0’ center to center (knee & ridge braces) with a maximum width of 54’-0”. For other roof configurations, contact Kelly Klosure Systems.***

***This specification is notated with options and descriptions to assist in specifying a Kelly Klosure Systems building for your project. Items listed in italics noted as “NTS” (Note to Specifier) are notes to you, the specifier, to assist in choosing which options to include in your project specification. These notes should be deleted upon completion of your specification.***

***Items listed in* BOLD *in a numbered line are items that need to be specified / verified for your particular project, such as design loads, R-values etc.***

***Items separated by “ – OR – “ are for options that need to be chosen from. Only one of these options should be left in the final specification. The line items that are not required can be deleted and the line numbering should automatically correct.***

***This specification includes Kelly Klosure Systems’ standard product offerings and options. Contact Kelly Klosure Systems for further options or custom features required for your project.***

***If you require any assistance in developing your project specification, a Kelly Klosure Systems representative would be happy to assist you or write the specification for you based on your requirements.***

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1. GENERAL
   1. SYSTEM DESCRIPTION
      1. General
         1. Pre-Framed Panel Pre-Engineered Metal Buildings, as that term is used in this Section, is intended to define a pre-engineered steel building system comprised of pre-framed modular roof and wall panel assemblies and accessories.
         2. Pre-framed roof and wall panel are to consist of exterior ribbed steel sheeting, and pre-fabricated structural steel panel frame with optional rigid insulation and interior steel insulation liner.
         3. Building systems that require field fastening exterior sheeting on an independently erected structural frame are not acceptable.
         4. The pre-framed roof and wall panels when combined with a few angle accessories, form moment frames on 3’-0” centers.
         5. The double sloped, gable roof shape and moment frame structure is formed with ridge angles and braces. The roof and wall panels are connected with eave angles and knee braces that complete the moment frame structural systems.
         6. The factory framed panels are fabricated from steel angles or a combination steel angle and channel frames as determined by structural engineering analysis.
      2. Design Requirements
         1. Building Configuration
            1. Roof slope shall be a minimum of 4:12 gable configuration.
            2. Panels shall be factory-assembled and delivered to the site in a ready-to-be-installed arrangement that do not require pre-setting of anchor bolts.
            3. The design of structural steel members shall comply with the provisions of the ANSI/AISC 360-10 “Specification for Structural Steel Buildings” June, 2010.
      3. Performance Requirements
         1. Design Loads

***(NTS: Kelly Klosure Systems Small Span buildings have been engineered in conformance to the current 2012 IBC Code and ASCE 7-10 Standards. Items in BOLD should be adjusted based on local code and project specific requirements. In the IBC 2012 building code, the Importance Factors are controlled by the Risk Category of a structure/building. Risk Category 2 is the most common for regular structures and has Importance Factors of 1.0. Previous versions of IBC including 2006 and 2009 use Occupancy Categories in lieu of Risk Categories.)***

* + - * 1. Dead Loads

Self-weight of the structure.

Collateral roof dead load of **5** psf uniformly distributed on main roof members (excluding roof sheeting and secondary support members).

* + - * 1. Live Loads

Minimum live load per **IBC 2012**.

* + - * 1. Snow Loads

Ground Snow load of **##** psf applied in accordance with the method prescribed in **IBC 2012**.

Importance Factor IS = **1.0**

* + - * 1. Wind Loads

Basic Wind Speed of **###** mph (3-second gust)with an Exposure factor of **[B] [C] [D]** applied in accordance with the method prescribed in **IBC 2012**.

Importance Factor IW = **1.0**

* + - * 1. Seismic Loads

In accordance with in **IBC 2012**.

Ss = **##** , S1 = **##**

Importance Factor IE = **1.0**

* + - * 1. Risk Category: 2
        2. Combination of Loads

Combine the above listed loads in compliance with **IBC 2012**.

* 1. SUBMITTALS
     1. Approval Drawings as Shop Drawings
        1. Building floor plan.
        2. Foundation plan & panel base section.
        3. Sheeting and trim color schedule.
        4. Elevations with location and description of all building accessories including but not limited to, doors, windows and ventilations items.
        5. Building cross-section.
        6. Door and Hardware schedule.

***(NTS: Choose from the following 3 items if the project requires an engineer stamp, delete if building will not need engineering stamp.)***

* + - 1. Structural design certification stamped and signed by a structural engineer licensed to practice in the state of **##**.

***- OR -***

* + - 1. Drawings stamped and signed by a structural engineer licensed to practice in the state of **##**.

***- OR -***

* + - 1. Project specific structural calculations stamped and signed by a structural engineer licensed to practice in the state of **##**.
    1. Assembly Drawings
       1. All information included on “Approved-Drawings”.
       2. Material and parts lists, structural framing details, connections, and manufacturer's recommended installation procedures.
       3. Tool List.
       4. Detailed unloading instructions.
       5. Pre-framed panel by panel Key Plan (Layflat Plan).
       6. Details of all structural steel connections.
       7. Details of all trim and flashing.
       8. Schematics and pictures illustrating assembly procedures.
       9. Installation instructions for all accessories.
    2. Warranties
       1. Manufacturer’s overall pre-framed pre-engineered metal building system warranty.
       2. Manufacturer’s exterior wall/roof sheeting warranty.
    3. Submit in accordance with manufacturer’s standard.
  1. WARRANTY
     1. Overall Systems
        1. Guarantee overall pre-framed pre-engineered metal building system to be free from defects in material and workmanship for 12 months from date of receipt of material.

***(NTS: Select either a galvalume or painted exterior finish.)***

* + 1. Exterior Wall/ Roof Galvalume Plus
       1. Guarantee wall/roof sheeting exterior galvalume finish by sheeting manufacturer for 25 years against rupture, structural fail, or perforate due to corrosion exposure of normal atmospheric conditions.

***-OR-***

* + 1. Exterior Wall/Roof Sheeting Painted
       1. Guarantee wall/roof sheeting exterior paint film color finish by sheeting manufacturer for 40 years against crack, check, peel or loose adhesion.
       2. Guarantee no excessive color change and chalking for 30 years. Color change shall not exceed 5 NBS units in accordance with ASTM D2244, and chalking shall not be less than rating of 8 in accordance with ASTM D4214.

1. PRODUCTS
   1. MANFACTURERS
      1. Kelly Klosure Systems pre-framed panel pre-engineered metal building system manufactured by Kelly Group, Inc. of Fremont, Nebraska. / [www.kellyklosure.com](http://www.kellyklosure.com) / [inquire@kellyklosure.com](mailto:inquire@kellyklosure.com) / 800.228.7230
      2. Pre-approved equal.
   2. STRUCTURAL FRAMING
      1. Primary Panel Frames and Braces: ASTM A36 AISC Standard Angle and/or Channel Shapes
      2. Anchor Bolts: Anchor building to foundation with screw anchors/expansion/adhesive-type anchors sized to resist applied loadings while building is assembled over pre-installed foundations.
      3. Connection Bolts:  
         ½” diameter and below: SAE J4269 Gr. 5, or ASTM A325  
         5/8” diameter and larger: ASTM A325
      4. Coatings

***(NTS: Select either a primer coating or for additional rust protection, a hot dipped zinc coating.)***

* + - 1. Standard Primer Coating:

Apply Water Reducible Alkyd Primer with conventional air or airless spray systems. Apply to a clean surface free from mill scale, oil, dust and rust to ensure good adhesion. Apply to a dry film thickness of 1.0 to 2.0 mils. Primer will be free of all lead and chromate hazards. Primer is to exhibit good lift resistance, corrosion resistance and is to resist flash rusting. Primer is to sustain durability for a minimum of 150 hours with less than 3 mm creep from the scribe under ASTM B117. Primer will additionally exhibit a Class 5 adhesion rating under ASTM D3359.

***- OR -***

* + - 1. Zinc Coating (Hot Dip Galvanized):  
         Apply a hot dipped zinc coating conforming to ASTM A123, unless otherwise noted. The minimum acceptable weight of coating shall be 1.25 ounces per square foot of surface when determined in accordance with ASTM A90. Components shall be hot dip galvanized only after all cutting and welding has been completed.
  1. EXTERIOR METAL SHEETING
     1. General
        1. Ribbed exterior face sheeting used to form pre-assembled pre-framed roof and wall panels shall be fabricated from Galvalume coated, primed and painted steel sheets in the thickness (gauge), yield strength (fy) and quality (grade) to satisfy the structural design loading requirements of Section 1.01 when configured into ribbed profile.

***(NTS – If the exterior sheeting and gauge is unknown, choose the 29 gauge. If a heavier gauge is required for engineering purposes, Kelly Klosure will include the heavier gauge on the proposal for the project. For projects with higher wind and snow loading conditions, 1.1/4” ribbed R-Panel sheeting may be required. A Kelly Klosure representative can help determine the correct gauge and profile of exterior sheeting.)***

* + - 1. Exterior sheeting to be **29** ***–OR- 26*** gauge, 80,000 PSI Grade ‘E’ base metal rolled in a ¾” high ribbed profile.

***- OR -***

* + - 1. Exterior sheeting to be 26 gauge, 80,000 PSI Grade ‘E’ base metal rolled in a 1.1/4” high ribbed profile (R-Panel).
      2. Exterior sheeting to be factory fastened to the modular panel frame with exposed hex washer head screws. Screws to have a 1000 hour salt spray coating and include a 5/8” EPDM rubber washer. Screws to be painted to match the exterior finish color.
      3. Sheeting closure, flashings, fascias, gutters, and trim shall be building manufacturer’s standard, compatible with pre-framed wall and roof panels.

***(NTS: Select either a galvalume or painted exterior finish.)***

* + 1. Galvalume exterior metal sheeting
       1. Steel shall be steel hot-dip coated with Galvalume zinc aluminum alloy at a minimum thickness of AZ55 (.55 oz/ft2 total both sides) to protect against undercutting corrosion through sacrificial behavior of zinc.

***-OR-***

* + 1. Pre-painted exterior metal sheeting
       1. Steel shall be steel hot-dip coated with Galvalume zinc aluminum alloy at a minimum thickness of AZ50 (.50 oz/ft2 total both sides) to protect against undercutting corrosion through sacrificial behavior of zinc.
       2. Pre-treat “Galvalume” coated steel sheets with chrome oxide to inhibit corrosion and promote adhesion. Apply a primer consisting of epoxy modified polyester to improve adhesion and flexibility. Apply topcoat consisting of 30% siliconize modified polyester (SMP) to minimize chalk and fade.
       3. Coatings shall be factory applied and baked so the solvents are released and incinerated and the pigments are resins are left on the substrate.
       4. **[Engineer] –OR- [Owner]** will select color(s) from manufacture’s standard color chart.
  1. FACTORY INSTALLED THERMAL INSULATION

***(NTS: Delete section if building does not require insulation. There are two types of insulation available; polyisocyanurate foam and mineral wool. Polyisocyanurate foam is a rigid plastic foam insulation with exceptional thermal efficiency and is Kelly Klosure Systems standard insulation product. 100% Non-combustible mineral wool is used in areas where non-flammable construction is more critical than thermal efficiency.)***

* + 1. Polyisocyanurate Foam Insulation
       1. Rigid, closed, cell, HCFC free thermal insulation board composed of a polyisocyanurate foam core bonded to glass fiber reinforced aluminum foil facer on both sides of the board.
       2. Accepted as a nonstructural insulation board by the International Building Code.
       3. Classified as Type 1 Class 1 pursuant to ASTM C1289.
       4. Qualified for use as exposed interior wall and/or ceiling insulation per IBC 2603.5.5 by meeting requirements of NFPA 285.
       5. Flame Spread of 25 or less per ASTM E84.
       6. Smoke Developed of 450 or less per ASTM E84.
       7. The aluminum facer to be 1.5 mil on the exposed side and 0.3 mil on the opposite side.

***(NTS – R-values of 13 and 20 are standard Kelly Klosure Systems options for walls. R-values of 13, 20, 27 and 34 are standard options for the roof.)***

* + - 1. Provide pre-framed roof panels with factory installed insulation with an R-value of **[13] [20] [27] [34]**.
      2. Provide pre-framed wall panels with factory installed insulation with an R-value of **[13] [20]**.

***-OR-***

* + 1. Non-combustible Mineral Wool Insulation
       1. Flame Spread of 10 or less per ASTM E84.
       2. Smoke Developed of 10 per ASTM E84.
       3. “Incombustible” per ASTM E 136 test method.

***(NTS – Mineral Wool Insulation is only available in Kelly Klosure Systems buildings at a 2” thickness with an R-value of 9)***

* + - 1. Provide pre-framed roof panels with factory installed insulation with an R-value of9.
      2. Provide pre-framed wall panels with factory installed insulation with an R-value of9.

***(NTS: Select the optional steel interior liner below if the building is insulated and requires additional protection in the walls and /or roof panels. Liner can be added to the walls and/or roof as required. Steel liner is required with Mineral Wool insulation. )***

* 1. INTERIOR FACE SHEETING
     1. Pre-framed **wall and roof** panels are to include factory installed flat interior face sheeting to consist of 28 gauge structural qualify zinc coated (galvanized) steel sheets to protect insulation.

***- OR –***

* + 1. Pre-framed **wall and roof** panels are to include factory installed flat interior face sheeting to consist of 29 gauge structural quality Galvalume coated steel with 30% silicone modified polyester paint finish in a standard “white” finish.

***(NTS: Delete the following section on Light Transmitting Roof Panels if skylights are not required.)***

* 1. LIGHT TRANSMITTING ROOF PANELS
     1. IBC 2009 code compliant light transmitting roof panels are formed from translucent exterior sheets factory applied to roof panel frames.
     2. Maximum size to be 3’wide by 8’ long and no longer than one side of the gable roof panel.
     3. For building with insulated roof panels, provide an air space approximately the thickness of the rigid thermal insulation between the exterior translucent sheets and the interior translucent sheets specified below.
     4. Exterior Translucent Sheets: White glass-fiber-reinforced polyester translucent plastic glazing sheets complying with ASTM D 3841, Type CC2, weather resistant, crinkle finish both sides, weight not less than 5 oz per sq ft. Match configuration of adjacent metal panels.
     5. Interior Translucent Sheets (Insulated Roof Panels Only): Twin wall 6mm thick polycarbonate extruded plastic sheets complying with ASTM D 635, Type CC2.
  2. ACCESSORIES

***(NTS: The following accessory items include personnel doors, equipment doors, windows, ventilation and gutters and downspouts. Some accessory items include optional upgrade these upgrades these upgrades are indicated by [brackets]. Select or delete as required.)***

* + 1. Personnel Doors, Frames and Hardware
       1. Hollow Metal Doors
          1. Fabricate from 18 gauge galvannealed cold rolled steel sheet.
          2. Provided steel top cap and bottom edges as an integral part of door construction.
          3. 1” Kraft honeycomb core bonded to interior and exterior face of door leaf.

***- OR -***

* + - * 1. **[Insulated polystyrene core with an R-Value of 2 per ASTM C1363.]**
        2. Glazing: None Required

***- OR -***

* + - * 1. **[Provide 2’ x 2’ view window with ¼” Plexiglas glazing] – OR - [1/4’ wire glass glazing.]**
        2. To the extent practical factory installed hardware specified. Securely attach door frames to panel structure.
        3. Shop prime paint.
        4. Factory top coat with corrosion resistant enamel paint in a color to match **[manufacturer’s standard gray] – OR - [wall sheeting, roof sheeting, or trim]** selected.
      1. Hollow Metal Door Frames
         1. Frames for single personnel doors are to provide for 3’-0” x 7’-0” hollow metal doors.
         2. Frames for double doors are to provide for a 3’-0” x 7’-0” active leaf and 2’-8” x 7’-0” inactive leaf.
         3. Fabricate of 16 gauge galvannealed sheet steel, cold rolled. Miter welder corners. Shop prime paint.
         4. Door silencers: Drill stop in strike jamb to receiver 3 silencers on single door frames and drill head jamb stop to receive 2 silencers on double door frames.
         5. Factory install hollow metal door frames including built-in threshold into pre-framed wall panel(s) located where shown on drawings to accommodate door swing.
         6. Factory top coat with corrosion resistant enamel paint in a color to match **[manufacturer’s standard gray] – OR - [wall sheeting, roof sheeting, or trim]** selected.
      2. Hardware
         1. Provide hardware of building manufacturer’s standard light commercial hardware.
         2. Building manufacturer’s standard 3/16” formed steel threshold, drip ledge and door sweep.

**-OR- (NTS – Select the following for heavy duty hardware or if an exit device / panic hardware is required.   
For Heavy Duty Locksets, select the Schlage lock unless a Best Access Systems compatible Keying system is required at the site.  
For Exit Devices, select the Series 22 for standard duty hardware and 99 Series for heavy duty.**

**An Exit Device replaces a lockset, both are not required.)**

* + - * 1. Lock: **[Schlage ND 53PD RHO Lever Lock ] *– OR –* [ Best 83K Lockset]**

***-OR-***

* + - * 1. Exit device: **[Von Duprin Series 99L with lever exterior entry 996L]   
           *– OR –* [Von Duprin Series 22 with lever exterior entry 22L]**
        2. 1-1/2 pair hinges, for each door leaf: **[FBB179] –OR- [FBB191]** 4 ½ x 4 ½ by Stanley
        3. Flush bolts for inactive leaf of double doors: (2) Ives FB 458-12
        4. 1 threshold – building manufacturer’s standard 3/16” Formed Steel
        5. Door sweeps: Aluminum drip ledge with vinyl sweep, Reese 353C
        6. Weather stripping: Rubber bulb seal, Reese 815C
        7. Astragal for double doors: door manufacturer’s standard
        8. Closer for active door leaf: American Eagle 7101 BC Alum
        9. Finishes shall be satin chrome (US26D / 626) or standard aluminum.
        10. Buildings with multiple doors shall be keyed the same
    1. Wall Louvers
       1. Pre-installed 24” wide louvers of the height and number shown on drawings in pre-framed wall panel.
       2. Louvers shall be 22 gauge galvanized steel in plain finish.
       3. Louver frame shall have 4” nominal depth with stationary blades.
       4. Each louver unit shall include 1/2“ bird screen in removable frame.

***[Or select Heavy Duty commercial louvers described below]***

* + - 1. Pre-installed 24” wide louvers of the height and number shown on drawings in pre-framed wall panel.
      2. Louvers shall be extruded aluminum Greenheck Model shown on the drawings or approved equal.
      3. Louvers frame shall have 4” nominal depth.
      4. Louver finish to be plain aluminum. ***–OR****-* [ coated in the color selected from louver manufacturer’s color chart.]
      5. Louvers shall be stationary drainable type with drain gutters in each blade and downspouts in jambs. Each louver unit shall include ¾” x 0.051” expanded, flattened aluminum bird screen in removable frame.
    1. Wall Exhaust Fans
       1. Field install 20” diameter wall exhaust fan(s) of the number shown on drawings in pre-framed wall panel. Fan shall be installed in 24” x 24” mfg. std. galvanized steel louver.
       2. Wall exhaust fans shall be Dayton shutter-mounted model shown on the drawings.
       3. Finish to be plain aluminum propellers with wire guards to comply with OSHA regulations.

***(NTS - Contact Kelly Klosure Systems for heavy duty Greenheck wall exhaust fans.)***

***(NTS – Fixed, special size, hurricane rated and anti-terrorism rated windows are available; contact Kelly Klosure Systems.)***

* + 1. Windows
       1. Pre-install manufacturer’s standard vinyl horizontal sliding window units 2’ wide x 3’ high pre-installed in pre-framed wall panels as shown on the drawings.
       2. Vinyl frame shall be white color.
    2. Gutters and Downspouts
       1. Provided manufacturer’s standard gutter and downspout accessories in the same finish as the wall and/or roof sheeting.
    3. Equipment Doors

***(NTS – If equipment doors are required, select from the following Overhead Door models, otherwise this section can be deleted.)***

* + - 1. **Overhead Door Company Model 620 non-insulated rolling steel door for heavy-duty commercial applications.**
         1. Minimum 24 Ga. galvanized steel interlocking slats in Overhead Door F-265 flat profile.
         2. Guides: Three structural steel angles.
         3. Base of door to have extruded aluminum bottom bar with weather seal or back to back steel angles for doors wider than 15’-4”.
         4. Hood: 24 ga. galvanized steel.
         5. Weatherseals to include vinyl bottom seal, vinyl exterior guide seal, internal hood seal, and lintel weather seal.
         6. Counterbalance: Adjustable helical torsion spring in steel tube or pipe.
         7. Door to be manually operated with chain hoist operater.

***- OR -***

* + - * 1. Door to be electrically operator with Overhead Door Model RHX heavy duty gear head electric operator and include one three button control station and a Nema 4 photo eye kit.
        2. Finishes: ***(NTS: Select one from the following finish levels)***

Standard finish: Guides to be powder coated in standard black finish, slats to receive primer and polyester paint finish in standard gray.

Better Finish: Guides to be powder coated zinc finish, slat to receive powder coat manufacturer’s standard color selection.

Best Finish: Complete door system including guides, slats and hood to receive PowerGuard Weather Finish from manufacturer’s standard color selection.

* + - 1. **Overhead Door Company Model 625 insulated rolling steel door for heavy-duty commercial applications.**
         1. Minimum 24 Ga. galvanized steel (interior and exterior) interlocking slats in Overhead Door F-265i flat insulated profile.
         2. Insulation to be foamed-in-place polyurethane with an R value of 7.7.
         3. Guides: Three structural steel angles.
         4. Base of door to have extruded aluminum bottom bar with weather seal or back to back steel angles for doors wider than 15’-4”.
         5. Hood: 24 ga. galvanized steel.
         6. Weatherseals to include vinyl bottom seal, vinyl exterior guide seal, internal hood seal, and lintel weather seal.
         7. Counterbalance: Adjustable helical torsion spring in steel tube or pipe.
         8. Door to be manually operated with chain hoist operater.

***- OR -***

* + - * 1. Door to be electrically operator with Overhead Door Model RHX heavy duty gear head electric operator and include one three button control station and a Nema 4 photo eye kit.
        2. Finishes: ***(NTS: Select one from the following finish levels)***

Standard finish: Guides to be powder coated in standard black finish, slats to receive primer and polyester paint finish in standard gray.

Better Finish: Guides to be powder coated zinc finish, slat to receive powder coat manufacturer’s standard color selection.

Best Finish: Complete door system including guides, slats and hood to receive PowerGuard Weather Finish from manufacturer’s standard color selection.

***(NTS – Delete the following if the building does not require a temporary foundation system. The following earth anchor foundation system is for temporary use in lieu of a new or existing concrete foundation. It may not meet local building codes. Contact Kelly Klosure Systems for more information.)***

* + 1. Temporary Earth Anchor Foundation System
       1. For temporary installation applications on grade including soil, gravel and asphalt, building shall include a temporary foundation.
       2. Building to include an appropriately sized steel base channel with factory installed connection holes and anchor tabs for installation of earth anchors.
       3. Earth anchors to be field driven into undisturbed soil without need for excavation or digging with conventional hydraulic or pneumatic equipment that is readily available worldwide.
       4. Building to be designed to be code compliant when installed on a permanent concrete foundation, base channel and earth anchor foundation may not meet the specific building codes listed above.

1. EXECUTION
   1. INSTALLATION
      1. Install in accordance with manufacturer’s instructions and approved submittals.