Abstract

The Paso Robles Residence is a light framed single family residence. Architectural plans were designed by Nina Nazarov Hambly at Catch Architecture, formerly Hambly Homes. Conclusions made in the soils report by Beacon Geotechnical Inc were used to design the foundation. Structural plans and calculations were made by Kaylie Di Paola and reviewed by licensed engineer Nick McClure. Structural plans include the complete framing and foundation plans and construction details. Calculations were made in accordance with the 2019 CBC, ASCE 7 and NDS. This report will cover the architectural design, structural analysis, and all of the building systems that function in the residence. This report will take a look into how the site influenced the structural system and the various challenges that arose during the design process. To understand the impact of this project, this report will dive into the environmental, global, political, and social implications of this residence.
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Introduction

The Paso Robles residence is a beautifully designed light framed single family home. The design started in 2020 after the pandemic caused the clients to start traveling more locally and build a vacation home within driving distance from their current residence. Their budget was flexible and allowed for a luxurious home over 3500 square feet. Throughout the lifetime of the project, lumber prices have surged dramatically, discouraging many prospective homeowners. These clients realized the rising cost of construction from the beginning and were willing to pay premium prices for their dream home away from home. The property they inherited was around 300 acres of undeveloped land. A home on their family’s land will create a gathering space for generations to come. The residence, shown in Figure 1, is elevated on a hill to capture the breathtaking landscape. The home will feature a large yard with north and south patios for the family to comfortably experience the outdoors.

Architectural Design

The architect responsible for this residence was Nina Nazarov Hambly, the owner of Catch Architecture. The clients requested her to design a three-bed, three-bath vacation home for them and their two sons. The high square footage allows every room in the house to be large and

Figure 1: Architectural Rendering

The architect responsible for this residence was Nina Nazarov Hambly, the owner of Catch Architecture. The clients requested her to design a three-bed, three-bath vacation home for them and their two sons. The high square footage allows every room in the house to be large and
comfortable. Every closet is spacious and each bathroom has ample counter space and a large shower. The kitchen has plenty of room for the entire family to cook dinner together and move around with ease. Having an open concept kitchen and living room area was important in creating a gathering space for the family. Each wall surrounding this space features large glass windows to provide natural light and the beautiful view. The clients wanted each of their sons to have his own bathroom so an additional powder room was added adjacent to the great room for guests. The master bedroom was particularly exciting for the clients. They wanted a spacious bathroom for the couple to get ready in the mornings. They also requested a large, wood burning fireplace for a cozy feel. Working with the clients, Nina suggested a partition in the closet to create a separate closet space for each of them. To create privacy from their children, Nina separated the master from the other bedrooms as much as possible. The laundry room is adjacent to the master suite for the couple’s convenience since they do the laundry for the family. Because the washer and dryer tend to be loud, the closet and bathroom create a sound barrier between the laundry room and sleeping area of the master.

With a property of 300 acres, choosing the residence location became the clients’ first decision. The couple chose an elevated knoll which rose above the oak trees spanning the property. The orientation of the house is key in highlighting the views and combating the temperature.
fluctuations of the area. To create a comfortable outdoor space overlooking the property Nina designed two patios. The “summer patio” was set on the north side of the building (Figure 2). It was blocked from the sun and could capture the pleasant, northern breeze. Located on the south side of the building, the ‘winter patio’ was protected from the harsh east wind and could soak up the sun (Figure 3).

The clients’ second challenge was deciding the aesthetics of the home. To aid the clients’ decision, Nina conducted an exercise she calls “tender for architecture.” She produces 10 renditions of the home, each with a different architectural facade. Nina spreads the printed renderings out around her office and lets the clients be drawn to different styles. Nina then incorporates all of the features the clients favored into one harmonious design. Allowing the clients to have as much input as possible, Nina created a design which exceeded the clients’ expectations. The only exception was the pergola. Initially, the clients agreed on the pergola design for the north patio (Figure 4). After the pergolas were completely engineered, the couple decided the appearance was no longer what they envisioned. After discussing multiple iterations, they could not decide and the pergola design was postponed. Structural plans were submitted without a pergola structure but will be designed by the same architect and engineers in the future.
Project Site

The entire property spans over 300 acres and has been divided into three parcels. The proposed development is set on the sloping hillside of a 92-acre parcel of land. The residence is at an elevation of 2,000 feet above sea level on a slope ranging from 3:1 to 6:1. The hill will be graded to create a flat area for the residence to stand. Unsuitable soil will be excavated so the foundation can rest on uniform competent material per soils report specification (Appendix E). In addition to the residence, the graded area needs to fit the north and south patios, the yard, a large storage...
shed, and septic and water tanks. The clients wanted a large front and backyard with room to add a pool in the future. The yard area will be graded at a 5% slope to drain water away from the home. Non-structural concrete flatwork will create a walkway from the driveway to the front door. The residence will sit 20 feet higher than the existing access road. The driveway spanning from the road to the residence is almost 300 feet long and at a gentle slope to ensure a comfortable drive up (Figure 5). All grading and sitework is to be done according to the civil engineering plans (Appendix F).

The soil consisted of mainly low expansive, elastic silt. Using ASCE 7-16 site classifications, the site was determined to be Class C, “Very Stiff Soil and Dense Rock.” The allowable bearing pressure was determined to be 1500 psf. The site conclusions made by GeoSolutions, Inc were used to design the foundation of the residence (Appendix E). The soils report specifies how to prepare the building pad to maintain moisture content and soil compaction. If either of these recommendations are not followed, the foundation may crack or become damaged.

The site’s proximity to fault lines and expected seismic activity is used to design the residence for seismic loads. The spectral response accelerations were found using the SEAOC Seismic
Design Map online tool and the seismic design category was found to be category D. The design speed of the wind is 92 mph and was found using the ASCE 7 Hazard tool. Seismic and wind loads governed different areas of the structure, so both were a vital part of the design.

**Structural Design**

The structural system of the Paso Robles Residence is light framed timber. The roof was designed with a 18 psf dead load to account for the standing seam metal roofing and solar panels and a 19 psf live load to account for the 4:12 slope. The metal roofing provides a flat, even surface that hand laid shingles cannot replicate. The upper roof framing on the great room as well as the east and west wings consist of trusses. Trusses were chosen for their efficiency and ability to span long distances. The truss types and layout (*Figure 6*) were calculated by Trusspro (Appendix D). The entry hall and kitchen are framed with Trus Joist I-Joists (TJI) rafters to create a flat roof condition. The different roof types set at varying heights create a unique framing connection. At each change in elevation, the break in the top plate creates a discontinuity. To maintain drag continuity, CS16 straps will be nailed from a beam at the lower roof and wrap around a post at the upper roof. This framing condition is unique to this project and drawn in detail 12/D1 (Appendix B). At horizontal discontinuities the roof diaphragm will be solid blocked.
Plywood shear walls are used to resist the lateral loads from wind and seismic forces. The architectural decision to have tall ceilings and large windows resulted in tall, skinny walls that must resist large loads. Because the widths of the structural walls in several locations were less than half the top plate height, a seismic increase factor was applied according to SDPWS. Lateral forces in each gridline were analyzed in each direction to determine the appropriate shear panel (Appendix C). The shear wall schedule on the roof framing plan specifies the sheathing thickness, edge supports, sill plate, nailing pattern and frequency of anchor bolts and connectors (Appendix B). In order to resist the overturning moment on the wall, holdowns are fastened from the edge of each wall to the foundation. The holdown schedule on the foundation plan specifies the holdown, post, anchor bolt, and embedment length required (Appendix B).

Typical window and door headers, with spans only 3’ and 6’ in length, were designed to be Douglas fir beams. At the open concept kitchen to great room transition, the supporting beam must span 24’. This beam carries a distributed load from the roof as well as point loads from two girder trusses. In order to account for the large span and heavy loading, a glue laminated beam is used. Both exterior walls in the entry hall are primarily glass and require two 9’ long LVL (laminated veneer lumber) beams to support the entire room’s roof. All beams demands were calculated by hand and capacities were determined in Enercalc (Appendix C).

One structural challenge occurred at the great room end wall. Large glass doors and windows span the wall, leaving little space for shear walls. In order to capture the full length of the walls the door header hung off the sides of the post, eliminating the need for trimmers. An additional
window sits higher up on the wall, flush with the top of the studs. Since there is no room for the window header to sit in the wall, the header is set flush into the trusses. The lack of structural walls in the entry hall created another challenge. The lateral loads on the entry hall needed to be transferred to the surrounding rooms through CS16 straps.

The foundation, designed based on the soils report, is slab on grade. The slab consists of a 4” concrete layer with #3 bars at 12” on center over a 2” sand and 4” gravel layer per. A 15 mil visqueen layer acts a moisture barrier preventing water from the soil from reaching and damaging the concrete. A 12” wide and 24” deep footing supports the building perimeter and structural walls. The typical footings are reinforced with 2 #5 bars on the top and bottom. Grade beams at a maximum spacing of 19” on center are 12” wide and 18” deep and reinforced with 2 #4 bars on the top and bottom. The 24’ kitchen beam transferred a high point load on the supporting posts that exceeded the capacity of the normal footing. To carry this high load, a 36” square, 24” deep concrete pad footing was centered under each supporting post. The pad footing is reinforced with 3 #5 bars each way on the top and bottom. A 8” thick concrete screen wall was designed for architectural aesthetics and had no structural considerations. Foundations will be constructed per details on sheet S-0.1 and D-2 (Appendix B).

**Permitting Process**

A grading permit is necessary in San Luis Obispo County when removing or depositing more than 50 cubic yards of soil. A grading permit for the site was obtained when the existing driveway was constructed. In order for construction to begin, the clients must obtain a building permit for the residence. The purpose of the building permit is to ensure the proposed structure
meets safety standards for zoning, construction, and land usage. Nina bundled the architectural and structural plans and calculations and submitted them to San Luis Obispo County for review on behalf of the client. The county looks for errors in the architect or engineer’s work for areas of potential hazard or neglect. Plan check corrections are then returned to the architect and engineer so they can make any necessary changes before sending them back for a final submission. Typically plan check corrections take 4-6 weeks to be returned. However, the county office is currently backlogged and cannot handle the amount of work they are receiving. The COVID pandemic created a boom in the construction industry as homeowners are spending more time inside and want to renovate and expand their space. The plans for the Paso Robles residence were submitted two months ago and the first review will most likely take until the deadline of four and a half months. Obtaining a building permit is the just first step in the lengthy construction process.

**Other Building Systems**

The clients wanted their space to feel as bright and open as possible. The home takes maximum advantage of natural daylight as much as possible. Tall glass windows and doors on every wall of the residence will provide light and a view of the property. The entry hall, the first room one enters in the house, needs to create a smooth transition from outside. The northern and southern walls are almost entirely glass allowing light to flood in. The great room, comprised of the kitchen, living, and dining area, also features large windows to help the room feel more open and create the perfect view for every meal. Natural light ensures a bright and cheery home during the
day, but ample lighting fixtures are necessary to provide the same feeling at night. Recessed downlights fixtures provide a sleek and modern look. Every sink features a wall sconce for extra brightness in the mirror. The garage will receive track lighting fixtures for efficiency and an industrial look. A custom feature the clients requested was strip lighting underneath the kitchen cabinets. The kitchen and dining room will be adorned with pendant fixtures for design aesthetics. Electricity will be provided to each lighting fixture per electrical and utility plan (Appendix A). In case of a power outage, a 18-22 kW backup generator will be on site.

Receptacle outlets will be placed in every room at a maximum of 12 feet apart per electrical code. To prevent electrocution, ground fault circuit interrupter outlets are used in bathrooms, the kitchen, and laundry room. Dedicated receptacles provide 220 volts for appliances requiring more than the standard 110 volts; these appliances include the dryer, stove, and refrigerator. Every room will have vacancy sensors to save energy. Both patios have outlets to service any decorative lighting or outdoor accessories they made add. In accordance with the 2020 California mandate, solar panels will be installed on the roof. Solar panels will produce power for the home efficiently and ultimately save the clients money. PGE will provide the remainder of the energy for the home.

Heating and air conditioning will be done by a split system air handling unit. The air handler consists of heating and cooling coils to change the temperature and a fan to distribute the air. The great room and each bedroom will have their own zone with a thermostat. This allows the bedrooms to be serviced at night without having the heat or cool the unoccupied great room. Each bedroom along with the great room will have a ceiling fan to provide extra cooling and circulation. A liquified petroleum gas (LPG) tank will be installed underground on the western
slope leading up to the yard. A gas line runs from the tank to the two fireplaces and to the outdoor fire pit on the south patio. A 50-gallon water heater in the garage will supply the family with hot water.

Because the residence is isolated, water and sewage must be handled on site. At the base of the driveway, a well will be drilled 100 feet down, into the ground aquifer. The well will extract water from the water table but will do so at a slow rate. However, showers and faucets require a higher pressure and flowrate than the well can provide. A water tank stores a sufficient supply of water to meet the shower and faucet demand. Water lines will run from the tank to the home to pump in clean running water. The 5000-gallon water storage tank will be installed on the west end of the property, downhill from the residence. The well will continuously fill and restore the water tank. To handle and dispose of wastewater, sewage lines will run from the residence to a 1500-gallon septic tank. The septic tank is buried underground, 34 feet from the garage door and stores wastewater in order for solids to settle. The septic tank was designed for a volume of 450 gallons per day based on the size of the home. Liquid wastewater then exits the tank through a 4” PVC pipe and heads to the distribution box. The distribution box receives wastewater from the sewage lines and re-distributes it to a series of pipes and the leech field. The leach field, located 100’ away from the house, safely disposes of the wastewater without contaminating the water table or endangering any animals. The leach field consists of a system of gravel trenches covered by a layer of soil. The required length of each trench was found to be 191 feet based on the volume of wastewater and the infiltration capacity of the soil. Three rock leach trenches and three infiltrator trenches will be 64 feet each (total of 192 feet) and 48 chambers at 4 feet each (total of 192 feet) will be placed. Adequate area was left for a future leech field expansion of up
to 100% of the current size. The septic tank and leech field design drawings can be found in appendix F.

One potential danger in home tucked away in the middle of 300 acres is the distance to the nearest fire station. An access road at the base of the driveway provides the fastest route for firetrucks to enter. A fire hydrant at the top of the driveway allows a hose to be connected from a fire truck and have access to the water storage tank. Water is then pumped in quickly to the sprinkler system. Every space in the home contains a smoke detector and concealed sprinkler to ensure safety. The home also needed to meet the CBC requirements for fire protection. All doors and windows have at least a 20 min fire resistance rating.

Cost Evaluation

The Paso Robles residence is estimated to cost around $350 per square foot. At 3680 square feet the estimate for this home comes out to around 1.3 million. However, the average cost of a new single family residence in the area is about $150-200 per square foot. The architectural features making this project stand out from a conventional home create expensive engineering and construction challenges. The clients wanted the entrance of their home to feature a high ceiling for a grand and open feel. The great room has a top plate height of 11’-6” which requires more materials and is harder to construct than a typical 8’ or 9’ top plate. The 8’-6” kitchen and entry height transitions to the 11’-6” great room height. At each of these discontinuities there are overlapping framing and extra hardware that doubles the price per square foot. Homes with conventional sized openings and ceiling heights can utilize standard windows and doors at a fixed, budget friendly price. However, this home features large glass doors and windows that
will require a custom order. Increasing the door height by as small as a foot can double the cost of the door. The stone veneer on the building’s facade is not only expensive to purchase but is an additional 15 psf dead load the home had to be designed for.

By the time the residence will be constructed, the initial cost estimate will most likely be inaccurate. Increasing material costs, specifically lumber, may raise the price to over $400 per square foot or over 1.5 million for the home. The clients had a flexible budget so this new price may not concern them. However, if the price of construction continues to rise, the architect may reconsider some of the more expensive design choices.

Between material and labor, construction costs will make up the great majority of the project cost. The foundation, between excavation, concrete, reinforcing, and formwork, makes up 10-15% of the construction budget. Framing costs include trusses, walls, and roofing material contribute to around 20% of the construction cost but, with the rising cost of lumber, may be much higher. Plumbing, electrical, HVAC, and septic each make up another 5% of construction costs. Half of the construction budget falls on the exterior and interior finishes. Finishings include windows and doors, insulation, drywall, appliances, plumbing and lighting fixtures, cabinets, and flooring. In an average home, the architect’s fee is only about 5% of the total project cost and the structural engineer’s only 1%. In a project this complex, it is difficult to estimate a percentage at this stage of the project. Clients like these, without a cap on their budget, tend to choose pricey finishes and fixtures. Prices for flooring, windows, door, appliances, lighting fixtures, and accessories can range from budget to luxury and will dramatically shift the
cost for the project. Because of the clients ability to upgrade their home, the actual construction costs range greatly.

Impacts

Environmental Impacts

Anytime a new house is constructed there are environmental consequences. This residence will be constructed of timber which is the most environmentally conscious building material. Of all building materials, timber produces the least carbon emissions. Timber is also biodegradable therefore will not have harmful effects at the end of the building’s life. Timber is a renewable resource as new trees can be planted regularly. However, if timber is extracted faster than it is replenished, there will be detrimental environmental effects. A surge in the construction industry during the COVID pandemic has greatly increased the demand for lumber. If we continue to consume timber at this rate, our forests will be in danger.

The foundation of the building is reinforced concrete. Concrete is a higher producer of carbon emissions and must undergo a complicated disposal process. Because the residence is isolated from main roads, transporting the materials and equipment to the site will take more time, require more fuel, and emit more greenhouse gasses. Installing this home’s own septic, water, electrical, and mechanical systems require energy and resources. The home was designed to be efficient post construction; an abundance of natural light during the day will reduce the use of electricity and solar panels will provide the majority of the home’s energy. The 300-acre
property is its own ecosystem which is home to a variety of trees, vegetation, and wildlife. Building the home will disturb the ecosystem and can displace the wildlife living in the site. All existing trees and plants will need to be cleared and excavating the building site will disrupt the soil. Constructing the home will cause noise pollution that may scare and harm the surrounding wildlife.

Economic Impacts
Creating this home will provide jobs at every step of the project. The clients wanted to use local companies to design and build their home. This project will contribute to the San Luis Obispo economy by providing work to local small businesses. Catch Architecture is a five-person architecture firm located in Paso Robles. MSD professional engineering in Atascadero is also a small business with only five employees. GeoSolutions, responsible for the soils and geology report in a small business located in San Luis Obispo. Roberts Engineering provided the civil plans and is another local small business located in Templeton. This project also creates jobs for city workers when obtaining permits and plan check corrections. Construction requires a large team of drivers, contractors, landscapers, electricians, and plumbers. Staying local allows the architects, contractors, and engineers to collaborate and communicate in person if needed. Being close to the site decreases travel time and is easier for workers. Additionally, the clients will pay property taxes on their new home. Property taxes are used to fund schools, parks, infrastructure, sanitation, and public service workers. This home will contribute the local economy by providing work to local businesses and fund vital governmental services.

Social Impacts
This home serves as a gathering space for the clients’ family. The land was passed down through the family and will be passed down to their sons. The new home will soon be a place of new memories and a great addition to the property. The clients will be able to pass down the home to their sons for generations to come. The main goal of the project was to create a vacation house within driving distance to the clients’ current residence as the COVID pandemic has made travel difficult. The Paso Robles residence is the perfect quarantine destination. The vacation home will be primarily for the family but will also be used by friends and neighbors. The spacious great room will soon host parties and family gatherings, bringing people closer together. The home will bring the family closer to nature as they get to explore their 300 acre backyard. Anyone who stays at the residence will experience the tranquil outdoors as they escape from the city. The clients want to instill their same love of nature in their family for generations.

Global Impacts

Catch architecture incorporates design elements from all over the world in every project. Members of the firm have studied or worked in England, Denmark, Switzerland, and France. Their work serves to bring global designs to San Luis Obispo County and inspire future designs around the world. This home can inspire others to travel locally rather than globally throughout the pandemic. Traveling internationally can contribute to the spread of the virus, putting health at risk. By avoiding planes and exposure to others, the clients are keeping their family safe and doing their part to end the pandemic. Unfortunately, construction on this home will also contribute to the recent lumber shortage and rising construction costs. The pandemic created supply change issues making lumber not only expensive, but more difficult to obtain. Construction costs are at an all-time high and affordable housing is scarce, especially in San Luis
Obispo County. The clients, who can afford a luxurious secondary residence, are not discouraged by the rising costs of construction. By increasing the demand for resources and labor, the clients are keeping the price of construction high and may be preventing others from affording to build.

**Conclusion**

This home will provide a gathering space for the family to escape and enjoy the views of nature. The clients were able to design the home they always imagined and had a large hand in the architectural design. The residence was custom designed to fit the family’s lifestyle and preferences, making the home feel personal. The home provided work for small businesses in San Luis Obispo County and a rewarding educational experience for me. The timeline of this project still has a long way to go. The clients and architect decided on a new pergola design which will need to be engineered. Plan check corrections were received in April. I will make corrections for the structural plans to be submitted a final time. After final revisions are approved, construction can begin. The driveway from the existing access road to the residence site has already been constructed. The site will be graded and building pad will be prepared first. Next the footings and foundation slab will be poured. Sewage, water, gas, electrical lines will need to be installed in the ground and later in the house. Framing of the home will be comprised of the walls, sheathing, trusses, windows, doors, roofing, and hardware. The construction will undergo multiple inspections before moving on the finishes, appliances, and lighting and water fixtures. The home was predicted to be completed by the end of 2022. However, plan check delays have already taken three months longer than anticipated. The project is currently behind schedule and does not have a new completion date. The finished product will ultimately be worth the wait and be cherished by the family for generations.
Reflection

Throughout my time at Cal Poly, my coursework and labs have provided hand-on experience to prepare me for work in the industry. Completing the structural design for a real home allowed me to combine and apply concepts I learned over the course of four years. This project exemplifies our schools “Learn by Doing” motto and is the perfect way to round out my education.

When I started working at MSD Professional Engineering, I worked on accessory dwelling units and small single-family homes. This project pushed me out of my comfort zone as the home was the largest and most intricate I worked on thus far. There are multiple height changes between the great room and the exterior wings. This was the first time I encountered top plate discontinuities on a project, so I had to learn how to strap and connect these diaphragms together. On the foundation level, I was familiar with slab on grade and designing footings. However, the great room required a pad footing to support a long spanning glulam beam (GLB). I learned how to design a pad footing and identify when it is required. I had also never designed a pergola before this project. I learned how a pergola is framed and connected and I even wrote an excel template for calculations. Ultimately the pergola was postponed and removed from this stage of construction. However, the time and effort I spent will only benefit me as an engineer and will benefit the clients when it is time to revisit the pergola.

Interfacing with new structural intricacies is something I experience everyday at work. Since finishing the structural design for the Paso Robles Residence, I have utilized this knowledge and
worked on more complicated residences. The most rewarding part of this senior project was learning about the nonstructural side of the residence. My work on the structural system is just one part of a much bigger picture. Understanding every step of design and construction will benefit me in my engineering career and help me connect the structural system to the complete project.

Previous to this project, my communication with my project’s architect was limited to clarifying discrepancies or recommending changes to improve efficiency. Nina, the architect on this home, was excited to share how she works with her clients to understand their needs and create a place they will love to call home. She walked me through her thought process for choosing the floorplan and orientation of the home. On my future homes I will take this knowledge and be more inquisitive of the architectural decisions.

While I was already familiar with soils and site reports, this project gave me the time to thoroughly read sections I normally skim. I learned about the septic, electrical, and mechanical systems which I rarely consider. Because I had little exposure to these other building systems, I found learning about them the most challenging.
References


Building Code Requirements for Structural Concrete (ACI 318) and Commentary (ACI 318). American Concrete Institute.


PASO ROBLES RESIDENCE
APPENDIX A: ARCHITECTURAL PLANS
Subject Property:
N 01°19'06" E 1470.12'
A10
APN: 026-331-054
5100 Peachy Canyon Road, Paso Robles, CA 93446

Proposed Residence:

Agreed upon 35' encroachment into 100' CC&R's setback for the proposed new residence.

General Notes:

Sheet Notes:
1. 1" = 500'-0"
2. Overall Site Plan
3. Pressure Tank
4. Booster Pump
5. Electrical Pump Controls
6. 500 gallon propane tank, 10' clearance to propane tank
7. Spa equipment, 5' x 8' allocated
8. 500 gallon propane tank, mini split condensor
9. Electrical meter
10. APPROXIMATE WELL LOCATION UNDER SEPARATE PERMIT
11. 4' x 6' water tank equipment area
12. ELECTRICAL SUBPANEL 1, located in laundry room or garage
13. ELECTRICAL SUBPANEL 2, located on utility platform

Site Plan:

Paso Robles Residence
Project No: 2025
Address Removed for Privacy

Hambly Homes Architecture

Issue Date: August 28, 2021
### EXTERIOR DOOR SCHEDULE

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### DOOR / WINDOW SCHEDULE + TYPES

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<tr>
<td>8</td>
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<td>CASEMENT</td>
<td>2' - 6&quot;</td>
<td>5' - 0&quot;</td>
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</tbody>
</table>

### GENERAL NOTES

1. BE CONSTRUCTED OF MULTI-PANE GLAZING WITH A
2. 20 MINUTE RATED, OR
3. 1 3/8" SOLID CORE WOOD OR PANEL DOORS. RAISED PANELS ARE TO BE 1 1/4" THICK MINIMUM TAPERING TO NOT LESS THAN 3/8" THICK.

### TEMPERED GLAZING

GLAZING IS TO BE TEMPERED IN ALL SWINGING, SLIDING AND BI-FOLD DOORS.

### EXTERIOR DOORS ARE TO COMPLY WITH THE FOLLOWING:

- HAVE A FIRE-RESISTANCE RATING OF NOT LESS THAN 20 MINUTES WHEN TESTED
- BE CONSTRUCTED OF GLASS BLOCK UNITS, OR
- 3 1/3" SOLID CORE WOOD OR PANEL DOORS. RAISED PANELS ARE TO BE 1 1/4" THICK MINIMUM TAPERING TO NOT LESS THAN 3/8" THICK.

### EXTERIOR GLAZING INCLUDING SKYLIGHTS IS TO COMPLY WITH THE FOLLOWING:

- U VALUE OF 0.45 MAX, SHGC OF 0.32 MAX

### MISCELLANEOUS

- TEMPERED GLAZING
- ALL EXTERIOR GLAZING INCLUDING SKYLIGHTS IS TO COMPLY WITH THE FOLLOWING:
- EXTERIOR DOORS ARE TO COMPLY WITH THE FOLLOWING:
- GLAZING IS TO BE TEMPERED IN WINDOWS IF:
- GLAZING IS TO BE TEMPERED IN ALL SWINGING, SLIDING AND BI-FOLD DOORS.
- SEE PLANS FOR DIRECTION OF SWING.

### MATERIALS, SYSTEMS AND/OR ASSEMBLIES USED IN THE EXTERIOR DESIGN AND CONSTRUCTION SHALL COMPLY WITH CHAPTER 7A OF C.B.C.

- EXCEPT FOR GLAZING ADJ TO FIXED PANEL OF DOOR.
- EXISTING BUILDINGS LOCATED IN WILDLAND-URBAN INTERFACE FIRE AREA AS DESIGNATED BY THE FIRE MARSHALL PER MARIN COUNTY CODE 16.17, SHALL COMPLY WITH THE FOLLOWING:
- • LOWER EDGE IS <18" AFF,
- • > 9SF,
- • 60" ABOVE WALKING SURFACE,
- • 24" RADIUS OF DOOR EDGE IN CLOSED POSITION AND IT IS WITHIN:
- • EXCEPT FOR GLAZING ADJ TO FIXED PANEL OF DOOR.
- • 12-7A-2.
- U VALUE OF 0.45 MAX, SHGC OF 0.32 MAX

### DESIGNER:

Hambly Homes Architecture

### ISSUE DATE:

AUGUST 28, 2021

### PROJECT NO:

2025

### ADDRESS:

2048 Vine Street, Paso Robles, CA 93446

### ARCHITECT:

Paso Robles Residence

### REVISIONS:


### NOTES:

- USE ENERGY ANALYSIS REPORT FOR MIN
APPENDIX B: STRUCTURAL PLANS

PROJECT: SKYRISE RESIDENCE

BUILDING CODE REFERENCES:
- 2019 California Building Code (CBC)
- Minimum Design Loads for Buildings and Other Structures (ASCE 7)
- Lumber and Timber

BUILDING CODE REFERENCES:
- All concrete and concrete work shall be performed in accordance with the latest edition of the California Building Code, Chapter 19.

CONSTRUCTION SPECIFICATIONS:
- All horizontal plywood diaphragms to be installed perpendicular to supports and shall be staggered in Case I layout.
- Minimum aggregate size for concrete placed with pumping equipment shall be 3/8" with no more than 20% of the aggregate.
- Anchor bolt spacing shall be five (5) feet maximum on center unless otherwise noted on plans or shear wall schedule. Bolts shall be a minimum 1/2" diameter.
- Anchor bolts, fasteners and hardware at pressure-treated wood connections shall be hot-dipped zinc coated galvanized, stainless steel, or other approved material.
- All engineered lumber shall be fabricated by an approved manufacturer with an AITC Certification of Compliance provided.

MIX DESIGNS:
- Written dimensions shown on architectural or structural plans shall govern over all scaled measurements.
- Written mix designs shall be prepared by an approved testing laboratory in order to meet the minimum required compressive strength.

ANCHOR BOLTS:
- Anchor bolt spacing shall be five (5) feet maximum on center unless otherwise noted on plans or shear wall schedule. Bolts shall be a minimum 1/2" diameter.
- Anchor bolts, fasteners and hardware at pressure-treated wood connections shall be hot-dipped zinc coated galvanized, stainless steel, or other approved material.
- All engineered lumber shall be fabricated by an approved manufacturer with an AITC Certification of Compliance provided.

REINFORCING STEEL:
- Concrete shall be placed in such a manner as to avoid partial lifting, and the order of placement shall be from the top to the bottom of the structure.
- Concrete shall be protected from freezing while in the form.

PRESTRESS:
- Prestressed concrete slabs shall be designed for a range of 1 to 1.5 times the minimum required compressive strength.

CONCRETE SHAPES:
- Concrete shapes shall be designed to meet the minimum required compressive strength.

PLUMBING:
- Plumbing shall be designed to meet the minimum required compressive strength.

ELECTRICAL:
- Electrical systems shall be designed to meet the minimum required compressive strength.

MECHANICAL:
- Mechanical systems shall be designed to meet the minimum required compressive strength.

Appendix B contains the structural plans for the Skyrise Residence project. These plans include detailed specifications for the building's structural elements, such as concrete and concrete work, plywood diaphragms, mix designs, anchor bolts, reinforcing steel, prestress, concrete shapes, plumbing, electrical, and mechanical systems. The plans also reference the California Building Code, Minimum Design Loads for Buildings and Other Structures, and Lumber and Timber standards to ensure compliance with current building codes and specifications. The Appendix B provides a comprehensive guide for the structural design and construction of the Skyrise Residence, ensuring that the project meets all necessary safety and performance criteria.
THE FOLLOWING TYPICAL DETAILS REPRESENT THE MINIMUM CONSTRUCTION REQUIREMENTS UNLESS THE PROJECT PLANS OR SPECIFIC DETAILS SPECIFY OTHERWISE. CONTRACTOR IS RESPONSIBLE FOR REVIEWING THESE DETAILS AND PROPERLY IMPLEMENTING THEM INTO THE PROJECT.

SCHEDULE OF INSPECTIONS, TESTING, AGENCIES, AND INSPECTORS

The following schedule of inspections, testing, agencies, and inspectors are required to be performed by the Contractor and/or their agents in accordance with the terms of this contract and as required by the Project Plans:

- Geotechnical Engineering
- Structural Engineering
- Building/Plumbing Code Enforcement

The Contractor shall ensure that all inspections are performed by the appropriate agency or inspector in accordance with the Project Plans.

PROJECT SPECIFIC DESIGN PARAMETERS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
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<tr>
<td>Project Type</td>
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<td>Building Height</td>
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<tr>
<td>Number of Floors</td>
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<tr>
<td>Roof Slope</td>
<td>4/12</td>
</tr>
<tr>
<td>Roof Area</td>
<td>2,400 sq ft</td>
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<tr>
<td>Building Area</td>
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<tr>
<td>Floor Area</td>
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<td>2,400 sq ft</td>
</tr>
<tr>
<td>Floor Area</td>
<td>2,400 sq ft</td>
</tr>
</tbody>
</table>

SCHEDULE OF SPECIAL INSPECTIONS

- Foundation Inspection
- Slab Placement Inspection
- Structural Steel Inspection
- Concrete Placement Inspection
- Roof Installation Inspection

The Contractor shall verify all dimensions and conditions at the job site before proceeding with work and report any discrepancies or changes to the Owner prior to the start of work.

SPECIFIC INSPECTION SCHEDULES

- SPECIAL INSPECTION SCHEDULES
- TYPICAL CONSTRUCTION DETAILS

SPECIFIC CONSTRUCTION DETAILS

- Non-Bearing Interior Wall Connections
- Shear Wall Construction at Tall Wall Conditions
- Typical Holdown Connection
- Typical Hanger Reinforcing
- Window/Door Opening Framing - Tall Walls

PROJECT SPECIFIC DESIGN PARAMETERS

- Concrete Compressive Strength:
  - Footings and Grade Beams: 2500 psi
  - Concrete Slabs-on-Grade: 2500 psi

LIVE LOADS

- Roof Live Load (4:12 Pitch): 20 PSF

DEAD LOADS

- Roof Dead Load Allowance: 18 PSF (Includes 3 psf Surcharge for Solar)
- Exterior Wall Dead Load Allowance: 15 PSF (Exterior Hardi or Stucco Siding)
- Interior Wall Dead Load Allowance: 8 PSF (Interior Drywall)

BUILDING RISK CATEGORY

- Risk Category II

WIND DESIGN DATA

- Design Wind Speed, V (MPH): 92 MPH
- Wind Exposure C
- Wind Design Method: Envelope Procedure ASCE7-16 Ch. 28 Part 1
- Wind Importance Factor, I: 1.0

SEISMIC DESIGN DATA

- Seismic Importance Factor, I: 1.0
- Site Class: C
- Seismic Design Category: S
- Short Period Spectral Acceleration, S: 1.065
- 1-Sec Period Spectral Acceleration, S: 0.389
- Short Period Design Spectral Acceleration, S: 0.852
- 1-Second Period Design Spectral Acceleration, S: 0.496

Basic Seismic Force Resisting System Type:
- Bearing Wall/Lateral Force Restraining System: Light Weight Wood Framed Shear Walls

Design Base Shear: 27,494#
NEW POURED-IN-PLACE ANCHOR BOLTS SET INTO NEW CONCRETE SHALL BE EMBEDDED 7" MINIMUM INTO PERIMETER FOOTING AND SHALL BE SPACED AT 5 FEET MAX. ON CENTER UNLESS OTHERWISE NOTED ON SHEAR WALL SCHEDULE.

2 x SILL PLATE → USE 5/8" DIAMETER X 10" MIN. ANCHOR BOLTS
3 x SILL PLATE → USE 5/8" DIAMETER X 12" MIN. ANCHOR BOLTS

FOR ADDITIONAL ANCHOR BOLTS USED IN EXISTING CONCRETE, USE 5/8" DIAMETER REDHEADS (OR EQUAL) OR SIMPSON TITEN-HD BOLTS W/ 5" MIN. EMBEDMENT INTO CONCRETE.

ANCHOR BOLTS SHALL BE SPACED AS REFERENCED ON PROJECT PLANS AND DETAILS. BOLTS SHALL BE A MAXIMUM OF 12" FROM SILL ENDS AND SPLICES WITH A MINIMUM OF (2) BOLTS PER SPLICE.

USE SIMPSON BP 5/8-3 3" x 3" x 0.25" THICK PLATE WASHERS AT EACH ANCHOR BOLT.

ANCHOR BOLT NOTE:
THESE STRUCTURAL PLANS PROVIDE THE NECESSARY STRUCTURAL SPECIFICATIONS AND DETAILS FOR THE PROJECT ONLY AND ARE NOT INTENDED TO INCLUDE DETAILS OR SPECIFICATIONS FOR FLASHING, WATERPROOFING, VENTILATION OR DRAINAGE CONDITIONS.

THE PROJECT CONTRACTOR SHALL COORDINATE ALL FLASHING, WATERPROOFING, VENTILATION AND DRAINAGE DETAILING WITH PROJECT ARCHITECT OR DESIGNER.

WATERPROOFING AND VENTILATION NOTE:
ARCHITECTURAL FLOOR PLANS CONTROL ALL BUILDING DIMENSIONS. CONTRACTOR TO REFERENCE ARCHITECTURAL PLANS FOR ALL DIMENSIONS ASSOCIATED WITH THIS PROJECT FOUNDATION AND FRAMELESS UNLESS OTHERWISE SPECIFIED ON THE STRUCTURAL PLANS AND DETAILS.

DIMENSION CONTROL NOTE:
1. AT ALL SLABS AND FOOTINGS:
   TYPICAL CONCRETE COMPRESSIVE STRENGTH TO BE 2500 PSI.
2. ALL HOLDOWNS AND ANCHOR BOLTS SHALL BE SECURE IN PLACE PRIOR TO CONCRETE INSPECTION.
3. A COPY OF THE SOILS REPORT SHALL BE ON SITE DURING THE FOUNDATION INSPECTION.
   SOILS REPORT BY: GeoSolutions, Inc.
   REPORT DATED: June 23, 2021
   REPORT #: SL12244-1
4. THIS PROJECT DESIGN IS BASED ON ALL FOOTINGS BEARING ON AN OVEREXCAVATED AND RECOMPACTED BUILDING PAD AS RECOMMENDED WITHIN THE ABOVE REFERENCED SOILS REPORT.
5. UNLESS OTHERWISE NOTED ON PLANS - ALL NEW FOUNDATIONS TO EXTEND TWELVE FEET (12') BEYOND MINIMUM BUILDING DECK./GROUND LEVEL.
6. PRIOR TO PLACING REINFORCING STEEL OR SETTING CONCRETE FORMS, THE SOILS ENGINEER OF RECORD SHALL CERTIFY TO THE BUILDING OFFICIAL, IN WRITING, THAT ALL SITE GRADING AND FOUNDATION GROUNDWATER PROTECTION HAS BEEN PREPARED IN ACCORDANCE WITH THE RECOMMENDATIONS WITHIN THE SOILS REPORT.
7. PRE-CAST UNITS BELOW FOOTINGS AND SLABS SHALL BE PERFORMED AS SPECIFIED IN THE PROJECT SOILS REPORT.

BUILDING PAD AND FOUNDATION NOTE:
THESE DRAWINGS AND SPECIFICATIONS ARE INSTRUMENTS OF SERVICE AND ARE THE PROPERTY OF Nick McClure. ALL DESIGNS AND OTHER INFORMATION ON THESE DRAWINGS ARE FOR USE ON THE SPECIFIED PROJECT AND SHALL NOT BE USED WITHOUT THE EXPRESSED, WRITTEN CONSENT OF Nick McClure.
1. UNLESS OTHERWISE NOTED, ALL HEADERS ABOVE OPENINGS AT EXTERIOR, BEARING AND SHEAR WALLS SHALL BE A MINIMUM:
   4 x 6 DF #2 AT 2 x 4 STUD WALLS
   6 x 8 DF #1 AT 2 x 6 STUD WALLS

2. UNLESS OTHERWISE NOTED, ALL HEADERS ABOVE OPENINGS AT NON-BEARING WALLS SHALL BE A MINIMUM:
   4 x 4 DF #2 AT 2 x 4 STUD WALLS
   6 x 6 DF #1 AT 2 x 6 STUD WALLS

3. ALL TOP PLATES TO HAVE 48" MIN. LAP AT SPLICES WITH 16d NAILS STAGGERED PER CONNECTION. (U.O.N.)

4. FRAME EXTERIOR, BEARING AND SHEAR WALLS WITH 2 X 6 DF #2 STUDS @ 16" O.C. (U.O.N.)

5. PROVIDE 1/8" GAP BETWEEN ALL ADJACENT PLYWOOD EDGES

6. CONNECT MULTIPLE LSL OR LVL MEMBERS WITH (2) ROWS OF SDS1/4" x 3 1/2" SCREWS SPACED AT 16" O.C. (U.O.N)

FRAMING NOTE:
THESE STRUCTURAL PLANS PROVIDE THE NECESSARY STRUCTURAL SPECIFICATIONS AND DETAILS FOR THE PROJECT ONLY AND ARE NOT INTENDED TO INCLUDE DETAILS OR SPECIFICATIONS FOR FLASHING, WATERPROOFING, VENTILATION OR DRAINAGE CONDITIONS.

WATERPROOFING AND VENTILATION NOTE:
THE PROJECT CONTRACTOR SHALL COORDINATE ALL FLASHING, WATERPROOFING, VENTILATION AND DRAINAGE DETAILING WITH PROJECT ARCHITECT OR DESIGNER.

DIMENSION CONTROL NOTE:
CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT THE JOB SITE BEFORE PROCEEDING WITH WORK AND REPORT ANY DISCREPANCIES OR CHANGES TO Nick McClure PRIOR TO CONSTRUCTION OF AFFECTED ASPECTS OF THE PROJECT.
THESE DRAWINGS AND SPECIFICATIONS ARE INSTRUMENTS OF SERVICE AND ARE THE PROPERTY OF Nick McClure. ALL DESIGNS AND OTHER INFORMATION ON THESE DRAWINGS ARE FOR USE ON THE SPECIFIED PROJECT AND SHALL NOT BE USED WITHOUT THE EXPRESSED, WRITTEN CONSENT OF Nick McClure.

DATE: 09/28/2021

SHEET: Details

CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT THE JOB SITE BEFORE PROCEEDING WITH WORK AND REPORT ANY DISCREPANCIES OR CHANGES TO Nick McClure PRIOR TO CONSTRUCTION OF AFFECTED ASPECTS OF THE PROJECT.
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DATE: 09/28/2021

CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AT THE JOB SITE BEFORE PROCEEDING WITH WORK AND REPORT ANY DISCREPANCIES OR CHANGES TO Nick McClure PRIOR TO CONSTRUCTION OF AFFECTED ASPECTS OF THE PROJECT.

SCALE: AS NOTED

SHEET:

DETAILS

D-2

Paso Robles Residence
Address Removed for Privacy
PROJECT STRUCTURAL CODE REFERENCES AND CONSTRUCTION SPECIFICATIONS:

BUILDING CODE REFERENCES:

- Building Code Requirements for Structural Concrete (ACI 318)
- Building Code Standards (ASCE 7)
- California Building Code (CBC)
- California Building Code Commentary

PROJECT STRUCTURAL AND SITE PREPARATION CONSTRUCTION:

Building Code References:

- 2019 California Building Code (CBC)
- California Building Code Commentary

Building Pad Preparation and Foundation Excavations:

- Prior to performing grading and/or excavation work at the project site, the Contractor shall locate and protect all sub-surface utilities.
- Any site irregularities, disturbances, groundwater, pumping-soils or sub-surface structures encountered during the grading work shall immediately be brought to the attention of the project soils engineer and MSD Professional Engineering, Inc. for appropriate investigation and/or mitigation.
- Foundation excavations shall be moistened immediately prior to pouring concrete. See the "Project Specific Construction Conditions and Design Parameters" on structural sheet S-0.1 for additional foundation pre-saturation requirements, if applicable.

Reticulation and/or construction joints shall be provided in all slabs-on-grade as shown in the typical details and shall be installed so that the finished concrete structure is separated from the ground surface by a minimum of 3" of 3/4" clear concrete.

De-water to maintain stability and clean working conditions when water or sub-surface moisture collects and ponds in foundation excavations. Additional de-watering equipment may be utilized if needed.

SCHEDULE OF INSPECTIONS, TESTING AGENCIES, AND INSPECTORS:

- The following schedule is not intended to be comprehensive and is subject to change based on the project's specific needs and conditions.
- All inspections shall be conducted in accordance with the applicable codes and specifications.

PROJECT SPECIFIC CONSTRUCTION CONDITIONS AND DESIGN PARAMETERS:

- The following schedule is not intended to be comprehensive and is subject to change based on the project's specific needs and conditions.
- All inspections shall be conducted in accordance with the applicable codes and specifications.

SCHEDULE OF SPECIAL INSPECTIONS:

- This statement of Special Inspections specifies the requirements for the evaluation and testing of materials and workmanship as outlined in the project drawings and specifications.
- All Special Inspections shall be performed in accordance with the applicable testing procedures and shall be witnessed by the building official.

GENERAL NOTES:

- All work shall be performed in accordance with the applicable codes and specifications.
- Any changes or modifications to the project drawings or specifications shall be submitted in writing to the Project Engineer prior to implementation.
- The project drawings and specifications shall be considered to be complete and final upon the approval of the architect and/or engineer.

STANDARD SPECIFICATIONS AND REQUIREMENTS:

- The following list includes all specifications and requirements that are applicable to the project.
- All specifications and requirements shall be considered to be complete and final upon the approval of the architect and/or engineer.

REVISIONS:

- The following list includes all revisions made to the project documents.
- All revisions shall be considered to be complete and final upon the approval of the architect and/or engineer.

SPECIFICATIONS ARE INSTRUMENTS OF CONTRACT WITHOUT THE EXPRESSED, WRITTEN CONSENT OF THE CONTRACTOR. VISION NEUTRAL.
Structural Design Calculations

For

Proposed Single Family Residence

Paso Robles, California

September 28, 2021

Report #: 0921-0767
PROJECT STRUCTURAL CODE REFERENCES AND CONSTRUCTION SPECIFICATIONS:

The following engineering calculations apply to this project only. The project contractor shall verify on-site all the conditions and dimensions provided for within these calculations and the associated project plans. The engineer of record is to be notified of any discrepancies prior to proceeding with work.

BUILDING CODE REFERENCES:

Unless otherwise specified below, the most current version of the following codes and standards shall govern the design and construction of the project. All work on the project shall be performed in accordance with the building codes and standards referenced below, the requirements of the local building official, or the specifications of these project plans, whichever is most conservative.

Governing Code: 2019 California Building Code (CBC)

Supporting Code References:
- Vertical and Lateral Load Development: Minimum Design Loads for Buildings and Other Structures (ASCE 7)
- Reinforced Concrete: Building Code Requirements for Structural Concrete (ACI 318)
- Structural Plywood Sheathing: Special Design Provisions for Wind and Seismic (SDPWS)

Minimum Material Design Specifications:

- Lumber (sawn): DF-L, WCLIB
  - 2x & 4x: #2 Joists/Rafters/Headers/Beams/Posts (U.O.N.)
  - 6x: #1 Rafters/Headers/Beams (U.O.N.)
- Fb = 2400 psi, E = 1800 ksi
- Laminated Veneer Lumber (LVL): DF-L, Fb = 2600 psi, E = 1900 ksi
- Plywood Sheathing: “Panels” shall be plywood (group 1 or 2) APA performance rated panels conforming to PS 1
- Structural Steel: ASTM A-36 (compact): Angles, Sections, Plates
  - ASTM A-53: Pipes
  - ASTM A-500: Grade ‘B’ tubes
- Hot Dipped Galvanized: ASTM A-123 and ASTM A-153 (All Hardware)
- Welding: AWS D1.1, E70xx Electrodes
- Bolts: Anchor Bolts: ASTM A-36 or better
  - Machine Bolts: ASTM A-307 or better
- Reinforcing Steel: ASTM A-615
  - Grade 40: # 4 bars and smaller
  - Grade 60: # 5 bars and larger
- Epoxy (Rebar to Conc.): ASTM C-881, Type 3, Grade 3
- Non-Shrink Grout: MinWax Por-Rok or approved equal
BUILDING PAD PREPARATION AND FOUNDATION EXCAVATIONS:

1) Prior to performing grading and/or excavation work at the project site, the Contractor shall locate and protect all sub-surface utilities.

2) Any site irregularities, disturbances, groundwater, pumping-soils or sub-surface structures encountered during the grading work shall immediately be brought to the attention of the project soils engineer and MSD Professional Engineering, Inc. for appropriate recommendations and remediation, if necessary.

3) Regardless of any other foundation recommendations specified within these plans, graded sites to be filled twelve (12) inches or more shall require a compaction test provided by the project soils engineer and submitted to the Building Official/Building Inspector for review and approval prior to the foundation inspection.

4) Foundation excavations shall be prepared to the depths and dimensions shown on the following construction plans and details. Excavations shall be cut square and smooth with the base of excavations prepared level and into uniformly firm soil material, unless noted otherwise.

5) Foundation excavations shall be moistened immediately prior to pouring concrete.

6) De-water to maintain stability and clean working conditions when water or sub-surface moisture collects and ponds in foundation excavations.

7) Foundations shall not be poured until all required formwork, reinforcing steel, anchor bolts, holdowns, etc. have been properly placed and verified by the local Building Official/Building Inspector as well as any additional inspections specified on these project documents.

8) No stakes shall be left or abandoned in place following concrete pour. Holes and openings in concrete created by stakes shall be filled with a non-shrink grout.

STEEL REINFORCEMENT FOR CONCRETE:

1) Unless otherwise noted on project plans and details, reinforcing steel shall conform to ASTM A-615 and be of the following grades:
   a. #4 Bars and Smaller -- 40 KSI
   b. #5 Bars and Larger -- 60 KSI

2) Reinforcing steel shall be clean of rust, grease, or other material likely to impair the bond between the steel and concrete.

3) Concrete cover over steel reinforcing is required as follows:
   a. 3” Clear – Concrete cast against and permanently exposed to earth
   b. 2” Clear – #6 bars or greater, concrete is exposed to earth or weather (poured against forms)
   c. 1 ½” Clear -- #5 bars or smaller, concrete is exposed to earth or weather (poured against forms)

4) All reinforcing steel shall be securely tied in place and braced prior to inspection from Building Official and/or pouring concrete.

5) All reinforcing steel shall clear form stakes and braces by 2”, minimum.

6) Where reinforcing steel is referenced on the project plans as continuous, splice laps at adjacent bars a minimum of 40 bar diameters or 24”, whichever is greatest. Stagger splices in adjacent bars a minimum of 24 inches.

7) For no reason shall reinforcing bars be heated in order to aid in bending or placing.
CONCRETE AND ANCHORAGE:

1) All new foundations shall be constructed of concrete with a minimum compressive strength f’c of 2500 psi at 28 days. See Project Specific Specs on Sheet S-0.1 for alternative concrete strength requirements.

2) All concrete and concrete work shall be performed in accordance with the latest edition of the California Building Code, Chapter 19 (CBC – Chapter 19), the ACI Building Code (ACI 318) and the ACI Manual of Concrete Practice.

3) The maximum concrete slump shall be:
   a. 3” (+/- 1”) – Slabs
   b. 4” (+/- 1”) – All other work

4) Cement shall be Portland Cement, Type I or II, low alkali, per ASTM C-150.

5) The maximum water-to-cement ratio shall be 0.45-0.5 unless otherwise noted on the project plans or pre-approved by this office.

6) Mix designs shall be prepared by an approved testing laboratory in order to meet the minimum required compressive strength values shown on these project plans.

7) Aggregate shall conform to ASTM C-33 and shall be limited to the following sizes:
   a. 1” – 1 ½” – Footings and grade beams
   b. ¾” – Slabs-on-grade

8) Minimum aggregate size for concrete placed with pumping equipment shall be 3/8” with no more than 20% of the aggregate proportion being 3/8” in size (50/50 mix).

9) Concrete shall not free-fall more than six (6) feet. Use tremie, pump or other approved methods to provide proper placement for heights greater than six (6) feet.

10) Vibrate all concrete (including slabs) as it is placed with a mechanical vibrator. Vibration equipment is to be operated by experienced personnel only. Vibration equipment shall be used to consolidate concrete only, and not for transport. Reinforcing and forms shall not be vibrated.

11) Freshly deposited concrete shall be protected from premature drying and excessively hot or cold temperatures and shall be maintained with minimal moisture loss for the time necessary for the hydration of the cement (typically 7 days). Continual wetting or other approved methods to control curing shall be used.

12) All poured-in-place anchor bolts shall have the minimum total embedments:
   a. 5/8” Diameter – 7”

13) The Contractor shall order the necessary anchor bolt lengths to accommodate the embedment depths referenced above and various sill plate thicknesses (2x or 3x) specified on the project plans and shear wall schedule.

14) Anchor bolt spacing shall be five (5) feet maximum on center unless otherwise noted on plans or shear wall schedule. Bolts shall be a maximum of 12” from sill ends and splices with a minimum of two (2) bolts per splice.

15) Structural anchor bolts shall be full diameter, cut thread, Grade A-36 steel bolts provided by an American Manufacturer.

16) Anchor bolts, fasteners and hardware at pressure-treated wood connections shall be hot-dipped zinc coated galvanized, stainless steel, silicon bronze or copper.
17) Anchor bolt washers at shear and bearing wall sill plates connections to concrete shall be 3”x3”x0.229” galvanized steel plate washers. Ok to use Simpson Strong Tie BP 5/8-3 washers for standard conditions and BPS 5/8-3 washers for conditions where a slotted washer is required.

18) The project Contractor is responsible for all concrete formwork design and installation.

19) Concrete forms shall be removed in accordance with the following schedule:
   a. 1 day minimum – Edge forms of slab-on-grade panels
   b. 2 days minimum – Side forms of footings
   c. 10 days minimum – Concrete retaining or stem walls

20) The location of all construction cold joints shall be as shown on the structural details or as approved by the project Engineer. Construction cold joints shall be thoroughly cleaned with compressed air and water and shall be rough with exposed coarse aggregates. Construction cold joints shall be continuously wet at least 3 hours in advance of pouring concrete.

21) The Contractor shall remove and replace any concrete that fails to meet the required compressive strength shown on these project plans and details.

STRUCTURAL DIAPHRAGM SPECIFICATIONS:

1) Horizontal Sheathing:
   a. Horizontal diaphragms shall be fully blocked and nailed at all boundary edges.
   b. Roof diaphragm ply shall be CDX or OSB Struct II (or better) with Panel ID# 32/16 and glued and nailed with 10d nails @ 6-6-12” spacing. See roof framing plans for specified thickness.
   c. Floor diaphragm ply shall be 23/32” CDX or OSB Struct II (or better) with Panel ID# 40/20 and glued and nailed with 10d nails @ 6-6-10” spacing.
   d. All horizontal plywood diaphragms to be installed perpendicular to supports and shall be staggered in Case I layout.
   e. All boundary blocking shall be solid, full depth blocking with (3) 16d toe nails for 24” long and (2) 16d toe nails for 16” long blocks (typical each end).
   f. Structural design properties for wood structural panels are based on DOC PS-1 and DOC PS-2 or wood structural panel design properties given in the APA SDPDS according to the CBC Section 2306.3.
   g. Nail heads shall not be driven through outer laminate of panels. If a nail gun is used it must be equipped with a flush nailer attachment.
   h. For trussed roof conditions, provide 2x blocking along all ridge lines.

2) Vertical Sheathing (Shear Wall Construction):
   a. Refer to Shear Wall Schedule for material specifications and nail spacing.
   b. Where nail guns are used to install nails for shear wall sheathing, care shall be taken to use common sized nail equivalents regarding diameter and length.
   c. All edges of plywood shear walls are to be fully blocked and nailed with full perimeter edge nailing. Plywood shall be edge nailed to end posts/studs and any member attached to a holdown.
   d. “Panels” shall be structural plywood sheathing Group 1 or 2 or APA performance rated panels.
   e. Panels to be applied horizontally or vertically to studs spaced at 16” or 24” on center spacing (see plans).
   f. Nail heads shall not be driven through outer laminate of panels. If a nail gun is used it must be equipped with a flush nailer attachment.
   g. Structural shear walls shall not be penetrated with electrical panels, conduits, plumbing pipes, or other such items unless detailed on the project plans.
TIMBER FRAMING:

1) All framing lumber, timber, and plywood to be grade stamped with a stamp of the association under whose grading rules it was produced.

2) Sawn lumber shall conform to the following minimums:
   a. DF-L#2 – Roof rafters, ceiling joists, floor joists, wall studs
   b. DF-L#2 – Posts and beams 2x – 4x nominal sizes
   c. DF-L#1 – Posts and beams 6x and larger nominal sizes
   d. Pressure Treated DF-L#1 – Lumber in contact with concrete or masonry
   e. DF-L Standard or Better – Non-bearing wall studs, sill plates and blocking

3) All fasteners less than ½” diameter and all hardware in contact with pressure treated lumber shall be hot dipped galvanized.

4) The maximum moisture content of sawn lumber shall not exceed 19%.

5) All double members to be nailed together with (2) rows of 16d nails @ 12” o.c. staggered.

6) All posts shall be as wide as the beam which it supports unless a “Simpson” post cap is used. All posts not framed into walls shall be secured with both post caps and bases.

7) 2x solid blocking shall be placed between joists, rafters and trusses at both ends and all supports. Provide bridging or blocking at intervals of 8’-0” o.c. at floor joists.

8) No structural members (joists, plates, studs, beams, etc.) shall be notched, cut or drilled (except for those holes required for bolting) unless in conformance with the following code references or specifically noted or permitted in writing by the Engineer.
   a. CBC Section 2308.4.2.4 – Notching and boring of horizontal structural members.
   b. CBC Section 2308.5.10 – Notching and boring of studs and top plates.

9) Interior non-bearing non-shear walls may be fastened to concrete with Hilti shot pins at 24” maximum on center. Non-bearing non-shear walls may be fasted to wood floor rims or blocking with 16d at 12” on center.

10) Fire stops shall be provided at all intersections of stud walls at floor, ceiling and roof. Fire stops shall be 2x (min) nominal thickness and shall be placed at maximum spacing of 8’-0” on center vertically.
STRUCTURAL FASTENERS AND CONNECTION HARDWARE:

1) Connection Hardware:
   a. All metal framing connectors referenced in the calculations or on the following structural plans and details are “Simpson Strong Tie.”
   b. Substitutions of equal (must be code listed) connectors are acceptable with written permission of the Engineer.
   c. All framing connectors shall be filled or bolted to their full capacity (all holes to be filled) with fasteners as specified the “Simpson Strong Tie”.

2) Bolts:
   a. All bolts shall be ASTM 307 unless otherwise noted on the project plans and details.
   b. Pre-drill holes in lumber and steel 1/32” – 1/16” larger than specified bolt diameter.
   c. All bolted connections shall have standard cut washers under the head and nut, unless larger washers are specified on the project plans or details.
   d. All bolts shall be re-tightened prior to the application of sheathing or other finish materials.

3) Nails:
   a. As a minimum, all nailing shall be performed in accordance with the CBC Nailing Table 2304.10.1 unless otherwise noted on the project plans and structural details.
   b. All nails shall conform to “common” sizing unless otherwise noted on plans or details.
   c. Installation with pneumatic air gun requires the use of a flush nailer attachment for nailing of all structural shear wall, floor or roof sheathing.

4) Simpson Strong Tie Titen-HD heavy duty screw anchors:
   a. Titen-HD screw anchors may be used in-lieu of standard anchor bolts and shall match the diameter of the anchor bolt specified on the project plans.
   b. Titen-HD screw anchors shall be installed per all the manufacturer’s recommendations.
   c. Embedment depth into concrete shall be 4” (minimum) for standard anchor bolt replacement in shear wall bottom plate application.
   d. All other applications shall require embedment depth into concrete to be specified by Engineer.

5) Wedge Anchors:
   a. Simpson Strong Tie Wedge-All, Red Head Wedge Anchor or other similar code listed wedge anchors may be used in-lieu of standard anchor bolts only at connections of wall bottom plates. No other applications are permitted unless approved in writing by the Engineer.
   b. Wedge anchors shall be the same size diameter as the anchor bolts specified on the project plans.
   c. Embedment depth into concrete shall be 4” (minimum) for standard anchor bolt replacement in shear wall bottom plate application.
PROJECT PROFILE

Description: Analysis of a single story single family residence

Building Information:

<table>
<thead>
<tr>
<th>Roof Pitch 1:</th>
<th>4 : 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate Height 1:</td>
<td>8.5 ft. Entry/Kitchen</td>
</tr>
<tr>
<td>Plate Height 2:</td>
<td>10 ft. E/W Wings</td>
</tr>
<tr>
<td>Plate Height 3:</td>
<td>11.5 ft. Great Room</td>
</tr>
</tbody>
</table>

Risk Category: II
Importance Factor: I = 1

Load Values:

<table>
<thead>
<tr>
<th>Roof 1:</th>
<th>18 psf Dead</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.0 psf Dead</td>
<td>Roof Base Dead Load - Standing Seam Metal w/ 3psf Surcharge for Future Solar</td>
</tr>
<tr>
<td>20 psf Live</td>
<td>Roof DL - Adjusted for Pitch 4 : 12 pitch</td>
</tr>
<tr>
<td>Walls:</td>
<td>15 psf Dead</td>
</tr>
<tr>
<td>8 psf Dead</td>
<td>Exterior-Stucco</td>
</tr>
<tr>
<td>10 psf Dead</td>
<td>Interior-Drywall</td>
</tr>
</tbody>
</table>

Additional Structural Loads:
Stucco Lid: 10 psf Dead
Veneer: 15 psf Dead

Site Specific Design Information:

Geographic Coordinates: 35.624719° N & 120.793501° W

Soils Report By: GeoSolutions, Inc.
Report Dated: June 23, 2021
Report Number: SL12244-1
Expansive Index: Low
Bearing Pressure: 1500 psf

$S_{05} = 0.852$
$S_{01} = 0.496$

SDC = D (From Geotech. Report)
Site Class = C (From Geotech. Report)
** Wind Profile **

** Design for the MWFRS as Defined by ASCE 7-16: Chapter 26 & Chapter 28 - Part 1 **

** Velocity Pressure Analysis (q_z): **

Velocity Pressure - ASCE7-16 Equation 26.10-1: \( q_z = (0.00256)V^2K_{zt}K_e \) (#/ft^2)

Wind Exposure: 

<table>
<thead>
<tr>
<th>C</th>
<th>V= 92 MPH</th>
</tr>
</thead>
</table>

\( K_{zt}= 1.00 \) From ASCE7-16 Sect. 26.8.2

\( K_e= 1.00 \) From ASCE7-16 Table 26.9-1

Define \( K_z \) (ASCE 7-16 Table 26.10-1): Heights referenced below rounded up to the nearest multiple of 5

\[ z_{Roof\ Level} = 15 \text{ ft} \]

\[ z_{Mean\ Roof\ Ht} = 20 \text{ ft} \]

\( q_z \) - Roof Level = 15.7 (#/ft^2)

\( q_z \) - Mean Roof Ht = 16.6 (#/ft^2)

** Design Wind Pressure Analysis (p_z): **

Design Wind Pressure - ASCE7-16 Equation 28.3-1: \( p_z = q_z[(GC_{pf-net})-(GC_{pi})] \) (#/ft^2)

\( GC_{pf-net} = [(GC_{pf-Windward})-(GC_{pf-Leeward})] \)

Define Building Enclosure Classification - ASCE7-16 Table 26.13-1:

Enclosed or Partially Open Building: X

Partially Enclosed Building: 

Open Building: 

\( (GC_{pi})= \pm 0.18 \) Internal Pressure Coefficient

Define GC_{pf-net}: \( \Sigma \) Windward and Leeward - ASCE7-16 Figure 28.3-1:

Wall Conditions: \( GC_{pf-net\ Walls} = 1.04 \)

Roof Pitch 1: 4 : 12 \( GC_{pf-net\ Roof-1} = -0.4 \)

Define \( p_z \) (#/ft^2):

\( p_z \) - Roof Level = 19.1 psf

\( p_z \) - Roof Area = 9.614 psf

** Analysis Assumptions:**

1) Wind analysis conservatively incorporates external pressure coefficients (\( GC_{pi} \)) for edge/corner conditions across full wall and roof widths

2) Code defined minimum wind pressure of 8psf is used for roof wind analysis when roof wind pressure < 8 psf (ASCE7-16 - 28.3.4)
# ROOF LEVEL E-W WIND LOADS

Lateral Wind Loads Governing Combination - ASCE7-16 Section 2.4.1, Combination S: 0.6W

\[ W(\#) = \frac{[(\text{Projected Roof Area}) \times P_{\text{net-Roof Area}} + (\text{Wall Area}) \times P_{\text{net-Roof Level}}]}{[(\text{Area of End Wall}) \times P_{\text{net-Roof Level}}]} \]

**Line A:**

<table>
<thead>
<tr>
<th>Tributary Dimensions:</th>
<th>Area of End Wall</th>
<th>Tributary Loads:</th>
<th>Total Wind Load</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Height</strong></td>
<td><strong>Width</strong></td>
<td>Wind Load Perpendicular to Ridge</td>
<td>Wind Load to End Wall</td>
</tr>
<tr>
<td>Projected Roof Area:</td>
<td>4 ft x 14 ft</td>
<td>(Roof area N/A)</td>
<td>0.6*(W⊥)</td>
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<tr>
<td>Wall Area:</td>
<td>5 ft x 11 ft</td>
<td>ft x ft</td>
<td>953 #</td>
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**Line B:**

<table>
<thead>
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<th>Area of End Wall</th>
<th>Tributary Loads:</th>
<th>Total Wind Load</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Height</strong></td>
<td><strong>Width</strong></td>
<td>Wind Load Perpendicular to Ridge</td>
<td>Wind Load to End Wall</td>
</tr>
<tr>
<td>Projected Roof Area:</td>
<td>4 ft x 12 ft</td>
<td>(Roof area N/A)</td>
<td>0.6*(W⊥)</td>
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<tr>
<td>Wall Area:</td>
<td>5 ft x 9 ft</td>
<td>ft x ft</td>
<td>793 #</td>
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**Line B.8:**

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<th>Total Wind Load</th>
</tr>
</thead>
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<td><strong>Height</strong></td>
<td><strong>Width</strong></td>
<td>Wind Load Perpendicular to Ridge</td>
<td>Wind Load to End Wall</td>
</tr>
<tr>
<td>Projected Roof Area:</td>
<td>4 ft x 18 ft</td>
<td>(Roof area N/A)</td>
<td>0.6*(W⊥)</td>
</tr>
<tr>
<td>Wall Area:</td>
<td>5 ft x 18 ft</td>
<td>ft x ft</td>
<td>1447 #</td>
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**Line C:**

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<th>Area of End Wall</th>
<th>Tributary Loads:</th>
<th>Total Wind Load</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Height</strong></td>
<td><strong>Width</strong></td>
<td>Wind Load Perpendicular to Ridge</td>
<td>Wind Load to End Wall</td>
</tr>
<tr>
<td>Projected Roof Area:</td>
<td>5 ft x 13 ft</td>
<td>(Roof area N/A)</td>
<td>0.6*(W⊥)</td>
</tr>
<tr>
<td>Wall Area:</td>
<td>6 ft x 9 ft</td>
<td>ft x ft</td>
<td>994 #</td>
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**Line D:**

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<th>Tributary Loads:</th>
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<tbody>
<tr>
<td>Projected Roof Area:</td>
<td>5 ft x 13 ft</td>
<td>(Roof area N/A)</td>
</tr>
<tr>
<td>Wall Area:</td>
<td>6 ft x 9 ft</td>
<td>ft x ft</td>
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**Line E:**

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<th>Tributary Dimensions:</th>
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<tbody>
<tr>
<td>Projected Roof Area:</td>
<td>(Roof area N/A)</td>
</tr>
<tr>
<td>Wall Area:</td>
<td>ft x ft</td>
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</table>
### ROOF LEVEL E-W WIND LOADS

#### Line F:

Tributary Dimensions:

<table>
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<th>Areas Perpendicular to Ridge</th>
<th>Area of End Wall</th>
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<tbody>
<tr>
<td>Height</td>
<td>Width</td>
<td>Wind Load Perpendicular to Ridge</td>
</tr>
<tr>
<td>Wall Area</td>
<td></td>
<td>Wind Load to End Wall</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total Wind Load</td>
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</table>

Projected Roof Area: 5 ft x 25 ft (Roof area N/A)

Wall Area: 5 ft x 25 ft

Total Wind Load = 2153 #

<table>
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<th>Height</th>
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<tbody>
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#### Line G:

No Wind Loads into this Line

#### Line H:

No Wind Loads into this Line

#### Line J:

Tributary Dimensions:

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<th>Areas Perpendicular to Ridge</th>
<th>Area of End Wall</th>
<th>Tributary Loads:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>Width</td>
<td>Wind Load Perpendicular to Ridge</td>
</tr>
<tr>
<td>Wall Area</td>
<td></td>
<td>Wind Load to End Wall</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total Wind Load</td>
</tr>
</tbody>
</table>

Projected Roof Area: 5 ft x 10 ft (Roof area N/A)

Wall Area: 6 ft x 6 ft

Total Wind Load = 701 #

<table>
<thead>
<tr>
<th>Height</th>
<th>Width</th>
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<tbody>
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<td>11.5 ft</td>
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#### Line K:

Tributary Dimensions:

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</thead>
<tbody>
<tr>
<td>Height</td>
<td>Width</td>
<td>Wind Load Perpendicular to Ridge</td>
</tr>
<tr>
<td>Wall Area</td>
<td></td>
<td>Wind Load to End Wall</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total Wind Load</td>
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</tbody>
</table>

Projected Roof Area: 4 ft x 10 ft (Roof area N/A)

Wall Area: 5 ft x 7 ft

Total Wind Load = 632 #

<table>
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<th>Height</th>
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<tbody>
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<td>10 ft</td>
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#### Line L:

Tributary Dimensions:

<table>
<thead>
<tr>
<th>Areas Perpendicular to Ridge</th>
<th>Area of End Wall</th>
<th>Tributary Loads:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>Width</td>
<td>Wind Load Perpendicular to Ridge</td>
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<tr>
<td>Wall Area</td>
<td></td>
<td>Wind Load to End Wall</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total Wind Load</td>
</tr>
</tbody>
</table>

Projected Roof Area: 4 ft x 18.5 ft (Roof area N/A)

Wall Area: 5 ft x 15.5 ft

Total Wind Load = 1315 #

<table>
<thead>
<tr>
<th>Height</th>
<th>Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 ft</td>
<td></td>
</tr>
</tbody>
</table>
**ROOF LEVEL N-S WIND LOADS**

Lateral Wind Loads Governing Combination -ASCE7-16 Section 2.4.1, Combination 5: \(0.6W\)

\[
W (\#) = \text{Wind Loads Transverse to Building Ridge} (W_t) + \text{Wind Loads to Gable End Wall (W_ew)}
\]

\[
W (\#) = \left[\text{Projected Roof Area}\right]^{P_{\text{net-Roof Area}}} + \left[\text{Wall Area}\right]^{P_{\text{net-Roof Level}}} + \left[\text{Area of End Wall}\right]^{P_{\text{net-Roof Level}}}
\]

**Line 1/2:**

<table>
<thead>
<tr>
<th>Tributary Dimensions:</th>
<th>Tributary Loads:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Areas Perpendicular to Ridge</td>
<td>Area of End Wall</td>
</tr>
<tr>
<td>Height</td>
<td>Width</td>
</tr>
<tr>
<td>Projected Roof Area:</td>
<td></td>
</tr>
<tr>
<td>Wall Area:</td>
<td></td>
</tr>
<tr>
<td>Plate Height = 10 ft</td>
<td></td>
</tr>
</tbody>
</table>

\[
\text{Wind Load to End Wall} = 0.6*(W_t) + 0.6*(W_ew) = 0.6*(W_t + W_ew)
\]

**Line 3:**

<table>
<thead>
<tr>
<th>Tributary Dimensions:</th>
<th>Tributary Loads:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Areas Perpendicular to Ridge</td>
<td>Area of End Wall</td>
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<tr>
<td>Height</td>
<td>Width</td>
</tr>
<tr>
<td>Projected Roof Area:</td>
<td></td>
</tr>
<tr>
<td>Wall Area:</td>
<td></td>
</tr>
<tr>
<td>Plate Height = 10 ft</td>
<td></td>
</tr>
</tbody>
</table>

\[
\text{Wind Load to End Wall} = 0.6*(W_t) + 0.6*(W_ew) = 0.6*(W_t + W_ew)
\]

**Line 4:**

<table>
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<tr>
<th>Tributary Dimensions:</th>
<th>Tributary Loads:</th>
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</thead>
<tbody>
<tr>
<td>Areas Perpendicular to Ridge</td>
<td>Area of End Wall</td>
</tr>
<tr>
<td>Height</td>
<td>Width</td>
</tr>
<tr>
<td>Projected Roof Area:</td>
<td></td>
</tr>
<tr>
<td>Wall Area:</td>
<td></td>
</tr>
<tr>
<td>Plate Height = # # # # ft</td>
<td></td>
</tr>
</tbody>
</table>

\[
\text{Wind Load to End Wall} = 0.6*(W_t) + 0.6*(W_ew) = 0.6*(W_t + W_ew)
\]

**Line 5:**

<table>
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<th>Tributary Dimensions:</th>
<th>Tributary Loads:</th>
</tr>
</thead>
<tbody>
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<td>Areas Perpendicular to Ridge</td>
<td>Area of End Wall</td>
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<tr>
<td>Height</td>
<td>Width</td>
</tr>
<tr>
<td>Projected Roof Area:</td>
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</tr>
<tr>
<td>Wall Area:</td>
<td></td>
</tr>
<tr>
<td>Plate Height = # # # # ft</td>
<td></td>
</tr>
</tbody>
</table>

\[
\text{Wind Load to End Wall} = 0.6*(W_t) + 0.6*(W_ew) = 0.6*(W_t + W_ew)
\]

**Line 6:**

<table>
<thead>
<tr>
<th>Tributary Dimensions:</th>
<th>Tributary Loads:</th>
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<tr>
<td>Areas Perpendicular to Ridge</td>
<td>Area of End Wall</td>
</tr>
<tr>
<td>Height</td>
<td>Width</td>
</tr>
<tr>
<td>Projected Roof Area:</td>
<td></td>
</tr>
<tr>
<td>Wall Area:</td>
<td></td>
</tr>
<tr>
<td>Plate Height = 10 ft</td>
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</tr>
</tbody>
</table>

\[
\text{Wind Load to End Wall} = 0.6*(W_t) + 0.6*(W_ew) = 0.6*(W_t + W_ew)
\]
## ROOF LEVEL N-S WIND LOADS

### Tributary Dimensions:

<table>
<thead>
<tr>
<th>Areas Perpendicular to Ridge</th>
<th>Area of End Wall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>Height</td>
</tr>
<tr>
<td>Width</td>
<td>Width</td>
</tr>
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<table>
<thead>
<tr>
<th>Projected Roof Area:</th>
<th>Wall Area:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 ft x 10 ft</td>
<td>5 ft x 7 ft</td>
</tr>
</tbody>
</table>

(Roof area N/A)

### Tributary Loads:

\[
\text{Wind Load Perpendicular to Ridge} = 0.6(W_p) \\
\text{Wind Load to End Wall} = 0.6(W_{ew}) \\
\text{Total Wind Load} = 0.6(W_p + W_{ew})
\]

<table>
<thead>
<tr>
<th>Wind Load Perpendicular to Ridge</th>
<th>Wind Load to End Wall</th>
<th>Total Wind Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>574 #</td>
<td>0 #</td>
<td>574 #</td>
</tr>
</tbody>
</table>

Plate Height = 10 ft
STRUCUTRE WEIGHTS

Roof: Weight of structure into roof diaphragm

<table>
<thead>
<tr>
<th>Element</th>
<th>Load (psf)</th>
<th>x Tributary Area (ft^2)</th>
<th>= Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roofing</td>
<td>19.0</td>
<td>5030</td>
<td>= 95438</td>
</tr>
<tr>
<td>Exterior Wall</td>
<td>15</td>
<td>2540</td>
<td>= 38100</td>
</tr>
<tr>
<td>Interior Wall</td>
<td>8</td>
<td>1060</td>
<td>= 8480</td>
</tr>
<tr>
<td>Porch Lid</td>
<td>10</td>
<td>1780</td>
<td>= 17800</td>
</tr>
<tr>
<td>Stone Veneer</td>
<td>15</td>
<td>102</td>
<td>= 1530</td>
</tr>
</tbody>
</table>

Total Weight of Roof = 161348

Weight of Structure Into Lateral Force Restrainting System = 161348
SEISMIC PROFILE

** The following equations are from the ASCE 7-16 Section 12.8

** Terms:**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>$C_t$</td>
<td>$S_{DS}$</td>
</tr>
<tr>
<td>$x$</td>
<td>$w$</td>
</tr>
<tr>
<td>$h_{tot}$</td>
<td>$k$</td>
</tr>
<tr>
<td>$T_a$</td>
<td>$R$</td>
</tr>
<tr>
<td>$I$</td>
<td>$p$</td>
</tr>
<tr>
<td>$T_L$</td>
<td>$S_{0S}$</td>
</tr>
<tr>
<td>$S_{0D}$</td>
<td>$S_{D1}$</td>
</tr>
<tr>
<td>$C_S$</td>
<td>$S_{DS}$</td>
</tr>
<tr>
<td>$C_S^{max}$</td>
<td>$S_{D1}$</td>
</tr>
<tr>
<td>$C_S^{min}$</td>
<td>$(T_a/ (T_a (R/I)))$</td>
</tr>
<tr>
<td>$V$</td>
<td>$w$</td>
</tr>
<tr>
<td>$E_h$</td>
<td>$C_{vx} V$</td>
</tr>
</tbody>
</table>

** Design Base Shear:**

$T_a = C_t h_{tot}^r = 0.175$ s

For $T_a > T_L$:

$C_{S^{max}} = S_{D1} / (T_a (R/I)) = 0.437$

$C_{S^{min}} = 0.01$

$C_S = S_{D1} / (R/I) = 0.131$

$C_{S^{min}} < C_S < C_{S^{max}}$  OKAY

$V = p C_S w = 27494$ #

** Vertical Distribution of Seismic Forces:**

$E_h = C_{vx} V$

$E_{h-ASD} = 0.7 E_h$

$C_{vx} = \frac{\sum w_i h_i}{\sum w_i h_i}$

<table>
<thead>
<tr>
<th>Level</th>
<th>$w_i$ (#)</th>
<th>$h_i$ (ft)</th>
<th>$w_i h_i$ (#-ft)</th>
<th>$C_{vx}$</th>
<th>$E_h$ (#)</th>
<th>$E_h / w_i$</th>
<th>$E_{h-ASD}$ (#)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roof</td>
<td>161348</td>
<td>10</td>
<td>1613475</td>
<td>1.000</td>
<td>27494</td>
<td>0.170</td>
<td>19246</td>
</tr>
<tr>
<td>Sum</td>
<td>161348</td>
<td>----</td>
<td>1613475</td>
<td>1</td>
<td>27494</td>
<td>0.170</td>
<td>19246</td>
</tr>
</tbody>
</table>
ROOF LEVEL E-W SEISMIC LOAD ANALYSIS

Story Area = 3680 ft$^2$
Story Weight = 161348 #
$C_s = 0.131$
$F_{s,w} = 0.17$
Story Shear = 19246 #

Check: Total Story Shear ≤ Sum of All Line Shear, $\sum V_i$

<table>
<thead>
<tr>
<th>Story Shear</th>
<th>$\sum V_i$</th>
</tr>
</thead>
<tbody>
<tr>
<td>19246 #</td>
<td>19314 #</td>
</tr>
</tbody>
</table>

Line A:

Line Shear = Story Shear $\times \left( \frac{\text{Tributary Area (ft}^2\right)}{\text{Story Area}} \right)

= 19246 # $\times \left( \frac{150 \text{ ft}^2}{3680 \text{ ft}^2} \right) = 784 #

Line B:

Line Shear = Story Shear $\times \left( \frac{\text{Tributary Area (ft}^2\right)}{\text{Story Area}} \right)

= 19246 # $\times \left( \frac{160 \text{ ft}^2}{3680 \text{ ft}^2} \right) = 837 #

Line B.8:

Line Shear = Story Shear $\times \left( \frac{\text{Tributary Area (ft}^2\right)}{\text{Story Area}} \right)

= 19246 # $\times \left( \frac{475 \text{ ft}^2}{3680 \text{ ft}^2} \right) = 2484 #

Line C:

Line Shear = Story Shear $\times \left( \frac{\text{Tributary Area (ft}^2\right)}{\text{Story Area}} \right)

= 19246 # $\times \left( \frac{394 \text{ ft}^2}{3680 \text{ ft}^2} \right) = 2061 #

Line D:

Line Shear = Story Shear $\times \left( \frac{\text{Tributary Area (ft}^2\right)}{\text{Story Area}} \right)

= 19246 # $\times \left( \frac{508 \text{ ft}^2}{3680 \text{ ft}^2} \right) = 2657 #

Line E:
Seismic loads at this line distributed into adjacent gridlines

Line F:

Line Shear = Story Shear $\times \left( \frac{\text{Tributary Area (ft}^2\right)}{\text{Story Area}} \right)

= 19246 # $\times \left( \frac{700 \text{ ft}^2}{3680 \text{ ft}^2} \right) = 3661 #

Line G:
Seismic loads at this line distributed into adjacent gridlines

Line H:

Line Shear = Story Shear $\times \left( \frac{\text{Tributary Area (ft}^2\right)}{\text{Story Area}} \right)

= 19246 # $\times \left( \frac{450 \text{ ft}^2}{3680 \text{ ft}^2} \right) = 2353 #
## ROOF LEVEL E-W SEISMIC LOAD ANALYSIS

### Line J:

\[
\text{Line Shear} = \text{Story Shear} \times \left( \frac{\text{Tributary Area (ft}^2\text{)}}{\text{Story Area}} \right)
\]

\[
= 19246 \text{ #} \times \left( \frac{394 \text{ ft}^2}{3680 \text{ ft}^2} \right) = 2061 \text{ #}
\]

### Line K:

\[
\text{Line Shear} = \text{Story Shear} \times \left( \frac{\text{Tributary Area (ft}^2\text{)}}{\text{Story Area}} \right)
\]

\[
= 19246 \text{ #} \times \left( \frac{90 \text{ ft}^2}{3680 \text{ ft}^2} \right) = 471 \text{ #}
\]

### Line L:

\[
\text{Line Shear} = \text{Story Shear} \times \left( \frac{\text{Tributary Area (ft}^2\text{)}}{\text{Story Area}} \right)
\]

\[
= 19246 \text{ #} \times \left( \frac{372 \text{ ft}^2}{3680 \text{ ft}^2} \right) = 1945 \text{ #}
\]
ROOF LEVEL N-S SEISMIC LOAD ANALYSIS

Story Area = 3680 ft²  Story Weight = 161348 #  C₀ = 0.131  Fₚ/wₚ = 0.17  Story Shear = 19246 #

Check: Total Story Shear ≤ Sum of All Line Shear, ∑Vi

<table>
<thead>
<tr>
<th>Story Shear ≤ ∑ Vi</th>
</tr>
</thead>
<tbody>
<tr>
<td>19246 # ≤ 19256 #</td>
</tr>
</tbody>
</table>

### Line 1/2:

Line Shear = Story Shear × (Tributary Area (ft²) / Story Area)

= 19246 # × (768 ft² / 3680 ft²) = 4016 #

### Line 3:

Line Shear = Story Shear × (Tributary Area (ft²) / Story Area)

= 19246 # × (847 ft² / 3680 ft²) = 4430 #

### Line 4:

Line Shear = Story Shear × (Tributary Area (ft²) / Story Area)

= 19246 # × (473 ft² / 3680 ft²) = 2474 #

### Line 5:

Line Shear = Story Shear × (Tributary Area (ft²) / Story Area)

= 19246 # × (560 ft² / 3680 ft²) = 2929 #

### Line 6:

Line Shear = Story Shear × (Tributary Area (ft²) / Story Area)

= 19246 # × (600 ft² / 3680 ft²) = 3138 #

### Line 7:

Line Shear = Story Shear × (Tributary Area (ft²) / Story Area)

= 19246 # × (434 ft² / 3680 ft²) = 2270 #
Roof E-W Lateral Analysis & Drag Force

### Line A:
- **Seismic loads increased by a factor of 1/(2w/h) per AF&PA SDPWS 4.3.4.**
- **Plate Height = 10 ft**

<table>
<thead>
<tr>
<th>Interior Cond.</th>
<th>Exterior Cond.</th>
<th>Horizontal Irregularity (ASCE 7-16 Table 12.3-1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Wall Length = 13.5 ft.</td>
<td>Shear Wall Length = 3.75 ft.</td>
<td></td>
</tr>
</tbody>
</table>

**From Wind Design Analysis:**
- Diaph. Shear = 77 plf
- Line Shear = 77 plf
- **Wall Shear = 279 plf**

**From Seismic Design Analysis:**
- Seismic = 953 #

**Shear Panel:**
- 2 Holdown & Post: HDU2-SDS2.5 and Dbl 2x Studs
- Sheathing: (1) 3'-9" wall

**Note:** H:W ratio at shear walls addressed through seismic increase.

### Line B:
- **Plate Height = 10 ft**

<table>
<thead>
<tr>
<th>Interior Cond.</th>
<th>Exterior Cond.</th>
<th>Horizontal Irregularity (ASCE 7-16 Table 12.3-1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Wall Length = 22 ft.</td>
<td>Shear Wall Length = 6.5 ft.</td>
<td></td>
</tr>
</tbody>
</table>

**From Wind Design Analysis:**
- Diaph. Shear = 38 plf
- Line Shear = 38 plf
- **Wall Shear = 129 plf**

**From Seismic Design Analysis:**
- Seismic = 837 #

**Shear Panel:**
- 1 Holdown & Post: HDU2-SDS2.5 and Dbl 2x Studs
- Sheathing: (1) 6'-6" wall

**Grade Beam Uplift Check:** Use typical footing per concrete note.

**Maximum Drag:**
- 755 #
- 903 #

**Provide (6) 16d nails**

**Provide (3) 16d nails**
**Roof E-W Lateral Analysis & Drag Force**

### Line B.8:
- **Plate Height = 10 ft**
- **Date: 9/28/2021**
- **Lateral, Drag, Uplift Check**

**Interior Cond.** | **Exterior Cond.** | **Horizontal Irregularity (ASCE 7-16 Table 12.3-1)**
--- | --- | ---
Walls (ft.) | 4 | 14 | 4

**From Wind Design Analysis:**
- **Diaph. Shear = 113 plf**
- **Line Shear = 113 plf**

\[
M_{RES} = (0.6) \times [\text{(roof load)} + \text{(wall load)} + \text{(floor load)} + \text{(additional loads)}] \times L_{min}/2
\]

\[
= -0.6 \times [18.97 \text{ psf} \times 2 \times 18] \times (15 \text{ psf} \times 14 \times 5)
\]

\[
+ (20 \text{ psf} \times 18) \times (18.97 \text{ psf} \times 14) \times 7 = -7279 \text{ ft-#}
\]

**M_{OT} = wall shear \times L_{min} \times H_{plate} = 177.4 plf \times 14 \times 10 = 2484 ft-#**

**Holdown = \frac{M_{OT} - M_{RES}}{L_{min}} = \frac{24841 \text{ ft-#} + 7279 \text{ ft-#}}{14}**

**Governs**

**From Seismic Design Analysis:**
- **Wall Shear = 177 plf**
- **Net Shear = -65 plf**

**Provide (4) 16d nails**

---

### Line C:
- **Plate Height = 11.5 ft**
- **Date: 9/28/2021**
- **Lateral, Drag, Uplift Check**

**Interior Cond.** | **Exterior Cond.** | **Horizontal Irregularity (ASCE 7-16 Table 12.3-1)**
--- | --- | ---
Walls (ft.) | 5.75 | 13 | 5.75

**From Wind Design Analysis:**
- **Diaph. Shear = 84 plf**
- **Line Shear = 84 plf**

\[
M_{RES} = (0.6) \times [\text{(roof load)} + \text{(wall load)} + \text{(floor load)} + \text{(additional loads)}] \times L_{min}/2
\]

\[
= -0.6 \times [18.97 \text{ psf} \times 2 \times 9.75] \times (15 \text{ psf} \times 5.75 \times 0)
\]

\[
+ (20 \text{ psf} \times 9.75) \times (18.97 \text{ psf} \times 9.75) \times 2.9 = -638 \text{ ft-#}
\]

**M_{OT} = wall shear \times L_{min} \times H_{plate} = 179.2 plf \times 5.75 \times 0**

**Holdown = \frac{M_{OT} - M_{RES}}{L_{min}} = \frac{0 \text{ ft-#} + 638 \text{ ft-#}}{5.75}**

**Governs**

**From Seismic Design Analysis:**
- **Wall Shear = 179 plf**
- **Net Shear = -95 plf**

**Provide (4) 16d nails**

---

**Grade Beam Uplift Check:**
- **Use typical footing per concrete note.**
- **Maximum Drag = 452 #**
- **Provide (4) 16d nails**
### Roof E-W Lateral Analysis & Drag Force

#### Line D:
- **Seismic loads increased by a factor of 1/((2w/h)) per AF&PA SDPWS 4.3.4.**
- **Plate Height = 8.5 ft**

<table>
<thead>
<tr>
<th>Walls (ft.)</th>
<th>Total Wall Length = 15.6 ft</th>
<th>Shear Wall Length = 6.6 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 9 3.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From Wind Design Analysis:  
Wind = 0  #  

From Seismic Design Analysis:  
Seismic = Seismic @ Line D x Increase per AF&PA SDPWS 4.3.4  
Seismic = 2657 # x 1.42 = 3764 #

<table>
<thead>
<tr>
<th>Diaph. Shear = 241 plf</th>
<th>Line Shear = 241 plf</th>
<th>Wall Shear = 570 plf</th>
<th>Net Shear = -329 plf</th>
</tr>
</thead>
</table>

**Shear Panel:** 4  
**Holdown & Post:** HDU5-SDS2.5 and 4x DF#2 posts  
**Sheathing:** (1) 3’ and (1) 3’-8” wall  
**Grade Beam Uplift Check:** Use typical footing per concrete note.

#### Line E:
- **Lateral loads at this line distributed into adjacent gridlines**
- **Plate Height = 8.5 ft**

<table>
<thead>
<tr>
<th>Walls (ft.)</th>
<th>Total Wall Length = 24 ft</th>
<th>Shear Wall Length = 15 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 9 3.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From Wind Design Analysis:  
Wind = 2153 #  

From Seismic Design Analysis:  
Seismic = 3661 #

<table>
<thead>
<tr>
<th>Diaph. Shear = 153 plf</th>
<th>Line Shear = 153 plf</th>
<th>Wall Shear = 244 plf</th>
<th>Net Shear = -92 plf</th>
</tr>
</thead>
</table>

**Shear Panel:** 1  
**Holdown & Post:** HDU2-SDS2.5 and Dbl 2x Studs  
**Sheathing:** (1) 15’ wall  
**Grade Beam Uplift Check:** Use typical footing per concrete note.

#### Line F:
- **Plate Height = 10 ft**

<table>
<thead>
<tr>
<th>Walls (ft.)</th>
<th>Total Wall Length = 24 ft</th>
<th>Shear Wall Length = 15 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 15 6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From Wind Design Analysis:  
Wind = 0  #  

From Seismic Design Analysis:  
Seismic = 0  #

<table>
<thead>
<tr>
<th>Diaph. Shear = 153 plf</th>
<th>Line Shear = 153 plf</th>
<th>Wall Shear = 244 plf</th>
<th>Net Shear = -92 plf</th>
</tr>
</thead>
</table>

**Shear Panel:** 1  
**Holdown & Post:** HDU2-SDS2.5 and Dbl 2x Studs  
**Sheathing:** (1) 15’ wall  
**Grade Beam Uplift Check:** Use typical footing per concrete note.

<table>
<thead>
<tr>
<th>Walls (ft.)</th>
<th>Total Wall Length = 24 ft</th>
<th>Shear Wall Length = 15 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 3 15 6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Drag Force: 0 458 -915 0 0 0 0 0 0 0 0 0 0 0 0  
Maximum Drag = 915 #  
Provide (7) 16d nails
**Roof E-W Lateral Analysis & Drag Force**

**Line G:** Lateral loads at this line distributed into adjacent gridlines

- Plate Height = 8.5 ft

<table>
<thead>
<tr>
<th>Interior Cond.</th>
<th>Exterior Cond.</th>
<th>Horizontal Irregularity (ASCE 7-16 Table 12.3-1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.5</td>
<td>4.5</td>
<td>3.5</td>
</tr>
</tbody>
</table>

**Line H:** Seismic loads increased by a factor of 1/(2w/h) per AF&PA SDPWS 4.3.4.

- Plate Height = 8.5 ft

<table>
<thead>
<tr>
<th>Interior Cond.</th>
<th>Exterior Cond.</th>
<th>Horizontal Irregularity (ASCE 7-16 Table 12.3-1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.5</td>
<td>4.5</td>
<td>3.5</td>
</tr>
</tbody>
</table>

**From Wind Design Analysis:**

- Diaph. Shear = 136 plf
- Line Shear = Line Shear = 136 plf
- Wall Shear = 285 plf
- Net Shear = -149 plf

**From Seismic Design Analysis:**

- Seismic = 235 # x 1.55 = 3637 #

**Note:** H:W ratio at shear walls addressed through seismic increase.

**Shear Panel:** 2

- Holdown & Post: HDU2-SDS2.5 and Dbl 2x Studs
- Sheathing: (1) 6-6" (1) 3'-6" and (1) 2'-9" wall

**Line J:**

- Plate Height = 11.5 ft

<table>
<thead>
<tr>
<th>Interior Cond.</th>
<th>Exterior Cond.</th>
<th>Horizontal Irregularity (ASCE 7-16 Table 12.3-1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.75</td>
<td>13</td>
<td>5.75</td>
</tr>
</tbody>
</table>

**From Wind Design Analysis:**

- Diaph. Shear = 84 plf
- Line Shear = 84 plf
- Wall Shear = 179 plf
- Net Shear = -95 plf

**From Seismic Design Analysis:**

- Seismic = 2061 #

**Shear Panel:** 1

- Holdown & Post: HDU2-SDS2.5 and 4x DF#2 Posts
- Sheathing: (2) 5'-9" walls

**Grade Beam Uplift Check:**

- Use typical footing per concrete note.

**Line J:**

- Maximum Drag = 970 #

- Provide (7) 16d nails

**Line J:**

- Maximum Drag = 547 #

- Provide (4) 16d nails
### Roof E-W Lateral Analysis & Drag Force

**Date:** 9/28/2021  
**Lateral, Drag, Uplift Check**

#### Line K:

<table>
<thead>
<tr>
<th>Walls (ft.)</th>
<th>Seismic loads increased by a factor of (1/((2w/h))) per AF&amp;PA SDPWS 4.3.4.</th>
<th>Plate Height = 10 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interior Cond.</td>
<td>Exterior Cond.</td>
<td>Horizontal Irregularity (ASCE 7-16 Table 12.3-1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>From Wind Design Analysis:</th>
<th><strong>Governs</strong></th>
<th>From Seismic Design Analysis:</th>
<th>Seismic @ Line K Increase per AF&amp;PA SDPWS 4.3.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind =</td>
<td>= 632 #</td>
<td>Seismic = 471 # (\times 1.33) = 628 #</td>
<td></td>
</tr>
<tr>
<td>Diaph. Shear = 47 plf</td>
<td>Line Shear = 47 plf</td>
<td>Wall Shear = 168 plf</td>
<td>Net Shear = -122 plf</td>
</tr>
</tbody>
</table>

\[
M_{RES} = (0.6) \times \left[ (\text{roof load}) + (\text{wall load}) + (\text{floor load}) + (\text{additional loads}) \right] \times \frac{L_{min}}{2}
\]

\[
M_{OT} = \text{wall shear} \times L_{min} \times H_{plate} = 168.5 \text{ plf} \times 3.75 \times 10
\]

\[
\text{Holdown} = \frac{M_{OT} - M_{RES}}{L_{min}} = \frac{6318 \text{ ft-#} - 1647 \text{ ft-#}}{3.25}
\]

Shear Panel:  
Holdown & Post: HDU2-SD52.5 and Dbl 2x Stubs  
Sheathing: (1) 3'9" wall

**Note:** H:W ratio at shear walls addressed through seismic increase.

**Grade Beam Uplift Check:** Use typical footing per concrete note.

<table>
<thead>
<tr>
<th>Walls (ft.)</th>
<th>Maximum Drag = 456 #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drag Force:</td>
<td>-456 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

| Line L: |
|--------------------------|----------------|----------------|----------------|
| Walls (ft.) | Seismic = 1315 # | From Seismic Design Analysis: | **Governs** |
| Interior Cond. | Exterior Cond. | Horizontal Irregularity (ASCE 7-16 Table 12.3-1) | Seismic = 1945 # |

<table>
<thead>
<tr>
<th>From Wind Design Analysis:</th>
<th><strong>Governs</strong></th>
<th>From Seismic Design Analysis:</th>
<th>Seismic = 1315 #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind =</td>
<td>= 1315 #</td>
<td>Seismic = 1945 #</td>
<td></td>
</tr>
<tr>
<td>Diaph. Shear = 81 plf</td>
<td>Line Shear = 81 plf</td>
<td>Wall Shear = 144 plf</td>
<td>Net Shear = -63 plf</td>
</tr>
</tbody>
</table>

\[
M_{RES} = (0.6) \times \left[ (\text{roof load}) + (\text{wall load}) + (\text{floor load}) + (\text{additional loads}) \right] \times \frac{L_{min}}{2}
\]

\[
M_{OT} = \text{wall shear} \times L_{min} \times H_{plate} = 144.1 \text{ plf} \times 6.5 \times 10
\]

\[
\text{Holdown} = \frac{M_{OT} - M_{RES}}{L_{min}} = \frac{9367 \text{ ft-#} - 1728 \text{ ft-#}}{6.5}
\]

Shear Panel:  
Holdown & Post: HDU2-SD52.5 and Dbl 2x Studs  
Sheathing: (1) 7' and (1) 6'-6" wall

**Grade Beam Uplift Check:** Use typical footing per concrete note.

<table>
<thead>
<tr>
<th>Walls (ft.)</th>
<th>Maximum Drag = 441 #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drag Force:</td>
<td>-441 410 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>
**Roof N-S Lateral Analysis & Drag Force**

**Line 1/2:**

<table>
<thead>
<tr>
<th>Interior Cond.</th>
<th>X Exterior Cond.</th>
<th>X Horizontal Irregularity (ASCE 7-16 Table 12.3-1)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Walls (ft.)</th>
<th>Total Wall Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 18.5 6 21 7 8.5</td>
<td>67 ft.</td>
</tr>
</tbody>
</table>

From Wind Design Analysis:

- Wind: 947 #
- Diaph. Shear = 60 plf
- Line Shear = 60 plf
- Net Shear = -151 plf
- Maximum Drag = 1136 #

From Seismic Design Analysis:

- Seismic: 4016 #
- Wall Shear = 211 plf

**Line 3:**

| Interior Cond. | X Exterior Cond. | Horizontal Irregularity (ASCE 7-16 Table 12.3-1) |
|----------------|------------------|---------------------------------

<table>
<thead>
<tr>
<th>Walls (ft.)</th>
<th>Total Wall Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 16 7 19 7 8</td>
<td>67 ft.</td>
</tr>
</tbody>
</table>

From Wind Design Analysis:

- Wind: 1231 #
- Diaph. Shear = 66 plf
- Line Shear = 66 plf
- Net Shear = -118 plf
- Maximum Drag = 1185 #

From Seismic Design Analysis:

- Seismic: 4430 #
- Wall Shear = 185 plf

**Grade Beam Uplift Check:**

Use typical footing per concrete note.

- Maximum Drag = 1136 #
- Provide (9) 16d nails

- Maximum Drag = 1185 #
- Provide (9) 16d nails
**Lateral, Drag, Uplift Check**

**Plate Height = 10 ft**

**Interior Cond.** | **Exterior Cond.** | **Horizontal Irregularity (ASCE 7-16 Table 12.3-1)**
--- | --- | ---
Walls (ft.): | 6 | 19 | 8

**Total Wall Length = 33 ft.**

**Shear Wall Length = 14 ft.**

**From Wind Design Analysis:**

- **Wind =** 1325 #
- **Diaph. Shear =** 75 plf
- **Line Shear =** 75 plf
- **Wall Shear =** 177 plf
- **Net Shear =** -102 plf

**From Seismic Design Analysis:**

- **Seismic =** 2474 #
- **Wall Shear =** 177 plf
- **Net Shear =** -102 plf

**Grade Beam Uplift Check:**

**Use typical footing per concrete note.**

**Walls (ft.):**

- Maximum Drag = 814 #

**Drag Force:**

- -610 814 0 0 0 0 0 0 0 0 0 0

**Provide (6) 16d nails**

**Line 5:**

**Seismic loads increased by a factor of 1/((2w/h)) per AF&PA SDPWS 4.3.4.**

- **Total Wall Length = 32 ft.**
- **Shear Wall Length = 8 ft.**

**From Wind Design Analysis:**

- **Wind =** 1446 #
- **Diaph. Shear =** 114 plf
- **Line Shear =** 114 plf

**From Seismic Design Analysis:**

- **Seismic =** 2929 #
- **Wall Shear =** 458 plf
- **Net Shear =** -343 plf

**Grade Beam Uplift Check:**

**Use typical footing per concrete note.**

**Walls (ft.):**

- Maximum Drag = 1373 #

**Drag Force:**

- -1373 1373 0 0 0 0 0 0 0 0 0 0

**Provide (10) 16d nails**

**Note:** H:W ratio at shear walls addressed through seismic increase.
**Lateral, Drag, Uplift Check**

**Date: 9/28/2021**

### Roof N-S Lateral Analysis & Drag Force

#### Line 6:

<table>
<thead>
<tr>
<th>Walls (ft.)</th>
<th>Plate Height = 10 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interior Cond.</td>
<td></td>
</tr>
<tr>
<td>Exterior Cond.</td>
<td>X</td>
</tr>
<tr>
<td>Horizontal Irregularity (ASCE 7-16 Table 12.3-1)</td>
<td></td>
</tr>
<tr>
<td>Total Wall Length = 64.3 ft.</td>
<td></td>
</tr>
<tr>
<td>Shear Wall Length = 14.6 ft.</td>
<td></td>
</tr>
</tbody>
</table>

From Wind Design Analysis:

Wind = 933 #

Diaph. Shear = 49 plf

Line Shear = 49 plf

Wall Shear = 215 plf

Net Shear = -166 plf

\[
M_{RES} = (0.6) \times \left( \left( \text{roof load} \right) + \left( \text{wall load} \right) + \left( \text{floor load} \right) + \left( \text{additional loads} \right) \right) \times \frac{L_{min}}{2}
\]

\[
= -0.6 \times \left( \left( 18.97 \text{ psf} \times 2 \times 10.6 \right) + \left( 15 \text{ psf} \times 6.6 \times 5 \right) + \left( 20 \text{ psf} \times 2 \times 10.6 \right) + \left( 18.97 \text{ psf} \times 2 \times 10.6 \right) \right) = -3412 \text{ ft-lb}
\]

\[
M_{OT} = \text{wall shear} \times L_{min} \times H_{plate} = 214.9 \text{ plf} \times 6.6 \times 10 = 14185 \text{ ft-lb}
\]

\[
\text{Holdown} = \frac{M_{OT} \times M_{RES}}{L_{min}} = \frac{14185 \times -3412}{6.6} = 1633 #
\]

Shear Panel: 1

Holdown & Post: HDU2-SDS2.5 and Dbl 2x Studs

Sheathing: (1) 6'-8" and (1) 8' wall

Grade Beam Uplift Check: Use typical footing per concrete note.

Walls (ft.): 0 7 6.6 37 8 5.7 0 0 0 0 0 0 Maximum Drag = 1051 #

Drag Force: 0 342 -755 1051 -278 0 0 0 0 0 0 0 Provide (8) 16d nails

#### Line 7:

<table>
<thead>
<tr>
<th>Walls (ft.)</th>
<th>Plate Height = 10 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interior Cond.</td>
<td></td>
</tr>
<tr>
<td>Exterior Cond.</td>
<td>X</td>
</tr>
<tr>
<td>Horizontal Irregularity (ASCE 7-16 Table 12.3-1)</td>
<td></td>
</tr>
<tr>
<td>Total Wall Length = 64 ft.</td>
<td></td>
</tr>
<tr>
<td>Shear Wall Length = 20 ft.</td>
<td></td>
</tr>
</tbody>
</table>

From Wind Design Analysis:

Wind = 574 #

Diaph. Shear = 35 plf

Line Shear = 35 plf

Wall Shear = 113 plf

Net Shear = -78 plf

\[
M_{RES} = (0.6) \times \left( \left( \text{roof load} \right) + \left( \text{wall load} \right) + \left( \text{floor load} \right) + \left( \text{additional loads} \right) \right) \times \frac{L_{min}}{2}
\]

\[
= -0.6 \times \left( \left( 18.97 \text{ psf} \times 2 \times 12 \right) + \left( 15 \text{ psf} \times 8 \times 5 \right) + \left( 20 \text{ psf} \times 2 \times 12 \right) + \left( 18.97 \text{ psf} \times 2 \times 12 \right) \right) = -2533 \text{ ft-lb}
\]

\[
M_{OT} = \text{wall shear} \times L_{min} \times H_{plate} = 113.5 \text{ plf} \times 8 \times 10 = 9079 \text{ ft-lb}
\]

\[
\text{Holdown} = \frac{M_{OT} \times M_{RES}}{L_{min}} = \frac{9079 \times -2533}{8} = 819 #
\]

Shear Panel: 1

Holdown & Post: HDU2-SDS2.5 and Dbl 2x Studs

Sheathing: (1) 12' and (1) 8' wall

Grade Beam Uplift Check: Use typical footing per concrete note.

Walls (ft.): 12 44 8 0 0 0 0 0 0 0 0 0 Maximum Drag = 936 #

Drag Force: -936 624 0 0 0 0 0 0 0 0 0 0 Provide (7) 16d nails
# SHEAR WALL SCHEDULE

<table>
<thead>
<tr>
<th>MARK</th>
<th>SHEATHING</th>
<th>STUDS @ PANEL EDGES</th>
<th>NAILING (E.N. F.N.)</th>
<th>SILL PLATE</th>
<th>TOP PLATE CONNECTOR</th>
<th>SILL PLATE CONNECTION AT SUBFLOOR</th>
<th>ANCHOR BOLTS AT FOUNDATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15/32&quot; PLY (ONE SIDE)</td>
<td>Dbl 2x</td>
<td>8d @ 6 - 12</td>
<td>2x</td>
<td>A35 @ 18&quot; o/c or 16d @ 6&quot;o/c ‡</td>
<td>SDS1/4 x 4 1/2&quot; Screws @ 12&quot; o/c</td>
<td>5/8&quot; DIAMETER @ 48&quot;o/c See note 5</td>
</tr>
<tr>
<td>2</td>
<td>15/32&quot; PLY (ONE SIDE)</td>
<td>Dbl 2x</td>
<td>8d @ 4 - 12</td>
<td>2x</td>
<td>A35 @ 16&quot; o/c or 16d @ 4&quot;o/c ‡</td>
<td>SDS1/4 x 4 1/2&quot; Screws @ 9&quot; o/c</td>
<td>5/8&quot; DIAMETER @ 32&quot;o/c See note 5</td>
</tr>
<tr>
<td>3 †</td>
<td>15/32&quot; PLY (ONE SIDE)</td>
<td>3x (Min)</td>
<td>8d @ 3 - 12</td>
<td>3x</td>
<td>A35 @ 9&quot; o/c or 16d @ 3&quot;o/c ‡</td>
<td>SDS1/4 x 6&quot; Screws @ 8&quot; o/c</td>
<td>5/8&quot; DIAMETER @ 18&quot;o/c See note 5</td>
</tr>
<tr>
<td>4 †</td>
<td>15/32&quot; PLY (ONE SIDE)</td>
<td>3x (Min)</td>
<td>10d @ 3 - 12</td>
<td>3x</td>
<td>A35 @ 9&quot; o/c</td>
<td>SDS1/4 x 6&quot; Screws @ 6&quot; o/c</td>
<td>5/8&quot; DIAMETER @ 12&quot;o/c See note 5</td>
</tr>
<tr>
<td>5 †</td>
<td>19/32&quot; PLY (ONE SIDE)</td>
<td>3x (Min)</td>
<td>10d @ 2 - 12</td>
<td>3x</td>
<td>A35 @ 6&quot; o/c</td>
<td>SDS1/4 x 6&quot; Screws @ 4&quot; o/c</td>
<td>5/8&quot; DIAMETER @ 10&quot;o/c See note 5</td>
</tr>
</tbody>
</table>

**KEY**
- † Studs shall be 3x minimum @ panel edges, use 3x p.t.d.f. bottom plate, stagger nails @ double top plate and panel edges.
- ‡ Provide 16d nails for pressure blocking connections to bottom chord of truss or top plate.

**NOTES**
1. All walls to be fully blocked.
2. All nails specified are common. Where "air-gun" nailing is used, care shall be taken to use true common nail equivalents.
3. Refer to "Vertical Diaphragm Notes" for material and application specifications.
4. For walls which bear trusses; one H-1 clip, from truss to top plate, may be used in place of one A35 top plate connector.
5. Provide Simpson BPS/8-3 bearing plate at all 5/8" dia anchor bolts, or BPS5/8-3 to allow for slotted condition.
6. Use LTP4 or RBC @ 3x sill plate to rim joist or solid blocking. Use spacing as per A35 under "Top Plate Connector".
7. Ok to use RBC in lieu of A35 @ truss/rafter blocking to top plate connections.
8. Structural design for wood structural panels based on DOC PS-1 and PS-2 or wood structural panel design properties given in the APA Panel Design Specification Plywood Sheathing, 24/0 panel index rated OSB or CDX ply.
### Beam 1: Typical Header- 3’ Max Span

**Simple Span:** 3 ft.

**Uniform Loads:**

\[
\begin{align*}
\omega_{DL} &= 19 \text{ psf} \times 11 + 10 \text{ psf} \times 5 = 259 \text{ plf} \\
\omega_{LL} &= 20 \text{ psf} \times 11 = 220 \text{ plf} \\
\omega_{TL} &= \omega_{DL} + \omega_{LL} = 479 \text{ plf}
\end{align*}
\]

**Reactions:**

\[
\begin{align*}
R_{LEFT} &= R_{DL,LT} + R_{LL,LT} = 388 \# + 330 \# = 718 \# \\
R_{RIGHT} &= R_{DL,RT} + R_{LL,RT} = 388 \# + 330 \# = 718 \#
\end{align*}
\]

Use 6x6 DF#1 Beam

Left Support: Use Single 2x Trimmer
Right Support: Use Single 2x Trimmer

### Beam 2: Typical Header- 6’ Max Span

**Simple Span:** 6 ft.

**Uniform Loads:**

\[
\begin{align*}
\omega_{DL} &= 19 \text{ psf} \times 11 + 10 \text{ psf} \times 4 = 249 \text{ plf} \\
\omega_{LL} &= 20 \text{ psf} \times 11 = 220 \text{ plf} \\
\omega_{TL} &= \omega_{DL} + \omega_{LL} = 469 \text{ plf}
\end{align*}
\]

**Point Loads:** (Referenced from the left end of beam)

\[
\begin{align*}
P_{DL} &= 665 \# \text{ at } 3 \text{ ft.} \\
P_{LL} &= 700 \#
\end{align*}
\]

**Reactions:**

\[
\begin{align*}
R_{LEFT} &= R_{DL,LT} + R_{LL,LT} = 1079 \# + 1010 \# = 2089 \# \\
R_{RIGHT} &= R_{DL,RT} + R_{LL,RT} = 1079 \# + 1010 \# = 2089 \#
\end{align*}
\]

Use 6x8 DF#1 Beam

Left Support: Use Single 2x Trimmer
Right Support: Use Single 2x Trimmer

### Beam 3: Kitchen Header-9’ Max Span

**Simple Span:** 9 ft.

**Uniform Loads:**

\[
\begin{align*}
\omega_{DL} &= 19 \text{ psf} \times 14 + 30 \text{ psf} \times 4 = 386 \text{ plf} \\
\omega_{LL} &= 20 \text{ psf} \times 14 = 280 \text{ plf} \\
\omega_{TL} &= \omega_{DL} + \omega_{LL} = 666 \text{ plf}
\end{align*}
\]

**Reactions:**

\[
\begin{align*}
R_{LEFT} &= R_{DL,LT} + R_{LL,LT} = 1735 \# + 1260 \# = 2995 \# \\
R_{RIGHT} &= R_{DL,RT} + R_{LL,RT} = 1735 \# + 1260 \# = 2995 \#
\end{align*}
\]

Use 6x10 DF#1 Beam

Left Support: Use 4x6 DF# 2
Right Support: Use 4x6 DF# 2

### Beam 4: Great Room Flush Set Beam

**Simple Span:** 12 ft.

**Uniform Loads:**

\[
\begin{align*}
\omega_{DL} &= 19 \text{ psf} \times 10 + 10 \text{ psf} \times 4 = 230 \text{ plf} \\
\omega_{LL} &= 20 \text{ psf} \times 10 = 200 \text{ plf} \\
\omega_{TL} &= \omega_{DL} + \omega_{LL} = 430 \text{ plf}
\end{align*}
\]

**Reactions:**

\[
\begin{align*}
R_{LEFT} &= R_{DL,LT} + R_{LL,LT} = 1378 \# + 1200 \# = 2578 \# \\
R_{RIGHT} &= R_{DL,RT} + R_{LL,RT} = 1378 \# + 1200 \# = 2578 \#
\end{align*}
\]

Use 6x10 DF#1 Beam

Left Support: Use 4x6 DF# 2
Right Support: Use 4x6 DF# 2
### Roof Level Vertical Analysis

#### Beam 5: Garage Door Header
Simple Span: 18 ft.

**Uniform Loads:**

\[
\begin{align*}
\omega_{DL} &= 19 \text{ psf} \times 12 + 10 \text{ psf} \times 3 = 303 \text{ plf} \\
\omega_{LL} &= 20 \text{ psf} \times 12 = 240 \text{ plf} \\
\omega_{TL} &= \omega_{DL} + \omega_{LL} = 543 \text{ plf}
\end{align*}
\]

**Point Loads:**

<table>
<thead>
<tr>
<th>Load</th>
<th>Value</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>(P_{DL})</td>
<td>1330 #</td>
<td>at 4.5 ft.</td>
</tr>
<tr>
<td>(P_{LL})</td>
<td>1400 #</td>
<td></td>
</tr>
</tbody>
</table>

**Reactions:**

\[
\begin{align*}
R_{LEFT} &= R_{DL, LT} + R_{LL, LT} = 3722 # + 3210 # = 6932 # \\
R_{RIGHT} &= R_{DL, RT} + R_{LL, RT} = 3057 # + 2510 # = 5567 #
\end{align*}
\]

Use 5 1/8” x 15” 24F-V4 DF/DF GLB

#### Beam 6: Roof support beam @ Line 5
Simple Span: 24 ft.

**Uniform Loads:**

\[
\begin{align*}
\omega_{DL} &= 19 \text{ psf} \times 18 + 10 \text{ psf} \times 6 = 402 \text{ plf} \\
\omega_{LL} &= 20 \text{ psf} \times 18 = 360 \text{ plf} \\
\omega_{TL} &= \omega_{DL} + \omega_{LL} = 762 \text{ plf}
\end{align*}
\]

**Point Loads:**

<table>
<thead>
<tr>
<th>Load</th>
<th>Value</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>(P_{DL})</td>
<td>800 #</td>
<td>at 5.5 ft.</td>
</tr>
<tr>
<td>(P_{LL})</td>
<td>800 #</td>
<td></td>
</tr>
</tbody>
</table>

**Reactions:**

\[
\begin{align*}
R_{LEFT} &= R_{DL, LT} + R_{LL, LT} = 5900 # + 5120 # = 11020 # \\
R_{RIGHT} &= R_{DL, RT} + R_{LL, RT} = 5900 # + 5120 # = 11020 #
\end{align*}
\]

Use 5 1/8” x 21” 24F-V4 DF/DF GLB

#### Beam 7: Entry Cantilever Support Beam
Simple Span: 9 ft.

**Uniform Loads:**

\[
\begin{align*}
\omega_{DL} &= 19 \text{ psf} \times 2.5 = 47 \text{ plf} \\
\omega_{LL} &= 20 \text{ psf} \times 2.5 = 50 \text{ plf} \\
\omega_{TL} &= \omega_{DL} + \omega_{LL} = 97 \text{ plf}
\end{align*}
\]

**Reactions:**

\[
\begin{align*}
R_{LEFT} &= R_{DL, LT} + R_{LL, LT} = 213 # + 225 # = 438 # \\
R_{RIGHT} &= R_{DL, RT} + R_{LL, RT} = 213 # + 225 # = 438 #
\end{align*}
\]

Use (2) 1 3/4” x 14” 2.0E LVL

Left Support: Use 4x4 DF# 2
Right Support: Use 4x4 DF# 2
# Roof Level Vertical Analysis

## Beam 8: Typical Header- Max Span 3’ w/ GT Support

**Simple Span:** 3 ft.

### Uniform Loads:

- \( \omega_{DL} = 19 \text{ psf} \times 11 + 10 \text{ psf} \times 5 = 259 \text{ plf} \)
- \( \omega_{LL} = 20 \text{ psf} \times 11 = 220 \text{ plf} \)
- \( \omega_{TL} = \omega_{DL} + \omega_{LL} = 479 \text{ plf} \)

### Point Loads:

- \( P_{DL} = 1250 \text{ # at 1.5 ft.} \)
- \( P_{LL} = 1000 \text{ #} \)

### Reactions:

- \( R_{LEFT} = R_{DL,LT} + R_{LL,LT} = 1013 \text{ #} + 830 \text{ #} = 1843 \text{ #} \)
- \( R_{RIGHT} = R_{DL,RT} + R_{LL,RT} = 1013 \text{ #} + 830 \text{ #} = 1843 \text{ #} \)

Use 6x6 DF#1 Beam

Left Support: Use Single 2x Trimmer
Right Support: Use Single 2x Trimmer

## Beam 9: Great Room Lower Header

**Simple Span:** 12 ft.

### Uniform Loads:

- \( \omega_{DL} = 19 \text{ psf} \times 2 = 38 \text{ plf} \)
- \( \omega_{LL} = 20 \text{ psf} \times 2 = 40 \text{ plf} \)
- \( \omega_{TL} = \omega_{DL} + \omega_{LL} = 78 \text{ plf} \)

### Reactions:

- \( R_{LEFT} = R_{DL,LT} + R_{LL,LT} = 1378 \text{ #} + 1200 \text{ #} = 2578 \text{ #} \)
- \( R_{RIGHT} = R_{DL,RT} + R_{LL,RT} = 1378 \text{ #} + 1200 \text{ #} = 2578 \text{ #} \)

Use 6x10 DF#1 Beam

Left Support: Use 4x6 DF# 2
Right Support: Use 4x6 DF# 2

## Beam 10: Entry/Kitchen Rafters

**Simple Span:** 29 ft.

### Uniform Loads:

- \( \omega_{DL} = 19 \text{ psf} \times 2 = 38 \text{ plf} \)
- \( \omega_{LL} = 20 \text{ psf} \times 2 = 40 \text{ plf} \)
- \( \omega_{TL} = \omega_{DL} + \omega_{LL} = 78 \text{ plf} \)

### Reactions:

- \( R_{LEFT} = R_{DL,LT} + R_{LL,LT} = 550 \text{ #} + 580 \text{ #} = 1130 \text{ #} \)
- \( R_{RIGHT} = R_{DL,RT} + R_{LL,RT} = 550 \text{ #} + 580 \text{ #} = 1130 \text{ #} \)

Use 14” TJI 360 Joists @ 16” O/C

Left Support: Use 1 3/4” LVL Ledger
Right Support: Use 1 3/4” LVL Ledger
Vert Analysis (BM 1-9)

Wood Beam Design: Beam 1- Typical Header 3' Max Span

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

**BEAM Size:** 6x6, Sawn, Fully Unbraced

Using Allowable Stress Design with ASCE 7-16 Load Combinations, Major Axis Bending

**Wood Species:** Douglas Fir-Larch

**Wood Grade:** No.1

<table>
<thead>
<tr>
<th>Property</th>
<th>Value 1</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fb - Tension</td>
<td>1,350.0 psi</td>
<td>925.0 psi</td>
</tr>
<tr>
<td>Fb - Compr</td>
<td>1,350.0 psi</td>
<td>625.0 psi</td>
</tr>
<tr>
<td>Fv</td>
<td>170.0 psi</td>
<td>675.0 psi</td>
</tr>
<tr>
<td>Eminbend</td>
<td>1,600.0 ksi</td>
<td></td>
</tr>
<tr>
<td>Density</td>
<td>31.210 pcf</td>
<td></td>
</tr>
</tbody>
</table>

**Applied Loads**

Beam self weight calculated and added to loads

Unif Load: D = 0.2590, Lr = 0.220 k/ft, Trib= 1.0 ft

**Design Summary**

Max fb/Fb Ratio = 0.140 : 1

Max Reactions (k)

<table>
<thead>
<tr>
<th>Direction</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>0.40</td>
</tr>
<tr>
<td>Lr</td>
<td>0.33</td>
</tr>
</tbody>
</table>

**Wood Beam Design: Beam 2- Typical Header 6' Max Span**

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

**BEAM Size:** 6x8, Sawn, Fully Unbraced

Using Allowable Stress Design with ASCE 7-16 Load Combinations, Major Axis Bending

**Wood Species:** Douglas Fir-Larch

**Wood Grade:** No.1

<table>
<thead>
<tr>
<th>Property</th>
<th>Value 1</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fb - Tension</td>
<td>1,350.0 psi</td>
<td>925.0 psi</td>
</tr>
<tr>
<td>Fb - Compr</td>
<td>1,350.0 psi</td>
<td>625.0 psi</td>
</tr>
<tr>
<td>Fv</td>
<td>170.0 psi</td>
<td>675.0 psi</td>
</tr>
<tr>
<td>Eminbend</td>
<td>1,600.0 ksi</td>
<td></td>
</tr>
<tr>
<td>Density</td>
<td>31.210 pcf</td>
<td></td>
</tr>
</tbody>
</table>

**Applied Loads**

Beam self weight calculated and added to loads

Unif Load: D = 0.2490, Lr = 0.220 k/ft, Trib= 1.0 ft

Point: D = 0.6550, Lr = 0.70 k @ 3.0 ft

**Design Summary**

Max fb/Fb Ratio = 0.582 : 1

Max Reactions (k)

<table>
<thead>
<tr>
<th>Direction</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>1.11</td>
</tr>
</tbody>
</table>

Max Deflections

<table>
<thead>
<tr>
<th>Condition</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transient Downward</td>
<td>9999 in</td>
</tr>
<tr>
<td>Total Downward</td>
<td>4937 in</td>
</tr>
<tr>
<td>Transient Upward</td>
<td>9999 in</td>
</tr>
<tr>
<td>Total Upward</td>
<td>9999 in</td>
</tr>
</tbody>
</table>
Wood Beam Design: Beam 3- Kitchen Header 9' Max Span

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

**BEAM Size:** 6x10, Sawn, Fully Unbraced

Using Allowable Stress Design with ASCE 7-16 Load Combinations, Major Axis Bending

**Wood Species:** Douglas Fir-Larch

**Wood Grade:** No.1

**Douglas Fir-Larch No.1**

- **Fb - Tension:** 1,350 psi
- **Fb - Compr:** 1,350 psi
- **Fc - Prll:** 925 psi
- **Fc - Perp:** 625 psi
- **Fv:** 170 psi
- **Ebend:** xx
- **Eminbend:** xx
- **Density:** 31.210pcf

**Applied Loads**

Beam self weight calculated and added to loads

**Unif Load:** D = 0.3860, Lr = 0.280 k/ft, Trib= 1.0 ft

**Design Summary**

Max fb/Fb Ratio = 0.595 : 1

Max fv/Fv Ratio = 0.340 : 1

Max Reactions (k)

<table>
<thead>
<tr>
<th>Load Comb</th>
<th>D</th>
<th>S</th>
<th>W</th>
<th>E</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left Support</td>
<td>1.79</td>
<td>1.26</td>
<td>1.79</td>
<td>1.26</td>
<td></td>
</tr>
<tr>
<td>Right Support</td>
<td>1.79</td>
<td>1.26</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Max Deflections**

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Transient Downward</th>
<th>Total Downward</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC: Lr Only</td>
<td>0.066 in</td>
<td>0.160 in</td>
</tr>
<tr>
<td>LC: +D+Lr+H</td>
<td>1634 Ratio</td>
<td>675 Ratio</td>
</tr>
</tbody>
</table>

**Max Deflections**

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Transient Upward</th>
<th>Total Upward</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC:</td>
<td>0.000 in</td>
<td>0.000 in</td>
</tr>
<tr>
<td>LC:</td>
<td>9999 Ratio</td>
<td>9999 Ratio</td>
</tr>
</tbody>
</table>

Wood Beam Design: Beam 4- Great Room Flush Set Beam

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

**BEAM Size:** 6x10, Sawn, Fully Unbraced

Using Allowable Stress Design with ASCE 7-16 Load Combinations, Major Axis Bending

**Wood Species:** Douglas Fir-Larch

**Wood Grade:** No.1

**Douglas Fir-Larch No.1**

- **Fb - Tension:** 1,350 psi
- **Fb - Compr:** 1,350 psi
- **Fc - Prll:** 925 psi
- **Fc - Perp:** 625 psi
- **Fv:** 170 psi
- **Ebend:** xx
- **Eminbend:** xx
- **Density:** 31.210pcf

**Applied Loads**

Beam self weight calculated and added to loads

**Unif Load:** D = 0.230, Lr = 0.20 k/ft, Trib= 1.0 ft

**Design Summary**

Max fb/Fb Ratio = 0.691 : 1

Max fv/Fv Ratio = 0.312 : 1

Max Reactions (k)

<table>
<thead>
<tr>
<th>Load Comb</th>
<th>D</th>
<th>S</th>
<th>W</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left Support</td>
<td>1.45</td>
<td>1.20</td>
<td>1.45</td>
<td>1.20</td>
</tr>
<tr>
<td>Right Support</td>
<td>1.45</td>
<td>1.20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Max Deflections**

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Transient Downward</th>
<th>Total Downward</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC: Lr Only</td>
<td>0.149 in</td>
<td>0.329 in</td>
</tr>
<tr>
<td>LC: +D+Lr+H</td>
<td>965 Ratio</td>
<td>437 Ratio</td>
</tr>
</tbody>
</table>

**Max Deflections**

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Transient Upward</th>
<th>Total Upward</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC:</td>
<td>0.000 in</td>
<td>0.000 in</td>
</tr>
<tr>
<td>LC:</td>
<td>9999 Ratio</td>
<td>9999 Ratio</td>
</tr>
</tbody>
</table>

32/43
Wood Beam Design: Beam 5- Garage Door Header

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

**BEAM Size:** 5.125x15, GLB, Fully Unbraced

Using Allowable Stress Design with ASCE 7-16 Load Combinations, Major Axis Bending

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fb - Tension</td>
<td>2,400.0 psi</td>
</tr>
<tr>
<td>Fb - Compr</td>
<td>1,850.0 psi</td>
</tr>
<tr>
<td>Fc - Prll</td>
<td>1,650.0 psi</td>
</tr>
<tr>
<td>Fc - Perp</td>
<td>650.0 psi</td>
</tr>
<tr>
<td>Fv</td>
<td>265.0 psi</td>
</tr>
<tr>
<td>Ebend - xx</td>
<td>1,800.0 ksi</td>
</tr>
<tr>
<td>Eminbend - xx</td>
<td>950.0 ksi</td>
</tr>
</tbody>
</table>

**Applied Loads**

Beam self weight calculated and added to loads

Unif Load: D = 0.3030, Lr = 0.240 k/ft, Trib= 1.0 ft

Point: D = 1.330, Lr = 1.40 k @ 4.50 ft

**Design Summary**

Max fb/Fb Ratio = 0.647 : 1

Max Reactions (k)

<table>
<thead>
<tr>
<th>Load Comb</th>
<th>H</th>
<th>W</th>
<th>S</th>
<th>Lr</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>+D+Lr+H</td>
<td>723</td>
<td>324</td>
<td>321</td>
<td>251</td>
<td>37</td>
</tr>
</tbody>
</table>

Max Deflections

<table>
<thead>
<tr>
<th>Direction</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transient Downward</td>
<td>0.298 in</td>
</tr>
<tr>
<td>Total Downward</td>
<td>0.666 in</td>
</tr>
</tbody>
</table>

**Wood Beam Design: Beam 6- Roof support beam @ Line 5**

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

**BEAM Size:** 5.125x21, GLB, Braced @ 1/3 Points

Using Allowable Stress Design with ASCE 7-16 Load Combinations, Major Axis Bending

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fb - Tension</td>
<td>2,400.0 psi</td>
</tr>
<tr>
<td>Fb - Compr</td>
<td>1,850.0 psi</td>
</tr>
<tr>
<td>Fc - Prll</td>
<td>1,650.0 psi</td>
</tr>
<tr>
<td>Fc - Perp</td>
<td>650.0 psi</td>
</tr>
<tr>
<td>Fv</td>
<td>265.0 psi</td>
</tr>
<tr>
<td>Ebend - xx</td>
<td>1,800.0 ksi</td>
</tr>
<tr>
<td>Eminbend - xx</td>
<td>950.0 ksi</td>
</tr>
</tbody>
</table>

**Applied Loads**

Beam self weight calculated and added to loads

Unif Load: D = 0.4020, Lr = 0.360 k/ft, Trib= 1.0 ft

Point: D = 0.80, Lr = 0.80 k @ 5.50 ft

Point: D = 0.80, Lr = 0.80 k @ 18.50 ft

**Design Summary**

Max fb/Fb Ratio = 0.744 : 1

Max Reactions (k)

<table>
<thead>
<tr>
<th>Load Comb</th>
<th>H</th>
<th>W</th>
<th>S</th>
<th>Lr</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>+D+Lr+H</td>
<td>638</td>
<td>296</td>
<td>296</td>
<td>638</td>
<td>638</td>
</tr>
</tbody>
</table>

Max Deflections

<table>
<thead>
<tr>
<th>Direction</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transient Downward</td>
<td>0.451 in</td>
</tr>
<tr>
<td>Total Downward</td>
<td>0.972 in</td>
</tr>
</tbody>
</table>

```
Wood Beam Design : Beam 7- Entry Cantilever Support Beam

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

BEAM Size : 2-1.75x14, Microllam LVL, Fully Unbraced
Using Allowable Stress Design with ASCE 7-16 Load Combinations, Major Axis Bending

Wood Species : Level Truss Joist
Wood Grade : MicroLam LVL 2.0 E
Fb - Tension 2,600.0 psi Fc - Prll 2,510.0 psi Fv 285.0 psi Ebend - xx 2,000.0 ksi Density 42.010 pcf
Fb - Compr 2,600.0 psi Fc - Perp 750.0 psi Ft 1,555.0 psi Eminbend - xx 1,016.54 ksi

Applied Loads
Beam self weight calculated and added to loads
Unif Load: D = 0.0470, Lr = 0.050 k/ft, Trib= 1.0 ft

Design Summary
Max fb/Fb Ratio = 0.039 : 1
fb : Actual : 118.27 psi at 4.500 ft in Span # 1
Fb : Allowable : 3,009.78 psi
Load Comb : +D+Lr+H
Max fv/FvRatio = 0.032 : 1
fv : Actual : 114.45 psi at 0.000 ft in Span # 1
Fv : Allowable : 356.25 psi
Load Comb : +D+Lr+H
Max Reactions (k)
Left Support 0.28 0.23
Right Support 0.28 0.23

Max Deflections
Transient Downward 0.005 in Total Downward 0.010 in
Ratio 9999 Ratio 9999
LC: Lr Only LC: +D+Lr+H
Transient Upward 0.000 in Total Upward 0.000 in
Ratio 9999 Ratio 9999
LC: LC:

Wood Beam Design : Beam 8- Typical Header 3' Max Span w/ GT Support

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

BEAM Size : 6x6, Sawn, Fully Unbraced
Using Allowable Stress Design with ASCE 7-16 Load Combinations, Major Axis Bending

Wood Species : Douglas Fir-Larch
Wood Grade : No.1
Fb - Tension 1,350.0 psi Fc - Prll 925.0 psi Fv 170.0 psi Ebend - xx 1,600.0 ksi Density 31.210 pcf
Fb - Compr 1,350.0 psi Fc - Perp 625.0 psi Ft 675.0 psi Eminbend - xx 580.0 ksi

Applied Loads
Beam self weight calculated and added to loads
Unif Load: D = 0.2590, Lr = 0.220 k/ft, Trib= 1.0 ft
Point: D = 1.250, Lr = 1.0 k @ 1.50 ft

Design Summary
Max fb/Fb Ratio = 0.573 : 1
fb : Actual : 966.67 psi at 1.500 ft in Span # 1
Fb : Allowable : 1,687.50 psi
Load Comb : +D+Lr+H
Max fv/FvRatio = 0.381 : 1
fv : Actual : 81.07 psi at 2.550 ft in Span # 1
Fv : Allowable : 212.50 psi
Load Comb : +D+Lr+H
Max Reactions (k)
Left Support 1.02 0.83
Right Support 1.02 0.83

Max Deflections
Transient Downward 0.011 in Total Downward 0.025 in
Ratio 3182 Ratio 1422
LC: Lr Only LC: +D+Lr+H
Transient Upward 0.000 in Total Upward 0.000 in
Ratio 9999 Ratio 9999
LC: LC:
Wood Beam Design: Beam 9- Great Room Lower Header

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

BEAM Size: 6x10, Sawn, Fully Unbraced
Using Allowable Stress Design with ASCE 7-16 Load Combinations, Major Axis Bending

Wood Species: Douglas Fir-Larch
Wood Grade: No.1

Applied Loads
Beam self weight calculated and added to loads
Unif Load: D = 0.230, Lr = 0.20 k/ft, Trib = 1.0 ft

Design Summary
Max fb/Fb Ratio = 0.691
Fb : Allowable : 1,666.76 psi
Load Comb : +D+Lr+H
Max fv/FvRatio = 0.312
Fv : Allowable : 212.50 psi
Load Comb : +D+Lr+H
Max Deflections
Transient Downward : 0.149 in
Total Downward : 0.329 in
Ratio : 965
LC: Lr Only : 437
Transient Upward : 0.000 in
Total Upward : 0.000 in
Ratio : 9999
LC: : 9999

Applied Loads

Max Reactions (k)
Left Support
D : 1.45
Lr : 1.20
S :
W :
E :
H :
Right Support
D : 1.45
Lr : 1.20
S :
W :
E :
H :
System: Roof  
Member Type: Joist  
Building Use: Residential  
Building Code: IBC 2015  
Design Methodology: ASD  
Member Pitch: 0/12

### Design Results

<table>
<thead>
<tr>
<th></th>
<th>Actual @ Location</th>
<th>Allowed</th>
<th>Result</th>
<th>LDF</th>
<th>Load: Combination (Pattern)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Member Reaction (lbs)</td>
<td>724 @ 2 1/2&quot;</td>
<td>1881 (3.50&quot;)</td>
<td>Passed (38%)</td>
<td>1.25</td>
<td>1.0 D + 1.0 Lr (All Spans)</td>
</tr>
<tr>
<td>Shear (lbs)</td>
<td>709 @ 3 1/2&quot;</td>
<td>2444</td>
<td>Passed (29%)</td>
<td>1.25</td>
<td>1.0 D + 1.0 Lr (All Spans)</td>
</tr>
<tr>
<td>Moment (ft-lbs)</td>
<td>5025 @ 14' 3 1/2&quot;</td>
<td>9169</td>
<td>Passed (55%)</td>
<td>1.25</td>
<td>1.0 D + 1.0 Lr (All Spans)</td>
</tr>
<tr>
<td>Live Load Defl. (in)</td>
<td>0.657 @ 14' 3 1/2&quot;</td>
<td>1.408</td>
<td>Passed (L/514)</td>
<td>--</td>
<td>1.0 D + 1.0 Lr (All Spans)</td>
</tr>
<tr>
<td>Total Load Defl. (in)</td>
<td>1.249 @ 14' 3 1/2&quot;</td>
<td>1.878</td>
<td>Passed (L/271)</td>
<td>--</td>
<td>1.0 D + 1.0 Lr (All Spans)</td>
</tr>
</tbody>
</table>

- Deflection criteria: LL (L/240) and TL (L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.

### Supports

<table>
<thead>
<tr>
<th>Supports</th>
<th>Bearing Length</th>
<th>Loads to Supports (lbs)</th>
<th>Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Stud wall - DF</td>
<td>3.50&quot;</td>
<td>3.50&quot;</td>
<td>1.75&quot;</td>
</tr>
<tr>
<td>2 - Stud wall - DF</td>
<td>3.50&quot;</td>
<td>3.50&quot;</td>
<td>1.75&quot;</td>
</tr>
</tbody>
</table>

- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

### Lateral Bracing

<table>
<thead>
<tr>
<th>Lateral Bracing</th>
<th>Bracing Intervals</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Edge (Lu)</td>
<td>4&quot; 7&quot; o/c</td>
<td></td>
</tr>
<tr>
<td>Bottom Edge (Lu)</td>
<td>28&quot; 7&quot; o/c</td>
<td></td>
</tr>
</tbody>
</table>

- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- Maximum allowable bracing intervals based on applied load.

### Vertical Load

<table>
<thead>
<tr>
<th>Vertical Load</th>
<th>Location</th>
<th>Spacing</th>
<th>Dead (0.90)</th>
<th>Roof Live (non-snow: 1.25)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Uniform (PSF)</td>
<td>0 to 28' 7&quot;</td>
<td>16&quot;</td>
<td>18.0</td>
<td>20.0</td>
<td>Default Load</td>
</tr>
</tbody>
</table>

### Weyerhaeuser Notes

Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC-ES under evaluation reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to www.weyerhaeuser.com/woodproducts/document-library.

The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator.
### Allowable Point Loads on Doug Fir Wood Posts / Columns

<table>
<thead>
<tr>
<th>Post Size</th>
<th>Height</th>
<th>L_e / d</th>
<th>F_CE</th>
<th>C_P</th>
<th>F_C''</th>
<th>F_C'</th>
<th>Area of post</th>
<th>P_ALLOW</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(inches)</td>
<td>(feet)</td>
<td>(in / in)</td>
<td>(psi)</td>
<td>(psi)</td>
<td>(psi)</td>
<td>(in^2)</td>
<td>(lbs)</td>
</tr>
<tr>
<td>4 x 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>27.4</td>
<td>638</td>
<td>0.38</td>
<td>1495</td>
<td>568</td>
<td>12.25</td>
<td>6958</td>
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<tr>
<td></td>
<td>9</td>
<td>30.9</td>
<td>523</td>
<td>0.32</td>
<td>1495</td>
<td>475</td>
<td>12.25</td>
<td>5819</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>34.3</td>
<td>408</td>
<td>0.26</td>
<td>1495</td>
<td>382</td>
<td>12.25</td>
<td>4680</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>37.7</td>
<td>346</td>
<td>0.22</td>
<td>1495</td>
<td>327</td>
<td>12.25</td>
<td>4000</td>
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<td>12</td>
<td>41.1</td>
<td>283</td>
<td>0.18</td>
<td>1495</td>
<td>271</td>
<td>12.25</td>
<td>3320</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>44.6</td>
<td>246</td>
<td>0.16</td>
<td>1495</td>
<td>237</td>
<td>12.25</td>
<td>2897</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>48.0</td>
<td>208</td>
<td>0.14</td>
<td>1495</td>
<td>202</td>
<td>12.25</td>
<td>2475</td>
</tr>
<tr>
<td>4 x 6</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>27.4</td>
<td>638</td>
<td>0.39</td>
<td>1430</td>
<td>564</td>
<td>19.25</td>
<td>10857</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>30.9</td>
<td>523</td>
<td>0.33</td>
<td>1430</td>
<td>472</td>
<td>19.25</td>
<td>9086</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>34.3</td>
<td>408</td>
<td>0.27</td>
<td>1430</td>
<td>380</td>
<td>19.25</td>
<td>7315</td>
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<tr>
<td></td>
<td>11</td>
<td>37.7</td>
<td>346</td>
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### Exterior Stud Capacity

#### Lateral Pressures and Load:

**Wind:** [See Wind Profile, $P_a = 0.6 \times P_{a,\text{max}}$]

**Seismic:** [See Seismic Profile]

$P_a = 11.5 \text{ psf} = 0.08 \text{ psi}$  
$P = (C_1 \times W)/1.4 = (0.131 \times 15 \text{ psf})/1.4 = 1.40 \text{ psf} = 0.01 \text{ psi}$

**Governing Lateral Load:** $W_{\text{max}} = P_a \times \text{Stud Spacing} = 1.27 \text{ lb/in}$

### Term Definitions:

- Stud Spacing = " o/c = depth of stud
- $F_b = \text{psi} \times \text{Area Section Modulus}
- $E_{\text{min}} = 58000 \text{ psi} \ *
- $F_c = 1350 \text{ psi} \ *
- * Design values for Douglas Fir from NDS 2015 Table 4A

### Design Equations for Bending and Axial Compression:

\[ \left( \frac{f_c}{F_c} \right)^2 + \frac{f_a}{F_a} \left[ 1 - \left( \frac{F_c}{F_c'} \right) \right] \leq 1.0 \]

NDS 2015 Eqn. 3.93-3

Where, $f_c < F_{\text{crit}} = \frac{0.822 E_{\text{min}}}{(d/E)'}$ (Buckling Check)

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* NDS 2015 Section 3.9.2

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Date: 9/28/2021  Exterior Stud Capacity

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38/43
CONTINUOUS FOOTING CHECK

Grade Beam Uplift Check:

depth of footing = 24 in. 
\[ d' = 21 \text{ in.} \]
\[ \varnothing = 0.9 \]
\[ f_{y40} = 40 \text{ ksi} \]
\[ f_{y60} = 60 \text{ ksi} \]
\[ f'c = 2.5 \text{ ksi} \]
\[ b = 12 \text{ in.} \]

\[ \omega_{DL} = \]
\[ 19 \times 3 = 56.9 \text{ plf (roof)} \]
\[ 8 \times 8 = 64 \text{ plf (wall)} \]
\[ 150 \times 2 \times 1 = 300 \text{ plf (footing)} \]
\[ 150 \times 0.33 \times 3 = 150 \text{ plf (slab)} \]

\[ \omega_{DL} = 571 \text{ plf (total)} \]

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<th>(P_{max}) (lbs)</th>
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Point Load Check:

depth of footing = 24 in. 
\[ d' = 21 \text{ in.} \]
\[ \varnothing = 0.9 \]
\[ f_{y40} = 40 \text{ ksi} \]
\[ f_{y60} = 60 \text{ ksi} \]
\[ f'c = 2.5 \text{ ksi} \]
\[ b = 12 \text{ in.} \]
\[ f_B = 1500 \text{ psf} \]

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<th>(L') (ft)</th>
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FOUNDATION PAD CHECK

Foundation Pad Capacity

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\[
\text{capacity} = (1500 \text{ psf})(9 \text{ ft}^2)
\]

\[
\text{capacity} = 13500 \#\]

\[
A_s = \frac{(0.0018)(36 \text{ in})(24 \text{ in})}{1.555 \text{ in}^2}
\]

At point load locations with loads ≤ 13,500#, provide 36” square x 24” deep concrete pad with (3) #5 bars each way, top and bottom.
Job #: See Detail 9/D2
Date: 25 SEP 2021

This Wall in File: E:\Work Folder\MSD Engineering Files\Hambly Homes - Anderson Residence\Engineerin

Cantilevered Retaining Wall

Criteria
Retained Height = 0.67 ft
Wall height above soil = 8.00 ft
Slope Behind Wall = 0.00
Height of Soil over Toe = 8.00 in
Water height over heel = 0.0 ft

Surcharge Loads
Surcharge Over Heel = 0.0 psf
Used To Resist Sliding & Overturning
Surcharge Over Toe = 0.0 psf
Used for Sliding & Overturning

Axial Load Applied to Stem
Axial Dead Load = 0.0 lbs
Axial Live Load = 0.0 lbs
Axial Load Eccentricity = 0.0 in

Stem Weight Seismic Load

Design Summary
Wall Stability Ratios
Overturning = 1.69 OK
Sliding = 4.15 OK
Total Bearing Load = 1,939 lbs
...resultant ecc. = 10.45 in
Soil Pressure @ Toe = 2,054 psf OK
Soil Pressure @ Heel = 0 psf OK
Allowable = 2,325 psf
Soil Pressure Less Than Allowable
ACI Factored @ Toe = 2,876 psf
ACI Factored @ Heel = 0 psf
Footing Shear @ Toe = 0.5 psi OK
Footing Shear @ Heel = 2.0 psi OK
Allowable = 75.0 psi

Sliding Calcs
Lateral Sliding Force = 404.2 lbs
less 100% Passive Force = -1,017.5 lbs
less 100% Friction Force = -659.1 lbs
Added Force Req’d = 0.0 lbs OK
...for 1.5 Stability = 0.0 lbs OK

Design Data
f/Fb + fa/Fa = 0.295 0.456
Total Force @ Section
Service Level lbs = 220.4 427.2
Strength Level lbs = 1,746.9 3,898.0

Shear......Actual
Service Level psi =
Strength Level psi = 4.6 8.9
Shear......Allowable psi = 75.0 75.0
Anet (Masonry) in =
Rebar Depth ‘d’ in = 4.00 4.00

Masonry Data
f’m =
Fs =
Solid Grouting =
Modular Ratio ‘n’ =
WALL TO Ftg CL Dist = 0.00 ft
Footing Type = Line Load
Base Above/Below Soil = 0.0 ft
Poisson’s Ratio = 0.300

Concrete Data
f’c = psi = 2,500.0 2,500.0
fy = psi = 40,000.0 60,000.0

Vertical component of active lateral soil pressure is considered in the calculation of soil bearing pressures.
Concrete Stem Rebar Area Details

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<td>(based on applied moment)</td>
<td>Min Stem T&amp;S Reinf Area per ft of stem Height: 0.134 in²/ft</td>
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<tr>
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<td>(4/3) * As</td>
<td>Horizontal Reinforcing Options:</td>
</tr>
<tr>
<td></td>
<td>0.0466 in²/ft</td>
<td>0.0621 in²/ft</td>
</tr>
<tr>
<td>200 bd/ft</td>
<td>0.24 in²/ft</td>
<td>Min Stem T&amp;S Reinf Area: 0.538 in²</td>
</tr>
<tr>
<td>0.0014 bh</td>
<td>0.1344 in²/ft</td>
<td>Min Stem T&amp;S Reinf Area per ft of stem Height: 0.134 in²/ft</td>
</tr>
<tr>
<td>0.0014 bh</td>
<td>0.1344 in²/ft</td>
<td>Horizontal Reinforcing Options:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>One layer of:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Two layers of:</td>
</tr>
<tr>
<td></td>
<td>Required Area:</td>
<td>#4@ 17.86 in</td>
</tr>
<tr>
<td></td>
<td>0.1344 in²/ft</td>
<td>#4@ 35.71 in</td>
</tr>
<tr>
<td></td>
<td>#5@ 27.68 in</td>
<td>#5@ 55.36 in</td>
</tr>
<tr>
<td></td>
<td>#6@ 39.29 in</td>
<td>#6@ 78.57 in</td>
</tr>
<tr>
<td></td>
<td>Provided Area:</td>
<td>#5@ 27.68 in</td>
</tr>
<tr>
<td></td>
<td>0.15 in²/ft</td>
<td>#5@ 55.36 in</td>
</tr>
<tr>
<td></td>
<td>Maximum Area:</td>
<td>#6@ 39.29 in</td>
</tr>
<tr>
<td></td>
<td>0.8128 in²/ft</td>
<td>#6@ 78.57 in</td>
</tr>
</tbody>
</table>

Bottom Stem

<table>
<thead>
<tr>
<th>Stem</th>
<th>Vertical Reinforcing</th>
<th>Horizontal Reinforcing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>As</td>
<td>Min Stem T&amp;S Reinf Area: 0.538 in²</td>
</tr>
<tr>
<td></td>
<td>(based on applied moment)</td>
<td>Min Stem T&amp;S Reinf Area per ft of stem Height: 0.134 in²/ft</td>
</tr>
<tr>
<td></td>
<td>(4/3) * As</td>
<td>Horizontal Reinforcing Options:</td>
</tr>
<tr>
<td></td>
<td>0.1073 in²/ft</td>
<td>0.1431 in²/ft</td>
</tr>
<tr>
<td>200 bd/ft</td>
<td>0.16 in²/ft</td>
<td>Min Stem T&amp;S Reinf Area: 0.538 in²</td>
</tr>
<tr>
<td>0.0014 bh</td>
<td>0.1344 in²/ft</td>
<td>Min Stem T&amp;S Reinf Area per ft of stem Height: 0.134 in²/ft</td>
</tr>
<tr>
<td>0.0014 bh</td>
<td>0.1344 in²/ft</td>
<td>Horizontal Reinforcing Options:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>One layer of:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Two layers of:</td>
</tr>
<tr>
<td></td>
<td>Required Area:</td>
<td>#4@ 17.86 in</td>
</tr>
<tr>
<td></td>
<td>0.1431 in²/ft</td>
<td>#4@ 35.71 in</td>
</tr>
<tr>
<td></td>
<td>#5@ 27.68 in</td>
<td>#5@ 55.36 in</td>
</tr>
<tr>
<td></td>
<td>#6@ 39.29 in</td>
<td>#6@ 78.57 in</td>
</tr>
<tr>
<td></td>
<td>Provided Area:</td>
<td>#5@ 27.68 in</td>
</tr>
<tr>
<td></td>
<td>0.2325 in²/ft</td>
<td>#5@ 55.36 in</td>
</tr>
<tr>
<td></td>
<td>Maximum Area:</td>
<td>#6@ 39.29 in</td>
</tr>
<tr>
<td></td>
<td>0.5419 in²/ft</td>
<td>#6@ 78.57 in</td>
</tr>
</tbody>
</table>

Footing Dimensions & Strengths

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heel Width</td>
<td>1.75 ft</td>
</tr>
<tr>
<td>Total Footing Thickness</td>
<td>18.00 in</td>
</tr>
<tr>
<td>Key Width</td>
<td>36.00 in</td>
</tr>
<tr>
<td>Key Depth</td>
<td>6.00 in</td>
</tr>
<tr>
<td>Key Distance from Toe</td>
<td>0.00 ft</td>
</tr>
<tr>
<td>f_c = 2,500 psi</td>
<td>Fy = 60,000 psi</td>
</tr>
<tr>
<td>Footing Concrete Density</td>
<td>150.00pcf</td>
</tr>
<tr>
<td>Min. As %</td>
<td>0.0018</td>
</tr>
<tr>
<td>Cover @ Top</td>
<td>2.00 in</td>
</tr>
<tr>
<td>Cover @ Btm.</td>
<td>3.00 in</td>
</tr>
</tbody>
</table>

Footing Design Results

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factored Pressure</td>
<td>2,876 psi</td>
</tr>
<tr>
<td>Mu' Upward</td>
<td>1,751 ft-#</td>
</tr>
<tr>
<td>Mu' Downward</td>
<td>280 ft-#</td>
</tr>
<tr>
<td>Mu: Design</td>
<td>1,471 ft-#</td>
</tr>
<tr>
<td>Actual 1-Way Shear</td>
<td>0.53 psi</td>
</tr>
<tr>
<td>Allow 1-Way Shear</td>
<td>40.00 psi</td>
</tr>
<tr>
<td>Toe Reinforcing</td>
<td># 5 @ 16.00 in</td>
</tr>
<tr>
<td>Heel Reinforcing</td>
<td># 5 @ 18.00 in</td>
</tr>
<tr>
<td>Key Reinforcing</td>
<td>None Spec'd</td>
</tr>
</tbody>
</table>

Other Acceptable Sizes & Spacings

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toe: Not req'd: Mu &lt; phi<em>5</em>lambda*sqrt(fc)*Sm 1.17 in²</td>
<td></td>
</tr>
<tr>
<td>Heel: Not req'd: Mu &lt; phi<em>5</em>lambda*sqrt(fc)*Sm 0.39 in²/ft</td>
<td></td>
</tr>
<tr>
<td>If one layer of horizontal bars:</td>
<td></td>
</tr>
<tr>
<td>#4@ 6.17 in</td>
<td>#4@ 12.35 in</td>
</tr>
<tr>
<td>#5@ 9.57 in</td>
<td>#5@ 19.14 in</td>
</tr>
<tr>
<td>#6@ 13.58 in</td>
<td>#6@ 27.16 in</td>
</tr>
</tbody>
</table>
Summary of Overturning & Resisting Forces & Moments

<table>
<thead>
<tr>
<th>Item</th>
<th>Force</th>
<th>Distance</th>
<th>Moment</th>
<th>Force</th>
<th>Distance</th>
<th>Moment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heel Active Pressure</td>
<td>117.7</td>
<td>0.72</td>
<td>85.2</td>
<td>Soil Over Heel</td>
<td>79.8</td>
<td>2.46</td>
</tr>
<tr>
<td>Sloped Soil Over Heel</td>
<td>79.8</td>
<td>2.46</td>
<td>196.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surcharge over Toe</td>
<td>79.8</td>
<td>2.46</td>
<td>196.3</td>
<td>Surcharge Over Heel</td>
<td>79.8</td>
<td>2.46</td>
</tr>
<tr>
<td>Adjacent Footing Load</td>
<td></td>
<td></td>
<td></td>
<td>Adjacent Footing Load</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Axial Dead Load on Stem</td>
<td></td>
<td></td>
<td></td>
<td>Axial Dead Load on Stem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Axial Live Load on Stem</td>
<td></td>
<td></td>
<td></td>
<td>* Axial Live Load on Stem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soil Over Toe</td>
<td>91.7</td>
<td>0.63</td>
<td>57.3</td>
<td>Soil Over Toe</td>
<td>91.7</td>
<td>0.63</td>
</tr>
<tr>
<td>Sloped Soil Over Toe</td>
<td></td>
<td></td>
<td></td>
<td>Sloped Soil Over Toe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjacent Footing Load</td>
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<td>Adjacent Footing Load</td>
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<td>Axial Dead Load on Stem</td>
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<td>Axial Dead Load on Stem</td>
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<tr>
<td>* Axial Live Load on Stem</td>
<td></td>
<td></td>
<td></td>
<td>* Axial Live Load on Stem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sloped Soil Over Toe</td>
<td></td>
<td></td>
<td></td>
<td>Sloped Soil Over Toe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjacent Footing Load</td>
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<td>Adjacent Footing Load</td>
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<td></td>
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<tr>
<td>Axial Dead Load on Stem</td>
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<td>Axial Dead Load on Stem</td>
<td></td>
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</tr>
<tr>
<td>* Axial Live Load on Stem</td>
<td></td>
<td></td>
<td></td>
<td>* Axial Live Load on Stem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soil Over Toe</td>
<td>675.0</td>
<td>1.50</td>
<td>1,012.5</td>
<td>Soil Over Toe</td>
<td>675.0</td>
<td>1.50</td>
</tr>
<tr>
<td>Sloped Soil Over Toe</td>
<td></td>
<td></td>
<td></td>
<td>Sloped Soil Over Toe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjacent Footing Load</td>
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<td>Adjacent Footing Load</td>
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<td></td>
</tr>
<tr>
<td>Axial Dead Load on Stem</td>
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<td>Axial Dead Load on Stem</td>
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</tr>
<tr>
<td>* Axial Live Load on Stem</td>
<td></td>
<td></td>
<td></td>
<td>* Axial Live Load on Stem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sloped Soil Over Toe</td>
<td></td>
<td></td>
<td></td>
<td>Sloped Soil Over Toe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjacent Footing Load</td>
<td></td>
<td></td>
<td></td>
<td>Adjacent Footing Load</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Axial Dead Load on Stem</td>
<td></td>
<td></td>
<td></td>
<td>Axial Dead Load on Stem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Axial Live Load on Stem</td>
<td></td>
<td></td>
<td></td>
<td>* Axial Live Load on Stem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soil Over Toe</td>
<td>225.0</td>
<td>1.50</td>
<td>337.5</td>
<td>Soil Over Toe</td>
<td>225.0</td>
<td>1.50</td>
</tr>
<tr>
<td>Sloped Soil Over Toe</td>
<td></td>
<td></td>
<td></td>
<td>Sloped Soil Over Toe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjacent Footing Load</td>
<td></td>
<td></td>
<td></td>
<td>Adjacent Footing Load</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Axial Dead Load on Stem</td>
<td></td>
<td></td>
<td></td>
<td>Axial Dead Load on Stem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Axial Live Load on Stem</td>
<td></td>
<td></td>
<td></td>
<td>* Axial Live Load on Stem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sloped Soil Over Toe</td>
<td></td>
<td></td>
<td></td>
<td>Sloped Soil Over Toe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjacent Footing Load</td>
<td></td>
<td></td>
<td></td>
<td>Adjacent Footing Load</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Axial Dead Load on Stem</td>
<td></td>
<td></td>
<td></td>
<td>Axial Dead Load on Stem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Axial Live Load on Stem</td>
<td></td>
<td></td>
<td></td>
<td>* Axial Live Load on Stem</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seismic Stem Self Wt</td>
<td>286.5</td>
<td>5.84</td>
<td>1,671.5</td>
<td>Seismic Stem Self Wt</td>
<td>286.5</td>
<td>5.84</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>Total</td>
<td>404.2</td>
<td>O.T.M.</td>
</tr>
<tr>
<td>Resisting/Overturning Ratio</td>
<td>1.69</td>
<td></td>
<td></td>
<td>Resisting/Overturning Ratio</td>
<td>1.69</td>
<td></td>
</tr>
<tr>
<td>Vertical Loads used for Soil Press</td>
<td>1,938.5</td>
<td></td>
<td></td>
<td>Vertical Loads used for Soil Press</td>
<td>1,938.5</td>
<td></td>
</tr>
</tbody>
</table>

If seismic is included, the OTM and sliding ratios be 1.1 per section 1807.2.3 of IBC 2009 or IBC 201

Vertical component of active lateral soil pressure IS considered in the calculation of Sliding Resistance.

Vertical component of active lateral soil pressure IS considered in the calculation of Overturning Resistance.

Tilt

Horizontal Deflection at Top of Wall due to settlement of soil

(Deflection due to wall bending not considered)

<table>
<thead>
<tr>
<th>Item</th>
<th>Force</th>
<th>Distance</th>
<th>Moment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil Spring Reaction Modulus</td>
<td>250.0</td>
<td>pci</td>
<td></td>
</tr>
<tr>
<td>Horizontal Dell @ Top of Wall (approximate only)</td>
<td>0.165</td>
<td>in</td>
<td></td>
</tr>
</tbody>
</table>

The above calculation is not valid if the heel soil bearing pressure exceeds that of the toe, because the wall would then tend to rotate into the retained soil.
TIMBER PRODUCTS INSPECTION, INC.
dba
GENERAL TESTING AND INSPECTION AGENCY

105 SE 124th AVENUE
VANCOUVER WA 98684

Timber Products Inspection (TP) and General Testing and Inspection (GTI) are code recognized by the International Conference of Building Officials (ICBO E.S.) which as of January 1, 2003 became the International Accreditation Service, Inc. (IAS) with the new assigned number of AA-664.

This is to verify that:

TRUSPRO
GUADALUPE CA
#7728

Is currently an active member in good standing in the TP Third Party Truss Auditing Program and has been since

OCTOBER, 2012

Brian Hensley
Truss Manager- Western Division
Office: 360.449.3840
Cell: 208.818.77869
July 30, 2014
March 6, 2020

Truspro
695 Obispo Street
Guadalupe, CA 93434

To Whom It May Concern,

Timber Products Inspection, Inc. is proud to announce that the following truss manufacturing facility, Truspro is a subscriber to our nationally accredited “Truss Quality Auditing Program”.

The TP Truss Quality Auditing Program is accredited under the IAS AA696 Evaluation Report and conforms to requirements for independent inspection of trusses under the International Building Code and International Residential Code.

The TP program involves daily in-plant quality control checks by plant personnel and periodic unannounced inspections by TP personnel for conformance to engineering and industry standards for fabricators. The TP quality stamp on each truss bearing the registered GTI log is your assurance that the trusses were fabricated in accordance with the TP Truss Quality Auditing Program and applicable sections of the IBC and IRC. Specific design loads and installation requirements are not covered by the TP Auditing Program.

Please note that the quality programs are automatically renewed unless requested otherwise. Any questions about this program, the facilities status in the program or the use of the TP registered quality stamps should be directed to Timber Products Inspection, Inc. at (770) 922-8000.

Sincerely,
Timber Products Inspection

Patrick C. Edwards, P.E.
Director of Engineering
DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 17 53—Shop-Fabricated Wood Trusses

REPORT HOLDER:

EAGLE METAL PRODUCTS

EVALUATION SUBJECT:

EAGLE METAL PRODUCTS EAGLE 20, EAGLE 18, EAGLE 16, EAGLE 20HS, EAGLE 18HS AND EAGLE 18 HINGE PLATE CONNECTOR TRUSS METAL CONNECTOR PLATES

1.0 EVALUATION SCOPE

Compliance with the following codes:


For evaluation for compliance with codes adopted by the Los Angeles Department of Building and Safety (LADBS), see ESR-1082 LABC and LARC Supplement.

Property evaluated:

Structural

2.0 USES

The Eagle Metal Products Eagle 20, Eagle 18, Eagle 16, Eagle 20HS, Eagle 18HS and Eagle 18 Hinge Plate Connector truss metal connector plates are used as joint connectors of light-framed wood roof and floor trusses.

3.0 DESCRIPTION

3.1 Eagle 20:

Eagle 20 truss metal connector plates are manufactured from minimum No. 20 gage [0.0356 inch (0.904 mm) total thickness], ASTM A653, SS designation, Grade 40, structural steel with a G60 galvanization coating [0.0005 inch (0.013 mm) thickness each side] with base-metal thickness of 0.0346 inch (0.878 mm). Each plate has 3/8-inch-long (9.5 mm) teeth that are stamped in pairs and bent at right angles from the face of the plate. The teeth are spaced 1 inch (25.4 mm) on center along the length, and 1/16 inch (6.4 mm) on center along the width, and are staggered 3/32 inch (2.38 mm) off center. Each plate has eight teeth per square inch (1.24 teeth/cm²). See Figure 2 for details.

3.2 Eagle 18:

Eagle 18 truss metal connector plates are manufactured from minimum No. 18 gage [0.0466 inch (1.184 mm) total thickness], ASTM A653, SS designation, Grade 40, structural steel with a minimum G60 galvanization coating [0.0005 inch (0.013 mm) thickness each side] with base-metal thickness of 0.0456 inch (1.158 mm). Eagle 18 truss metal connector plates are stamped identically to the Eagle 20 truss metal connector plates. See Figure 2 for details.

3.3 Eagle 16:

Eagle 16 truss metal connector plates are manufactured from minimum No. 16 gage [0.0575 inch (1.461 mm) total thickness], ASTM A653, SS designation, Grade 40, structural steel with a G60 galvanization coating [0.0005 inch (0.013 mm) thickness each side] with base-metal thickness of 0.0565 inch (1.435 mm). Each plate is stamped with slightly staggered rows of slots, punched to form two teeth in each slot, with one tooth slightly longer than the other. Teeth are 1/10 inch (11.1 mm) and 1/16 inch (7.9 mm) long, and are formed with a slight twist that alternates (twists in the opposite direction) every third row. Slots are 3/32 inch (4 mm) in width and 1/16 inch (11.1 mm) in length. The slots are spaced every 1 inch (25.4 mm) along the plate length and every 1/16 inch (8.5 mm) along the plate width. Every third row of slots is staggered 1/8 inch (3.2 mm). Each plate has six teeth per square inch of plate area (0.93 tooth/cm²). See Figure 3 for details.

3.4 Eagle 20HS:

Eagle 20HS truss metal connector plates are manufactured from minimum No. 20 gage [0.0356 inch (0.904 mm) total thickness], ASTM A653, HSLAS designation, Grade 60, structural steel with a G60 galvanization coating [0.0005 inch (0.013 mm) thickness each side] with base-metal thickness of 0.0346 inch (0.878 mm). Each plate has 3/8-inch-long (9.5 mm) teeth that are stamped in pairs and bent at right angles from the face of the plate. The teeth are spaced 1 inch (25.4 mm) on center along the length, and 1/4 inch (6.4 mm) on center along the width, and are staggered 3/32 inch (2.4 mm) off center. Each plate has six teeth per square inch (1.24 teeth/cm²), and every fourth row is removed. See Figure 4 for details.

3.5 Eagle 18HS:

Eagle 18HS truss metal connector plates are manufactured from minimum No. 18 gage [0.0466 inch (1.184 mm) total thickness], ASTM A653, HSLAS designation, Grade 60, structural steel with a G60 galvanization coating [0.0005 inch (0.013 mm) thickness
NOTAS GENERALES

Las travesas no están marcadas de ninguna manera que indiquen la localización de restricción lateral y sujeto de carga temporal. Utilice las recomendaciones de manojo, instalación, restricción y alineación de los travesas. Vea las normas BCSI para el Manejo, Restricción y Alineación de los Travesas de Natación Conectados con Planas de Metal para información más detallada.

Las diapositivas de los travesas pueden especificar las localizaciones de restricción lateral permanente o restringidas en los instaladores individuales del travesa. Vea los manuales BCSI para más información. El resto de los derechos de autor y licencias son responsabilidad del dibujante del dibujo.

MECHANICAL HOISTING RECOMMENDATIONS FOR SINGLE TRUSSES RECOMENDACIONES DE LEVANTAMIENTO DE TRUSSES INDIVIDUALES

NOTICE

Use a single pick-point at the peak can damage the trusses.

El uso de un solo lugar en el pico para levantar puede hacer daño al travesa.

INSTALLATION OF SINGLE TRUSSES BY HAND RECOMENDACIONES DE LEVANTAMIENTO DE TRUSSES INDIVIDUALES POR LA MANO

Types: 20' (6.1 m) or less, support at rear peak.
Soporte cerca al pico los travesas de 20 pies o menos.

Types: 30' (9.1 m) or less, support at quarter points.
Soporte de los cuartos de los travesas de 30 pies o menos.

TEMPORARY RERAINT RESTRAINT & BRACING RESTRICCION Y ARROISTRE TEMPORAL

Refer to BCSI-B3**** for more information.

Vea el manual BCSI-B3**** para más información.

Locate ground braces for first truss directly in line with all rows of top chord temporary lateral restraint (see table in next column).

Coloque los arrastres de tierra para el primer travesa directamente en línea con todas las filas de restricción lateral temporal de la cuarta superior (vea la tabla en el próximo cuadro).

DO NOT work on unbraced braces.

NO mueva en travesas sueltos.

DO NOT walk on unbraced braces.

NO camine en travesas sueltos.

WARNING! Do not use boom truck to lift a bundle.

WARNING! No use de alzamiento con remolque para levantar una pala.
**Warning:** Disregarding permanent restraint/bracing is a major cause of truss field performance problems and has been shown to lead to roof or floor system collapse.

**Avis:** La omisión de la restricción permanente es una causa principal de los problemas de rendimiento de los travesaños en campo y ha llevado al colapso del sistema de techos o pisos.

**Notice:** Section 2303.4.1.3 of the International Building Code (IBC) requires the permanent individual truss member restraint/bracing for all trusses with clear spans 60 feet (18.3 m) or greater to be designed by a registered design professional.

**Nota:** Sección 2303.4.1.3 del Código de construcción internacional (IBC) requiere que la instalación temporal de restricción de arriostrado para todos los travesaños con pasarelas libres de 60 pies (18.3 m) o más sea diseñada por un profesional registrado.

**Restraint/Bracing Materials & Fasteners Materiales y Cierres de Restricción/Arriostrado**

- Comunmente usados restraint/bracing materials include wood structural panels, gypsum board sheathing, stress-graded lumber, proprietary metal products, and metal purlins and straps.

**Permanent Bracing for the Various Planes of a Truss Arriostre Permante para Varios Planos de un Travesaño**

- Permanent bracing is important because it:
  - Prevents out-of-plane buckling of truss members,
  - Helps maintain proper truss spacing, and
  - Resists and transfers lateral loads from wind and seismic forces.

**Trusses require permanent bracing within ALL of the following planes:**

1. Top chord plane
2. Bottom chord plane
3. Web member plane

**Caution:** The truss, or a portion of its members, will buckle (i.e., fail) at loads far less than design without permanent bracing.

**Ejemplo:** Si el arriostrado permanente del travesaño, o una parte de sus miembros, torcerán (es, fallarán) a cargas mucho menores a las cargas que el travesaño es diseñado a llevar.

**1. Permanent Bracing for the Top Chord Plane Arriostre Permante para el Punto de la Cuerda Superior**

- Use plywood, oriented strand board (OSB), or wood or metal structural purlins that are properly braced. Attach to each truss.
- Use contrachapado, panel de fibras orientadas (OSB), o vigas de soporte de madera o metal que estén arriostrados apropiadamente. Sujete a cada truss.
- The Truss Design Drawing (TDD) provides information on the assumed support for the top chord.
- El Dibujo del Diseño de Truss (TDD) provee información sobre el soporte supuesto para el punto superior.

- Fastener size and spacing requirements and
grace for the sheathing, purlins and bracing are provided in the building code and/or by the building designer.
- El tamaño de clavo y requisitos de espaciamien-
to y grano para el tabladillo, vigas de soporte y arriostrado, provistos en el código del edificio y/o por el diseñador del espacio.

**2. Permanent Bracing for the Bottom Chord Plane Arriostre Permante para el Punto de la Cuerda Inferior**

- Use rows of continuous lateral restraint with diagonal bracing, gypsum board sheathing or some other ceiling material capable of functioning as a diaphragm.
- Use filas de restricción lateral continua con arriostrado diagonal, entablado de yeso o cualquier otro material para techos que pueda funcionar como un diaphragma.

**The TDD provides information on the assumed support for the bottom chord.**

**Intall bottom chord permanent lateral restraint at the spacing indicated on the TDD and/or by the designer with a minimum of 10’ (3 m) on center.**

**Diagonal bracing required at each end of the building, between each row of lateral restraint, and at intervals of 20’ (6.1 m).**

**Attach diagonal bracing to each truss.**

**Restricción lateral y arriostrado diagonal también puede ser usado con grupos pequeños de travesaños (es, tres o menos). Sujete la restricción lateral y el arriostrado diagonal a cada miembro.**

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**Exemplos de Diagonal Brasagem com Contínua**

- **Lateral Restraint**
  - Use lateral restraint and diagonal bracing can also be used with small groups of trusses (i.e., three or less).
  - Attach the lateral restraint and diagonal brace to each web member.
  - **Nota:** Algunos travesaños pueden ser usados con grupos pequeños de travesaños (es, tres o menos). Sujete la restricción lateral y el arriostrado diagonal a cada miembro.
ALWAYS DIAGONALLY BRACE THE CONTINUOUS LATERAL RESTRAINT!
SÍEMPRE ARROSTÉ LA RESTRIECCIÓN LATERAL CONTÍNUA DIAGONALMENTE!

B. Individual Web Member Reinforcement
Refuerzo de Miembros Secundarios Individuales
T - L - , Sca, L - , U-Reinforcement, proprietary metal reinforcement and stacked web products provide an alternative for resisting web buckling.
T - L - , Sca, L - , U-Refréns, refuerzo de metal patenteado y productos de miembros secundarios amonitados proveen una alternativa para resistir el torcer de los miembros secundarios.

The following table may be used unless more specific information is provided.
La siguiente tabla puede ser usada a menos que información más específica esté provista.

**WEB REINFORCEMENT FOR SINGLE PLY TRUSSES**

<table>
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<th>Specified CLR</th>
<th>Size of Truss Web</th>
<th>Type &amp; Size of Web Reinforcement</th>
<th>Grade of Web Reinforcement</th>
<th>Minimum Length of Web Reinforcement</th>
<th>Minimum Connection of Web Reinforcement to Web</th>
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<td>2x4</td>
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<td>50% of web</td>
<td>16d (13/16&quot;) nails @ 6&quot; (150 mm) on center</td>
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Maximum web length is 8' (14 ft - 3")
Nota: El largo máximo de la viga es de 14 pies - 3".

Some truss manufacturers provide additional assistance by using tags to mark the web members that require lateral restraint or reinforcement.
Algunos fabricantes de trusas marcan en el truss las ubicaciones de refuerzo o restricción lateral de miembros secundarios con etiquetas similares a las aristas.

**Web Member Plane Permanent Building Stability Bracing to Transfer Wind & Seismic Forces**

![Diagram of web member reinforcement](image)

<table>
<thead>
<tr>
<th>Web Member Plane Permanent Building Stability Bracing to Transfer Wind &amp; Seismic Forces</th>
</tr>
</thead>
<tbody>
<tr>
<td>The web member restraint or reinforcement specified on a TDO is required to resist buckling due to axial forces caused by the in-plane loads applied to the truss. Additional restraint and bracing within the web member plane may also be required to transfer lateral forces due to wind and/or seismic loads applied perpendicular to the plane of the trusses. This restraint and bracing is typically specified by the building designer.</td>
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</table>

La restricción o refuerzo de miembros secundarios especificado en un TDO es requerido para resistir la deformación bajo fuerzas axiales causadas por cargas verticales aplicadas al truss. La restricción adicional y el soporte ortogonal dentro del plano de los miembros de viga también puede ser necesaria para transferir fuerzas laterales debidas al viento y/o cargas sísmicas aplicadas perpendiculares a la planta de los trusses. Este refuerzo y soporte es típicamente especificado por el arquitecto del edificio.

**Permanente Restraint/Bracing for the Top Chord in a Piggyback Assembly**

**Arriostre Permanente Para la Cuerda Superior en un Ensamblaje de Piggyback**

- Provide restraint and bracing by:
  - using rows of minimum 4x2 stress-graded lumber CLR and diagonal bracing, or
  - connecting the CLR to the roof diaphragm, or
  - adding structural sheathing or bracing frames, or
  - some other equivalent means.

- Provee restricción y arrostrado por:
  - usando fila de 4x2 de madera graduada por esfuerzo y arrostrado diagonal, o
  - conectando el CLR a la diaphragm del techo, o
  - añadiendo tabiques estructurales o marcos de arrostrado, o
  - otros métodos equivalentes.

- Refer to the TDO for the maximum assumed spacing between rows of lateral restraint (e.g., purines) attached to the top chord of the supporting truss.
- Consúlte el TDO para el espaciado máximo supuesto para sujetar la restricción lateral (e.g., purines) a la cuerda superior del truss soportante.

- The TDO provides the assumed thickness of the restraint and minimum connection requirements between the cap and the supporting truss or restraint.
- El TDO provee el espesor supuesto de la restricción y los requisitos mínimos entre la capa y el truss soportante o la restricción.

- If diagonal bracing is used to restrain the CLR(s), repeat at 10" (3 m) intervals, or as specified in the construction documents.
- Si se usan estribos diagonales para restringir el CLR(s), repita a intervalos de 10 pies o como especificado en los documentos de construcción.
**TrusPro Structural Components Inc**

P.O. Box 850  
Guadalupe, CA. 93434  
Phone: (805) 343-2555 Fax: (805) 343-2377  
Steve@TrusPro.com www.TrusPro.com

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**Bill Of Lading**

**Customer:** _Owner/Builder_

**Contact:**

**Bill To**

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| Total Board Feet | 7382   | Total Lineal Feet | 9061   | Total Trusses | 217   | Max Span | 31-0-0   | Total Truss Weight | 13124 lbs | Max Truss Height | 5-8-1 |

9/22/2021 10:27:25 AM
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WARRANTIES PROVISIONS:
Supplier warrants for one year from date of delivery that its manufactured Products shall be new and of industry standard quality in the trade and within the description set forth in this Agreement. Any items not manufactured by Supplier are warranted only as warranted by the manufacturer of such items, otherwise all such items are sold on an “AS IS” basis. THE FOREGOING WARRANTIES ARE EXCLUSIVE, AND ARE IN LIEU OF ALL OTHER WARRANTIES (WHETHER WRITTEN, ORAL, OR IMPLIED AND INCLUDING ANY REGARDING THE MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE) NOT SPECIFIED HEREIN, RESPECTING THIS CONTRACT. Supplier’s warranty shall exclude losses caused by improper operating, storing, handling, installation, and bracing. Supplier’s obligations and liabilities under this Contract are expressly and exclusively limited to repair or replacement of defective Products or, at the option of the Supplier, to the refund of the purchase price. IN NO EVENT SHALL THE CONTRACTOR BE ENTITLED TO RECOVER FOR INCIDENTAL, CONSEQUENTIAL, OR SPECIAL DAMAGE, INCLUDING THE LOSS OF PROFITS, OR OTHER COMMERCIAL LOSS.

DEFAULT AND TERMINATION PROVISIONS:
In case of a good faith claim against Supplier for any defect or non-conformity with respect to the Products sold, written notice setting forth such defect or non-conformity must be submitted to Supplier within 30 days of truss delivery. Supplier shall have no less than 7 business days from date of receipt of such notice to either accept such claim or commence any necessary repair or replacement of Product. Upon termination for convenience, Supplier shall be paid for all Products manufactured and delivered.

By signing below, it is agreed that at least one set of bracing and installation instructions have been received with this order.

Accepted By: _______________________________ Date: ____________

9/22/2021 10:27:25 AM  Eagle Metal Products - TrueBuild® Report Engine v5.5.30.2  Job# 5433M  3 of 3
### Notes
- All connector plates to be Eagle 20 gauge unless otherwise noted.

### Loading (psf)

<table>
<thead>
<tr>
<th>Carried Loads (psf)</th>
<th>General</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bldg Code: CBC 2019/</td>
<td>TC: 0.15 (7-8)</td>
</tr>
<tr>
<td>TPI: 201-2014</td>
<td>BC: 0.21 (11-12)</td>
</tr>
<tr>
<td>Rep Mbr: No</td>
<td>Web: 0.24 (3-12)</td>
</tr>
</tbody>
</table>

### Deflection

<table>
<thead>
<tr>
<th>L/ (loc)</th>
<th>Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vert TL: 0.07 in</td>
<td>L/999 (10-11) L/240</td>
</tr>
<tr>
<td>Vert LL: 0.02 in</td>
<td>L/999 (11-12) L/360</td>
</tr>
<tr>
<td>Cant/OH TL: 0.01 in</td>
<td>2L/999 (1-1) 2L/120</td>
</tr>
<tr>
<td>Cant/OH LL: 0.01 in</td>
<td>2L/999 (1-1) 2L/120</td>
</tr>
<tr>
<td>Horz TL: 0.02 in</td>
<td>9</td>
</tr>
</tbody>
</table>

### Reaction

<table>
<thead>
<tr>
<th>JT</th>
<th>Bracing</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC: DFL #2 2 x 6</td>
<td>BC: Sheathed or Purlins at 6-3-0, Purlin design by Others.</td>
</tr>
<tr>
<td>Bldg Code: CBC 2019/</td>
<td>BC: Sheathed or Purlins at 10-0-0, Purlin design by Others.</td>
</tr>
</tbody>
</table>

### Material

<table>
<thead>
<tr>
<th>DFL: #2 2 x 6</th>
<th>SPF Stud 2 x 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web: SPF Stud 2 x 4</td>
<td></td>
</tr>
</tbody>
</table>

### Loads

1. This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2. This truss has been designed for the effects of wind loads in accordance with ASCE7 - 16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=B=L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
3. Minimum storage attic loading has been applied in accordance with IBC 1607.1
4. A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

### Load Case Lr1: Std Live Load

<table>
<thead>
<tr>
<th>Distributed Loads</th>
<th>Location 1</th>
<th>Location 2</th>
<th>Direction</th>
<th>Spread</th>
<th>Start Load</th>
<th>End Load</th>
<th>Trib Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>0-0-0</td>
<td>31-0-0</td>
<td>Down</td>
<td>Proj</td>
<td>15 plf</td>
<td>15 plf</td>
<td></td>
</tr>
<tr>
<td>Top</td>
<td>0-0-0</td>
<td>12-2-6</td>
<td>Down</td>
<td>Proj</td>
<td>20 plf</td>
<td>18.67 plf</td>
<td></td>
</tr>
<tr>
<td>Top</td>
<td>12-2-6</td>
<td>13-11-4</td>
<td>Down</td>
<td>Proj</td>
<td>18.67 plf</td>
<td>1.25 plf</td>
<td></td>
</tr>
<tr>
<td>Top</td>
<td>17-0-12</td>
<td>18-9-11</td>
<td>Down</td>
<td>Proj</td>
<td>1.25 plf</td>
<td>18.67 plf</td>
<td></td>
</tr>
<tr>
<td>Top</td>
<td>18-9-11</td>
<td>31-0-0</td>
<td>Down</td>
<td>Proj</td>
<td>18.67 plf</td>
<td>20 plf</td>
<td></td>
</tr>
</tbody>
</table>

### ALL PERSONS FABRICATING, HANDLING, ERECTING OR INSTALLING ANY TRUSS BASED UPON THIS TRUSS DESIGN DRAWING ARE INSTRUCTED TO REFER TO ALL OF THE INSTRUCTIONS, LIMITATIONS AND QUALIFICATIONS SET FORTH IN THE EAGLE METAL PRODUCTS DESIGN NOTES ISSUED WITH THIS DESIGN AND AVAILABLE FROM EAGLE UPON REQUEST. DESIGN VALID ONLY WHEN EAGLE METAL CONNECTORS ARE USED.
<table>
<thead>
<tr>
<th>SPAN</th>
<th>PITCH</th>
<th>QTY</th>
<th>OHL</th>
<th>OHR</th>
<th>CANTL</th>
<th>CANTR</th>
<th>PLYS</th>
<th>SPPACING</th>
<th>WGT/PLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>31-0-0</td>
<td>4/12</td>
<td>2</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>2</td>
<td>21 in</td>
<td>171 lbs</td>
</tr>
</tbody>
</table>

**Member Forces**

<table>
<thead>
<tr>
<th>Member</th>
<th>Location 1</th>
<th>Location 2</th>
<th>Direction</th>
<th>Spread</th>
<th>Start Load</th>
<th>End Load</th>
<th>Trib Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC</td>
<td></td>
<td></td>
<td>Down</td>
<td>Proj</td>
<td>11.25 plf</td>
<td>11.25 plf</td>
<td></td>
</tr>
<tr>
<td>TC</td>
<td>0-0-0</td>
<td>12-2-6</td>
<td>Down</td>
<td>Proj</td>
<td>14 plf</td>
<td>14 plf</td>
<td></td>
</tr>
<tr>
<td>TC</td>
<td>12-2-6</td>
<td>13-11-4</td>
<td>Down</td>
<td>Proj</td>
<td>14 plf</td>
<td>0.94 plf</td>
<td></td>
</tr>
<tr>
<td>TC</td>
<td>17-0-12</td>
<td>18-9-11</td>
<td>Down</td>
<td>Proj</td>
<td>0.94 plf</td>
<td>14 plf</td>
<td></td>
</tr>
<tr>
<td>Top</td>
<td>0-0-0</td>
<td>12-2-6</td>
<td>Down</td>
<td>Proj</td>
<td>14 plf</td>
<td>15 plf</td>
<td></td>
</tr>
<tr>
<td>Top</td>
<td>12-2-6</td>
<td>13-11-4</td>
<td>Down</td>
<td>Proj</td>
<td>14 plf</td>
<td>0.94 plf</td>
<td></td>
</tr>
<tr>
<td>Top</td>
<td>17-0-12</td>
<td>18-9-11</td>
<td>Down</td>
<td>Proj</td>
<td>0.94 plf</td>
<td>14 plf</td>
<td></td>
</tr>
<tr>
<td>Bot</td>
<td>0-0-0</td>
<td>12-2-6</td>
<td>Down</td>
<td>Proj</td>
<td>7.5 plf</td>
<td>9.34 plf</td>
<td></td>
</tr>
<tr>
<td>Bot</td>
<td>12-2-6</td>
<td>13-11-4</td>
<td>Down</td>
<td>Proj</td>
<td>9.34 plf</td>
<td>0.62 plf</td>
<td></td>
</tr>
<tr>
<td>Bot</td>
<td>17-0-12</td>
<td>18-9-11</td>
<td>Down</td>
<td>Proj</td>
<td>0.62 plf</td>
<td>9.34 plf</td>
<td></td>
</tr>
<tr>
<td>Bot</td>
<td>18-9-11</td>
<td>31-0-0</td>
<td>Down</td>
<td>Proj</td>
<td>9.34 plf</td>
<td>10 plf</td>
<td></td>
</tr>
</tbody>
</table>

**Notes**

1) Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2) This truss has been designed using the green service reduction factors.
3) The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4) Provide adequate drainage to prevent ponding.
5) Brace bottom chord with approved sheathing or purlins per Bracing Summary.
6) A creep factor of 2.00 has been applied for this truss analysis.
7) The forces shown for this multi-ply truss are per ply and the reactions are for all plies. Two identical trusses shall be built and attached as follows, per ply:
   0.131"x3" Nails TC - 2 staggered rows @ 12 in oc, BC - 2 staggered rows @ 12 in oc, Webs - 1 row @ 12 in oc.
   Provided the hanger connections do not adequately transfer the applied load to all plies: in addition to connectors shown above, attach each pair of girder plies with supplemental 0.131"x3" Nails as follows within 24" of the location shown:
   BC: 13-11-4, (2) Connectors
   BC: 17-0-12, (2) Connectors

Connections shall not encroach on other girder ply connectors or truss-to-truss connectors in accordance with the NDS or the connector manufacturer recommendations.
8) When applied loads are on one side of girder, do not flip girder during girder connector installation, install connectors on the girder side where supported loads are applied. When applied loads are on both sides of girder, double the spacing and install half of the connectors on one side of girder and then flip the girder to install the other half of the connectors on the opposite side (at double the connector spacing). Connectors on opposite sides of the girder shall be offset.
9) Lateral bracing shall be attached to each ply.
10) All fasteners minimum 2-1/2" long, unless otherwise noted.
11) Nails in 1st and 2nd ply shall be offset from successive plies by 1/2 the nail spacing.
12) Listed wind uplift reactions based on MWFRS & C&C loading.
TrusPro Inc.
695 Obispo Street
Guadalupe, CA 93434
Ph: (805)343-2555    Fax: (805)343-2377

Truss: 1A1
Job: 5433M
Date: 09/22/21   10:30:37
Page: 1 of 1
Notes: All connector plates to be Eagle 20 gauge unless otherwise noted.

Span Pitch QTY OHL OHR Cantl Cantr Plys Spacing Wgt/Ply
31-0-0 4/12 6 0-0-0 0-0-0 0-0-0 0-0-0 0-0-0 1 24 in 145 lbs

All persons fabricating, handling, erecting or installing any truss based upon this truss design drawing are instructed to refer to all of the instructions, limitations and qualifications set forth in the Eagle Metal Products design notes issued with this design and available from Eagle upon request. Design valid only when Eagle Metal Connectors are used.

Loading (psf)
- TCLL: 20 Bldg Code: CBC 2019/TPI 2019-
- TCDL: 15 (rake)
- BCLL: 0 Rep Mfr: Yes
- BCLDL: 10 Lumber D.O.L.: 125%

Deflection
- Vert TL: 0.35 in L/734 (9-10) L/240
- Vert LL: 0.14 in L/999 (9-10) L/360
- Cant/OTH TL: 0.05 in L/999 (7-8) L/120
- Cant/OTH LL: 0.02 in L/999 (7-8) L/120
- Horz TL: 0.04 in 8

Material
- TC: DFL #2 2 x 6
- BC: DFL #2 2 x 4
- Web: SPF Stud 2 x 4

Bracing
- TC: Sheathed or Purlins at 6-3-0, Purlin design by Others.
- BC: Sheathed or Purlins at 9-1-0, Purlin design by Others.
- Web: One Midpoint Row: 3-11, 5-8

Loads
1) This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2) This truss has been designed for the effects of wind loads in accordance with ASCE7-16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Galile, Risk Category II, h=B=L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
3) Minimum storage attic loading has been applied in accordance with IBC 1607.1
4) A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

Member Forces
Table indicates: Member ID, max CSI, max axial force, (max compr. force if different from max axial force). Only forces greater than 300 lbs are shown in this table.

Notes
1) Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2) This truss has been designed using the green service reduction factors.
3) The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4) Brace bottom chord with approved sheathing or purlins per Bracing Summary.
5) Lateral bracing shown is for illustration purposes only and may be placed on either edge of truss member.
6) A creep factor of 2.00 has been applied for this truss analysis.
7) Indicates lateral bracing required perpendicular to the plane of the truss at either the midpoint (one shown) or third points (two shown), bracing by others. See BCST B3 for additional information.
8) Listed wind uplift reactions based on MWFRS & C&C loading.

TrueBuild® Truss Software v5.6.375
Eagle Metal Products
All persons fabricating, handling, erecting or installing any truss based upon this truss design drawing are instructed to refer to all of the instructions, limitations and qualifications set forth in the Eagle Metal Products design notes issued with this design and available from Eagle upon request. Design valid only when Eagle metal connectors are used.

<table>
<thead>
<tr>
<th>SPAN</th>
<th>PITCH</th>
<th>QTY</th>
<th>OHL</th>
<th>OHR</th>
<th>CANTL</th>
<th>CANTR</th>
<th>PLYS</th>
<th>SPACING</th>
<th>WGT/PLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-0-0</td>
<td>4/12</td>
<td>1</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>2</td>
<td>23.62 in</td>
<td>172 lbs</td>
</tr>
</tbody>
</table>

All plates shown to be Eagle 20 gauge unless otherwise noted.

<table>
<thead>
<tr>
<th>Loading (psf)</th>
<th>General</th>
<th>CSI</th>
<th>Deflection</th>
<th>L/ (loc)</th>
<th>Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carried Loads (psf)</td>
<td>Bldg Code: CBC2019/</td>
<td>TC: 0.17 (2-3)</td>
<td>Vert TL: 0.19 in</td>
<td>L/999</td>
<td>(10-11)</td>
</tr>
<tr>
<td>TCLL: 20</td>
<td>TPI 1-2014</td>
<td>BC: 0.33 (11-12)</td>
<td>Vert LL: 0.05 in</td>
<td>L/999</td>
<td>(11-12)</td>
</tr>
<tr>
<td>TCDL: 15 (rake)</td>
<td>Rep Mbr: No</td>
<td>Cant/OH TL: 0.01 in</td>
<td>2L/999</td>
<td>(1-1)</td>
<td>2L/120</td>
</tr>
<tr>
<td>BCCL: 0</td>
<td>Lumber D.O.L.: 125%</td>
<td>Cant/OH LL: 0.01 in</td>
<td>2L/999</td>
<td>(8-8)</td>
<td>2L/120</td>
</tr>
<tr>
<td>BCODL: 10</td>
<td></td>
<td>Horz TL: 0.04 in</td>
<td>9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reaction</th>
<th>Material Bracing</th>
</tr>
</thead>
<tbody>
<tr>
<td>JT</td>
<td>TC: DFL #2 2 x 6</td>
</tr>
<tr>
<td>14</td>
<td>5.5 in</td>
</tr>
<tr>
<td>9</td>
<td>5.5 in</td>
</tr>
<tr>
<td>Bracing</td>
<td>TC: Sheathed or Purlins at 6-3-0, Purlin design by Others.</td>
</tr>
<tr>
<td>BC: DFL #2 2 x 6</td>
<td>BC: Sheathed or Purlins at 10-0-0, Purlin design by Others.</td>
</tr>
<tr>
<td>Web: SPF Stud 2 x 4</td>
<td></td>
</tr>
</tbody>
</table>

**Loads**

1) This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2) This truss has been designed for the effects of wind loads in accordance with ASCE7 - 16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=B=L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
3) Minimum storage attic loading has been applied in accordance with IBC 1607.1
4) A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

**Load Case L1: Std Live Load**

<table>
<thead>
<tr>
<th>Distributed Loads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Member</td>
</tr>
<tr>
<td>Top</td>
</tr>
<tr>
<td>Top</td>
</tr>
<tr>
<td>Top</td>
</tr>
<tr>
<td>Top</td>
</tr>
<tr>
<td>Top</td>
</tr>
</tbody>
</table>
Notes

1) Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.

2) This truss has been designed using the green service reduction factors.

3) The fabrication tolerance for this roof truss is 20% (Cq = 0.80).

4) Provide adequate drainage to prevent ponding.

5) Brace bottom chord with approved sheathing or purlins per Bracing Summary.

6) A creep factor of 2.00 has been applied for this truss analysis.

7) The forces shown for this multi-ply truss are per ply and the reactions are for all plies. Two identical trusses shall be built and attached as follows, per ply:

0.131"x3" Nails TC - 2 staggered rows @ 12 in oc, BC - 2 staggered rows @ 12 in oc, Webs - 1 row @ 12 in oc.

Provided the hanger connections do not adequately transfer the applied load to all plies: in addition to connectors shown above, attach each pair of girder plies with supplemental 0.131"x3" Nails as follows within 24" of the location shown:

BC: 13-11-4,(6)Connectors
BC: 16-0-12,(6)Connectors

Connectors shall not encroach on other girder ply connectors or truss-to-truss connectors in accordance with the NDS or the connector manufacturer recommendations.

8) When applied loads are on one side of girder, do not flip girder during girder connector installation, install connectors on the girder side where supported loads are applied. When applied loads are on both sides of girder, double the spacing and install half of the connectors on one side of the girder and then flip the girder to install the other half of the connectors on the opposite side (at double the connector spacing). Connectors on opposite sides of the girder shall be offset.

9) Lateral bracing shall be attached to each ply.

10) All fasteners minimum 2-1/2" long, unless otherwise noted.

11) Nails in 1st and 2nd ply shall be offset from successive plies by 1/2 the nail spacing.

12) Listed wind uplift reactions based on MWFRS & C&C loading.
**All persons fabricating, handling, erecting or installing any truss based upon this truss design drawing are instructed to refer to all of the instructions, limitations and qualifications set forth in the Eagle metal products design notes issued with this design and available from Eagle upon request. Design valid only when Eagle metal connectors are used.**

### Loading (psf)

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCLL</td>
<td>20</td>
</tr>
<tr>
<td>TCDL</td>
<td>15 (rake)</td>
</tr>
<tr>
<td>BCLL</td>
<td>0</td>
</tr>
<tr>
<td>BCDL</td>
<td>10</td>
</tr>
</tbody>
</table>

### General

- **Bldg Code**: CBC 2019/
- **TPI**: 1-2014
- **Rep Mbr**: Yes
- **Lumber D.O.L.**: 125%

### CSI

- **TC**: 0.31 (1-2)
- **BC**: 0.73 (10-11)
- **Web**: 0.50 (3-11)

### Deflection

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vert TL</td>
<td>0.54 in</td>
</tr>
<tr>
<td>Vert LL</td>
<td>0.2 in</td>
</tr>
<tr>
<td>Cant/Oh TL</td>
<td>0.03 in</td>
</tr>
<tr>
<td>Cant/Oh LL</td>
<td>0.02 in</td>
</tr>
<tr>
<td>Horz TL</td>
<td>0.07 in</td>
</tr>
</tbody>
</table>

### Reaction

- **JT**: 1-2, 2-3, 3-4, 4-5, 5-6, 6-7
- **Max React**: 1,585 lbs (compression)

### Material

- **TC**: DFL #2 2 x 6
- **BC**: DFL #2 2 x 4
- **Web**: SPF Stud 2 x 4

### Loads

1. This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2. This truss has been designed for the effects due to a 1,000 lbs (31.6 plf) drag load distributed along the TC rake from each direction.
3. This truss has been designed for the effects of wind loads in accordance with ASCE7 - 16 with the following user defined input: 110 mph (Factor), Exposure C, Enclosed, Gable, Risk Category II, 60 mph = 60 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
4. Minimum storage attic loading has been applied in accordance with IBC 1007.1
5. A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

### Member Forces

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC</td>
<td>1-2</td>
</tr>
<tr>
<td>BGL</td>
<td>0.306</td>
</tr>
<tr>
<td>BGL</td>
<td>3.101</td>
</tr>
<tr>
<td>BLK</td>
<td>8-9</td>
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<td>BLK</td>
<td>0.780</td>
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<tr>
<td>BLK</td>
<td>1.468</td>
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<tr>
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<td>0.148</td>
</tr>
<tr>
<td>BLK</td>
<td>0.095</td>
</tr>
</tbody>
</table>

### Notes

1. Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2. This truss has been designed using the green service reduction factors.
3. Brace bottom chord with approved sheathing or purlins per Bracing Summary.
4. Lateral bracing shown is for illustration purposes only and may be placed on either edge of truss member.
5. A creep factor of 2.00 has been applied for this truss analysis.
6. Indicates lateral bracing required perpendicular to the plane of the truss at either the midpoint (one shown) or third points (two shown), bracing by others. See BCSI-B3 for additional information.
7. Listed wind uplift reactions based on MWFRS & C&C loading.
All connector plates to be Eagle 20 gauge unless otherwise noted.

### Loading (psf)

<table>
<thead>
<tr>
<th>Description</th>
<th>Valuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>TcDL: 15(rake)</td>
<td>RC Code: Yes</td>
</tr>
<tr>
<td>BcLL: 0</td>
<td>Design by Others.</td>
</tr>
<tr>
<td>BcDL: 10</td>
<td>Design by Others.</td>
</tr>
</tbody>
</table>

### CSI

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tc: 0.36 (1-2)</td>
<td></td>
</tr>
<tr>
<td>Bc: 0.90 (11-12)</td>
<td></td>
</tr>
<tr>
<td>Web: 0.85 (3-13)</td>
<td></td>
</tr>
</tbody>
</table>

### Deflection

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vert TL: 0.77 in</td>
<td></td>
</tr>
<tr>
<td>Vert LL: 0.3 in</td>
<td></td>
</tr>
<tr>
<td>Cant/Oh TL: 0.08 in</td>
<td></td>
</tr>
<tr>
<td>Cant/Oh LL: 0.04 in</td>
<td></td>
</tr>
<tr>
<td>Horz TL: 0.05 in</td>
<td></td>
</tr>
</tbody>
</table>

### Reaction

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>JT: 5.5 in</td>
<td></td>
</tr>
<tr>
<td>Bracing Combo: Sheathed or Purlins at 6-3-0, Purlin design by Others.</td>
<td></td>
</tr>
<tr>
<td>Bq: 1.67 in</td>
<td></td>
</tr>
<tr>
<td>Max React: 1.568 lbs</td>
<td></td>
</tr>
<tr>
<td>Max Grav Uplift: -54 lbs</td>
<td></td>
</tr>
<tr>
<td>Max MWFRS Uplift: -125 lbs</td>
<td></td>
</tr>
<tr>
<td>Max C&amp;C Uplift: -125 lbs</td>
<td></td>
</tr>
<tr>
<td>Max Uplift: -125 lbs</td>
<td></td>
</tr>
<tr>
<td>Max Horiz: 1.003 lbs</td>
<td></td>
</tr>
</tbody>
</table>

### Material

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC: DFL #2 2 x 6</td>
<td></td>
</tr>
<tr>
<td>BC: DFL #2 2 x 4</td>
<td></td>
</tr>
<tr>
<td>Web: SPF Stud 2 x 4</td>
<td></td>
</tr>
</tbody>
</table>

### Loads

1. This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2. This truss has been designed for the effects due to a 1,000 lbs (31.6 plf) drag load distributed along the TC rafter from each direction.
3. This truss has been designed for the effects of wind loads in accordance with ASCE 7-16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=B=L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
4. Minimum storage attic loading has been applied in accordance with IBC 1607.1
5. A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

### Member Forces

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC: 0.357 632 lbs (177 lbs)</td>
<td>0.248 1.000 lbs</td>
</tr>
<tr>
<td>BC: 0.357 559 lbs (117 lbs)</td>
<td>0.246 -360 lbs</td>
</tr>
<tr>
<td>Web: 0.469 1,568 lbs (606 lbs)</td>
<td>0.386 322 lbs (103 lbs)</td>
</tr>
</tbody>
</table>

### Notes

1. Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2. This truss has been designed using the green service reduction factors.
3. The fabrication tolerance for this roof truss is 20% (Cq = 0.80).

---

ALL PERSONS FABRICATING, HANDLING, ERECTING OR INSTALLING ANY TRUSS BASED UPON THIS TRUSS DESIGN DRAWING ARE INSTRUCTED TO REFER TO ALL OF THE INSTRUCTIONS, LIMITATIONS AND QUALIFICATIONS SET FORTH IN THE EAGLE METAL PRODUCTS DESIGN NOTES ISSUED WITH THIS DESIGN AND AVAILABLE FROM EAGLE UPON REQUEST. DESIGN VALID ONLY WHEN EAGLE METAL CONNECTORS ARE USED.
<table>
<thead>
<tr>
<th>SPAN</th>
<th>PITCH</th>
<th>QTY</th>
<th>OHL</th>
<th>OHR</th>
<th>CANTL</th>
<th>CANTR</th>
<th>PLYS</th>
<th>SPACING</th>
<th>WGT/PLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>30'0&quot;</td>
<td>4/12</td>
<td>12</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>1</td>
<td>24 in</td>
<td>160 lbs</td>
</tr>
</tbody>
</table>

4) Brace bottom chord with approved sheathing or purlins per Bracing Summary.
5) Lateral bracing shown is for illustration purposes only and may be placed on either edge of truss member.
6) A creep factor of 2.00 has been applied for this truss analysis.
7) ❌ Indicates lateral bracing required perpendicular to the plane of the truss at either the midpoint (one shown) or third points (two shown), bracing by others. See BCSI-B3 for additional information.
8) Listed wind uplift reactions based on MWFRS & C&G loading.
All plates shown to be Eagle 20 gauge unless otherwise noted.

### Loading (psf)
- **Carried Loads (psf)**:
  - **Bldg Code**: CBC 2019
  - **TC**: 0.15 (1-2)
  - **BC**: 0.23 (11-12)
  - **Lumber D.O.L.**: 125%
- **Racking**:
  - **TC**: 0.15 (1-2)
  - **BC**: 0.23 (11-12)
  - **Web**: 0.48 (7-10)
- **Deflection**:
  - **Vert TL**: 0.11 in  L/999 (10-11)  L/240
  - **Vert LL**: 0.03 in  L/999 (10-11)  L/360
- **Horiz TL**: 0.02 in  L/999 (10-11)  L/360

### Reaction
- **JT**: Brg Combo
- **BC**: DFL #2 2 x 6
- **Web**: SPF Stud 2 x 4

### Material
- **TC**: DFL #2 2 x 6
- **BC**: DFL #2 2 x 6

### Bracing
- **TC**: Sheathed or Purlins at 3-6-0, Purlin design by Others.
- **BC**: Sheathed or Purlins at 10-0-0, Purlin design by Others.

### Loads
1. This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2. This truss has been designed for the effects of wind loads in accordance with ASCE 7-16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=B=L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
3. Minimum storage attic loading has been applied in accordance with IBC 1607.1
4. A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

### Load Case Lr1: Std Live Load

### Distributed Loads

<table>
<thead>
<tr>
<th>Member</th>
<th>Location 1</th>
<th>Location 2</th>
<th>Direction</th>
<th>Spread</th>
<th>Start Load</th>
<th>End Load</th>
<th>Trib Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>0-0-0</td>
<td>12-2-6</td>
<td>Down</td>
<td>Proj</td>
<td>20 plf</td>
<td>18.67 plf</td>
<td></td>
</tr>
<tr>
<td>Top</td>
<td>12-2-6</td>
<td>13-11-4</td>
<td>Down</td>
<td>Proj</td>
<td>18.67 plf</td>
<td>12.5 plf</td>
<td></td>
</tr>
<tr>
<td>Top</td>
<td>16-0-12</td>
<td>17-9-11</td>
<td>Down</td>
<td>Proj</td>
<td>12.5 plf</td>
<td>18.67 plf</td>
<td></td>
</tr>
<tr>
<td>Top</td>
<td>17-9-11</td>
<td>30-0-0</td>
<td>Down</td>
<td>Proj</td>
<td>18.67 plf</td>
<td>20 plf</td>
<td></td>
</tr>
<tr>
<td>Top</td>
<td>0-0-0</td>
<td>30-0-0</td>
<td>Down</td>
<td>Proj</td>
<td>19.37 plf</td>
<td>19.37 plf</td>
<td></td>
</tr>
</tbody>
</table>
Span: 30'0-0  Pitch: 4/12  QTY: 1  OHL: 0-0-0  OHR: 0-0-0  CantL: 0-0-0  CantR: 0-0-0  PlyS: 2  Spacing: 23.62 in  Wgt/Pl: 170 lbs

Notes:
1) All connector plates to be Eagle 20 gauge unless otherwise noted.

Load Case D1: Std Dead Load

Distributed Loads

<table>
<thead>
<tr>
<th>Member</th>
<th>Location 1</th>
<th>Location 2</th>
<th>Direction</th>
<th>Spread</th>
<th>Start Load</th>
<th>End Load</th>
<th>Trib Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>0-0-0</td>
<td>12-2-6</td>
<td>Down Proj</td>
<td>15 plf</td>
<td>14 plf</td>
<td>15 plf</td>
<td></td>
</tr>
<tr>
<td>Top</td>
<td>16-0-12</td>
<td>17-9-11</td>
<td>Down Proj</td>
<td>14 plf</td>
<td>0.94 plf</td>
<td>15 plf</td>
<td></td>
</tr>
<tr>
<td>Top</td>
<td>17-9-11</td>
<td>0-0-0</td>
<td>Down Proj</td>
<td>14 plf</td>
<td>15 plf</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bot</td>
<td>0-0-0</td>
<td>12-2-6</td>
<td>Down Proj</td>
<td>10 plf</td>
<td>9.34 plf</td>
<td>15 plf</td>
<td></td>
</tr>
<tr>
<td>Bot</td>
<td>16-0-12</td>
<td>17-9-11</td>
<td>Down Proj</td>
<td>0.62 plf</td>
<td>9.34 plf</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bot</td>
<td>17-9-11</td>
<td>0-0-0</td>
<td>Down Proj</td>
<td>9.34 plf</td>
<td>10 plf</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bot</td>
<td>0-0-0</td>
<td>30-0-0</td>
<td>Down Proj</td>
<td>9.69 plf</td>
<td>9.69 plf</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Member Forces

<table>
<thead>
<tr>
<th>Member</th>
<th>Location 1</th>
<th>Location 2</th>
<th>Direction</th>
<th>Spread</th>
<th>Start Load</th>
<th>End Load</th>
<th>Trib Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC</td>
<td>2-3</td>
<td>0.091</td>
<td>-759 lbs</td>
<td>0.475</td>
<td>1.113 lbs</td>
<td>0.130</td>
<td>-1.316 lbs</td>
</tr>
<tr>
<td>BC</td>
<td>10-11</td>
<td>0.222</td>
<td>1.215 lbs</td>
<td>0.440</td>
<td>2.108 lbs</td>
<td>0.390</td>
<td>-2.286 lbs</td>
</tr>
<tr>
<td>Web</td>
<td>2-14</td>
<td>0.196</td>
<td>2.91 lbs</td>
<td>0.500</td>
<td>1.385 lbs</td>
<td>0.390</td>
<td>-2.286 lbs</td>
</tr>
<tr>
<td></td>
<td>11-12</td>
<td>0.229</td>
<td>1.272 lbs</td>
<td>0.440</td>
<td>2.108 lbs</td>
<td>0.390</td>
<td>-2.286 lbs</td>
</tr>
</tbody>
</table>

Truss to Truss Connection Summary

<table>
<thead>
<tr>
<th>Carried Truss</th>
<th>Carrying Chord</th>
<th>Carrying Offset</th>
</tr>
</thead>
<tbody>
<tr>
<td>4DBX</td>
<td>BC</td>
<td>13-11-4</td>
</tr>
<tr>
<td>J14</td>
<td>TC</td>
<td>14-0-0</td>
</tr>
<tr>
<td>J14</td>
<td>BC</td>
<td>14-0-0</td>
</tr>
<tr>
<td>J14</td>
<td>TC</td>
<td>16-0-0</td>
</tr>
<tr>
<td>J14</td>
<td>BC</td>
<td>16-0-0</td>
</tr>
<tr>
<td>4DB</td>
<td>BC</td>
<td>16-0-12</td>
</tr>
</tbody>
</table>

Notes

1) Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2) This truss has been designed using the green service reduction factors.
3) The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4) Provide adequate drainage to prevent ponding.
5) Brace bottom chord with approved sheathing or purlins per Bracing Summary.
6) A creep factor of 2.00 has been applied for this truss analysis.
7) The forces shown for this multi-ply truss are per ply and the reactions are for all plies. Two identical trusses shall be built and attached as follows, per ply:
   0.131"x3" Nails TC - 2 staggered rows @ 12 in oc, BC - 2 staggered rows @ 12 in oc, Webs - 1 row @ 12 in oc.
   Provided the hanger connections do not adequately transfer the applied load to all plies: in addition to connectors shown above, attach each pair of girder plies with supplemental 0.131"x3" Nails as follows within 24" of the location shown:
   BC: 13-11-4,(3) Connectors
   BC: 16-0-12,(6) Connectors
   Connectors shall not encroach on other girder ply connectors or trans-to-truss connectors in accordance with the NDS or the connector manufacturer recommendations.
8) When applied loads are on one side of girder, do not flip girder during girder connector installation, install connectors on the girder side where supported loads are applied. When applied loads are on both sides of girder, double the spacing and install half of the connectors on one side of girder and then flip the girder to install the other half of the connectors on the opposite side (at double the connector spacing). Connectors on opposite sides of the girder shall be offset.
9) Lateral bracing shall be attached to each ply.
10) All fasteners minimum 2-1/2" long, unless otherwise noted.
11) Nails in 1st and 2nd ply shall be offset from successive plies by 1/2 the nail spacing.
12) Listed wind uplift reactions based on MWFRS & C&C loading.
All persons fabricating, handling, erecting or installing any truss based upon this truss design drawing are instructed to refer to all of the instructions, limitations and qualifications set forth in the Eagle Metal Products design notes issued with this design and available from Eagle upon request. Design valid only when Eagle metal connectors are used.

All plates shown to be Eagle 20 unless otherwise noted.

### Loading (psf)
- **Carried Loads (psf)**
  - **Bldg Code:** CBC 2019
  - **TCCL:** 20
  - **TCDL:** 15
  - **BCCL:** 0
  - **BCDCL:** 10
- **Loading:**
  - **Carried Loads:**
    - Bottom Chord: 20 psf
    - Top Chord: 15 psf
    - Web: 0 psf
  - **Total Load:**
    - Bottom Chord: 35 psf
    - Top Chord: 30 psf
    - Web: 0 psf

### CSI
- **TC:** 0.11 (1-2)
- **BC:** 0.06 (7-8)
- **Web:** 0.06 (4-7)

### Deflection
- **Vert TL:** 0.01 in L/999 (7-8) L/240
- **Vert LL:** 0.01 in L/999 (7-8) L/360
- **CantTL:** 0.01 in 2L/999 (1-1) 2L/120
- **Cant LL:** 0.01 in 2L/999 (1-1) 2L/120
- **Hor TL:** 0 in 6

### Reaction
- **Max React:**
  - **Max Uplift:**
    - **Max MWFRS Uplift:**
      - **Max GkC Uplift:**
        - **Max Horiz:**
          - **Max Uplift:**

### Material
- **TC:** DFL #2 2 x 6
- **BC:** DFL #2 2 x 6
- **Web:** SPF Stud 2 x 4

### Bracing
- **TC:** Sheathed or Purlins at 6-3-0, Purlin design by Others.
- **BC:** Sheathed or Purlins at 10-0-0, Purlin design by Others.

### Loads
1. This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2. This truss has been designed for the effects of wind loads in accordance with ASCE7 - 16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=B=L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
3. Minimum storage attic loading has been applied in accordance with IBC1607.1
4. A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

### Load Case Lr1: Std Live Load

<table>
<thead>
<tr>
<th>Member</th>
<th>Location 1</th>
<th>Location 2</th>
<th>Direction</th>
<th>Spread</th>
<th>Start Load</th>
<th>End Load</th>
<th>Trib Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>0-0-0</td>
<td>19-6-0</td>
<td>Down</td>
<td>Proj</td>
<td>13.75 plf</td>
<td>13.75 plf</td>
<td>19.12 plf</td>
</tr>
<tr>
<td>Top</td>
<td>8-0-0</td>
<td>9-8-4</td>
<td>Down</td>
<td>Proj</td>
<td>18.13 plf</td>
<td>18.13 plf</td>
<td>19.12 plf</td>
</tr>
<tr>
<td>Top</td>
<td>9-9-12</td>
<td>11-6-0</td>
<td>Down</td>
<td>Proj</td>
<td>1.25 plf</td>
<td>18.13 plf</td>
<td>19.12 plf</td>
</tr>
<tr>
<td>Top</td>
<td>11-6-0</td>
<td>19-6-0</td>
<td>Down</td>
<td>Proj</td>
<td>18.13 plf</td>
<td>18.13 plf</td>
<td>19.12 plf</td>
</tr>
</tbody>
</table>
Truss Pro Inc.
695 Obispo Street
Guadalupe, CA 93434
Ph: (805)343-2555    Fax: (805)343-2377

Truss: 3C
Job: 5433M
Date: 09/22/21  10:30:41
Page: 2 of 2
Notes: All connector plates to be Eagle 20 gauge unless otherwise noted

<table>
<thead>
<tr>
<th>SPAN</th>
<th>PITCH</th>
<th>QTY</th>
<th>OHL</th>
<th>OHR</th>
<th>CANTL</th>
<th>CANTR</th>
<th>PLYS</th>
<th>SPACING</th>
<th>WGT/PLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>19-6-0</td>
<td>4/12</td>
<td>2</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>2</td>
<td>19.12 in</td>
<td>101 lbs</td>
</tr>
</tbody>
</table>

Notes:
1) Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2) This truss has been designed using the green service reduction factors.
3) The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4) Brace bottom chord with approved sheathing or purlins per Bracing Summary.
5) A creep factor of 2.00 has been applied for this truss analysis.
6) The forces shown for this multi-ply truss are per ply and the reactions are for all plies. Two identical trusses shall be built and attached as follows, per ply: 0.131" x 3" Nails TC - 2 staggered rows @ 12 in oc, BC - 2 staggered rows @ 12 in oc, Webs - 1 row @ 12 in oc.

Provided the hanger connections do not adequately transfer the applied load to all plies: in addition to connectors shown above, attach each pair of girder plies with supplemental 0.131" x 3" Nails as follows within 24" of the location shown:
- BC 9-8-4, (2) Connectors
- BC 9-9-12, (2) Connectors

Connectors shall not encroach on other girder ply connectors or truss-to-truss connectors in accordance with the NDS or the connector manufacturer recommendations.
7) When applied loads are on one side of girder, do not flip girder during girder connector installation, install connectors on the girder side where supported loads are applied. When applied loads are on both sides of girder, double the spacing and install half of the connectors on one side of girder and then flip the girder to install the other half of the connectors on the opposite side (at double the connector spacing). Connectors on opposite sides of the girder shall be offset.
8) Lateral bracing shall be attached to each ply.
9) All fasteners minimum 2-1/2" long, unless otherwise noted.
10) Nails in 1st and 2nd ply shall be offset from successive plies by 1/2 the nail spacing.
11) Listed wind uplift reactions based on MWFRS & C&C loading.

Load Case D1: Std Dead Load
Distributed Loads

<table>
<thead>
<tr>
<th>Member</th>
<th>Location 1</th>
<th>Location 2</th>
<th>Direction</th>
<th>Spread</th>
<th>Start Load</th>
<th>End Load</th>
<th>Trib Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>0-0-0</td>
<td>19-6-0</td>
<td>Down Proj</td>
<td>13.59 plf</td>
<td>13.59 plf</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top</td>
<td>0-0-0</td>
<td>8-0-0</td>
<td>Down Proj</td>
<td>13.59 plf</td>
<td>0.94 plf</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top</td>
<td>9-9-12</td>
<td>11-6-0</td>
<td>Down Proj</td>
<td>0.94 plf</td>
<td>13.59 plf</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top</td>
<td>11-6-0</td>
<td>19-6-0</td>
<td>Down Proj</td>
<td>13.59 plf</td>
<td>13.59 plf</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bot</td>
<td>0-0-0</td>
<td>19-6-0</td>
<td>Down Proj</td>
<td>6.88 plf</td>
<td>6.88 plf</td>
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<td></td>
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<tr>
<td>Bot</td>
<td>0-0-0</td>
<td>8-0-0</td>
<td>Down Proj</td>
<td>9.06 plf</td>
<td>9.06 plf</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bot</td>
<td>8-0-0</td>
<td>9-8-4</td>
<td>Down Proj</td>
<td>9.06 plf</td>
<td>0.62 plf</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bot</td>
<td>9-9-12</td>
<td>11-6-0</td>
<td>Down Proj</td>
<td>0.62 plf</td>
<td>9.06 plf</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bot</td>
<td>11-6-0</td>
<td>19-6-0</td>
<td>Down Proj</td>
<td>9.06 plf</td>
<td>9.06 plf</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Member Forces

| TC  | Web |

Truss to Truss Connection Summary

<table>
<thead>
<tr>
<th>Carried Truss</th>
<th>Carrying Chord</th>
<th>Carrying Offset</th>
</tr>
</thead>
<tbody>
<tr>
<td>4DC BC</td>
<td>9-8-4</td>
<td></td>
</tr>
<tr>
<td>4DC BC</td>
<td>9-9-12</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1) Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2) This truss has been designed using the green service reduction factors.
3) The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4) Brace bottom chord with approved sheathing or purlins per Bracing Summary.
5) A creep factor of 2.00 has been applied for this truss analysis.
6) The forces shown for this multi-ply truss are per ply and the reactions are for all plies. Two identical trusses shall be built and attached as follows, per ply: 0.131" x 3" Nails TC - 2 staggered rows @ 12 in oc, BC - 2 staggered rows @ 12 in oc, Webs - 1 row @ 12 in occ.

Provided the hanger connections do not adequately transfer the applied load to all plies: in addition to connectors shown above, attach each pair of girder plies with supplemental 0.131" x 3" Nails as follows within 24" of the location shown:
- BC 9-8-4, (2) Connectors
- BC 9-9-12, (2) Connectors

Connectors shall not encroach on other girder ply connectors or truss-to-truss connectors in accordance with the NDS or the connector manufacturer recommendations.
7) When applied loads are on one side of girder, do not flip girder during girder connector installation, install connectors on the girder side where supported loads are applied. When applied loads are on both sides of girder, double the spacing and install half of the connectors on one side of girder and then flip the girder to install the other half of the connectors on the opposite side (at double the connector spacing). Connectors on opposite sides of the girder shall be offset.
8) Lateral bracing shall be attached to each ply.
9) All fasteners minimum 2-1/2" long, unless otherwise noted.
10) Nails in 1st and 2nd ply shall be offset from successive plies by 1/2 the nail spacing.
11) Listed wind uplift reactions based on MWFRS & C&C loading.
TrusPro Inc.
695 Obispo Street
Guadalupe, CA 93434
Ph: (805)343-2555    Fax: (805)343-2377

Truss: 3C1
Job: 5433M
Date: 09/22/21 10:30:41
Page: 1 of 1
Notes: All connector plates to be Eagle 20 gauge unless otherwise noted

---

### SPAN PITCH QTY OHL OHR CANTL CANTR PLYS SPACING WGT/PLY

<table>
<thead>
<tr>
<th>SPAN</th>
<th>PITCH</th>
<th>QTY</th>
<th>OHL</th>
<th>OHR</th>
<th>CANTL</th>
<th>CANTR</th>
<th>PLYS</th>
<th>SPACING</th>
<th>WGT/PLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>19-6-0</td>
<td>4/12</td>
<td>10</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>1</td>
<td>24 in</td>
<td>87 lbs</td>
</tr>
</tbody>
</table>

---

All plates shown to be Eagle 20 unless otherwise noted.

### Loading (psf)

<table>
<thead>
<tr>
<th>Loading</th>
<th>General</th>
<th>CST</th>
<th>Deflection</th>
<th>L/ (loc)</th>
<th>Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCLL: 20</td>
<td>Bldg Code: CBC2019/</td>
<td>TC: 0.27 (1-2)</td>
<td>Vert TL: 0.08 in</td>
<td>L/999 (6-7)</td>
<td>L/240</td>
</tr>
<tr>
<td>TCDL: 15(rake)</td>
<td>TP1 1-2014</td>
<td>BC: 0.24 (7-8)</td>
<td>Vert LL: 0.05 in</td>
<td>L/999 (6-7)</td>
<td>L/360</td>
</tr>
<tr>
<td>BCLL: 0</td>
<td>Rep Mbr: Yes</td>
<td>Web: 0.28 (4-7)</td>
<td>Cant/OH TL: 0.03 in</td>
<td>2L/999 (5-5)</td>
<td>2L/120</td>
</tr>
<tr>
<td>BCDL: 10</td>
<td>Lumber D.O.L.: 125%</td>
<td>Cant/OH LL: 0.01 in</td>
<td>2L/999 (5-5)</td>
<td>2L/120</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horz TL: 0 in</td>
<td></td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

### Reaction

<table>
<thead>
<tr>
<th>JT</th>
<th>JTBrg Combo</th>
<th>Brg Width</th>
<th>Rsl Brg Width</th>
<th>Max React</th>
<th>Max Grav Uplift</th>
<th>Max MWFRS Uplift</th>
<th>Max C&amp;C Uplift</th>
<th>Max Uplift</th>
<th>Max Horiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>1</td>
<td>5.5 in</td>
<td>1.50 in</td>
<td>911 lbs</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>16 lbs</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>5.5 in</td>
<td>1.50 in</td>
<td>911 lbs</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>16 lbs</td>
<td></td>
</tr>
</tbody>
</table>

### Material

<table>
<thead>
<tr>
<th>TC</th>
<th>DFL #2</th>
<th>2 x 6</th>
<th>BC: DFL #2</th>
<th>2 x 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web: SPF Stud</td>
<td>2 x 4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Loads

1) This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2) This truss has been designed for the effects of wind loads in accordance with ASCE7 - 16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=B=L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
3) Minimum storage attic loading has been applied in accordance with IBC 1607.1
4) A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

### Member Forces

| Table indicates: Member ID, max CST, max axial force (max compr. force if different from max axial force). Only forces greater than 300 lbs are shown in this table. |
|---|---|---|---|---|---|---|---|---|
| TC | 1.2 | 0.274 | 326 lbs | 326 lbs | 1.23 | 0.195 | 694 lbs | 694 lbs |
| 2.7 | 0.275 | 695 lbs | 695 lbs | 4.6 | 0.159 | 784 lbs |

### Notes

1) Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2) This truss has been designed using the green service reduction factors.
3) The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4) Brace bottom chord with approved sheathing or purlins per Bracing Summary.
5) A creep factor of 2.00 has been applied for this truss analysis.
6) Listed wind uplift reactions based on MWFRS & C&C loading.
All plates shown to be Eagle 20 gauge unless otherwise noted.

**Loading (psf)**
- **TCCL**: 20
- **TCDL**: 15
- **BCLL**: 0
- **BCDL**: 10

**General**
- **Bldg Code**: CBC 2019/TPI 1-2014
- **Rep Mbr**: Yes
- **Lumber D.O.L.**: 125%

**C SI**
- **TC**: 0.33 (1-2)
- **BC**: 0.25 (6-7)
- **Web**: 0.54 (4-7)

**Deflection**
- **L/ (loc)**
  - **Vert TL**: 0.09 in L/999 (6-7) L/240
  - **Vert LL**: 0.05 in L/999 (6-7) L/360
  - **Cant/OH TL**: 0.1 in 2L/999 (8-1) 2L/120
  - **Cant/OH LL**: 0.04 in UP 2L/999 (1-1) 2L/120
- **Horiz TL**: 0.01 in L/240

**Reaction**
- **JT**: DFL #2 2 x 6
- **Bracing**: Sheathed or Purlins at 6-3-0, Purlin design by Others.

**Material**
- **TC**: DFL #2 2 x 6
- **BC**: DFL #2 2 x 4
- **Web**: SPF Stud 2 x 4

**Bracing**
- **TC**: Sheathed or Purlins at 6-3-0, Purlin design by Others.
- **BC**: Sheathed or Purlins at 4-11-0, Purlin design by Others.

**Loads**
1) This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2) This truss has been designed for the effects due to a 1,500 lbs (73 plf) drag load distributed along the TC rake from each direction.
3) This truss has been designed for the effects of wind loads in accordance with ASCE7 - 16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=B=L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
4) Minimum storage attic loading has been applied in accordance with IBC 1607.1
5) A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

**Member Forces**

**Notes**
1) Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2) This truss has been designed using the green service reduction factors.
3) The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4) Brace bottom chord with approved sheathing or purlins per Bracing Summary.
5) A creep factor of 2.00 has been applied for this truss analysis.
6) Listed wind uplift reactions based on MWFRS & C&C Loading.
All plates shown to be Eagle 20 gauge unless otherwise noted.

<table>
<thead>
<tr>
<th>Loading (psf)</th>
<th>General</th>
<th>CSI</th>
<th>Deflection</th>
<th>L/ (loc)</th>
<th>Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carried Loads (psf)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bldg Code: CBC 2019/</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>TPI 1-2014</td>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td>TCDL: 20</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>TCDL: 15 (rake)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Rep Mbr: No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lumber D.O.L.: 125%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TC: 0.66 (2-3)</td>
<td></td>
<td></td>
<td>Vert TL: 0.15 in UP L/999</td>
<td>(6-7)</td>
<td>L/240</td>
</tr>
<tr>
<td>BC: 0.43 (7-1)</td>
<td></td>
<td></td>
<td>Vert LL: 0.04 in UP L/999</td>
<td>(6-7)</td>
<td>L/360</td>
</tr>
<tr>
<td>Web: 0.83 (2-6)</td>
<td></td>
<td></td>
<td>Cant/OH TL: 0.5 in 2L/267</td>
<td>(1-1)</td>
<td>2L/120</td>
</tr>
<tr>
<td>Cant/OH LL: 0.14 in 2L/932</td>
<td></td>
<td></td>
<td>(1-1)</td>
<td>2L/120</td>
<td></td>
</tr>
<tr>
<td>Horz TL: 0.04 in 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JT Big Combo</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Bldg Width</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Rbl Bldg Width</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Max React</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Max Grav Uplift</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max MWFRS Uplift</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max C&amp; C Uplift</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max Uplift</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max Horiz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>7.778 in</td>
<td>1.57 in</td>
<td>1,468 lbs</td>
<td>14.14 plf</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>1.5 in</td>
<td>--</td>
<td>116 lbs</td>
<td>-47 lbs</td>
</tr>
<tr>
<td>Material</td>
<td></td>
<td></td>
<td>Bracing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TC: DFL SS 2 x 6</td>
<td></td>
<td></td>
<td>TC: Sheathed or Purlins at 6-3-0, Purlin design by Others.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BC: DFL SS 2 x 6</td>
<td></td>
<td></td>
<td>BC: Sheathed or Purlins at 3-10-0, Purlin design by Others.</td>
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<td></td>
</tr>
<tr>
<td>Web: SPF Stud 2 x 4 except: DFL Stud 2 x 2</td>
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<tr>
<td>Bracing</td>
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<tr>
<td>Loads</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) This truss has been designed for the effects of wind loads in accordance with ASCE7-16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=B=L=10 ft, Not End Zone Truss, Both end walls considered. DOL = 1.60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) Minimum storage attic loading has been applied in accordance with IBC 1607.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load Case Lr1: Std Live Load</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distributed Loads</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td>Location 1</td>
<td>Location 2</td>
<td>Direction</td>
<td>Spread</td>
<td>Start Load</td>
</tr>
<tr>
<td>Top</td>
<td>0-0-0</td>
<td>0-8-2</td>
<td>Down</td>
<td>Proj</td>
<td>14.14 plf</td>
</tr>
<tr>
<td>Top</td>
<td>0-8-2</td>
<td>2-9-3</td>
<td>Down</td>
<td>Proj</td>
<td>14.14 plf</td>
</tr>
<tr>
<td>Top</td>
<td>0-0-0</td>
<td>0-8-2</td>
<td>Down</td>
<td>Proj</td>
<td>14.14 plf</td>
</tr>
<tr>
<td>Point Loads</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td>Location</td>
<td>Direction</td>
<td>Load</td>
<td>Trib Width</td>
<td></td>
</tr>
<tr>
<td>Top</td>
<td>-0-0-1</td>
<td>Down</td>
<td>440 lbs</td>
<td></td>
<td></td>
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</tbody>
</table>
### Load Case D1: Std Dead Load

#### Distributed Loads

<table>
<thead>
<tr>
<th>Member</th>
<th>Location 1</th>
<th>Location 2</th>
<th>Direction</th>
<th>Spread</th>
<th>Start Load</th>
<th>End Load</th>
<th>Trib Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>0-0-0</td>
<td>0-8-2</td>
<td>Down</td>
<td>Proj</td>
<td>0 plf</td>
<td>10.61 plf</td>
<td>0 plf</td>
</tr>
<tr>
<td>Top</td>
<td>0-8-2</td>
<td>2-9-3</td>
<td>Down</td>
<td>Proj</td>
<td>10.61 plf</td>
<td>0 plf</td>
<td>0 plf</td>
</tr>
<tr>
<td>Top</td>
<td>0-0-0</td>
<td>0-8-2</td>
<td>Down</td>
<td>Proj</td>
<td>0 plf</td>
<td>10.61 plf</td>
<td>0 plf</td>
</tr>
<tr>
<td>Top</td>
<td>0-8-2</td>
<td>2-9-3</td>
<td>Down</td>
<td>Proj</td>
<td>10.61 plf</td>
<td>0 plf</td>
<td>0 plf</td>
</tr>
</tbody>
</table>

#### Point Loads

<table>
<thead>
<tr>
<th>Member</th>
<th>Location</th>
<th>Direction</th>
<th>Load</th>
<th>Trib Width</th>
</tr>
</thead>
</table>
| Top    | -0-0-1   | Down      | 500 lbs |}

### Member Forces

| Table indicates: Member ID, max CFS, max axial force, (max compr. force if different from max axial force). Only forces greater than 300lbs are shown in this table. |
|---------------|--------------------------------------------------|
| **TC**        | **BC**                                           | **Web**                                      |
| J02A          | TC                                                | 1.2  | 0.590 | 3,779 lbs | 0.10 lbs | 2.3  | 0.666 | 1.091 lbs |
| J02A          | BC                                                | 1.6  | 0.219 | 4,951 lbs | 0.10 lbs | 2.3  | 0.666 | 1.091 lbs |
| J04A          | TC                                                | 2.7  | 0.154 | -408 lbs  | 0.154    | 3.6  | 0.154 | -408 lbs  |
| J04A          | BC                                                | 2.6  | 0.825 | 2,681 lbs | 3.5      | 0.417 | 1,053 lbs |

### Truss to Truss Connection Summary

<table>
<thead>
<tr>
<th>Carried Truss</th>
<th>Carrying Chord</th>
<th>Carrying Offset</th>
</tr>
</thead>
<tbody>
<tr>
<td>J02A TC</td>
<td>2-8-7</td>
<td></td>
</tr>
<tr>
<td>J02A BC</td>
<td>2-8-7</td>
<td></td>
</tr>
<tr>
<td>J04A TC</td>
<td>5-6-6</td>
<td></td>
</tr>
<tr>
<td>J04A BC</td>
<td>5-6-6</td>
<td></td>
</tr>
<tr>
<td>J06A TC</td>
<td>8-4-5</td>
<td></td>
</tr>
<tr>
<td>J06A BC</td>
<td>8-4-5</td>
<td></td>
</tr>
<tr>
<td>J08A TC</td>
<td>11-2-4</td>
<td></td>
</tr>
<tr>
<td>J08A BC</td>
<td>11-2-4</td>
<td></td>
</tr>
<tr>
<td>J10A TC</td>
<td>11-2-4</td>
<td></td>
</tr>
<tr>
<td>J10A BC</td>
<td>11-2-4</td>
<td></td>
</tr>
<tr>
<td>J12A TC</td>
<td>16-10-2</td>
<td></td>
</tr>
<tr>
<td>J12A BC</td>
<td>16-10-2</td>
<td></td>
</tr>
<tr>
<td>J12A BC</td>
<td>16-10-2</td>
<td></td>
</tr>
</tbody>
</table>

### Notes

1) Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2) This truss has been designed using the green service reduction factors.
3) The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4) Hanger is for graphical interpretation only. Install hanger per manufacturer's recommendation.
5) Brace bottom chord with approved sheathing or purlins per Bracing Summary.
6) A creep factor of 2.00 has been applied for this truss analysis.
7) Due to negative reactions in gravity load cases, special connections to the bearing surface at joint 5 may need to be considered.
8) Listed wind uplift reactions based on MWFRS & C&C loading.
**Notes:** All connector plates to be Eagle 20 gauge unless otherwise noted.

### Loading (psf)

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carried Loads (psf)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TCLL:</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>TCDL:</td>
<td>15 (rake)</td>
<td></td>
</tr>
<tr>
<td>BCLL:</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>BCDEL:</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

### Cripple

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bldg Code</td>
<td>CBC 2019/ TPI 1-2014</td>
<td></td>
</tr>
<tr>
<td>Rep Mbr</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

### Material

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC:</td>
<td>DFL 2 x 6</td>
<td></td>
</tr>
<tr>
<td>BC:</td>
<td>DFL 2 x 6</td>
<td></td>
</tr>
<tr>
<td>Web:</td>
<td>SPF Stud 2 x 4: 2-6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DFL Stud 2 x 4: 3-5</td>
<td></td>
</tr>
</tbody>
</table>

### Loads

1. This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2. This truss has been designed for the effects of wind loads in accordance with ASCE7 - 16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, H=H=L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
3. Minimum storage attic loading has been applied in accordance with IBC 1607.1
4. A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

### Load Cases

**Load Case L1: Std Live Load**

<table>
<thead>
<tr>
<th>Location</th>
<th>Direction</th>
<th>Spread</th>
<th>Start Load</th>
<th>End Load</th>
<th>Trib Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-0-0</td>
<td>Top</td>
<td>Proj</td>
<td>0 plf</td>
<td>14.14 plf</td>
<td>14.14 plf</td>
</tr>
<tr>
<td>0-8-2</td>
<td>Top</td>
<td>Proj</td>
<td>0 plf</td>
<td>14.14 plf</td>
<td>14.14 plf</td>
</tr>
<tr>
<td>0-8-2</td>
<td>Top</td>
<td>Proj</td>
<td>0 plf</td>
<td>14.14 plf</td>
<td>14.14 plf</td>
</tr>
<tr>
<td>0-0-1</td>
<td>Top</td>
<td>Down</td>
<td>3.30 lbs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notes

ALL PERSONS FABRICATING, HANDLING, ERECTING OR INSTALLING ANY TRUSS BASED UPON THIS TRUSS DESIGN DRAWING ARE INSTRUCTED TO REFER TO ALL OF THE INSTRUCTIONS, LIMITATIONS AND QUALIFICATIONS SET FORTH IN THE EAGLE METAL PRODUCTS DESIGN NOTES ISSUED WITH THIS DESIGN AND AVAILABLE FROM EAGLE UPON REQUEST. DESIGN VALID ONLY WHEN EAGLE METAL CONNECTORS ARE USED.
### Load Case D1: Std Dead Load

#### Distributed Loads

<table>
<thead>
<tr>
<th>Member</th>
<th>Location 1</th>
<th>Location 2</th>
<th>Direction</th>
<th>Spread</th>
<th>Start Load</th>
<th>End Load</th>
<th>Trib Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>0-0-0</td>
<td>0-8-2</td>
<td>Down</td>
<td>Proj</td>
<td>0 plf</td>
<td>0 plf</td>
<td>0 plf</td>
</tr>
<tr>
<td>Top</td>
<td>0-0-0</td>
<td>0-8-2</td>
<td>Down</td>
<td>Proj</td>
<td>0 plf</td>
<td>0 plf</td>
<td>0 plf</td>
</tr>
<tr>
<td>Top</td>
<td>0-8-2</td>
<td>2-9-3</td>
<td>Down</td>
<td>Proj</td>
<td>10.61 plf</td>
<td>0 plf</td>
<td>0 plf</td>
</tr>
</tbody>
</table>

#### Point Loads

<table>
<thead>
<tr>
<th>Member</th>
<th>Location</th>
<th>Direction</th>
<th>Load</th>
<th>Trib Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>0-0-1</td>
<td>Down</td>
<td>420 lbs</td>
<td>240 lbs</td>
</tr>
</tbody>
</table>

#### Distributed Loads Table

<table>
<thead>
<tr>
<th>Member</th>
<th>Direction</th>
<th>Load</th>
<th>Trib Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC</td>
<td>-0-0-1</td>
<td>420 lbs</td>
<td>240 lbs</td>
</tr>
</tbody>
</table>

#### Member Forces Table

<table>
<thead>
<tr>
<th>Member</th>
<th>Direction</th>
<th>Load</th>
<th>Trib Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC</td>
<td>-0-0-1</td>
<td>420 lbs</td>
<td>240 lbs</td>
</tr>
</tbody>
</table>

### Truss to Truss Connection Summary

<table>
<thead>
<tr>
<th>Carried Truss</th>
<th>Carrying Chord</th>
<th>Carrying Offset</th>
</tr>
</thead>
<tbody>
<tr>
<td>J02 TC</td>
<td>2-8-7</td>
<td></td>
</tr>
<tr>
<td>J02 TC</td>
<td>2-8-7</td>
<td></td>
</tr>
<tr>
<td>J02 BC</td>
<td>2-8-7</td>
<td></td>
</tr>
<tr>
<td>J04 TC</td>
<td>5-6-6</td>
<td></td>
</tr>
<tr>
<td>J04 BC</td>
<td>5-6-6</td>
<td></td>
</tr>
<tr>
<td>J04 BC</td>
<td>5-6-6</td>
<td></td>
</tr>
<tr>
<td>J06 TC</td>
<td>8-4-5</td>
<td></td>
</tr>
<tr>
<td>J06 TC</td>
<td>8-4-5</td>
<td></td>
</tr>
<tr>
<td>J06 BC</td>
<td>8-4-5</td>
<td></td>
</tr>
<tr>
<td>J08 TC</td>
<td>11-2-4</td>
<td></td>
</tr>
<tr>
<td>J08 TC</td>
<td>11-2-4</td>
<td></td>
</tr>
<tr>
<td>J08 BC</td>
<td>11-2-4</td>
<td></td>
</tr>
<tr>
<td>J10 TC</td>
<td>14-2-4</td>
<td></td>
</tr>
<tr>
<td>J10 BC</td>
<td>14-2-4</td>
<td></td>
</tr>
<tr>
<td>J12 TC</td>
<td>16-10-2</td>
<td></td>
</tr>
</tbody>
</table>

### Notes

1. Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2. This truss has been designed using the green service reduction factors.
3. The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4. Hanger is for graphical interpretation only. Install hanger per manufacturer's recommendation.
5. Brace bottom chord with approved sheathing or purlins per Bracing Summary.
6. Lateral bracing shown is for illustration purposes only and may be placed on either edge of truss member.
7. A creep factor of 2.00 has been applied for this truss analysis.
8.  Indicates lateral bracing required perpendicular to the plane of the truss at either the midpoint (one shown) or third points (two shown), bracing by others. See BCSI-B3 for additional information.
All plates shown to be Eagle 20 unless otherwise noted.

### Loading (psf)

- **General**
  - Bldg Code: CBC 2019/
  - TPI 1-2014
  - Rep Mbr: No
  - Lumber D.O.L.: 125%

- **Deflection**
  - L/: Vert TL: 0.07 in UP L:/ 999 (7-8) L:/ 240
  - Vert LL: 0.02 in UP L:/ 999 (7-8) L:/ 360
  - Cant/OH TL: 0.61 in 2L:/ 278 (1-1) 2L:/ 120
  - Cant/OH LL: 0.18 in 2L:/ 967 (1-1) 2L:/ 120
  - Horz TL: 0.04 in 6

- **Material**
  - TC: DFL SS 2 x 6
  - BC: DFL SS 2 x 6
  - Web: SPF Stud 2 x 4: 3-7

- **Bracing**
  - TC: Sheathed or Purlins at 6-3-0, Purlin design by Others.
  - BC: Sheathed or Purlins at 3-5-0, Purlin design by Others.

### Loads

1. This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2. This truss has been designed for the effects of wind loads in accordance with ASCE 7-16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=B=L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
3. Minimum storage attic loading has been applied in accordance with IBC 1607.1
4. A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

### Load Case 1: Std Live Load

#### Distributed Loads

<table>
<thead>
<tr>
<th>Member</th>
<th>Location 1</th>
<th>Location 2</th>
<th>Direction</th>
<th>Spread</th>
<th>Start Load</th>
<th>End Load</th>
<th>Trib Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>0-0-0</td>
<td>0-8-2</td>
<td>Down</td>
<td>Proj</td>
<td>0 pf</td>
<td>14.14 pf</td>
<td>0 pf</td>
</tr>
<tr>
<td>Top</td>
<td>0-0-0</td>
<td>0-8-2</td>
<td>Down</td>
<td>Proj</td>
<td>0 pf</td>
<td>14.14 pf</td>
<td>0 pf</td>
</tr>
<tr>
<td>Top</td>
<td>0-8-2</td>
<td>2-9-3</td>
<td>Down</td>
<td>Proj</td>
<td>14.14 pf</td>
<td>0 pf</td>
<td>0 pf</td>
</tr>
</tbody>
</table>

#### Point Loads

<table>
<thead>
<tr>
<th>Member</th>
<th>Location</th>
<th>Direction</th>
<th>Load</th>
<th>Trib Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>-0-0-1</td>
<td>Down</td>
<td>526 lbs</td>
<td></td>
</tr>
</tbody>
</table>
Notes

1) Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2) This truss has been designed using the green service reduction factors.
3) The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4) Hanger is for graphical interpretation only. Install hanger per manufacturer's recommendation.
5) Brace bottom chord with approved sheathing or purlins per Bracing Summary.
6) A creep factor of 2.00 has been applied for this truss analysis.
7) Due to negative reactions in gravity load cases, special connections to the bearing surface at joint 6 may need to be considered.
8) Listed wind uplift reactions based on MWFES & C&C loading.
TrusPro Inc.
695 Obispo Street
Guadalupe, CA 93434
Ph: (805)343-2555    Fax: (805)343-2377

Truss: 4DC
Job: 5433M
Date: 09/22/21 10:30:44
Page: 1 of 2

Notes: All connector plates to be Eagle 20 gauge unless otherwise noted.

13-8-3 2828/12 4 0-0-0 0-0-0 0-0-0 0-0-0 1 24 in 70 lbs

All plates shown to be Eagle 20 unless otherwise noted.

<table>
<thead>
<tr>
<th>Loading (psf)</th>
<th>General</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bldg Code: CBC 2019/</td>
</tr>
<tr>
<td></td>
<td>TC: 0.75 (1-2)</td>
</tr>
<tr>
<td></td>
<td>Rep Mbr: No</td>
</tr>
<tr>
<td></td>
<td>BC: 0.31 (6-1)</td>
</tr>
<tr>
<td></td>
<td>Lumber D.O.L.: 125 %</td>
</tr>
<tr>
<td></td>
<td>Web: 0.75 (3-6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CSI</th>
<th>Deflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC:</td>
<td>Vert TL: 0.05 in UP L/999 (5-6)</td>
</tr>
<tr>
<td>BC:</td>
<td>Vert LL: 0.05 in L/999 (5-6)</td>
</tr>
<tr>
<td></td>
<td>Cant/TL: 0.22 in 2L/463 (1-1)</td>
</tr>
<tr>
<td></td>
<td>Cant/RR: 0.07 in 2L/999 (1-1)</td>
</tr>
<tr>
<td></td>
<td>Horz TL: 0.01 in 5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reaction</th>
<th>Member Location</th>
<th>Direction</th>
<th>Load Trib Width</th>
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</thead>
<tbody>
<tr>
<td>JT: 1</td>
<td>0-0-0</td>
<td>Down Proj</td>
<td>330 lbs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Material</th>
<th>Bracing</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC: DFL #2 2 x 6</td>
<td></td>
</tr>
<tr>
<td>BC: DFL #2 2 x 6</td>
<td></td>
</tr>
<tr>
<td>Web: SPF Stud 2 x 4</td>
<td></td>
</tr>
<tr>
<td>TC: Sheathed or Purlins at 6-3-0, Purlin design by Others.</td>
<td></td>
</tr>
<tr>
<td>BC: Sheathed or Purlins at 6-3-0, Purlin design by Others.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Loads</th>
<th>Load Case Lr1: Std Live Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distributed Loads</td>
<td></td>
</tr>
<tr>
<td>Member</td>
<td>Location 1</td>
</tr>
<tr>
<td>Top</td>
<td>0-0-0</td>
</tr>
<tr>
<td>Top</td>
<td>0-8-2</td>
</tr>
<tr>
<td>Top</td>
<td>0-0-0</td>
</tr>
</tbody>
</table>

Point Loads |
| Member | Location | Direction | Load | Trib Width |
| Top    | 0-0-1    | Down     | 330 lbs |
Load Case D1: Std Dead Load

<table>
<thead>
<tr>
<th>Member</th>
<th>Location 1</th>
<th>Location 2</th>
<th>Direction</th>
<th>Spread</th>
<th>Start Load</th>
<th>End Load</th>
<th>Trib Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>0-0-0</td>
<td>0-8-2</td>
<td>Down Proj</td>
<td>Proj</td>
<td>0 plf</td>
<td>10.61 plf</td>
<td>0 plf</td>
</tr>
<tr>
<td>Top</td>
<td>0-8-2</td>
<td>2-9-3</td>
<td>Down Proj</td>
<td>Proj</td>
<td>10.61 plf</td>
<td>0 plf</td>
<td>0 plf</td>
</tr>
<tr>
<td>Top</td>
<td>0-0-0</td>
<td>0-8-2</td>
<td>Down Proj</td>
<td>Proj</td>
<td>0 plf</td>
<td>10.61 plf</td>
<td>0 plf</td>
</tr>
<tr>
<td>Top</td>
<td>0-8-2</td>
<td>2-9-3</td>
<td>Down Proj</td>
<td>Proj</td>
<td>10.61 plf</td>
<td>0 plf</td>
<td>0 plf</td>
</tr>
</tbody>
</table>

Point Loads

<table>
<thead>
<tr>
<th>Member</th>
<th>Location</th>
<th>Direction</th>
<th>Load</th>
<th>Trib Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top</td>
<td>-0-0-1</td>
<td>Down</td>
<td>4.20 lbs</td>
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Member Forces

<table>
<thead>
<tr>
<th>TC</th>
<th>Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1.2</td>
<td>0.754</td>
</tr>
<tr>
<td>-1.2</td>
<td>2.158 lbs</td>
</tr>
<tr>
<td>2.3</td>
<td>44 lbs</td>
</tr>
<tr>
<td>2.3</td>
<td>0.735</td>
</tr>
<tr>
<td>2.3</td>
<td>2.067 lbs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BC</th>
<th>Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.6</td>
<td>0.291</td>
</tr>
<tr>
<td>1.6</td>
<td>6.6</td>
</tr>
<tr>
<td>1.6</td>
<td>0.369</td>
</tr>
<tr>
<td>1.6</td>
<td>-2.04 lbs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Web</th>
<th>Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.6</td>
<td>0.126</td>
</tr>
<tr>
<td>1.6</td>
<td>-6.4 lbs</td>
</tr>
<tr>
<td>1.6</td>
<td>0.751</td>
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<tr>
<td>1.6</td>
<td>-1.56 lbs</td>
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<tr>
<td>1.6</td>
<td>-5.5</td>
</tr>
<tr>
<td>1.6</td>
<td>0.269</td>
</tr>
<tr>
<td>1.6</td>
<td>0.09 lbs</td>
</tr>
</tbody>
</table>

Truss to Truss Connection Summary

<table>
<thead>
<tr>
<th>Carried Truss</th>
<th>Carrying Chord</th>
<th>Carrying Offset</th>
</tr>
</thead>
<tbody>
<tr>
<td>J02 TC</td>
<td>J02 BC</td>
<td>2-8-7</td>
</tr>
<tr>
<td>J02 TC</td>
<td>J02 BC</td>
<td>2-8-7</td>
</tr>
<tr>
<td>J02 BC</td>
<td>J02 TC</td>
<td>2-8-7</td>
</tr>
<tr>
<td>J02 BC</td>
<td>J02 TC</td>
<td>2-8-7</td>
</tr>
<tr>
<td>J04 TC</td>
<td>J04 BC</td>
<td>5-6-6</td>
</tr>
<tr>
<td>J04 TC</td>
<td>J04 BC</td>
<td>5-6-6</td>
</tr>
<tr>
<td>J04 BC</td>
<td>J04 TC</td>
<td>5-6-6</td>
</tr>
<tr>
<td>J06 TC</td>
<td>J06 BC</td>
<td>8-4-5</td>
</tr>
<tr>
<td>J06 TC</td>
<td>J06 BC</td>
<td>8-4-5</td>
</tr>
<tr>
<td>J06 BC</td>
<td>J06 TC</td>
<td>8-4-5</td>
</tr>
<tr>
<td>J06 BC</td>
<td>J06 TC</td>
<td>8-4-5</td>
</tr>
<tr>
<td>J08 TC</td>
<td>J08 BC</td>
<td>11-2-4</td>
</tr>
<tr>
<td>J08 TC</td>
<td>J08 BC</td>
<td>11-2-4</td>
</tr>
<tr>
<td>J08 BC</td>
<td>J08 TC</td>
<td>11-2-4</td>
</tr>
<tr>
<td>J08 BC</td>
<td>J08 TC</td>
<td>11-2-4</td>
</tr>
</tbody>
</table>

Notes

1) Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2) This truss has been designed using the green service reduction factors.
3) The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4) Hanger is for graphical interpretation only. Install hanger per manufacturer's recommendation.
5) Brace bottom chord with approved sheathing or purlins per Bracing Summary.
6) A creep factor of 2.00 has been applied for this truss analysis.
7) Due to negative reactions in gravity load cases, special connections to the bearing surface at joint 5 may need to be considered.
8) Listed wind uplift reactions based on MWFRS & C&C loading.
Notes:
1) Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2) This truss has been designed using the green service reduction factors.
3) The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4) Nailing schedule shall be specified by the truss manufacturer per NDS.
5) Brace bottom chord with approved sheathing or purlins per Bracing Summary.
6) A creep factor of 2.00 has been applied to this truss analysis.
7) Listed wind uplift reactions based on MWFRS & C&C loading.

Table indicates: Member ID, max CSI, max axial force, (max comp. force if different from max axial force). Only forces greater than 300 lbs are shown in this table.

<p>| Note | All connector plates to be Eagle 20 gauge unless otherwise noted. | TrusPro Inc. | 695 Obispo Street | Guadalupe, CA 93434 | Ph: (805)343-2555 | Fax: (805)343-2377 | 09/22/21 10:30:45 | 1 of 1 | TrueBuild® Truss Software v5.6.375 | Eagle Metal Products |</p>
<table>
<thead>
<tr>
<th>SPAN</th>
<th>PITCH</th>
<th>QTY</th>
<th>OHL</th>
<th>OHR</th>
<th>CANTL</th>
<th>CANTR</th>
<th>PLYS</th>
<th>SPACING</th>
<th>WGT/PLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-10-15</td>
<td>4/12</td>
<td>8</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>1</td>
<td>24 in</td>
<td>7 lbs</td>
</tr>
</tbody>
</table>

All plates shown to be Eagle 20 unless otherwise noted.

### Loading (psf)

| TCCL : | 20 |
| TCDO : | 15 (rake) |
| BCL : | 0 |
| BCDL : | 10 |

### General

| Bldg Code : | CBC 2019/ |
| Bldg Code : | TP 1-2014 |

### CSI

| TC : | 0.04 (1-2) |
| BC : | 0.04 (3-1) |

### Deflection

| L/ (loc) | Allowed |
| Vert TL : | 0 in | L/999 | (3-1) | L/240 |
| Vert LL : | 0 in | L/999 | (3-1) | L/360 |
| Horz TL : | 0 in | 2 |

### Reaction

<table>
<thead>
<tr>
<th>JT</th>
<th>Bg Combo</th>
<th>Bg Width</th>
<th>Bgd Bg Width</th>
<th>Max React</th>
<th>Max Grav</th>
<th>Uplift</th>
<th>Max MWFRS</th>
<th>Uplift</th>
<th>Max C&amp;C</th>
<th>Uplift</th>
<th>Max MWFRS</th>
<th>Uplift</th>
<th>Max Horiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1.5 in</td>
<td>1.50 in</td>
<td>125 lbs</td>
<td>-</td>
<td>-37 lbs</td>
<td>-37 lbs</td>
<td>63 lbs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1.5 in</td>
<td>1.50 in</td>
<td>99 lbs</td>
<td>-15 lbs</td>
<td>-62 lbs</td>
<td>-62 lbs</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1.5 in</td>
<td>1.50 in</td>
<td>63 lbs</td>
<td>-1 lbs</td>
<td>-1 lbs</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Material

| TC : DFL #2 2 x 6 |
| BC : DFL #2 2 x 4 |
| Web : |

### Bracing

| TC : Sheathed or Purlins at 6-3-0, Purlin design by Others. |
| BC : Sheathed or Purlins at 10-0-0, Purlin design by Others. |

### Loads

1. This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2. This truss has been designed for the effects of wind loads in accordance with ASCE7 - 16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=B=L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
3. Minimum storage attic loading has been applied in accordance with IBC 1607.1
4. A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

### Member Forces

Table indicates: Member ID, max CSI, max axial force, (max compr. force if different from max axial force). Only forces greater than 300lbs are shown in this table.

### Notes

1. Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2. This truss has been designed using the green service reduction factors.
3. The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4. Nailing schedule shall be specified by truss manufacturer per NDS.
5. Brace bottom chord with approved sheathing or purlins per Bracing Summary.
6. A creep factor of 2.00 has been applied for this truss analysis.
7. Listed wind uplift reactions based on MWFRS & C&C loading.
### Notes

1. Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2. This truss has been designed using the green service reduction factors.
3. The fabrication tolerance for this roof truss is 20% ($C_q = 0.80$).
4. Nailing schedule shall be specified by truss manufacturer per NDS.
5. Brace bottom chord with approved sheathing or purlins per Bracing Summary.
6. A creep factor of 2.00 has been applied for this truss analysis.
7. Listed wind uplift reactions based on MWFRS & C&C loading.

### Materials

- **TC**: DFL #2 2 x 6
- **BC**: DFL #2 2 x 4

### Bracing

- **TC**: Sheathed or Purlins at 6-3-0, Purlin design by Others.
- **BC**: Sheathed or Purlins at 10-0-0, Purlin design by Others.

### Loading (psf)

<table>
<thead>
<tr>
<th>General</th>
<th>CSI</th>
<th>Deflection</th>
<th>L/ (loc)</th>
<th>Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bldg Code: CBC'2019/ TPI 1-2014</td>
<td>TC: 0.11 (1-2)</td>
<td>Vert TL: 0.02 in</td>
<td>L/999 (3-1)</td>
<td>L/240</td>
</tr>
<tr>
<td>Rep Mbr: Yes</td>
<td>BC: 0.12 (3-1)</td>
<td>Vert LL: 0.01 in</td>
<td>L/999 (3-1)</td>
<td>L/360</td>
</tr>
<tr>
<td>Lumber D.O.L.: 125 %</td>
<td>Web: 0.00 (1)</td>
<td>Horz TL: 0 in</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

### Reaction

<table>
<thead>
<tr>
<th>JT</th>
<th>Brg Combo</th>
<th>Brg Width</th>
<th>Rgl Brg Width</th>
<th>Max React</th>
<th>Max Grav Uplift</th>
<th>Max MWFRS Uplift</th>
<th>Max C&amp;C Uplift</th>
<th>Max Uplift</th>
<th>Max Horiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1.5 in</td>
<td>1.50 in</td>
<td>194 lbs</td>
<td>-</td>
<td>-19 lbs</td>
<td>-</td>
<td>-19 lbs</td>
<td>119 lbs</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1.5 in</td>
<td>1.50 in</td>
<td>194 lbs</td>
<td>-</td>
<td>-33 lbs</td>
<td>-</td>
<td>-130 lbs</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1.5 in</td>
<td>1.50 in</td>
<td>108 lbs</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>108 lbs</td>
</tr>
</tbody>
</table>

### Loads

1. This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2. This truss has been designed for the effects of wind loads in accordance with ASCE7 - 16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=B=L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
3. Minimum storage attic loading has been applied in accordance with IBC 1607.1
4. A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

### Member Forces

<table>
<thead>
<tr>
<th>TC</th>
<th>BC</th>
<th>Web</th>
</tr>
</thead>
</table>

### Notes

1. This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2. This truss has been designed for the effects of wind loads in accordance with ASCE7 - 16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=B=L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
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<thead>
<tr>
<th>TC</th>
<th>BC</th>
<th>Web</th>
</tr>
</thead>
</table>

### Notes

1. This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2. This truss has been designed for the effects of wind loads in accordance with ASCE7 - 16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=B=L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
3. Minimum storage attic loading has been applied in accordance with IBC 1607.1
4. A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.
TrueBuild® Truss Software v5.6.375
Eagle Metal Products

**TrusPro Inc.**
695 Obispo Street
Guadalupe, CA 93434
Ph: (805)343-2555    Fax: (805)343-2377

**TrussJ04A**
Job: 5433M
Date: 09/22/21 10:30:46
Page: 1 of 1
Notes: All connector plates to be Eagle 20 gauge unless otherwise noted

<table>
<thead>
<tr>
<th>SPAN</th>
<th>PITCH</th>
<th>QTY</th>
<th>OHL</th>
<th>OHR</th>
<th>CANTL</th>
<th>CANTR</th>
<th>PLYS</th>
<th>SPACING</th>
<th>WGT/PLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-10-15</td>
<td>4/12</td>
<td>8</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>1</td>
<td>24 in</td>
<td>14 lbs</td>
</tr>
</tbody>
</table>

---

**Notes:**
1. Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2. This truss has been designed using the green service reduction factors.
3. The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4. Nailing schedule shall be specified by truss manufacturer per NDS.
5. Brace bottom chord with approved sheathing or purlins per Bracing Summary.
6. A creep factor of 2.00 has been applied for this truss analysis.
7. Listed wind uplift reactions based on MWFRS & C&C loading.

---

**Loading (psf)**

**General**

<table>
<thead>
<tr>
<th>TC</th>
<th>BC</th>
<th>DOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>1.2</td>
<td>1.25</td>
</tr>
</tbody>
</table>

**Deflection**

<table>
<thead>
<tr>
<th>Vert TL</th>
<th>L/999 (loc)</th>
<th>Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.02 in</td>
<td>L/999 (3-1)</td>
<td>L/240</td>
</tr>
<tr>
<td>0.01 in</td>
<td>L/999 (3-1)</td>
<td>L/360</td>
</tr>
</tbody>
</table>

---

**Material Bracing**

TC: Sheathed or Purlins at 6-3-0, Purlin design by Others.

BC: Sheathed or Purlins at 10-0-0, Purlin design by Others.
All plates shown to be Eagle 20 unless otherwise noted.

<table>
<thead>
<tr>
<th>SPAN</th>
<th>PITCH</th>
<th>QTY</th>
<th>OHL</th>
<th>OHR</th>
<th>CANTL</th>
<th>CANTR</th>
<th>PLYS</th>
<th>SPACING</th>
<th>WGT/PLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-10-15</td>
<td>4/12</td>
<td>15</td>
<td>0-0</td>
<td>0-0</td>
<td>0-0</td>
<td>0-0</td>
<td>1</td>
<td>24 in</td>
<td>22 lbs</td>
</tr>
</tbody>
</table>

All persons fabricating, handling, erecting or installing any truss based upon this truss design drawing are instructed to refer to all of the instructions, limitations and qualifications set forth in the Eagle Metal Products design notes issued with this design and available from Eagle upon request. Design valid only when Eagle metal connectors are used.
**Notes:**

1. Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2. This truss has been designed using the green service reduction factors.
3. The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4. Nailing schedule shall be specified by truss manufacturer per NDS.
5. Bracing bottom chord with approved sheathing or purlins per Bracing Summary.
6. A creep factor of 2.00 has been applied for this truss analysis.
7. Due to negative reactions in gravity load cases, special connections to the bearing surface at joints 3 and 4 may need to be considered.
8. Listed wind uplift reactions based on MWFRS & C&C loading.

---

**Loading (psf)**

<table>
<thead>
<tr>
<th>SPAN</th>
<th>PITCH</th>
<th>QTY</th>
<th>OHL</th>
<th>OHR</th>
<th>CANTL</th>
<th>CANTR</th>
<th>PLYS</th>
<th>SPACING</th>
<th>WGT/PLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-10-15</td>
<td>4/12</td>
<td>8</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>1</td>
<td>24 in</td>
<td>22 lbs</td>
</tr>
</tbody>
</table>

---

**Reactions**

<table>
<thead>
<tr>
<th>JT</th>
<th>Brg Combo</th>
<th>Brg Width</th>
<th>Rgl Brg Width</th>
<th>Max React</th>
<th>Max Grav</th>
<th>Uplift</th>
<th>Max MWFRS</th>
<th>Max C&amp;C</th>
<th>Max Uplift</th>
<th>Max Horiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1</td>
<td>5.5 in</td>
<td>1.50 in</td>
<td>956 lbs</td>
<td>-20 lbs</td>
<td>-733 lbs</td>
<td>-733 lbs</td>
<td>-105 lbs</td>
<td>-105 lbs</td>
<td>-105 lbs</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1.5 in</td>
<td>1.50 in</td>
<td>208 lbs</td>
<td>-363 lbs</td>
<td>-363 lbs</td>
<td>-363 lbs</td>
<td>-15 lbs</td>
<td>-15 lbs</td>
<td>-15 lbs</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1.5 in</td>
<td>1.50 in</td>
<td>91 lbs</td>
<td>-105 lbs</td>
<td>-105 lbs</td>
<td>-105 lbs</td>
<td>-15 lbs</td>
<td>-15 lbs</td>
<td>-15 lbs</td>
</tr>
</tbody>
</table>

---

**Material**

TC: DFL #2 2 x 6
BC: DFL #2 2 x 4
Web: SPF Stud 2 x 4

---

**Loads**

1. This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2. This truss has been designed for the effects of wind loads in accordance with ASCE7-16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=B=L=10 ft, Not End Zone Truss, Both end walls considered. DOL = 1.60
3. Minimum storage attic loading has been applied in accordance with IBC 2019.
4. A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

---

**Member Forces**

Table indicates: Member ID, max CSI, max axial force, (max comp. force if different from max axial force). Only forces greater than 300lbs are shown in this table.

<table>
<thead>
<tr>
<th>TC</th>
<th>BC</th>
<th>Web</th>
<th>Max CSI</th>
<th>Max Axial</th>
<th>Comp. Axial</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-5</td>
<td>0.182</td>
<td>-34 lbs</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1) This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
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3) Minimum storage attic loading has been applied in accordance with IBC 1607.1
4) A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

**Member Forces**

<table>
<thead>
<tr>
<th>Member</th>
<th>Table indicates: Member ID, max CSI, max axial force, (max comp. force if different from max axial force). Only forces greater than 300lbs are shown in this table.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC</td>
<td></td>
</tr>
<tr>
<td>BC</td>
<td></td>
</tr>
<tr>
<td>Web</td>
<td>2-5</td>
</tr>
</tbody>
</table>

**Notes**

1) Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2) This truss has been designed using the green service reduction factors.
3) The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4) Nailing schedule shall be specified by truss manufacturer per NDS.
5) Brace bottom chord with approved sheathing or purlins per Bracing Summary.
6) A creep factor of 2.00 has been applied for this truss analysis.
7) Due to negative reactions in gravity load cases, special connections to the bearing surface at joints 3, 4 may need to be considered.
8) Listed wind uplift reactions based on MWFRS & C&C loading.
All plates shown to be Eagle 20 unless otherwise noted.

Loading (psf)  General
<table>
<thead>
<tr>
<th>SPAN</th>
<th>PITCH</th>
<th>QTY</th>
<th>OHL</th>
<th>OHR</th>
<th>CANTL</th>
<th>CANTR</th>
<th>PLYS</th>
<th>SPACING</th>
<th>WGT/PLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-10-15</td>
<td>4/12</td>
<td>15</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>1</td>
<td>24 in</td>
<td>28 lbs</td>
</tr>
</tbody>
</table>

Reaction

<table>
<thead>
<tr>
<th>JT</th>
<th>Big Combo</th>
<th>Big Width</th>
<th>Reqd Big Width</th>
<th>Max React</th>
<th>Max Grav Uplift</th>
<th>Max MWFRS Uplift</th>
<th>Max C&amp;C Uplift</th>
<th>Max Uplift</th>
<th>Max Horiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1</td>
<td>5.5 in</td>
<td>1.50 in</td>
<td>615 lbs</td>
<td>-6 lbs</td>
<td>-351 lbs</td>
<td>-351 lbs</td>
<td>199 lbs</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1.5 in</td>
<td>1.50 in</td>
<td>123 lbs</td>
<td>-15 lbs</td>
<td>-103 lbs</td>
<td>-103 lbs</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1.5 in</td>
<td>1.50 in</td>
<td>113 lbs</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Material

<table>
<thead>
<tr>
<th>TC</th>
<th>DFL #2 2 x 6</th>
</tr>
</thead>
</table>

Bracing

<table>
<thead>
<tr>
<th>TC</th>
<th>Sheathed or Purlins at 6-3-0, Purlin design by Others.</th>
</tr>
</thead>
</table>

5) Minimum storage attic loading has been applied in accordance with BIC 1007.1

4) A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

Member Forces

| TC | Table indicates: Member ID, max CSI, max axial force, (max compr. force if different from max axial force). Only forces greater than 300 lbs are shown in this table. |

Notes

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**TrusPro Inc.**  
695 Obispo Street  
Guadalupe, CA 93434  
Ph: (805)343-2555    Fax: (805)343-2377

**Truss: J08A**  
**Job: 5433M**  
**Date: 09/22/21**  
**Page: 1 of 1**  
**Notes:** All connector plates to be Eagle 20 gauge unless otherwise noted.

---

### SPAN PITCH QTY OHL OHR CANTL CANTR PLYS SPACING WGT/PLY
<table>
<thead>
<tr>
<th>7-10-15</th>
<th>4/12</th>
<th>6</th>
<th>0-0-0</th>
<th>0-0-0</th>
<th>0-0-0</th>
<th>0-0-0</th>
<th>1</th>
<th>24 in</th>
<th>29 lbs</th>
</tr>
</thead>
</table>

---

**Notes:**

1. **Unless noted otherwise,** do not cut or alter any truss member or plate without prior approval from a Professional Engineer.  
2. **This truss has been designed using the green service reduction factors.**  
3. **The fabrication tolerance for this roof truss is 20% (Cq = 0.80).**  
4. **Nailing schedule shall be specified by truss manufacturer per NDS.**  
5. **Due to negative reactions in gravity load cases, special connections to the bearing surface at joints 3, 4 may need to be considered.**  
6. **Listed wind uplift reactions based on MWFRS & C&C loading.**

---

### Loading (psf)  
<table>
<thead>
<tr>
<th>TC</th>
<th>TCDL</th>
<th>BCDL</th>
<th>TPI 1-2014</th>
<th>Lumber DO.L.</th>
<th>Max React</th>
<th>Max Grav Uplift</th>
<th>Max MWFRS Uplift</th>
<th>Max C&amp;C Uplift</th>
<th>Max Uplift</th>
<th>Max Horiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCLL: 20</td>
<td>TCDL: 15</td>
<td>BCDL: 0</td>
<td>TPI 1-2014</td>
<td>Lumber DO.L.: 125 %</td>
<td>782 lbs</td>
<td>-8 lbs</td>
<td>-85 lbs</td>
<td>-85 lbs</td>
<td>199 lbs</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1.5 in</td>
<td>1.50 in</td>
<td>49 lbs</td>
<td>-121 lbs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>4.5 in</td>
<td>1.50 in</td>
<td>85 lbs</td>
<td>-18 lbs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

### Material  
**TC:** DFL #2 2 x 6  
**BC:** DFL #2 2 x 4  
**Web:** SPF Stud 2 x 4

---

### Bracing  
**TC:** Sheathed or Purlins at 6-3-0, Purlin design by Others.  
**BC:** Sheathed or Purlins at 10-0-0, Purlin design by Others.

---

### Loads  
1. This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.  
2. This truss has been designed for the effects of wind loads in accordance with ASCE7 - 16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=L=10 ft, Not End Zone Truss, Both ends webs considered. DOL = 1.60  
3. Minimum storage attic loading has been applied in accordance with IBC 1607.1  
4. A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

---

### Member Forces  
Table indicates: Member ID, max CSI, max axial force, (max compr. force if different from max axial force). Only forces greater than 300 lbs are shown in this table.

<table>
<thead>
<tr>
<th>TC</th>
<th>Max CSI</th>
<th>Max Axial Force</th>
<th>Max Compr. Force</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web</td>
<td>25</td>
<td>0.134</td>
<td>607 lbs</td>
</tr>
</tbody>
</table>

---

### Notes  
1. **Unless noted otherwise,** do not cut or alter any truss member or plate without prior approval from a Professional Engineer.  
2. **This truss has been designed using the green service reduction factors.**  
3. **The fabrication tolerance for this roof truss is 20% (Cq = 0.80).**  
4. **Nailing schedule shall be specified by truss manufacturer per NDS.**  
5. **Due to negative reactions in gravity load cases, special connections to the bearing surface at joints 3, 4 may need to be considered.**  
6. **Listed wind uplift reactions based on MWFRS & C&C loading.**
ALL PERSONS FABRICATING, HANDLING, ERECTING OR INSTALLING ANY TRUSS BASED UPON THIS TRUSS DESIGN DRAWING ARE INSTRUCTED TO REFER TO ALL OF THE INSTRUCTIONS, LIMITATIONS AND QUALIFICATIONS SET FORTH IN THE EAGLE METAL PRODUCTS DESIGN NOTES ISSUED WITH THIS DESIGN AND AVAILABLE FROM EAGLE UPON REQUEST. DESIGN VALID ONLY WHEN EAGLE METAL CONNECTORS ARE USED.

**Notes:**
1. Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2. This truss has been designed using the green service reduction factors.
3. The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4. Nailing schedule shall be specified by truss manufacturer per NDS.
5. Brace bottom chord with approved sheathing or purlins per Bracing Summary.
6. A creep factor of 2.0 has been applied for this truss analysis.
7. Due to negative reactions in gravity load cases, special connections to the bearing surface at joints 3, 4 may need to be considered.
8. Listed wind uplift reactions based on MWFRS & C&C loading.

**Loading (psf)**

<table>
<thead>
<tr>
<th>Span</th>
<th>Pitch</th>
<th>QTY</th>
<th>OHL</th>
<th>OHR</th>
<th>CantL</th>
<th>CantR</th>
<th>Plys</th>
<th>Spacing</th>
<th>Wgt/Ply</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-10-15</td>
<td>4/12</td>
<td>2</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>1</td>
<td>24 in</td>
<td>29 lbs</td>
</tr>
</tbody>
</table>

**Material**

- **TC:** DFL #2 2 x 6
- **BC:** DFL #2 2 x 4
- **Web:** SPF Stud 2 x 4

**Reaction**

<table>
<thead>
<tr>
<th>JT</th>
<th>Brg Combo</th>
<th>Brg Width</th>
<th>Rqd Brg Width</th>
<th>Max React</th>
<th>Max Grav Uplift</th>
<th>Max MWFRS</th>
<th>Max Conc Uplift</th>
<th>Max Uplift</th>
<th>Max Horiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1</td>
<td>5.5 in</td>
<td>1.50 in</td>
<td>996 lbs</td>
<td>-24 lbs</td>
<td>199 lbs</td>
<td>-63 lbs</td>
<td>-258 lbs</td>
<td>-258 lbs</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1.5 in</td>
<td>1.50 in</td>
<td>99 lbs</td>
<td>-258 lbs</td>
<td>-4 lbs</td>
<td>-1.0 lbs</td>
<td>-4 lbs</td>
<td>-4 lbs</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1.5 in</td>
<td>1.50 in</td>
<td>68 lbs</td>
<td>-63 lbs</td>
<td>-4 lbs</td>
<td>-1.0 lbs</td>
<td>-4 lbs</td>
<td>-4 lbs</td>
</tr>
</tbody>
</table>

**Bracing**

- **TC:** Sheathed or Purlins at 6-3, Purlin design by Others.
- **BC:** Sheathed or Purlins at 10-0, Purlin design by Others.

**Loads**

1. This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2. This truss has been designed for the effects of wind loads in accordance with ASCE7-16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Rake Category II, h=B=L=10 ft, Not End Zone Truss, Both end walls connected. DOL = 1.60
3. Minimum storage attic loading has been applied in accordance with IBC 1607.1
4. A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

**Member Forces**

<table>
<thead>
<tr>
<th>TC</th>
<th>MaxCSI</th>
<th>Max Axial Force</th>
<th>Max Conc Force</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>0.168</td>
<td>-373 lbs</td>
<td></td>
</tr>
</tbody>
</table>

**Notes (Cont.)**

1. Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2. This truss has been designed using the green service reduction factors.
3. The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4. Nailing schedule shall be specified by truss manufacturer per NDS.
5. Brace bottom chord with approved sheathing or purlins per Bracing Summary.
6. A creep factor of 2.0 has been applied for this truss analysis.
7. Due to negative reactions in gravity load cases, special connections to the bearing surface at joints 3, 4 may need to be considered.
8. Listed wind uplift reactions based on MWFRS & C&C loading.
<table>
<thead>
<tr>
<th>SPAN</th>
<th>PITCH</th>
<th>QTY</th>
<th>OHL</th>
<th>OHR</th>
<th>CANTL</th>
<th>CANTR</th>
<th>PLYS</th>
<th>SPACING</th>
<th>WGT/PLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-10-15</td>
<td>4/12</td>
<td>1</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>1</td>
<td>24 in</td>
<td>29 lbs</td>
</tr>
</tbody>
</table>

**Notes:**
- All connector plates to be Eagle 20 gauge unless otherwise noted.
- Loading (psf):
  - TCLL: 20
  - TCDL: 15
  - BCLL: 0
  - BCDL: 10
- General:
  - Bldg Code: CBC 2019/
  - TPI: 1-2014
- CSI:
  - TC: 0.96 (1-2)
  - BC: 0.51 (5-1)
- Deflection:
  - Vert TL: 0.03 in UP 
  - Vert LL: 0.02 in L
- L/ (loc):
  - Allowed: L/240
- All plates shown to be Eagle 20 unless otherwise noted.

---

**All persons fabricating, handling, erecting or installing any truss based upon this truss design drawing are instructed to refer to all of the instructions, limitations and qualifications set forth in the Eagle Metal Products Design Notes issued with this design and available from Eagle upon request. Design valid only when Eagle Metal Connectors are used.**

---

**TrusPro Inc.**
695 Obispo Street
Guadalupe, CA 93434
Ph: (805)343-2555 Fax: (805)343-2377

**Truss Job:**
- Job: 5433M
- Date: 09/22/21 10:30:50
- Page: 1 of 1
- Notes: All connector plates to be Eagle 20 gauge unless otherwise noted.
### All plates shown to be Eagle 20 unless otherwise noted.

<table>
<thead>
<tr>
<th>Loading (psf)</th>
<th>General</th>
<th>CSI</th>
<th>Deflection</th>
<th>L/ (loc)</th>
<th>Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>T CDL: 15 (rake)</td>
<td>BC: 0.41 (4-5)</td>
<td>BC: 0.41 (4-5)</td>
<td>Vert LL: 0.1 in</td>
<td>L/.899 (4-5)</td>
<td>L/.360</td>
</tr>
<tr>
<td>B CLL: 0</td>
<td>Web: 0.11 (2-5)</td>
<td>BC: 0.41 (4-5)</td>
<td>Cant/OH TL: 0.08 in UPL 2L/.694 (1-1)</td>
<td>2L/.120</td>
<td></td>
</tr>
<tr>
<td>B CDL: 10</td>
<td></td>
<td>BC: 0.41 (4-5)</td>
<td>Cant/OH LL: 0.08 in 2L/.710 (1-1)</td>
<td>2L/.120</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Horz TL: 0.03 in</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

### Reaction

<table>
<thead>
<tr>
<th>JT</th>
<th>Brg Combo</th>
<th>Brg Width</th>
<th>Brgd Brg Width</th>
<th>Max React</th>
<th>Max Grav Uplift</th>
<th>Max MWFRS Uplift</th>
<th>Max C&amp;C Uplift</th>
<th>Max Uplift</th>
<th>Max Horiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1</td>
<td>5.5 in</td>
<td>1.50 in</td>
<td>619 lbs</td>
<td>-6 lbs</td>
<td>-264 lbs</td>
<td>-264 lbs</td>
<td>221 lbs</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1.5 in</td>
<td>1.50 in</td>
<td>229 lbs</td>
<td>-77 lbs</td>
<td>-174 lbs</td>
<td>-174 lbs</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1.5 in</td>
<td>1.50 in</td>
<td>150 lbs</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

### Material

- **TC:** DFL #2 2 x 6
- **BC:** DFL #2 2 x 4
- **Web:** SPF Stud 2 x 4

### Bracing

- **TC:** Sheathed or Purlins at 6-3-0, Purlin design by Others.
- **BC:** Sheathed or Purlins at 10-0-0, Purlin design by Others.

### Loads

1. This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2. This truss has been designed for the effects of wind loads in accordance with ASCE7 - 16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=B=L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
3. Minimum storage attic loading has been applied in accordance with IBC 1607.1
4. A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

### Member Forces

<table>
<thead>
<tr>
<th>TC</th>
<th>Web</th>
<th>Max Axial Force</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.115</td>
<td>-247 lbs</td>
</tr>
</tbody>
</table>

### Notes

1. Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2. This truss has been designed using the green service reduction factors.
3. The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4. Nailing schedule shall be specified by truss manufacturer per NDS.
5. Brace bottom chord with approved sheathing or purlins per Bracing Summary.
6. A creep factor of 2.00 has been applied for this truss analysis.
7. Listed wind uplift reactions based on MWFRS & C&C loading.
### Loading (psf)

<table>
<thead>
<tr>
<th>Loading</th>
<th>General</th>
<th>CSI</th>
<th>Deflection</th>
<th>L/ (loc)</th>
<th>Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCLL: 20</td>
<td>Bldg Code: CBC20/19</td>
<td>TC: 0.71 (1-2)</td>
<td>Vert TL: 0.06 in</td>
<td>L/999 (4-5)</td>
<td>L/240</td>
</tr>
<tr>
<td>TCCL: 15(knee)</td>
<td>Truss 1-2</td>
<td>BC: 0.50 (5-1)</td>
<td>Vert LL: 0.05 in</td>
<td>L/999 (4-5)</td>
<td>L/360</td>
</tr>
<tr>
<td>BCLL: 0</td>
<td>Rep Mbr: No</td>
<td>Web: 0.13 (2-5)</td>
<td>Cant/OH TL: 0.02 in</td>
<td>2L/186 (1-1)</td>
<td>2L/120</td>
</tr>
<tr>
<td>BCCL: 10</td>
<td>Lumber D.O.L.: 125%</td>
<td></td>
<td>Cant/OH LL: 0.01 in</td>
<td>2L/409 (1-1)</td>
<td>2L/120</td>
</tr>
</tbody>
</table>

### Reaction

<table>
<thead>
<tr>
<th>JT</th>
<th>Brg Combo</th>
<th>Brg Width</th>
<th>Brgd Brg Width</th>
<th>Max React</th>
<th>Max Grav Uplift</th>
<th>Max MWFRS Uplift</th>
<th>Max C&amp;C Uplift</th>
<th>Max Uplift</th>
<th>Max Horiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1</td>
<td>5.0 in</td>
<td>1.00 in</td>
<td>794 lbs</td>
<td>-67 lbs</td>
<td>-400 lbs</td>
<td>-400 lbs</td>
<td>221 lbs</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1.5 in</td>
<td>1.00 in</td>
<td>138 lbs</td>
<td>-97 lbs</td>
<td>-97 lbs</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1.5 in</td>
<td>1.00 in</td>
<td>120 lbs</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### Material

<table>
<thead>
<tr>
<th>TC</th>
<th>DFL #2 2 x 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC</td>
<td>DFL #2 2 x 4</td>
</tr>
<tr>
<td>Web</td>
<td>SPF Stud 2 x 4</td>
</tr>
</tbody>
</table>

### Bracing

<table>
<thead>
<tr>
<th>BC</th>
<th>Sheathed or Purlins at 6-3-0, Purlin design by Others.</th>
</tr>
</thead>
</table>

### Loads

1. This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2. This truss has been designed for the effects of wind loads in accordance with ASCE7 - 16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=B=L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
3. Minimum storage attic loading has been applied in accordance with IBC 1607.1
4. A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.
5. Table indicates: Member ID, max CSI, max axial force, (max comp. force if different from max axial force). Only forces greater than 300lbs are shown in this table.
6. A creep factor of 2.00 has been applied for this truss analysis.
7. Due to negative reactions in gravity load cases, special connections to the bearing surface at joint 3 may need to be considered.
8. Listed wind uplift reactions based on MWFRS & C&C loading.

### Notes

1. Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2. This truss has been designed using the green service reduction factors.
3. The fabrication tolerance for this roof truss is 20 % (Cq = 0.80).
4. Nailing schedule shall be specified by truss manufacturer per NDS.
5. Brace bottom chord with approved sheathing or purlins per Bracing Summary.
6. A creep factor of 2.00 has been applied for this truss analysis.
7. Due to negative reactions in gravity load cases, special connections to the bearing surface at joint 3 may need to be considered.
8. Listed wind uplift reactions based on MWFRS & C&C loading.
All plates shown to be Eagle 20 gauge unless otherwise noted.

### Loading (psf)
- **TCLL:** 20 psf
- **TCDL:** 15 psf
- **BCLL:** 0 psf
- **BCDL:** 10 psf

### General
- **Bldg Code:** CBC 2019/TPI 1-2014
- **Rep Mbr:** Yes
- **Lumber D.O.L.:** 125%

### CSI
- **TC:** 0.69 (5-1)
- **BC:** 0.31 (3-4)
- **Web:** 0.06 (1-4)

### Deflection
- **Vert TL:** 0.08 in
- **Vert LL:** 0.05 in
- **Horiz TL:** 0 in

### Allowed
- **Vert TL:** L/1801
- **Vert LL:** L/360
- **Horiz TL:** 3

### Reaction
<table>
<thead>
<tr>
<th>JT</th>
<th>Brg Combo</th>
<th>Brg Width</th>
<th>Brgd Brg Width</th>
<th>Max React</th>
<th>Max Grav Uplift</th>
<th>Max MWFRS Uplift</th>
<th>Max C&amp;C Uplift</th>
<th>Max Uplift</th>
<th>Max Horiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>5.5 in</td>
<td>1.50 in</td>
<td>698 lbs</td>
<td>-121 lbs</td>
<td>-534 lbs</td>
<td>-534 lbs</td>
<td>320 lbs</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1.5 in</td>
<td>1.50 in</td>
<td>137 lbs</td>
<td>-19 lbs</td>
<td>-27 lbs</td>
<td>-46 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1.5 in</td>
<td>1.50 in</td>
<td>164 lbs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Material Bracing
- **TC:** DFL #2 2 x 6
- **BC:** DFL #2 2 x 4
- **Web:** SPF Stud 2 x 4

### Loads
1. This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2. This truss has been designed for the effects of wind loads in accordance with ASCE7 - 16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=B=L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
3. Minimum storage attic loading has been applied in accordance with IBC 1607.1
4. A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

### Member Forces
- **TC:** Table indicates: Member ID, max CSI, max axial force, (max compr. force if different from max axial force). Only forces greater than 300 lbs are shown in this table.
- **BC:**

### Notes
1. Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2. Unlabeled plates are 1.5x3 20ga.
3. This truss has been designed using the green service reduction factors.
4. The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
5. Nailing schedule shall be specified by truss manufacturer per NDS.
6. Brace bottom chord with approved sheathing or purlins per Bracing Summary.
7. A creep factor of 2.00 has been applied for this truss analysis.
8. Horizontal clearance between inside face of bearing and where the outside edge of the end web meets the bottom side of the top chord shall not exceed 0.5”
9. Due to negative reactions in gravity load cases, special connections to the bearing surface at joint 2 may need to be considered.
10. Listed wind uplift reactions based on MWFRS & C&C loading.
### Loading (psf)

<table>
<thead>
<tr>
<th>SPAN</th>
<th>PITCH</th>
<th>QTY</th>
<th>OHL</th>
<th>OHR</th>
<th>CANTL</th>
<th>CANTR</th>
<th>PLYS</th>
<th>SPACING</th>
<th>WGT/PLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-10-15</td>
<td>4/12</td>
<td>2</td>
<td>0.0-0</td>
<td>0.0-0</td>
<td>0.0-0</td>
<td>0.0-0</td>
<td>1</td>
<td>24 in</td>
<td>41 lbs</td>
</tr>
</tbody>
</table>

### Notes

All connector plates to be Eagle 20 gauge unless otherwise noted.

---

### General

- **Bldg Code:** CBC 2019/
- **TPI:** 1-2014
- **Rep Mbr:** No
- **Lumber D.O.L.:** 125%

### CSI

<table>
<thead>
<tr>
<th>TC</th>
<th>BC</th>
<th>Web</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.36</td>
<td>0.19</td>
<td>0.21</td>
</tr>
</tbody>
</table>

### Deflection L/(loc)

<table>
<thead>
<tr>
<th>Vert TL</th>
<th>Vert LL</th>
<th>Cant/OH TL</th>
<th>Cant/OH LL</th>
<th>Horz TL</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.03 in</td>
<td>0.02 in</td>
<td>0.07 in</td>
<td>0.04 in</td>
<td>0.02 in</td>
</tr>
</tbody>
</table>

### Alluvium

**Allowed**

<table>
<thead>
<tr>
<th>L/999</th>
<th>L/240</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-5</td>
<td>4-5</td>
</tr>
<tr>
<td>5-1</td>
<td>5-1</td>
</tr>
</tbody>
</table>

### Reaction

- **JTBrg Combbo Brg Width Rqd Brg Width Max React Max Grav Uplift Max MWFRS UpliftMax C&C Uplift Max Uplift Max Horiz**
- **Material**
  - **TC:** DFL #2 2 x 6
  - **BC:** DFL #2 2 x 4
  - **Web:** SPF Stud 2 x 4
- **Bracing**
  - **TC:** Sheathed or Purlins at 6-3-0, Purlin design by Others.
  - **BC:** Sheathed or Purlins at 8-7-0, Purlin design by Others.

### Loads

1. This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2. This truss has been designed for the effects of wind loads in accordance with ASCE7 - 16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=B=L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
3. Minimum storage attic loading has been applied in accordance with IBC 1607.1
4. A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

### Member Forces

<table>
<thead>
<tr>
<th>TC</th>
<th>BC</th>
<th>Web</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.36</td>
<td>0.19</td>
<td>0.21</td>
</tr>
</tbody>
</table>

### Notes

1. Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2. This truss has been designed using the green service reduction factors.
3. The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4. Nailing schedule shall be specified by truss manufacturer per NDS.
5. Brace bottom chord with approved sheathing or purlins per Bracing Summary.
6. A creep factor of 2.00 has been applied for this truss analysis.
7. Due to negative reactions in gravity load cases, special connections to the bearing surface at joint 4 may need to be considered.
8. Listed wind uplift reactions based on MWFRS & C&C loading.
### Notes

1. All connector plates to be Eagle 20 gauge unless otherwise noted.

### Loading (psf)

<table>
<thead>
<tr>
<th>Loading (psf)</th>
<th>General</th>
<th>CSI</th>
<th>Deflection</th>
<th>L/ (loc)</th>
<th>Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCLL: 20</td>
<td>Bldg Code: CBC 2019/</td>
<td>TC: 0.37 (1-2)</td>
<td>Vent TL: 0.04 in L/999 (4-5)</td>
<td>L/240</td>
<td></td>
</tr>
<tr>
<td>TCDL: 15</td>
<td>TPI 1-2014</td>
<td>BC: 0.21 (4-5)</td>
<td>Vent LL: 0.03 in L/999 (4-5)</td>
<td>L/360</td>
<td></td>
</tr>
<tr>
<td>BCLL: 0</td>
<td>Rep Mfr: No</td>
<td>Web: 0.22 (2-4)</td>
<td>Cant/OH TL: 0.08 in L/999 (5-1)</td>
<td>2L/120</td>
<td></td>
</tr>
<tr>
<td>BCDL: 10</td>
<td>Lumber D.O.L.: 125%</td>
<td>Cant/OH LL: 0.04 in UP 2L/999 (5-1)</td>
<td>2L/120</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horz TL: 0.02 in</td>
<td></td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

### Reaction

<table>
<thead>
<tr>
<th>JT</th>
<th>Brg Combo</th>
<th>Brg Width</th>
<th>Brg Width</th>
<th>Max React</th>
<th>Max Grav</th>
<th>Uplift</th>
<th>Max MWFRS Uplift</th>
<th>Max C&amp;C Uplift</th>
<th>Max Uplift</th>
<th>Max Horiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1</td>
<td>5.5 in</td>
<td>1.50 in</td>
<td>965 lbs</td>
<td>-11 lbs</td>
<td>-523 lbs</td>
<td>-523 lbs</td>
<td>221 lbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1.5 in</td>
<td>1.50 in</td>
<td>134 lbs</td>
<td>-39 lbs</td>
<td>-82 lbs</td>
<td>-82 lbs</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1.5 in</td>
<td>1.50 in</td>
<td>114 lbs</td>
<td>-177 lbs</td>
<td>-24 lbs</td>
<td>-177 lbs</td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Material

| TC | DFL #2 2 x 6 | BC | DFL #2 2 x 4 | Web | SPF Stud 2 x 4 |

### Bracing

- TC: Sheathed or Purlins at 6-3-0, Purlin design by Others.
- BC: Sheathed or Purlins at 8-5-0, Purlin design by Others.

### Loads

1. This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2. This truss has been designed for the effects of wind loads in accordance with ASCE7 - 16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=B=L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
3. Minimum storage attic loading has been applied in accordance with IBC 1607.1
4. A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

### Member Forces

<table>
<thead>
<tr>
<th>TC</th>
<th>1-2</th>
<th>0.370</th>
<th>615 lbs</th>
<th>407 lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC</td>
<td>5-5</td>
<td>0.211</td>
<td>522 lbs</td>
<td>33 lbs</td>
</tr>
<tr>
<td>Web</td>
<td>2-5</td>
<td>0.176</td>
<td>830 lbs</td>
<td>561 lbs</td>
</tr>
</tbody>
</table>

### Notes

1. Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2. This truss has been designed using the green service reduction factors.
3. The fabrication tolerance for this roof truss is 20 % (Cq = 0.80).
4. Nailing schedule shall be specified by truss manufacturer per NDS.
5. Brace bottom chord with approved sheathing or purlins per Bracing Summary.
6. A creep factor of 2.00 has been applied for this truss analysis.
7. Due to negative reactions in gravity load cases, special connections to the bearing surface at joint 4 may need to be considered.
8. Listed wind uplift reactions based on MWFRS & C&C loading.
### Loading (psf)

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Design Limitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC: 0.44 (1-2)</td>
<td>BC: 0.42 (4-5)</td>
<td></td>
</tr>
<tr>
<td>BCLL: 0</td>
<td>Rep Mfr: No</td>
<td>BCLL: 0</td>
</tr>
<tr>
<td>BCDL: 10</td>
<td>Lumber D.O.L.: 125%</td>
<td>BCDL: 10</td>
</tr>
</tbody>
</table>

### Deflection

<table>
<thead>
<tr>
<th>Component</th>
<th>TC</th>
<th>BC</th>
<th>Web</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vert TL:</td>
<td>0.12 in</td>
<td>L / 593 (4-5)</td>
<td>L / 240</td>
</tr>
<tr>
<td>Vert LL:</td>
<td>0.07 in</td>
<td>L / 946 (4-5)</td>
<td>L / 360</td>
</tr>
<tr>
<td>Cant/OH TL:</td>
<td>0.16 in</td>
<td>2L / 443 (1-1)</td>
<td>2L / 120</td>
</tr>
<tr>
<td>Cant/OH LL:</td>
<td>0.13 in</td>
<td>2L / 567 (1-1)</td>
<td>2L / 120</td>
</tr>
<tr>
<td>Horiz TL:</td>
<td>0.06 in</td>
<td>2L / 240 (4-5)</td>
<td>2L / 120</td>
</tr>
</tbody>
</table>

### Reaction

<table>
<thead>
<tr>
<th>Reaction</th>
<th>JT</th>
<th>Brg Combo</th>
<th>Brg Width</th>
<th>Max React</th>
<th>Max Grav Uplift</th>
<th>Max MWFRS Uplift</th>
<th>Max C&amp;C Uplift</th>
<th>Max Max Uplift</th>
<th>Max Max Horiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCLL: 5</td>
<td>1</td>
<td>5.5 in</td>
<td>1.50 in</td>
<td>668 lbs</td>
<td>-6 lbs</td>
<td>-313 lbs</td>
<td>-313 lbs</td>
<td>219 lbs</td>
<td></td>
</tr>
<tr>
<td>TCLL: 3</td>
<td>1</td>
<td>5.5 in</td>
<td>1.50 in</td>
<td>192 lbs</td>
<td>-72 lbs</td>
<td>-146 lbs</td>
<td>-146 lbs</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>TCLL: 4</td>
<td>1</td>
<td>5.5 in</td>
<td>1.50 in</td>
<td>137 lbs</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

### Bracing

- TC: Sheathed or Purlins at 6-3-0, Purlin design by Others.
- BC: Sheathed or Purlins at 10-0-0, Purlin design by Others.

### Loads

1. This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2. This truss has been designed for the effects of wind loads in accordance with ASCE7 - 16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=B=L=10 ft, Not End Zone Truss, Both end webs considered. DOF = 1.60
3. Minimum storage attic loading has been applied in accordance with IBC 1607.1
4. A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

### Member Forces

<table>
<thead>
<tr>
<th>Component</th>
<th>Design Limitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC</td>
<td>Max CSI, max axial force, (max compr. force if different from max axial force). Only forces greater than 300lbs are shown in this table.</td>
</tr>
<tr>
<td>Web 3</td>
<td>0.114</td>
</tr>
</tbody>
</table>

### Notes

1. Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2. This truss has been designed using the green service reduction factors.
3. The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4. Nailing schedule shall be specified by truss manufacturer per NDS.
5. Brace bottom chord with approved sheathing or purlins per Bracing Summary.
6. A creep factor of 2.00 has been applied for this truss analysis.
7. Listed wind uplift reactions based on MWFRS & C&C loading.
Notes:

1. All connector plates to be Eagle 20 gauge unless otherwise noted.

2. Loading (psf)
   - TCLL: 20 psf
   - TCDL: 15 psf (rake)
   - BCLL: 0 psf
   - BCDL: 10 psf

3. Sheathing
   - TC: DFL #2
   - BC: DFL #2
   - Web: SPF Sheathed Stud

4. Member Forces
   - Table indicates: Member ID, max CSI, max axial force, (max compr. force if different from max axial force).

5. Material
   - TC: DFL #2
   - BC: DFL #2
   - Web: SPF Stud

6. Loads
   - 1) This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
   - 2) This truss has been designed for the effects of wind loads in accordance with ASCE7 - 16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=H=L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
   - 3) Minimum storage attic loading has been applied in accordance with IBC 1607.1
   - 4) A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

7. Reaction
   - Table indicates: Member ID, max CSI, max axial force, (max compr. force if different from max axial force). Only forces greater than 300 lbs are shown in this table.

8. Member Forces
   - Table indicates: Member ID, max CSI, max axial force, (max compr. force if different from max axial force). Only forces greater than 300 lbs are shown in this table.

9. Notes
   - 1) Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
   - 2) This truss has been designed using the green service reduction factors.
   - 3) The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
   - 4) Nailing schedule shall be specified by truss manufacturer per NDS.
   - 5) Brace bottom chord with approved sheathing or purlins per Bracing Summary.
   - 6) A creep factor of 2.00 has been applied for this truss analysis.
   - 7) Listed wind uplift reactions based on MWFRS & C&C loading.

---

**Unparsable Content:**

- TrusPro Inc.
- 695 Obispo Street
- Guadalupe, CA 93434
- Ph: (805)343-2555    Fax: (805)343-2377
- Truss:J12
- Job: 5433M
- Date: 09/22/21 10:30:53
- Page: 1 of 1
- Notes: All connector plates to be Eagle 20 gauge unless otherwise noted.
Notes: All connector plates to be Eagle 20 gauge unless otherwise noted.

<table>
<thead>
<tr>
<th>SPAN</th>
<th>PITCH</th>
<th>QTY</th>
<th>OHL</th>
<th>OHR</th>
<th>CANTL</th>
<th>CANTR</th>
<th>PLYS</th>
<th>SPACING</th>
<th>WGT/PLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-10-15</td>
<td>4/12</td>
<td>2</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>1</td>
<td>24 in</td>
<td>42 lbs</td>
</tr>
</tbody>
</table>

**All persons fabricating, handling, erecting or installing any truss based upon this truss design drawing are instructed to refer to all of the instructions, limitations and qualifications set forth in the Eagle Metal Products Design Notes issued with this design and available from Eagle upon request. Design valid only when Eagle Metal Connectors are used.**

---

### Loading (psf)

- **TCLL:** 20 psf
- **TCDL:** 15 psf
- **BCLL:** 0 psf
- **BCDL:** 10 psf

### General

- Building Code: CBC 2019/
- Tpi: 1-2014
- Rep Mbr: No
- Lumber D.O.L.: 125%

### CSI

<table>
<thead>
<tr>
<th>TC</th>
<th>BC</th>
<th>Web</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.71</td>
<td>0.65</td>
<td>0.14</td>
</tr>
</tbody>
</table>

### Deflection

<table>
<thead>
<tr>
<th>L/ (loc)</th>
<th>Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vert TL: 0.2 in</td>
<td>L/438 (4-5)</td>
</tr>
<tr>
<td>Vert LL: 0.13 in</td>
<td>L/697 (4-5)</td>
</tr>
<tr>
<td>Cant/OH TL: 0.42 in</td>
<td>2L/229 (1-1)</td>
</tr>
<tr>
<td>Cant/OH LL: 0.28 in</td>
<td>2L/340 (1-1)</td>
</tr>
<tr>
<td>Horz TL: 0.15 in</td>
<td>3</td>
</tr>
</tbody>
</table>

### Reaction

<table>
<thead>
<tr>
<th>JT</th>
<th>Brg Combo</th>
<th>Brg Width</th>
<th>Rgl Brg Width</th>
<th>Max React</th>
<th>Max Grav Uplift</th>
<th>Max MWFRS Uplift</th>
<th>Max C&amp;C Uplift</th>
<th>Max Uplift</th>
<th>Max Horiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1</td>
<td>5.5 in</td>
<td>1.50 in</td>
<td>848 lbs</td>
<td>-</td>
<td>-348 lbs</td>
<td>-348 lbs</td>
<td>238 lbs</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1.5 in</td>
<td>1.50 in</td>
<td>221 lbs</td>
<td>-86 lbs</td>
<td>-141 lbs</td>
<td>-141 lbs</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1.5 in</td>
<td>1.50 in</td>
<td>147 lbs</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### Material

- **TC:** DFL #2 2 x 6
- **BC:** DFL #2 2 x 4
- **Web:** SPF Stud 2 x 4

### Bracing

- **TC:** Sheathed or Purlins at 6-3-0, Purlin design by Others.
- **BC:** Sheathed or Purlins at 10-0-0, Purlin design by Others.

### Loads

1. This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2. This truss has been designed for the effects of wind loads in accordance with ASCE7 - 16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=8-L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
3. Minimum storage attic loading has been applied in accordance with IBC 1607.1
4. A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

### Member Forces

<table>
<thead>
<tr>
<th>TC</th>
<th>BC</th>
<th>Web</th>
<th>Max</th>
<th>Max Axial Force</th>
<th>Max Compr. Force</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-5</td>
<td>0.136</td>
<td>-660 lbs</td>
<td>2-5</td>
<td>0.136</td>
<td>-660 lbs</td>
</tr>
</tbody>
</table>

### Notes

1. Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2. This truss has been designed using the green service reduction factors.
3. The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4. Nailing schedule shall be specified by truss manufacturer per NDS.
5. Brace bottom chord with approved sheathing or purlins per Bracing Summary.
6. A creep factor of 2.00 has been applied for this truss analysis.
7. Listed wind uplift reactions based on MWFRS & C&C loading.
All plates shown to be Eagle 20 unless otherwise noted.

### Loading (psf)

<table>
<thead>
<tr>
<th>Loading (psf)</th>
<th>General</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCCLL: 20</td>
<td>Bldg Code: CBC'2019/</td>
</tr>
<tr>
<td>TCDEL: 15 (rake)</td>
<td>TP1'1-2014</td>
</tr>
<tr>
<td>BCLL: 0</td>
<td>Rep Mbr: Yes</td>
</tr>
<tr>
<td>BCDEL: 10</td>
<td>Lumber D.O.L., 125%</td>
</tr>
</tbody>
</table>

### CSI

<table>
<thead>
<tr>
<th>SPAN</th>
<th>PITCH</th>
<th>QTY</th>
<th>OHL</th>
<th>OHR</th>
<th>CANTL</th>
<th>CANTR</th>
<th>PLYS</th>
<th>SPACING</th>
<th>WGT/PLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-10-15</td>
<td>4/12</td>
<td>4</td>
<td>4-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>1</td>
<td>24 in</td>
<td>54 lbs</td>
</tr>
</tbody>
</table>

### Deflection

<table>
<thead>
<tr>
<th>Reaction</th>
<th>Vert TL:</th>
<th>L / (loc)</th>
<th>Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.24 in</td>
<td>L / 374 (3-4)</td>
<td>L / 240</td>
</tr>
<tr>
<td>2</td>
<td>0.12 in</td>
<td>L / 721 (3-4)</td>
<td>L / 360</td>
</tr>
<tr>
<td>3</td>
<td>0 in</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

### Material

<table>
<thead>
<tr>
<th>TC</th>
<th>BC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFL #2 2 x 6</td>
<td>DFL #2 2 x 4</td>
</tr>
<tr>
<td>SPF Stud 2 x 4 except</td>
<td>SPF Stud 2 x 4 except</td>
</tr>
<tr>
<td>Sheathed or Purlins at 6-3-0, Purlin design by Others.</td>
<td>Sheathed or Purlins at 10-0-0, Purlin design by Others.</td>
</tr>
</tbody>
</table>

### Bracing

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC</td>
<td>Sheathed or Purlins at 6-3-0, Purlin design by Others.</td>
</tr>
<tr>
<td>BC</td>
<td>Sheathed or Purlins at 10-0-0, Purlin design by Others.</td>
</tr>
</tbody>
</table>

### Loads

1) This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2) This truss has been designed for the effects of wind loads in accordance with ASCE7-16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, H = B = L = 10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
3) Minimum storage attic loading has been applied in accordance with IBC 1607.1
4) A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

### Member Forces

<table>
<thead>
<tr>
<th>TC</th>
<th>BC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table indicates: Member ID, max CSI, max axial force, (max compr. force if different from max axial force). Only forces greater than 300lbs are shown in this table.</td>
<td></td>
</tr>
<tr>
<td>Table indicates: Member ID, max CSI, max axial force, (max compr. force if different from max axial force). Only forces greater than 300lbs are shown in this table.</td>
<td></td>
</tr>
</tbody>
</table>

### Notes

1) Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2) Unlabeled plates are 1.5x3 20ga.
3) This truss has been designed using the green service reduction factors.
4) The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
5) Nailing schedule shall be specified by truss manufacturer per NDS.
6) Brace bottom chord with approved sheathing or purlins per Bracing Summary.
7) A creep factor of 2.00 has been applied for this truss analysis.
8) Horizontal clearance between inside face of bearing and where the outside edge of the end web meets the bottom side of the top chord shall not exceed 0.5".
9) Listed wind uplift reactions based on MWFRS & C&C loading.
**TrusPro Inc.**  
695 Obispo Street  
Guadalupe, CA 93434  
Ph: (805)343-2555    Fax: (805)343-2377

---

**Truss:J12AZ**  
**Job:** 5433M  
**Date:** 09/22/21  
**Page:** 1 of 1  
**Notes:** All connector plates to be Eagle 20 gauge unless otherwise noted

---

**Table: Span, Pitch, QTY, OHL, OHR, CANTL, CANTR, PLYS, SPACING, WGT/PLY**

<table>
<thead>
<tr>
<th>SPAN</th>
<th>PITCH</th>
<th>QTY</th>
<th>OHL</th>
<th>OHR</th>
<th>CANTL</th>
<th>CANTR</th>
<th>PLYS</th>
<th>SPACING</th>
<th>WGT/PLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-10-15</td>
<td>4/12</td>
<td>2</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>0-0-0</td>
<td>1</td>
<td>24 in</td>
<td>42 lbs</td>
</tr>
</tbody>
</table>

---

**Notes:**

1. Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
2. This truss has been designed using the green service reduction factors.
3. The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
4. Nailing schedule shall be specified by truss manufacturer per NDS.
5. Brace bottom chord with approved sheathing or purlins per Bracing Summary.
6. A creep factor of 2.00 has been applied for this truss analysis.
7. Due to negative reactions in gravity load cases, special connections to the bearing surface at joint 3 may need to be considered.
8. Listed wind uplift reactions based on MWFRS & C&C loading.

---

**Loading (psf):**

<table>
<thead>
<tr>
<th>Loading</th>
<th>General</th>
<th>CSI</th>
<th>Deflection</th>
<th>L/ (loc)</th>
<th>Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>T CLL</td>
<td>20</td>
<td>CBC 2019/</td>
<td>TC: 0.89 (1-2)</td>
<td>Vert TL: 0.09 in</td>
<td>L/827 (4-5)</td>
</tr>
<tr>
<td>T CDL</td>
<td>15(rake)</td>
<td>TPI 1-2014</td>
<td>BC: 0.55 (5-1)</td>
<td>Vert LL: 0.12 in</td>
<td>L/933 (4-5)</td>
</tr>
<tr>
<td>B CLL</td>
<td>0</td>
<td>Rep Mbr: No</td>
<td>Web: 0.15 (2-5)</td>
<td>Cant/OH TL: 0.94 in</td>
<td>L/123 (1-1)</td>
</tr>
<tr>
<td>B CDL</td>
<td>10</td>
<td>Lumber D.O.L.: 10%</td>
<td></td>
<td>Cant/OH LL: 0.38 in</td>
<td>L/303 (1-1)</td>
</tr>
</tbody>
</table>

---

**Reaction:**

| JT | Brg Combo | Brg Width | Rqd Brg Width | Max React | Max Grav | Uplift Max MWFRS Uplift Max C&C Uplift Max Uplift Max Horizon |
|----|-----------|-----------|--------------|-----------|----------|--------------------|-------------------|
| 5  | 1         | 5.5 in    | 1.50 in      | 946 lbs   | -        | -9 lbs             | -415 lbs          |
| 3  | 1         | 1.5 in    | 1.50 in      | 171 lbs   | -14 lbs  | -81 lbs            | -103 lbs          |
| 4  | 1         | 1.5 in    | 1.50 in      | 130 lbs   | -        | -                    | -                  |

---

**Material:**

<table>
<thead>
<tr>
<th>TC</th>
<th>DFL #1 2 x 6</th>
<th>BC: DFL #1B 2 x 4</th>
<th>Web: SPF Stud 2 x 4</th>
</tr>
</thead>
</table>

---

**Bracing:**

<table>
<thead>
<tr>
<th>TC</th>
<th>Sheathed or Purlins at 6-3-0, Purlin design by Others.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC</td>
<td>Sheathed or Purlins at 10-0-0, Purlin design by Others.</td>
</tr>
</tbody>
</table>

---

**Loads:**

1. This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
2. This truss has been designed for the effects of wind loads in accordance with ASCE7-16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, b=10 ft, L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60

---

**Member Forces:**

<table>
<thead>
<tr>
<th>TC</th>
<th>Max CSI</th>
<th>Max axial force</th>
<th>(max compr. force if different from max axial force)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5</td>
<td>0.154</td>
<td>-984 lbs</td>
<td></td>
</tr>
</tbody>
</table>

---

**ALL PERSONS FABRICATING, HANDLING, ERECTING OR INSTALLING ANY TRUSS BASED UPON THIS TRUSS DESIGN DRAWING ARE INSTRUCTED TO REFER TO ALL OF THE INSTRUCTIONS, LIMITATIONS AND QUALIFICATIONS SET FORTH IN THE EAGLE METAL PRODUCTS DESIGN NOTES ISSUED WITH THIS DESIGN AND AVAILABLE FROM EAGLE UPON REQUEST. DESIGN VALID ONLY WHEN EAGLE METAL CONNECTORS ARE USED.
TrusPro Inc.
695 Obispo Street
Guadalupe, CA 93434
Ph: (805)343-2555    Fax: (805)343-2377

Truss: J12B
Job: 5433M
Date: 09/22/21
Page: 1
Notes: All connector plates to be Eagle 20 gauge unless otherwise noted

Notes:
- All plates shown to be Eagle 20 unless otherwise noted.
- Loading (psf):
  - TCLL: 20
  - TCDL: 15
  - BCLL: 0
  - BCDL: 10
- CSI:
  - TC: 0.47 (1-2)
  - BC: 0.35 (4-5)
  - Web: 0.20 (2-4)
- Deflection:
  - Vert TL: 0.09 in
  - Vert LL: 0.06 in
  - Cant/OH TL: 0.08 in
  - Cant/OH LL: 0.04 in
- L/ (loc):
  - TCLL: 806
  - TCDL: 999
  - BCLL: 999
  - BCDL: 999
- Reaction:
  - JTBrg Combo:
    - Width Rqd: 5.5 in
    - Width Max: 1.50 in
    - React Max: 981 lbs
    - Uplift Max: -10 lbs
    - MWFRS Uplift Max: -442 lbs
    - C&C Uplift Max: -442 lbs
    - Max Horiz: 238 lbs
  - 3:
    - Width Rqd: 1.5 in
    - Width Max: 1.50 in
    - React Max: 195 lbs
    - Uplift Max: -58 lbs
    - MWFRS Uplift Max: -119 lbs
    - C&C Uplift Max: -119 lbs
    - Max Horiz: -
  - 4:
    - Width Rqd: 1.5 in
    - Width Max: 1.50 in
    - React Max: 84 lbs
    - Uplift Max: -92 lbs
    - MWFRS Uplift Max: -
    - C&C Uplift Max: -92 lbs
    - Max Horiz: -
- Material:
  - TC: DFL #2 x 6
  - BC: DFL #2 x 4
  - Web: SPF Stud 2 x 4
- Bracing:
  - TC: Sheathed or Purlins at 6-3-0
  - BC: Sheathed or Purlins at 8-7-0
- Loads:
  1) This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
  2) This truss has been designed for the effects of wind loads in accordance with ASCE7 - 16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=L=L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60
  3) Minimum storage attic loading has been applied in accordance with IBC 1607.1
  4) A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.
- Member Forces:
  Table indicates: Member ID, max CSI, max axial force, (max compr. force if different from max axial force). Only forces greater than 300lbs are shown in this table.
- Notes:
  1) Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
  2) This truss has been designed using the green service reduction factors.
  3) The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
  4) Nailing schedule shall be specified by truss manufacturer per NDS.
  5) Brace bottom chord with approved sheathing or purlins per Bracing Summary.
  6) A creep factor of 2.00 has been applied for this truss analysis.
  7) Due to negative reactions in gravity load cases, special connections to the bearing surface at joint 4 may need to be considered.
  8) Listed wind uplift reactions based on MWFRS & C&C loading.

ALL PERSONS FABRICATING, HANDLING, ERECTING OR INSTALLING ANY TRUSS BASED UPON THIS TRUSS DESIGN DRAWING ARE INSTRUCTED TO REFER TO ALL OF THE INSTRUCTIONS, LIMITATIONS AND QUALIFICATIONS SET FORTH IN THE EAGLE METAL PRODUCTS DESIGN NOTES ISSUED WITH THIS DESIGN AND AVAILABLE FROM EAGLE UPON REQUEST. DESIGN VALID ONLY WHEN EAGLE METAL CONNECTORS ARE USED.
This truss has been designed for the effects of wind loads in accordance with ASCE7-16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=b=L=10 ft, Not End Zone Truss, Both end webs considered. DOL = 1.60

5) Minimum storage attic loading has been applied in accordance with IBC 1607.1

4) A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.

Member Forces

Table indicates: Member ID, max CSI, max axial force, (max compr. force if different from max axial force). Only forces greater than 300 lbs are shown in this table.

Notes

1) Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.

2) This truss has been designed using the green service reduction factors.

3) The fabrication tolerance for this roof truss is 20% (Cq = 0.80).

4) Nailing schedule shall be specified by truss manufacturer per NDS.

5) Brace bottom chord with approved sheathing or purlins per Bracing Summary.

6) A creep factor of 2.00 has been applied for this truss analysis.

7) Listed wind uplift reactions based on MWFRS & C&C loading.

ALL PERSONS FABRICATING, HANDLING, ERECTING OR INSTALLING ANY TRUSS BASED UPON THIS TRUSS DESIGN DRAWING ARE INSTRUCTED TO REFER TO ALL OF THE INSTRUCTIONS, LIMITATIONS AND QUALIFICATIONS SET FORTH IN THE EAGLE METAL PRODUCTS DESIGN NOTES ISSUED WITH THIS DESIGN AND AVAILABLE FROM EAGLE UPON REQUEST. DESIGN VALID ONLY WHEN EAGLE METAL CONNECTORS ARE USED.
Notes:

- All connector plates to be Eagle 20 gauge unless otherwise noted.
- All plates shown to be Eagle 20 unless otherwise noted.
- Loading (psf)
  - TCLL: 20
  - TCDL: 15
  - BCLL: 0
  - BCCL: 10
- General
  - Building Code: CBC 2019/
  - TPI 1-2014
  - Rep Mbr: Yes
  - Lumber D.O.L.: 125%
- CSI
  - TC: 0.69 (7-1)
  - BC: 0.26 (4-5)
  - Web: 0.24 (2-4)
- Deflection
  - Vert TL: 0.05 in
  - Vert LL: 0.03 in
  - Horz TL: 0 in
- Reaction
  - Max React: 832 lbs
  - Max Grav: -103 lbs
  - Uplift: -428 lbs
  - MWFRS: 358 lbs
- Material
  - TC: DFL #2 2 x 6
  - BC: DFL #2 2 x 4
  - Web: SPF Stud 2 x 4
- Bracing
  - TC: Sheathed or Purlins at 6-3-0, Purlin design by Others.
  - BC: Sheathed or Purlins at 10-0-0, Purlin design by Others.
- Loads
  - This truss has been designed for the effects due to 10 psf bottom chord live load plus dead loads.
  - This truss has been designed for the effects of wind loads in accordance with ASCE7 - 16 with the following user defined input: 110 mph (Factored), Exposure C, Enclosed, Gable, Risk Category II, h=B=L=10 ft, Not End Zone Truss, Both end webs considered, DOL = 1.60
  - Minimum storage attic loading has been applied in accordance with IBC 1607.1
  - A moving/sprinkler point load of 300 lbs to the TC and 300 lbs to the BC has been applied concurrent with other dead loads.
- Member Forces
  - TC: 1-2 0.522 -363 lbs
  - BC: 1-5 0.532 -363 lbs
  - Web: 1-5 0.127 321 lbs
- Notes
  - Unless noted otherwise, do not cut or alter any truss member or plate without prior approval from a Professional Engineer.
  - Unlabeled plates are 1.5x3 20ga.
  - This truss has been designed using the green service reduction factors.
  - The fabrication tolerance for this roof truss is 20% (Cq = 0.80).
  - Nailing schedule shall be specified by truss manufacturer per NDS.
  - Brace bottom chord with approved sheathing or purlins per Bracing Summary.
  - A creep factor of 2.00 has been applied for this truss analysis.
  - Horizontal clearance between inside face of bearing and where the outside edge of the end web meets the bottom side of the top chord shall not exceed 0.5’.
  - Listed wind uplift reactions based on MWFRS & C&C loading.
APPENDIX E: SOILS REPORT

SOILS ENGINEERING REPORT
PASO ROBLES AREA SAN LUIS OBISPO
COUNTY, CALIFORNIA

PROJECT SL12244-1

Prepared by
GeoSolutions, Inc.
220 High Street
San Luis Obispo, California 93401
(805) 543-8539

©

June 23, 2021
SOILS ENGINEERING REPORT

This Soils Engineering Report has been prepared for the proposed single-family residence to be located at [removed] in the Paso Robles area of San Luis Obispo County, California. Geotechnically, the site is suitable for the proposed development provided the recommendations in this report for site preparation, earthwork, foundations, slabs, retaining walls, and pavement sections are incorporated into the design.

It is anticipated that all foundations for the proposed residence will be excavated into the competent formational material encountered at a depth of 2.0 to 3.0 feet below ground surface during the field investigation. As an alternative, a graded pad may be developed for the proposed residence with all foundations excavated into engineered fill. All foundations are to be excavated into uniform material to limit the potential for distress of the foundation systems due to differential settlement. If cuts steeper than allowed by State of California Construction Safety Orders for “Excavations, Trenches, Earthwork” are proposed, a numerical slope stability analysis may be necessary for temporary construction slopes.

Thank you for the opportunity to have been of service in preparing this report. If you have any questions, please contact the undersigned at (805) 543-8539.

Sincerely,

GeoSolutions, Inc.

Kraig R. Crozier
Principal, C.E.
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1.0 INTRODUCTION

This report presents the results of the geotechnical investigation for the proposed single-family residence to be located at [removed] in the Paso Robles area of San Luis Obispo County, California. See Figure 1: Site Location Map for the general location of the project area. Figure 1: Site Location Map was obtained from the program GIS Surfrider 1.8 (Eifelt, 2016).

1.1 Site Description

[removed] degrees west longitude at a general elevation of 2,000 feet above mean sea level. The parcel is irregularly shaped and 92 acres in size. The proposed development is to be limited to the southeast portion of the parcel. The site is access from a paved roadway to the north. See Figure 2: Site Plan for the general layout of the Site.

The Site is situated on a hill top that drops to the east, south and west at varying slope gradients from 3:1 to 6:1 (horizontal to vertical). Surface drainage follows the topography to the east, west and south towards existing slopes. Annual grasses currently vegetate the Site.

1.2 Project Description

A single-family residence and associated driveway are proposed on the hilltop in the southeast portion of the parcel. Grading quantities are anticipated to consist of 1,000 cubic yards of cut and 800 cubic yards of fill. At the time of the preparation of this report, the proposed single-family residence is to be constructed using light wood framing. The proposed development area will hereafter be referred to as the “Site.”

It is anticipated that the proposed single-family residence will utilize a slab-on-grade and/or raised wood lower floor system. Dead and sustained live loads are currently unknown, but they are anticipated to be relatively light with maximum continuous footing and column loads estimated to be approximately 1.5 kips per linear foot and 15 kips, respectively.
2.0 PURPOSE AND SCOPE

The purpose of this study was to explore and evaluate the surface and sub-surface soil conditions at the Site and to develop geotechnical information and design criteria. The scope of this study includes the following items:

1. A literature review of available published and unpublished geotechnical data pertinent to the project site including geologic maps, and available on-line or in-house aerial photographs.

2. A field study consisting of site reconnaissance and subsurface exploration including exploratory trenches in order to formulate a description of the sub-surface conditions at the Site.

3. Laboratory testing performed on representative soil samples that were collected during our field study.

4. Engineering analysis of the data gathered during our literature review, field study, and laboratory testing.

5. Development of recommendations for site preparation and grading as well as geotechnical design criteria for building foundations, retaining walls, pavement sections, underground utilities, and drainage facilities.

3.0 FIELD AND LABORATORY INVESTIGATION

The field investigation was conducted on May 6, 2021 using a mini excavator with a twelve-inch bucket. Three exploratory trenches were advanced to a maximum depth of 6 feet below ground surface (bgs) at the approximate locations indicated on Figure 3: Field Investigation.

Data gathered during the field investigation suggest that the soil materials at the Site consist of colluvial soil overlying competent formational material. The surface material at the Site generally consisted of dark olive brown sandy elastic SILT (MH) with cobbles encountered in a dry to slightly moist condition. The sub-surface materials consisted of light brown sandy SILT (MH), interpreted as shale and encountered in a highly fractured, thinly bedded, moderately hard and moderately weathered and dry condition.
Regional site geology was obtained from United States Geological Survey MapView internet application (USGS, 2013) which compiles existing geologic maps. Figure 4: Regional Geologic Map presents the geologic conditions in site vicinity as mapped on the Geologic Map of the Adelaida Quadrangle (Dibblee, 2006). The majority of all underlying material at the Site was interpreted as Monterey Shale and will hereafter be referred to as competent formational material.

Groundwater was not encountered in any of the trenches. It should be expected that groundwater elevations may vary seasonally and with irrigation practices.

During the trenching operations the soils encountered were continuously examined, visually classified, and sampled for general laboratory testing. A project engineer has reviewed a continuous log of the soils encountered at the time of field investigation. See Appendix A for the Trenching Logs from the field investigation.
Laboratory tests were performed on soil samples that were obtained from the Site during the field investigation. The results of these tests are listed below in Table 1: Engineering Properties. Laboratory data reports and detailed explanations of the laboratory tests performed during this investigation are provided in Appendix B.

Table 1: Engineering Properties

<table>
<thead>
<tr>
<th>Sample Name</th>
<th>Sample Description</th>
<th>USCS Specification</th>
<th>Expansion Index</th>
<th>Expansion Potential</th>
<th>Maximum Dry Density, $\gamma_d$ (pcf)</th>
<th>Optimum Moisture (%)</th>
<th>Plasticity Index</th>
<th>Fines Content (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Dark Olive Brown Sandy Elastic SILT</td>
<td>MH</td>
<td>23</td>
<td>Low</td>
<td>86.5</td>
<td>27.8</td>
<td>26</td>
<td>66.3</td>
</tr>
<tr>
<td>B</td>
<td>Pale Brown Elastic SILT</td>
<td>MH</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>16</td>
<td>-</td>
</tr>
</tbody>
</table>

4.0 SEISMIC DESIGN CONSIDERATIONS

Estimating the design ground motions at the Site depends on many factors including the distance from the Site to known active faults; the expected magnitude and rate of recurrence of seismic events produced on such faults; the source-to-site ground motion attenuation characteristics; and the Site soil profile characteristics. According to section 1613 of the 2019 CBC (CBSC, 2019), all structures and portions of structures should be designed to resist the effects of seismic loadings caused by earthquake ground motions in accordance with the ASCE 7: Minimum Design Loads for Buildings and Other Structures, hereafter referred to as ASCE 7-16 (ASCE, 2016). The Site soil profile classification (Site Class) can be determined by the average soil properties in the upper 100 feet of the Site profile and the criteria provided in Table 20.3-1 of ASCE 7-16.

Spectral response accelerations and peak ground accelerations, provided in this report were obtained using the computer-based Seismic Design Maps tool available from the Structural Engineers Association of California (SEAOC, 2019). This program utilizes the methods developed in ASCE 7-16 in conjunction with user-inputted Site location to calculate seismic design parameters and response spectra (both for period and displacement) for soil profile Site Classes A through E.

Site coordinates of 35.624819 degrees north latitude and -120.793501 degrees east longitude were used in the web-based probabilistic seismic hazard analysis (SEAOC, 2019). Based on the results from the in-situ tests performed during the field investigation, the Site was defined as Site Class C, “Very Stiff Soil and Dense Rock” profile per ASCE7-16, Chapter 20. Relevant seismic design parameters obtained from the program are summarized in Table 2: Seismic Design Parameters.
Table 2: Seismic Design Parameters

<table>
<thead>
<tr>
<th>Site Class</th>
<th>C “Very Dense Soil &amp; Soft Rock”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seismic Design Category</td>
<td>D</td>
</tr>
<tr>
<td>1-Second Period Design Spectral Response Acceleration, $S_{D1}$</td>
<td>(See Note 1)</td>
</tr>
<tr>
<td>Short-Period Design Spectral Response Acceleration, $S_{DS}$</td>
<td>0.854g</td>
</tr>
<tr>
<td>Site Specific MCE Peak Ground Acceleration, PGA_M</td>
<td>0.551g</td>
</tr>
</tbody>
</table>

Note 1: It is assumed that this design-period acceleration will not be required for the project.

5.0 LIQUEFACTION HAZARD ASSESSMENT

Liquefaction occurs when saturated cohesionless soils lose shear strength due to earthquake shaking. Ground motion from an earthquake may induce cyclic reversals of shear stresses of large amplitude. Lateral and vertical movement of the soil mass combined with the loss of bearing strength can result from this phenomenon. Liquefaction potential of soil deposits during earthquake activity depends on soil type, void ratio, groundwater conditions, the duration of shaking, and confining pressures on the potentially liquefiable soil unit. Fine, poorly graded loose sand, shallow groundwater, high intensity earthquakes, and long duration of ground shaking are the principal factors leading to liquefaction.

As the underlying material encountered at the Site was weathered rock rather than soil, there is no potential for liquefaction, seismically induced settlement or differential settlement. Rock material differs from soil in that it cannot be saturated, cohesion is considered infinite and relative density is not applicable. Assuming the rock material encountered at the Site accurately represents these conditions, liquefaction potential does not apply.

6.0 GENERAL SOIL-Foundation DISCUSSION

It is anticipated that all foundations for the proposed residence will be excavated into the competent formational material encountered at a depth of 2.0 to 3.0 feet below ground surface during the field investigation. As an alternative, a graded pad may be developed for the proposed residence with all foundations excavated into engineered fill. All foundations are to be excavated into uniform material to limit the potential for distress of the foundation systems due to differential settlement. If cuts steeper than allowed by State of California Construction Safety Orders for “Excavations, Trenches, Earthwork” are proposed, a numerical slope stability analysis may be necessary for temporary construction slopes.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The Site is suitable for the proposed development provided the recommendations presented in this report are incorporated into the project plans and specifications.

The primary geotechnical concerns at the Site are:

1. The presence of potentially expansive material. Influx of water from irrigation, leakage from the residence, or natural seepage could cause expansive soil problems. Foundations supported by expansive soils should be designed by a Structural Engineer in accordance with the 2019 California Building Code.

2. The potential for differential settlement occurring between foundations supported on two soil materials having different settlement characteristics, such as native soil and engineered fill or competent formational material. Therefore, it is important that all of the foundations are founded in equally competent uniform material in accordance with this report.
7.1 Preparation of Building Pad

1. It is anticipated that the foundations for the proposed residence will be excavated into the uniform competent formational material encountered approximately 2.0 to 3.0 below ground surface during the field investigation, as observed and approved by a representative of GeoSolutions, Inc. Deepened footings may be required in certain areas to achieve the required embedment depth in uniform competent formational material. As an alternative, a graded pad may be developed for the proposed residence with foundations excavated into engineered fill.

2. For slab-on-grade construction with footings founded a minimum of 12 inches into uniform competent formational material, the pad area to receive slab-on-grade construction should be graded such that all slabs are supported on uniform competent material. The native material should be over-excavated beneath the slab at least 10 inches below finished floor elevation, or to competent (dense) material; whichever is greatest. The exposed surface should be scarified to a depth of 6 inches, moisture conditioned to slightly above optimum moisture content, and compacted to a minimum relative density of 90 percent (ASTM D1557-12). Refer to Figure 6: Sub-Slab Detail for under-slab drainage material and Appendix D for more details on fill placement.

3. For the development of an engineered fill pad, the native material should be over-excavated at least 12 inches below existing grade, 12 inches below the bottom of the footings, to competent (dense) material, or to two-thirds the depth of the deepest fill (measured from the bottom of the deepest footing); whichever is greatest. The limits of over-excavation should extend a minimum of 5 feet beyond the perimeter foundation, to property lines, or existing improvements, whichever is least. The exposed surface should be scarified to a depth of 6 inches; moisture conditioned to 3% over optimum moisture content, and compacted to a minimum relative density of 90 percent (ASTM D1557-12). The over-excavated material may then be processed as engineered fill. Onsite soil and rock material is suitable as fill material provided it is processed to remove concentrations of organic material, debris, and oversize particles. Refer to Figure 6: Sub-Slab Detail for under-slab drainage material and Appendix D for more details on fill placement.

4. The ground immediately adjacent to the foundation shall be sloped away from the building at a slope of not less than one unit vertical in 20 units horizontal (5 percent slope) for a minimum distance of 10 feet measured perpendicular to the exterior of the structure per Section 1804.3 of the 2019 CBC.

5. If fill areas are constructed on slopes greater than 10-to-1 (horizontal-to-vertical), we recommend that benches be cut every four (vertical) feet as fill is placed. Each bench shall be a minimum of 10 feet wide with a minimum of two percent gradient into the slope. If fill areas are constructed on slopes greater than 5-to-1, we recommend that the toe of all areas to receive fill be keyed a minimum of 24 inches into underlying dense material. Sub-drains shall be placed in the keyway and benches as required. See Appendix D, Detail A, Key and Bench with Backdrain for details on key and bench construction.

6. The recommended soil moisture content should be maintained during construction and following construction of the proposed development. Where soil moisture content is not maintained, desiccation cracks may develop which indicate a loss of soil compaction, leading to the potential for damage to foundations, flatwork, pavements, and other improvements. Soils that have become cracked due to moisture loss should be removed sufficient depth to repair the cracked soil as observed by the soils engineer, and the removed materials should then be moisture conditioned to approximately 3 percent over optimum value, and compacted.
7.2 Conventional Foundations

1. Conventional continuous and spread footings with grade beams may be used for support of the proposed structure. Isolated pad footings are not permitted. Spread footings should be a minimum of 2 feet square and connected to the perimeter foundation by grade beams.

2. Minimum footing and grade beam sizes and depths in engineered fill or uniform competent formational material should conform to the following table, as observed and approved by a representative of GeoSolutions, Inc.

Table 3: Minimum Footing and Grade Beam Recommendations

<table>
<thead>
<tr>
<th></th>
<th>Perimeter Footings</th>
<th>Grade Beams</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Minimum Width</strong></td>
<td>12 inches (one or two story)</td>
<td>12 inches</td>
</tr>
<tr>
<td><strong>Minimum Depth</strong></td>
<td>24 inches</td>
<td>18 inches</td>
</tr>
<tr>
<td><strong>Minimum Embedment into Competent Formational Material</strong></td>
<td>12 inches</td>
<td>--</td>
</tr>
<tr>
<td><strong>Minimum Reinforcing</strong></td>
<td>4 #5 bars (2 top / 2 bottom)</td>
<td>4 #4 bars (2 top / 2 bottom)</td>
</tr>
<tr>
<td><strong>Spacing</strong></td>
<td>-</td>
<td>19 feet on-center each way</td>
</tr>
</tbody>
</table>

* Steel should be held in place by stirrups at appropriate spacing to ensure proper positioning of the steel (see WRI Design of Slab-on-Ground Foundations and ACI 318, Section 26.6.6 – Placing Reinforcement).

3. Minimum reinforcing for footings should conform to the recommendations provided in Table 3: Minimum Footing and Grade Beam Recommendations which meets the specifications of Section 1808.6 of the 2019 California Building Code for the soil conditions at the Site. Reinforcing steel should be held in place by stirrups at appropriate spacing to ensure proper positioning of the steel in accordance with WRI Design of Slab-on-Ground Foundations, and ACI 318, Section 26.6.6 – Placing Reinforcement.

4. A representative of this firm should observe and approve all foundation excavations for required embedment depth prior to the placement of reinforcing steel and/or concrete. Concrete should be placed only in excavations that are free of loose, soft soil and debris that have been maintained in a moist condition with no desiccation cracks present.

5. An allowable dead plus live load bearing pressure of 1,500 psf may be used for the design of footings founded in engineered fill or uniform competent formational material.

6. Allowable bearing capacities may be increased by one-third when transient loads such as wind and/or seismicity are included.

7. A total settlement of less than 1 inch and a differential settlement of less than 1 inch in 30 feet are anticipated.
8. Lateral forces on structures may be resisted by passive pressure acting against the sides of shallow footings and/or friction between the engineered fill or uniform competent formational material and the bottom of the footings. For resistance to lateral loads, a friction factor of 0.35 may be utilized for sliding resistance at the base of footings extending a minimum of 24 inches into engineered fill or 24 inches deep with a minimum embedment of 12 inches into uniform competent formational material. A passive pressure of 250-pcf equivalent fluid weight may be used against the side of shallow footings in engineered fill or uniform competent formational material. If friction and passive pressures are combined to resist lateral forces acting on shallow footings, the lesser value should be reduced by 50 percent.

9. Foundation excavations should be observed and approved by a representative of this firm prior to the placement of formwork, reinforcing steel and/or concrete.

10. Foundation design should conform to the requirements of Chapter 18 of the latest edition of the CBC (CBSC, 2019).

11. The base of all grade beams and footings should be level and stepped as required to accommodate any change in grade while still maintaining the minimum required footing embedment and slope setback distance.

12. The minimum footing setback distance from ascending or descending slope steeper than 3-to-1 (horizontal-to-vertical) but less than 1-to-1 must be maintained. See Figure 5: Setback Dimensions – Slope Gradients Between 3-to-1 and 1-to-1 for the minimum horizontal setback distances from ascending and descending slopes steeper than 3-to-1 but not steeper than 1-to-1.

Figure 5: Setback Dimensions – Slope Gradients Between 3-to-1 and 1-to-1

7.3 Slab-On-Grade Construction

1. Concrete slabs-on-grade and flatwork should not be placed directly on unprepared native materials. Preparation of sub-grade to receive concrete slabs-on-grade and flatwork should be processed as discussed in the preceding sections of this report. Concrete slabs should be placed only over sub-grade that is free of loose, soft soil and debris and that has been maintained in a moist condition with no desiccation cracks present.

2. Concrete slabs-on-grade should be in conformance with the recommendations provided in Table 4: Minimum Slab Recommendations. Reinforcing should be placed on-center both ways at or slightly above the center of the structural section. Reinforcing bars should
have a minimum clear cover of 1.5 inches. Where lapping of the slab steel is required, laps in adjacent bars should be staggered a minimum of every five feet (see WRI Design of Slab-on-Ground Foundations, Steel Placement). The recommended reinforcement may be used for anticipated uniform floor loads not exceeding 200 psf. If floor loads greater than 200 psf are anticipated, a Structural Engineer should evaluate the slab design.

Table 4: Minimum Slab Recommendations

<table>
<thead>
<tr>
<th>Minimum Thickness</th>
<th>4 inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reinforcing*</td>
<td>#3 bars at 12 inches on-center each way</td>
</tr>
</tbody>
</table>

* Where lapping of the slab steel is required, laps in adjacent bars should be staggered a minimum of every five feet (see WRI/CSRI-81 recommendations for Steel Placement, Section 2).

3. Concrete for all slabs should be placed at a maximum slump of less than 5 inches. Excessive water content is the major cause of concrete cracking. If fibers are used to aid in the control of cracking, a water-reducing admixture may be added to the concrete to increase slump while maintaining a water/cement ratio, which will limit excessive shrinkage. Control joints should be constructed as required to control cracking.

4. Where concrete slabs-on-grade are to be constructed for interior conditioned spaces, the slabs should be underlain by a minimum of four inches of clean free-draining material, such as a ¾ inch coarse aggregate mix, to serve as a cushion and a capillary break. Where moisture susceptible storage or floor coverings are anticipated, a 15-mil Stego Wrap membrane (or equivalent installed per manufacturer’s specifications) should be placed between the free-draining material and the slab to minimize moisture condensation under the floor covering. See Figure 6: Sub-Slab Detail for the placement of under-slab drainage material. It is suggested, but not required, that a two-inch thick sand layer be placed on top of the membrane to assist in the curing of the concrete, increasing the depth of the under-slab material to a total of six inches. The sand should be lightly moistened prior to placing concrete.

![Figure 6: Sub-Slab Detail](image-url)
5. It should be noted that for a vapor barrier installation to conform to manufacturer’s specifications, sealing of penetrations, joints and edges of the vapor barrier membrane are typically required. As required by the California Building Code, joints in the vapor barrier should be lapped a minimum of 6 inches. If the installation is not performed in accordance with the manufacturer’s specifications, there is an increased potential for water vapor to affect the concrete slabs and floor coverings.

6. The most effective method of reducing the potential for moisture vapor transmission through concrete slabs-on-grade would be to place the concrete directly on the surface of the vapor barrier membrane. However, this method requires a concrete mix design specific to this application with low water-cement ratio in addition to special concrete finishing and curing practices, to minimize the potential for concrete cracks and surface defects. The contractor should be familiar with current techniques to finish slabs poured directly onto the vapor barrier membrane.

7. Moisture condensation under floor coverings has become critical due to the use of water-soluble adhesives. Therefore, it is suggested that moisture sensitive slabs not be constructed during inclement weather conditions.

7.4 Exterior Concrete Flatwork

1. Due to the presence of expansive surface soils within the proposed development areas, there is a potential for considerable soil movement and distress to reinforced concrete flatwork if conventional measures are used, such as the placement of 4 to 6 inches of imported sand materials placed beneath concrete flatwork. Heaving and cracking are anticipated to occur. To reduce the potential for movement associated with expansive soils, we recommend the placement of a minimum of 12 inches of approved non-expansive import material placed as engineered fill beneath the flatwork.

2. Minimum flatwork for conventional pedestrian areas should be a minimum of 4 inches thick and consist of No. 3 (#3) rebar spaced at 24 inches on-center each-way at or slightly above the center of the structural section.

3. Flatwork should be constructed with frequent joints to allow for movement due to fluctuations in temperature and moisture content in the adjacent soils. Flatwork at doorways, driveways, curbs and other areas where restraining the elevation of the flatwork is desired, should be doweled to the perimeter foundation by a minimum of No. 3 reinforcing steel dowels, spaced at a maximum distance of 24 inches on-center.

4. As an alternative, interlocking concrete pavers may be utilized for exterior improvements in lieu of reinforced concrete flatwork. Concrete pavers, when installed in accordance with manufacturers’ recommendations and industry standards (ICPI), allow for a greater degree of soil movement as they are part of a flexible system. If interlocking concrete pavers are selected for use in the driveway area, the structural section should be underlain by a woven geotextile fabric, such as Mirafi HP570 or equivalent, to function as a separation layer and to provide additional support for vehicle tire loads.

7.5 Retaining Walls

1. Retaining walls should be designed to resist lateral pressures from adjacent soils and surcharge loads applied behind the walls. We recommend using the lateral pressures presented in Table 5: Retaining Wall Design Parameters and Figure 7: Retaining Wall Detail for the design of retaining walls at the Site. The Active Case may be used for the design of unrestrained retaining walls, and the At-Rest Case may be used for the design of restrained retaining walls.
Table 5: Retaining Wall Design Parameters

<table>
<thead>
<tr>
<th>Lateral Pressure and Condition</th>
<th>Equivalent Fluid Pressure, pcf</th>
</tr>
</thead>
<tbody>
<tr>
<td>Static, Active Case, Native ($\gamma'K_a$)</td>
<td>50</td>
</tr>
<tr>
<td>Static, At-Rest Case, Native ($\gamma'K_o$)</td>
<td>65</td>
</tr>
<tr>
<td>Static, Passive Case, Engineered Fill or Uniform Competent Formational Material ($\gamma'K_p$)</td>
<td>250</td>
</tr>
</tbody>
</table>

2. The above values for equivalent fluid pressure are based on retaining walls having level retained surfaces, having an approximately vertical surface against the retained material, and retaining granular backfill material or engineered fill composed of native soil within the active wedge. See Figure 7: Retaining Wall Detail and Figure 8: Retaining Wall Active and Passive Wedges for a description of the location of the active wedge behind a retaining wall.

3. Proposed retaining walls having a retained surface that slopes upward from the top of the wall should be designed for an additional equivalent fluid pressure of 1 pcf for the active case and 1.5 pcf for the at-rest case, for every degree of slope inclination.

4. We recommend that the proposed retaining walls at the Site have an approximately vertical surface against the retained material. If the proposed retaining walls are to have sloped surfaces against the retained material, the project designers should contact the Soils Engineer to determine the appropriate lateral earth pressure values for retaining walls located at the Site.
5. Retaining wall foundations should be founded a minimum of 24 inches below lowest adjacent grade in engineered fill or founded a minimum of 24 inches below lowest adjacent grade with a minimum embedment of 12 inches in uniform competent formational material as observed and approved by a representative of GeoSolutions, Inc. A coefficient of friction of 0.35 may be used between engineered fill or uniform competent formational material and concrete footings. Project designers may use a maximum toe pressure of 1,500 psf for the design of retaining wall footings founded in engineered fill or uniform competent formational material.

6. For earthquake conditions, retaining walls greater than 6 feet in height should be designed to resist an additional seismic lateral soil pressure of 25 pcf equivalent fluid pressure for unrestrained walls (active condition). The pressure resultant force from earthquake loading should be assumed to act a distance of \( \frac{1}{3}H \) above the base of the retaining wall, where \( H \) is the height of the retaining wall. Seismic active lateral earth pressure values were determined using the simplified dynamic lateral force component (SEAOC 2010) utilizing the design peak ground acceleration, PGA\(_{m}\), discussed in Section 4.0 (PGA\(_{m}\) = 0.551g). The dynamic increment in lateral earth pressure due to earthquakes should be considered during the design of retaining walls at the Site. Based on research presented by Dr. Marshall Lew (Lew et al., 2010), lateral pressures associated with seismic forces should not be applied to restrained walls (at-rest condition).

7. Seismically induced forces on retaining walls are considered to be short-term loadings. Therefore, when performing seismic analyses for the design of retaining wall footings, we recommend that the allowable bearing pressure and the passive pressure acting against the sides of retaining wall footings be increased by a factor of one-third.

8. In addition to the static lateral soil pressure values reported in Table 5: Retaining Wall Design Parameters, the retaining walls at the Site should be designed to support any design live load, such as from vehicle and construction surcharges, etc., to be supported by the wall backfill. If construction vehicles are required to operate within 10 feet of a retaining wall, supplemental pressures will be induced and should be taken into account in the design of the retaining wall.

9. The recommended lateral earth pressure values are based on the assumption that sufficient sub-surface drainage will be provided behind the walls to prevent the build-up of hydrostatic pressure. To achieve this we recommend that a granular filter material be
placed behind all proposed walls. The blanket of granular filter material should be a minimum of 12 inches thick and should extend from the bottom of the wall to 12 inches from the ground surface. The top 12 inches should consist of moisture conditioned, compacted, clayey soil. Neither spread nor wall footings should be founded in the granular filter material used as backfill.

10. A 4-inch diameter perforated or slotted drainpipe (ASTM D1785 PVC) should be installed near the bottom of the filter blanket with perforations facing down. The drainpipe should be underlain by at least 4 inches of filter type material and should daylight to discharge in suitably projected outlets with adequate gradients. The filter material should consist of a clean free-draining aggregate, such as a coarse aggregate mix. If the retaining wall is part of a structural foundation, the drainpipe must be placed below finished slab sub-grade elevation.

11. The filter material should be encapsulated in a permeable geotextile fabric. A suitable permeable geotextile fabric, such as non-woven needle-punched Mirafi 140N or equal, may be utilized to encapsulate the retaining wall drain material and should conform to Caltrans Standard Specification 88-1.03 for underdrains.

12. For hydrostatic loading conditions (i.e. no free drainage behind retaining wall), an additional loading of 45-pcf equivalent fluid weight should be added to the active and at-rest lateral earth pressures. If it is necessary to design retaining structures for submerged conditions, the allowed bearing and passive pressures should be reduced by 50 percent. In addition, soil friction beneath the base of the foundations should be neglected.

13. Precautions should be taken to ensure that heavy compaction equipment is not used adjacent to walls, so as to prevent undue pressure against, and movement of the walls.

14. The use of water-stops/impermeable barriers should be used for any basement construction, and for building walls that retain earth. Damproofing and waterproofing shall meet the minimum standards of Section 1805 of the 2019 California Building Code.

7.6 Preparation of Paved Areas

1. Pavement areas should be excavated to approximate sub-grade elevation or to competent material; whichever is deeper. The exposed surface should be scarified an additional depth of 12 inches, moisture conditioned to slightly above optimum moisture content, and compacted to a minimum relative density of 95 percent (ASTM D1557-12 test method).

2. The top 12 inches of sub-grade soil under all pavement sections should be compacted to a minimum relative density of 95 percent based on the ASTM D1557-12 test method at slightly above optimum.

3. Sub-grade soils should not be allowed to dry out or have excessive construction traffic between moisture conditioning and compaction, and placement of the pavement structural section.

4. Due to the expansive potential of the soils at the Site, the base courses beneath unreinforced pavement sections may fail, causing cracking of the pavement surfaces, as the sub-grade materials move laterally during expansive shrink-swell cycles.

5. Therefore, in order to minimize the potential for the failure of pavement sections at the Site, GeoSolutions, Inc. recommends that a Type 2 laterally-reinforcing geotextile grid, such as Tensar BX1200, Syntec SBX12, ADS BX124GG, or equivalent, be installed between the prepared sub-grade and base materials at the Site.
6. GeoSolutions, Inc. should be contacted prior to the design and construction of pavement sections at the Site in order to assist in the selection of an appropriate laterally-reinforcing biaxial geogrid product and to provide recommendations regarding the procedures for the installation of geogrid products at the Site.

7.7 Pavement Design

1. All pavement construction and materials used should conform to Sections 25, 26 and 39 of the latest edition of the State of California Department of Transportation Standard Specifications (State of California, 1999).

2. As indicated previously in Section 7.6, the top 12 inches of sub-grade soil under pavement sections should be compacted to a minimum relative density of 95 percent based on the ASTM D1557-12 test method at slightly above optimum moisture content. Aggregate bases and sub-bases should also be compacted to a minimum relative density of 95 percent based on the aforementioned test method.

3. A minimum of six inches of Class II Aggregate Base is recommended for all pavement sections. All pavement sections should be crowned for good drainage.

4. In order to minimize the potential for cracking of the pavement surfaces at the Site due to lateral movement of the base courses during expansive shrink-swell cycles of the sub-grade materials, GeoSolutions, Inc. recommends that a Type 2 laterally-reinforcing geotextile grid, such as Tensar BX1200, Syntec SBX12, ADS BX124GG, or equivalent, be installed between the prepared sub-grade and base materials at the Site.

5. GeoSolutions, Inc. should be contacted prior to the design and construction of the pavement sections to provide recommendations regarding the selection of and installation of an appropriate laterally-reinforcing biaxial geogrid product.

8.0 ADDITIONAL GEOTECHNICAL SERVICES

The recommendations contained in this report are based on a limited number of trenches and on the continuity of the sub-surface conditions encountered. GeoSolutions, Inc. assumes that it will be retained to provide additional services during future phases of the proposed project. These services would be provided by GeoSolutions, Inc. as required by the County of San Luis Obispo, the 2019 CBC, and/or industry standard practices. These services would be in addition to those included in this report and would include, but are not limited to, the following services:

1. Consultation during plan development.

2. Plan review of grading and foundation documents prior to construction and a report certifying that the reviewed plans are in conformance with our geotechnical recommendations.

3. Consultation during selection and placement of a laterally-reinforcing biaxial geogrid product.

4. Construction inspections and testing, as required, during all grading and excavating operations beginning with the stripping of vegetation at the Site, at which time a site meeting or pre-job meeting would be appropriate.

5. Special inspection services during construction of reinforced concrete, structural masonry, high strength bolting, epoxy embedment of threaded rods and reinforcing steel, and welding of structural steel.
6. Preparation of construction reports certifying that building pad preparation and foundation excavations are in conformance with our geotechnical recommendations.

7. Preparation of special inspection reports as required during construction.

8. In addition to the construction inspections listed above, section 1705.6 of the 2019 CBC (CBSC, 2019) requires the following inspections by the Soils Engineer for controlled fill thicknesses greater than 12 inches as shown in Table 6: Required Special Inspections and Tests of Soils:

<table>
<thead>
<tr>
<th>Verification and Inspection Task</th>
<th>Continuous During Task Listed</th>
<th>Periodically During Task Listed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Verify materials below footings are adequate to achieve the design bearing capacity.</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>2. Verify excavations are extended to proper depth and have reached proper material.</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>3. Perform classification and testing of controlled fill materials.</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of controlled fill.</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>5. Prior to placement of controlled fill, observe sub-grade and verify that site has been prepared properly.</td>
<td>-</td>
<td>X</td>
</tr>
</tbody>
</table>

9.0 LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The recommendations of this report are based upon the assumption that the soil conditions do not deviate from those disclosed during our study. Should any variations or undesirable conditions be encountered during the development of the Site, GeoSolutions, Inc. should be notified immediately and GeoSolutions, Inc. will provide supplemental recommendations as dictated by the field conditions.

2. This report is issued with the understanding that it is the responsibility of the owner or his/her representative to ensure that the information and recommendations contained herein are brought to the attention of the architect and engineer for the project, and incorporated into the project plans and specifications. The owner or his/her representative is responsible to ensure that the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

3. As of the present date, the findings of this report are valid for the property studied. With the passage of time, changes in the conditions of a property can occur whether they are due to natural processes or to the works of man on this or adjacent properties. Therefore, this report should not be relied upon after a period of 3 years without our review nor should it be used or is it applicable for any properties other than those studied. However many events such as floods, earthquakes, grading of the adjacent properties and building and municipal code changes could render sections of this report invalid in less than 3 years.
REFERENCES

American Concrete Institute (ACI). Building Code Requirements for Structural Concrete (318-08), Chapter 7, Section 7.5, Placing Reinforcement, ACI Committee 318, 2008.


APPENDIX A

Field Investigation

Soil Classification Chart

Trench Logs
FIELD INVESTIGATION

The field investigation was conducted May 6, 2021 using a backhoe. The surface and sub-surface conditions were studied by advancing three exploratory trenches. This exploration was conducted in accordance with presently accepted geotechnical engineering procedures consistent with the scope of the services authorized to GeoSolutions, Inc.

The mini excavator advanced three exploratory trenches near the approximate locations indicated on Figure 3: Field Investigation. The drilling and field observation were performed under the direction of the project engineer. A representative of GeoSolutions, Inc. maintained a log of the soil conditions and obtained soil samples suitable for laboratory testing. The soils were classified in accordance with the Unified Soil Classification System. See the Soil Classification Chart in this appendix.

Disturbed bulk samples are obtained from cuttings developed during trenching operations. The bulk samples are selected for classification and testing purposes and may represent a mixture of soils within the noted depths. Recovered samples are placed in transport containers and returned to the laboratory for further classification and testing.

Logs of the trenches showing the approximate depths and descriptions of the encountered soils, applicable geologic structures, and the results of laboratory tests are presented in this appendix. The logs represent the interpretation of field logs and field tests as well as the interpolation of soil conditions between samples. The results of laboratory observations and tests are also included in the trenching logs. The stratification lines recorded in the trenching logs represent the approximate boundaries between the surface soil types. However, the actual transition between soil types may be gradual or varied.
# Soil Classification Chart

<table>
<thead>
<tr>
<th>Major Divisions</th>
<th>Laboratory Classification Criteria</th>
<th>Group Symbols</th>
<th>Primary Divisions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gravels</strong></td>
<td>Clean gravel (less than 5% fines)</td>
<td>C4, greater than 4 and C2 between 1 and 3</td>
<td>GW</td>
</tr>
<tr>
<td></td>
<td>Not meeting both criteria for GW</td>
<td></td>
<td>GP</td>
</tr>
<tr>
<td></td>
<td>Gravel with fines (more than 12% fines)</td>
<td></td>
<td>GM</td>
</tr>
<tr>
<td></td>
<td>Atterberg limits plot below “A” line or plasticity index less than 4</td>
<td></td>
<td>GC</td>
</tr>
<tr>
<td></td>
<td>Atterberg limits plot below “A” line and plasticity index greater than 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sands</strong></td>
<td>Clean sand (less than 5% fines)</td>
<td>C4, greater than 6 and C2 between 1 and 3</td>
<td>SW</td>
</tr>
<tr>
<td></td>
<td>Not meeting both criteria for SW</td>
<td></td>
<td>SP</td>
</tr>
<tr>
<td></td>
<td>Sand with fines (more than 12% fines)</td>
<td></td>
<td>SM</td>
</tr>
<tr>
<td></td>
<td>Atterberg limits plot below “A” line or plasticity index less than 4</td>
<td></td>
<td>SC</td>
</tr>
<tr>
<td></td>
<td>Atterberg limits plot above “A” line and plasticity index greater than 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Silt and Clays</strong> (liquid limit less than 50)</td>
<td>Inorganic soil</td>
<td>PI &lt; 4 or plots below “A” line</td>
<td>ML</td>
</tr>
<tr>
<td><strong>Fine Grained Soils</strong> (50% or more passes No. 200 sieve)</td>
<td>Inorganic soil</td>
<td>PI &gt; 7 and plots on or above “A” line**</td>
<td>CL</td>
</tr>
<tr>
<td><strong>Silt and Clays</strong> (liquid limit 50 or more)</td>
<td>Organic Soil</td>
<td>LL (oven dried)/LL (not dried) &lt; 0.75</td>
<td>OL</td>
</tr>
<tr>
<td></td>
<td>Inorganic soil</td>
<td>Plots below “A” line</td>
<td>MH</td>
</tr>
<tr>
<td></td>
<td>Organic soil</td>
<td>Plots on or above “A” line</td>
<td>CI</td>
</tr>
<tr>
<td></td>
<td>Organic Soil</td>
<td>LL (oven dried)/LL (not dried) &lt; 0.75</td>
<td>OH</td>
</tr>
</tbody>
</table>

**Fine soils are those soil particles that pass the No. 200 sieve. For gravels and sands with between 5 and 12% fines, use of dual symbols is required (i.e., GW-GM, GW-GC, GP-GM, or GP-GC).**

**If the plasticity index is between 4 and 7 and it plots above the “A” line, then dual symbols (i.e., CL-ML) are required. If the “A” line, then dual symbols (i.e., CL-ML) are required.**

<table>
<thead>
<tr>
<th>Consistency</th>
<th>Strength Tons/Sp. Ft. **</th>
<th>Blows/foot</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Very Soft</strong></td>
<td>0.1 - 1.2</td>
<td>0 - 3</td>
<td></td>
</tr>
<tr>
<td><strong>Soft</strong></td>
<td>1/2 - 1</td>
<td>3 - 6</td>
<td></td>
</tr>
<tr>
<td><strong>Firm</strong></td>
<td>1 - 2</td>
<td>6 - 16</td>
<td></td>
</tr>
<tr>
<td><strong>Stiff</strong></td>
<td>2 - 4</td>
<td>16 - 32</td>
<td></td>
</tr>
<tr>
<td><strong>Very Stiff</strong></td>
<td>Over 4</td>
<td>Over 32</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Relative Density</th>
<th>Sands, Gravels and Non-Plastic Silts</th>
<th>Blows/foot</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Very Loose</strong></td>
<td>0 - 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Loose</strong></td>
<td>4 - 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Medium Dense</strong></td>
<td>10 - 30</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dense</strong></td>
<td>30 - 50</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Very Dense</strong></td>
<td>Over 50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

+ Number of blows of a 140-pound hammer falling 30-inches to drive a 2-inch O.D. (3/8-inch I.D.) split spade (ASTM D1556).
++ Unconfined compressive strength in tons/sq.ft., as determined by laboratory testing or approximated by the standard penetration test (ASTM D1556), pocket penetrometer, torque, or visual observation.

## Soil Classification Based on Percentage of Finer

- Less than 5%, Pass N. 200 (75mm sieve)
- More than 12% Pass N. 200 (75 mm) sieve

<table>
<thead>
<tr>
<th>Classification</th>
<th>Group Symbols</th>
<th>Primary Divisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 5%</td>
<td>GW</td>
<td>Well-graded gravels and gravel-sand mixtures, little or no fines</td>
</tr>
<tr>
<td>More than 12%</td>
<td>GP</td>
<td>Poorly graded gravels and gravel-sand mixtures, little or no fines</td>
</tr>
</tbody>
</table>

### Drilling Notes:
1. Sampling and blow counts
   a. California Modified — number of blows per foot of a 140 pound hammer falling 30 inches
   b. Standard Penetration Test — number of blows per 12 inches of a 140 pound hammer falling 30 inches

### Types of Samples:
- X — Sample
- SPT — Standard Penetration
- CA — California Modified
- N — Nuclear Gauge
- PO — Pocket Penetrometer (tons/sq. ft.)
TRENCHING LOGS

PASO ROBLES AREA, SAN LUIS OBISPO COUNTY, CALIFORNIA

T-1
TD@6.0 FT.

FILL
dark olive brown sandy elastic SILT, with cobbles, dry to slightly moist
MONTEREY FORMATION (Tml)
light brown shale, highly fractured, thinly bedded, moderately hard, moderately weathered, dry

T-2
TD@5.0 FT.

FILL
dark olive brown sandy elastic SILT, with cobbles, dry to slightly moist
MONTEREY FORMATION (Tml)
light brown shale, highly fractured, thinly bedded, moderately hard, moderately weathered

T-3
TD@5.0 FT.

FILL
dark olive brown sandy elastic SILT, with cobbles, dry to slightly moist
MONTEREY FORMATION (Tml)
light brown shale, highly fractured, thinly bedded, moderately hard, moderately weathered

NO SCALE
APPENDIX B

Laboratory Testing

Soil Test Reports
LABORATORY TESTING

This appendix includes a discussion of the test procedures and the laboratory test results performed as part of this investigation. The purpose of the laboratory testing is to assess the engineering properties of the soil materials at the Site. The laboratory tests are performed using the currently accepted test methods, when applicable, of the American Society for Testing and Materials (ASTM).

Undisturbed and disturbed bulk samples used in the laboratory tests are obtained from various locations during the course of the field exploration, as discussed in Appendix A of this report. Each sample is identified by sample letter and depth. The Unified Soils Classification System is used to classify soils according to their engineering properties. The various laboratory tests performed are described below:

Expansion Index of Soils (ASTM D4829) is conducted in accordance with the ASTM test method and the California Building Code Standard, and are performed on representative bulk and undisturbed soil samples. The purpose of this test is to evaluate expansion potential of the site soils due to fluctuations in moisture content. The sample specimens are placed in a consolidometer, surcharged under a 144-psf vertical confining pressure, and then inundated with water. The amount of expansion is recorded over a 24-hour period with a dial indicator. The expansion index is calculated by determining the difference between final and initial height of the specimen divided by the initial height.

Laboratory Compaction Characteristics of Soil Using Modified Effort (ASTM D1557) is performed to determine the relationship between the moisture content and density of soils and soil-aggregate mixtures when compacted in a standard size mold with a 10-lbf hammer from a height of 18 inches. The test is performed on a representative bulk sample of bearing soil near the estimated footing depth. The procedure is repeated on the same soil sample at various moisture contents sufficient to establish a relationship between the maximum dry unit weight and the optimum water content for the soil. The data, when plotted, represents a curvilinear relationship known as the moisture density relations curve. The values of optimum water content and modified maximum dry unit weight can be determined from the plotted curve.

Liquid Limit, Plastic Limit, and Plasticity Index of Soils (ASTM D4318) are the water contents at certain limiting or critical stages in cohesive soil behavior. The liquid limit (LL or W_L) is the lower limit of viscous flow, the plastic limit (PL or W_P) is the lower limit of the plastic stage of clay and plastic index (PI or I_P) is a range of water content where the soil is plastic. The Atterberg Limits are performed on samples that have been screened to remove any material retained on a No. 40 sieve. The liquid limit is determined by performing trials in which a portion of the sample is spread in a brass cup, divided in two by a grooving tool, and then allowed to flow together from the shocks caused by repeatedly dropping the cup in a standard mechanical device. To determine the Plastic Limit a small portion of plastic soil is alternately pressed together and rolled into a 1/8-inch diameter thread. This process is continued until the water content of the sample is reduced to a point at which the thread crumbles and can no longer be pressed together and re-rolled. The water content of the soil at this point is reported as the plastic limit. The plasticity index is calculated as the difference between the liquid limit and the plastic limit.

Particle Size Analysis of Soils (ASTM D422) is used to determine the particle-size distribution of fine and coarse aggregates. In the test method the sample is separated through a series of sieves of progressively smaller openings for determination of particle size distribution. The total percentage passing each sieve is reported and used to determine the distribution of fine and coarse aggregates in the sample.
### LABORATORY SUMMARY REPORT SHEET

**Project:** 5100 Peachy Canyon Road  
**Client:** Doug and Judy Anderson  
**Job #:** SL12244-1  
**Lab #:** 11283  
**Date:** 6/1/21  
**Checked By:** AE

<table>
<thead>
<tr>
<th>Boring Hole</th>
<th>Depth (ft)</th>
<th>Sample No.</th>
<th>Material Description</th>
<th>USCS Specifications</th>
<th>Dry Density (pcf)</th>
<th>Moisture Content (%)</th>
<th>% Fines</th>
<th>Atterberg Limits</th>
<th>Compaction Test</th>
<th>Direct Shear</th>
<th>Compressive Strength</th>
<th>Expansion Index</th>
<th>R-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-1</td>
<td>1'</td>
<td>A</td>
<td>Dark Olive Brown Sandy Elastic SILT</td>
<td>MH</td>
<td>66.3</td>
<td>61</td>
<td>26</td>
<td>86.5</td>
<td>27.8</td>
<td>23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-1</td>
<td>4'</td>
<td>B</td>
<td>Pale Brown Elastic SILT</td>
<td>MH</td>
<td>63</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
LEGEND

<table>
<thead>
<tr>
<th>symbol</th>
<th>location</th>
<th>depth</th>
<th>CLASSIFICATION</th>
<th>Liquid Limit (LL)</th>
<th>Plastic Limit (PL)</th>
<th>Plasticity Index (PI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>⚫️</td>
<td>T-1</td>
<td>1'</td>
<td>Dark Olive Brown Sandy Elastic SILT</td>
<td>61</td>
<td>35</td>
<td>26</td>
</tr>
<tr>
<td>▲</td>
<td>T-1</td>
<td>4'</td>
<td>Pale Brown Elastic SILT</td>
<td>63</td>
<td>47</td>
<td>16</td>
</tr>
</tbody>
</table>

PLASTICITY CHART
For classification of fine-grained soils and fine fraction of coarse-grained soils *

*Atterberg Limits - plotting between dotted lines are borderline classifications requiring CL-ML, ML or OL, MH or OH

Remarks:
Testing was performed in accordance with ASTM D4318

NP - material tested is nonplastic (liquid or plastic limit tests could not be performed)

Report By: Aaron Eichman
**PLASTICITY (FINER FRACTION)**

<table>
<thead>
<tr>
<th>Symbol Location Depth</th>
<th>Liquid Limit (LL)</th>
<th>Plastic Limit (PL)</th>
<th>Plasticity Index (PI)</th>
<th>Expansion Index (EI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-1 1'</td>
<td>61</td>
<td>35</td>
<td>26</td>
<td>23</td>
</tr>
</tbody>
</table>

**SAMPLE DESCRIPTION**

Dark Olive Brown Sandy Elastic Silt

**LEGEND**

- **symbol**
- **location**
- **depth**

<table>
<thead>
<tr>
<th>Symbol Location Depth</th>
<th>D$_{100}$</th>
<th>D$_{60}$</th>
<th>D$_{30}$</th>
<th>D$_{10}$</th>
<th>Cu</th>
<th>Cc</th>
<th>% Gravel</th>
<th>% Sand</th>
<th>% Passing No. 200</th>
<th>% Silt</th>
<th>% Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-1 1'</td>
<td>#N/A</td>
<td>0.068</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>13.0</td>
<td>20.7</td>
<td>66.3</td>
<td>NM</td>
<td>NA</td>
</tr>
</tbody>
</table>

**LEGEND**

- **symbol**
- **location**
- **depth**

Remarks: Testing was performed in accordance with ASTM D422 and D4318 (where applicable)

NP - non-plastic
NA - not available (could not be calculated from data)

D$_{100}$ - grain size diameter corresponding to 100% passing (mm)
D$_{60}$ - grain size diameter corresponding to 60% passing (mm)
D$_{30}$ - grain size diameter corresponding to 30% passing (mm)
D$_{10}$ - grain size diameter corresponding to 30% passing (mm)

C$_c$ - coefficient of curvature: C$_c$ = (D$_{30}$)$^2$ / (D$_{60}$D$_{10}$)
Cu - coefficient of uniformity: C$_u$ = D$_{60}$ / D$_{10}$
**LAB COMPACATION REPORT**

**ASTM D1557**

**Project:** 5100 Peachy Canyon Road  
**Client:** Doug and Judy Anderson  
**Sample:** A  
**Depth:** 1.0 Foot  
**Lab #:** 11283  
**Source:** T-1  
**Sample Date:** May 6, 2021  
**Material:** Dark Olive Brown Sandy Elastic SILT  
**Sampled By:** JP  

**Laboratory Test Results**

<table>
<thead>
<tr>
<th>Trial #</th>
<th>Water Content, %</th>
<th>Dry Density,pcf</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24.0</td>
<td>85.6</td>
</tr>
<tr>
<td>2</td>
<td>27.6</td>
<td>86.5</td>
</tr>
<tr>
<td>3</td>
<td>30.1</td>
<td>86.0</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MAXIMUM DRY DENSITY, pcf:** 86.5  
**OPTIMUM MOISTURE, %:** 27.8

**Report By:** Aaron Eichman
APPENDIX C

Seismic Hazard Analysis

Design Map Summary (SEAOC, 2019)
According to section 1613 of the 2019 CBC (CBSC, 2019), all structures and portions of structures should be designed to resist the effects of seismic loadings caused by earthquake ground motions in accordance with the ASCE 7: Minimum Design Loads for Buildings and Other Structures, hereafter referred to as ASCE7-16 (ASCE, 2016). Estimating the design ground motions at the Site depends on many factors including the distance from the Site to known active faults; the expected magnitude and rate of recurrence of seismic events produced on such faults; the source-to-site ground motion attenuation characteristics; and the Site soil profile characteristics. As per section 1613.2.2 of the 2019 CBC, the Site soil profile classification is determined by the average soil properties in the upper 100 feet of the Site profile and can be determined based on the criteria provided in Table 20.3-1 of ASCE7-16.

ASCE7-16 provides recommendations for estimating site-specific ground motion parameters for seismic design considering a Risk-targeted Maximum Considered Earthquake (MCE_R) in order to determine design spectral response accelerations and a Maximum Considered Earthquake Geometric Mean (MCE_G) in order to determine probabilistic geometric mean peak ground accelerations.

Spectral accelerations from the MCE_R are based on a 5% damped acceleration response spectrum and a 1% probability of exceedance in 50 years. Maximum short period (S_s) and 1-second period (S_1) spectral accelerations are interpolated from the MCE_R-based ground motion parameter maps for bedrock, provided in ASCE7-16. These spectral accelerations are then multiplied by site-specific coefficients (F_s, F_v), based on the Site soil profile classification and the maximum spectral accelerations determined for bedrock, to yield the maximum short period (S_MS) and 1-second period (S_M1) spectral response accelerations at the Site. According to section 11 of ASCE7-16 and section 1613 of the 2019 CBC, buildings and structures should be specifically proportioned to resist design earthquake ground motions. Section 1613.2.4 of the 2019 CBC indicates the site-specific design spectral response accelerations for short (S_DS) and 1-second (S_D1) periods can be taken as two-thirds of maximum (S_DS = 2/3*S_MS and S_D1 = 2/3*S_M1).

Per ASCE7-16, Section 21.5, the probabilistic maximum mean peak ground acceleration (PGA) corresponding to the MCE_G can be computed assuming a 2% probability of exceedance in 50 years (2475-year return period) and is initially determined from mapped ground accelerations for bedrock conditions. The site-specific peak ground acceleration (PGA_M) is then determined by multiplying the PGA by the site-specific coefficient F_h (where F_h is a function of Site Class and PGA).

Spectral response accelerations and peak ground accelerations, provided in this report were obtained using the computer-based Seismic Design Maps tool available from the Structural Engineers Association of California (SEAOC, 2019). This program utilizes the methods developed in ASCE 7-16 in conjunction with user-inputted Site location to calculate seismic design parameters and response spectra (both for period and displacement) for soil profile Site Classes A through E.
<table>
<thead>
<tr>
<th>Type</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ss</td>
<td>1.067</td>
<td>MCE&lt;sub&gt;R&lt;/sub&gt; ground motion. (for 0.2 second period)</td>
</tr>
<tr>
<td>S1</td>
<td>0.39</td>
<td>MCE&lt;sub&gt;R&lt;/sub&gt; ground motion. (for 1.0s period)</td>
</tr>
<tr>
<td>SM</td>
<td>1.28</td>
<td>Site-modified spectral acceleration value</td>
</tr>
<tr>
<td>SM1</td>
<td>0.565</td>
<td>Site-modified spectral acceleration value</td>
</tr>
<tr>
<td>S1DS</td>
<td>0.854</td>
<td>Numeric seismic design value at 0.2 second SA</td>
</tr>
<tr>
<td>SD1</td>
<td>0.39</td>
<td>Numeric seismic design value at 1.0 second SA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDC</td>
<td>D</td>
<td>Seismic design category</td>
</tr>
<tr>
<td>Fa</td>
<td>1.2</td>
<td>Site amplification factor at 0.2 second</td>
</tr>
<tr>
<td>Fv</td>
<td>1.5</td>
<td>Site amplification factor at 1.0 second</td>
</tr>
<tr>
<td>PGA</td>
<td>0.46</td>
<td>MCE&lt;sub&gt;G&lt;/sub&gt; peak ground acceleration</td>
</tr>
<tr>
<td>FPG</td>
<td>1.2</td>
<td>Site amplification factor at PGA</td>
</tr>
<tr>
<td>PGA&lt;sub&gt;M&lt;/sub&gt;</td>
<td>0.551</td>
<td>Site modified peak ground acceleration</td>
</tr>
<tr>
<td>TL</td>
<td>12</td>
<td>Long-period transition period in seconds</td>
</tr>
<tr>
<td>SsRT</td>
<td>1.067</td>
<td>Probabilistic risk-targeted ground motion. (0.2 second)</td>
</tr>
<tr>
<td>SsUH</td>
<td>1.148</td>
<td>Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration</td>
</tr>
<tr>
<td>SsD</td>
<td>1.661</td>
<td>Factored deterministic acceleration value. (0.2 second)</td>
</tr>
<tr>
<td>S1RT</td>
<td>0.39</td>
<td>Probabilistic risk-targeted ground motion. (1.0 second)</td>
</tr>
<tr>
<td>S1UH</td>
<td>0.428</td>
<td>Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration</td>
</tr>
<tr>
<td>S1D</td>
<td>0.6</td>
<td>Factored deterministic acceleration value. (1.0 second)</td>
</tr>
<tr>
<td>PGA&lt;sub&gt;d&lt;/sub&gt;</td>
<td>0.688</td>
<td>Factored deterministic acceleration value. (Peak Ground Acceleration)</td>
</tr>
<tr>
<td>CRS</td>
<td>0.929</td>
<td>Mapped value of the risk coefficient at short periods</td>
</tr>
<tr>
<td>CR1</td>
<td>0.911</td>
<td>Mapped value of the risk coefficient at a period of 1 s</td>
</tr>
</tbody>
</table>
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APPENDIX D

Preliminary Grading Specifications

Key and Bench with Backdrain
PRELIMINARY GRADING SPECIFICATIONS

A. General

1. These preliminary specifications have been prepared for the subject site; GeoSolutions, Inc. should be consulted prior to the commencement of site work associated with site development to ensure compliance with these specifications.

2. GeoSolutions, Inc. should be notified at least 72 hours prior to site clearing or grading operations on the property in order to observe the stripping of surface materials and to coordinate the work with the grading contractor in the field.

3. These grading specifications may be modified and/or superseded by recommendations contained in the text of this report and/or subsequent reports.

4. If disputes arise out of the interpretation of these grading specifications, the Soils Engineer shall provide the governing interpretation.

B. Obligation of Parties

1. The Soils Engineer should provide observation and testing services and should make evaluations to advise the client on geotechnical matters. The Soils Engineer should report the findings and recommendations to the client or the authorized representative.

2. The client should be chiefly responsible for all aspects of the project. The client or authorized representative has the responsibility of reviewing the findings and recommendations of the Soils Engineer. During grading the client or the authorized representative should remain on-site or should remain reasonably accessible to all concerned parties in order to make decisions necessary to maintain the flow of the project.

3. The contractor is responsible for the safety of the project and satisfactory completion of all grading and other operations on construction projects, including, but not limited to, earthwork in accordance with project plans, specifications, and controlling agency requirements.

C. Site Preparation

1. The client, prior to any site preparation or grading, should arrange and attend a meeting which includes the grading contractor, the design Structural Engineer, the Soils Engineer, representatives of the local building department, as well as any other concerned parties. All parties should be given at least 72 hours' notice.

2. All surface and sub-surface deleterious materials should be removed from the proposed building and pavement areas and disposed of off-site or as approved by the Soils Engineer. This includes, but is not limited to, any debris, organic materials, construction spoils, buried utility line, septic systems, building materials, and any other surface and subsurface structures within the proposed building areas. Trees designated for removal on the construction plans should be removed and their primary root systems grubbed under the observations of a representative of GeoSolutions, Inc. Voids left from site clearing should be cleaned and backfilled as recommended for structural fill.

3. Once the Site has been cleared, the exposed ground surface should be stripped to remove surface vegetation and organic soil. A representative of GeoSolutions, Inc. should determine the required depth of stripping at the time of work being completed. Strippings may either be disposed of off-site or stockpiled for future use in landscape areas, if approved by the landscape architect.
D. Site Protection

1. Protection of the Site during the period of grading and construction should be the responsibility of the contractor.

2. The contractor should be responsible for the stability of all temporary excavations.

3. During periods of rainfall, plastic sheeting should be kept reasonably accessible to prevent unprotected slopes from becoming saturated. Where necessary during periods of rainfall, the contractor should install check-dams, de-silting basins, sand bags, or other devices or methods necessary to control erosion and provide safe conditions.

E. Excavations

1. Materials that are unsuitable should be excavated under the observation and recommendations of the Soils Engineer. Unsuitable materials include, but may not be limited to: 1) dry, loose, soft, wet, organic, or compressible natural soils; 2) fractured, weathered, or soft bedrock; 3) non-engineered fill; 4) other deleterious materials; and 5) materials identified by the Soils Engineer or Engineering Geologist.

2. Unless otherwise recommended by the Soils Engineer and approved by the local building official, permanent cut slopes should not be steeper than 2:1 (horizontal to vertical). Final slope configurations should conform to section 1804 of the 2019 California Building Code unless specifically modified by the Soil Engineer/Engineering Geologist.

3. The Soil Engineer/Engineer Geologist should review cut slopes during excavations. The contractor should notify the Soils Engineer/Engineer Geologist prior to beginning slope excavations.

F. Structural Fill

1. Structural fill should not contain rocks larger than 3 inches in greatest dimension, and should have no more than 15 percent larger than 2.5 inches in greatest dimension.

2. Imported fill should be free of organic and other deleterious material and should have very low expansion potential, with a plasticity index of 12 or less. Before delivery to the Site, a sample of the proposed import should be tested in our laboratory to determine its suitability for use as structural fill.

G. Compacted Fill

1. Structural fill using approved import or native should be placed in horizontal layers, each approximately 8 inches in thickness before compaction. On-site inorganic soil or approved imported fill should be conditioned with water to produce a soil water content near optimum moisture and compacted to a minimum relative density of 90 percent based on ASTM D1557-12e1.

2. Fill slopes should not be constructed at gradients greater than 2-to-1 (horizontal to vertical). The contractor should notify the Soils Engineer/Engineer Geologist prior to beginning slope excavations.

3. If fill areas are constructed on slopes greater than 10-to-1 (horizontal to vertical), we recommend that benches be cut every 4 feet as fill is placed. Each bench shall be a minimum of 10 feet wide with a minimum of 2 percent gradient into the slope.
4. If fill areas are constructed on slopes greater than 5-to-1, we recommend that the toe of all areas to receive fill be keyed a minimum of 24 inches into underlying dense material. Key depths are to be observed and approved by a representative of GeoSolutions, Inc. Sub-drains shall be placed in the keyway and benches as required.

H. Drainage

1. During grading, a representative of GeoSolutions, Inc. should evaluate the need for a sub-drain or back-drain system. Areas of observed seepage should be provided with sub-surface drains to release the hydrostatic pressures. Sub-surface drainage facilities may include gravel blankets, rock filled trenches or Multi-Flow systems or equal. The drain system should discharge in a non-erosive manner into an approved drainage area.

2. All final grades should be provided with a positive drainage gradient away from foundations. Final grades should provide for rapid removal of surface water runoff. Ponding of water should not be allowed on building pads or adjacent to foundations. Final grading should be the responsibility of the contractor, general Civil Engineer, or architect.

3. Concentrated surface water runoff within or immediately adjacent to the Site should be conveyed in pipes or in lined channels to discharge areas that are relatively level or that are adequately protected against erosion.

4. Water from roof downspouts should be conveyed in solid pipes that discharge in controlled drainage localities. Surface drainage gradients should be planned to prevent ponding and promote drainage of surface water away from building foundations, edges of pavements and sidewalks. For soil areas we recommend that a minimum of 2 percent gradient be maintained.

5. Attention should be paid by the contractor to erosion protection of soil surfaces adjacent to the edges of roads, curbs and sidewalks, and in other areas where hard edges of structures may cause concentrated flow of surface water runoff. Erosion resistant matting such as Miramat, or other similar products, may be considered for lining drainage channels.

6. Sub-drains should be placed in established drainage courses and potential seepage areas. The location of sub-drains should be determined after a review of the grading plan. The sub-drain outlets should extend into suitable facilities or connect to the proposed storm drain system or existing drainage control facilities. The outlet pipe should consist of a non-perforated pipe the same diameter as the perforated pipe.

I. Maintenance

1. Maintenance of slopes is important to their long-term performance. Precautions that can be taken include planting with appropriate drought-resistant vegetation as recommended by a landscape architect, and not over-irrigating, a primary source of surficial failures.

2. Property owners should be made aware that over-watering of slopes is detrimental to long term stability of slopes.

J. Underground Facilities Construction

1. The attention of contractors, particularly the underground contractors, should be drawn to the State of California Construction Safety Orders for “Excavations, Trenches, Earthwork.” Trenches or excavations greater than 5 feet in depth should be shored or sloped back in accordance with OSHA Regulations prior to entry.
2. Bedding is defined as material placed in a trench up to 1 foot above a utility pipe and backfill is all material placed in the trench above the bedding. Unless concrete bedding is required around utility pipes, free-draining sand should be used as bedding. Sand to be used as bedding should be tested in our laboratory to verify its suitability and to measure its compaction characteristics. Sand bedding should be compacted by mechanical means to achieve at least 90 percent relative density based on ASTM D1557-12e1.

3. On-site inorganic soils, or approved import, may be used as utility trench backfill. Proper compaction of trench backfill will be necessary under and adjacent to structural fill, building foundations, concrete slabs, and vehicle pavements. In these areas, backfill should be conditioned with water (or allowed to dry), to produce a soil water content of about 2 to 3 percent above the optimum value and placed in horizontal layers, each not exceeding 8 inches in thickness before compaction. Each layer should be compacted to at least 90 percent relative density based on ASTM D1557-12e1. The top lift of trench backfill under vehicle pavements should be compacted to the requirements given in report under Preparation of Paved Areas for vehicle pavement sub-grades. Trench walls must be kept moist prior to and during backfill placement.

K. Completion of Work

1. After the completion of work, a report should be prepared by the Soils Engineer retained to provide such services. The report should including locations and elevations of field density tests, summaries of field and laboratory tests, other substantiating data, and comments on any changes made during grading and their effect on the recommendations made in the approved Soils Engineering Report.

2. Soils Engineers shall submit a statement that, to the best of their knowledge, the work within their area of responsibilities is in accordance with the approved soils engineering report and applicable provisions within Chapter 18 of the 2019 CBC.
FILL OVER SLOPE

RECONTOUR, SLOPE TO DRAIN OR PROVIDE PAVED DRAINAGE SWALES AND DOWN DRAINS

NATURAL SLOPE

* 2 FT. MIN. KEY DEPTH AT TOE. TIP KEY 1 FT. NOMINAL OR 4% INTO SLOPE

2 FT. MIN.

10 FT. MIN.

FILL SLOPE

REMOVE UNSUITABLE MATERIAL

SEE DRAIN DETAIL BELOW

BENCH: VERTICAL 4 FT. MINIMUM HORIZONTAL 6 FT. MINIMUM

NOTES:

*BACKDRAIN AS RECOMMENDED BY GEOFORICAL PER DETAIL.

DRAIN DETAIL

CLEAN, OPEN-GRADED ROCK, 3/8, 1/2, 3/4 OR 1-INCH; 3 FT./FT. MINIMUM

2 FEET MINIMUM

GEOFABRIC: MIRafi 140N OR EQUIVALENT; 1 FT. MINIMUM OVERLAP

2 FEET NOMINAL

GeoSolutions, Inc.
220 High Street
San Luis Obispo, CA 93401
(805) 543-8539 Fax: (805) 543-2171

KEY AND BENCH WITH BACKDRAIN

DETAIL A
PRO vision 3: Street and Area Stabilization

1. THE STRAW BALES SHALL BE PLACED ON AN AREA STABILIZED WITH CRUSHED STONE ENDING TIGHTLY ABUTTING. USE STRAW, ROCKS, AND FILTER FABRIC THROUGH BALE. WOODEN STAKES ARE MOUNTED TO YARD EQUIPMENT WITH A FEW FEET OF COMPRESSED FILL TO ATTACH CENTRE FILTER FABRIC FOR EASIER INSTALLATION. BUS, OR MOUNTAIN, OR MEMBER OF THE AREA THAT WILL NOT CONTRIBUTE SEDIMENT TO THE NEARLY ABUTTING AREA.

2. THE ENTRANCE SHALL BE MAINTAINED IN A 50' MIN WIDTH. NOT MORE THAN 6" THICK AGGREGATE SUPPLY WATER TO WASH THROUGH BALE. WOODEN STAKES ARE MOUNTED TO YARD EQUIPMENT WITH A FEW FEET OF COMPRESSED FILL TO ATTACH CENTRE FILTER FABRIC FOR EASIER INSTALLATION. BUS, OR MOUNTAIN, OR MEMBER OF THE AREA THAT WILL NOT CONTRIBUTE SEDIMENT TO THE NEARLY ABUTTING AREA.

3. Perform classification and testing of compacted fill soil. Observation & Testing Program.

4. Wet weather erosion control measures/devices shall be available, included in the plans with additional measures/devices noted from the Observation & Testing Program.

5. Prior to placement of compacted fill, observe where GRADE EXCEEDS 2%.

6. In the event of failure and/or lack of performance by the owner and/or his representative, the Owner shall determine that proper materials and procedures are used in accordance with Section 1705 for submittal by the permit application (see Section 1705.1 General). A locally based standby crew for emergency work shall be available, and public water system intake points from contamination.

7. The Owner shall be responsible for maintaining self-regulation of these requirements. Erosion control measures shall be to keep all generated sediments from entering a swale, drainage way, watercourse, atmosphere, or migrate onto adjacent properties or onto the public right-of-way.

8. Site inspections and appropriate maintenance of all erosion control measures/devices when water is anticipated.

9. Trees, trees that are not in place or have failed to provide erosion control.

10. All utility companies shall be notified prior to start of construction activities to ensure minimum interference with public water system intake points from contamination.

11. SEPTIC TANK CAPACITY SHALL BE AT LEAST 1500 GALLON. A SEPTIC TANK DETAIL.

12. SEPTIC SYSTEM SETBACKS.

13. SEPTIC SYSTEM DESIGN AND NOTES.

14. SEPTIC SYSTEM STANDARDS Trenching and Grading - Roadway Construction.

15. ALL UTILITIES SHALL BE LOCATED PRIOR TO START OF CONSTRUCTION BY THE CONTRACTOR BY CALLING 811.